



June 12, 2020

The Rewilding Institute (TRI) and Project Coyote (PC) appreciate the opportunity to comment on the following action by the U.S. Fish and Wildlife Service (FWS):

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R2–ES–2020–0007; FXES111302WOLF0-201-FF02ENEH00]

RIN 1018–BE52

Endangered and Threatened Wildlife and Plants; Revision to the Nonessential Experimental Population of the Mexican Wolf (*Canis lupus baileyi*); Environmental Impact Statement

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of intent to prepare a supplement to an environmental impact statement.

These comments have been prepared by TRI’s Carnivore Conservation Biologist and PC’s Science Advisor, David R. Parsons. Mr. Parsons, who holds B.S. and M.S. degrees in Wildlife Biology, was a career wildlife biologist with the U.S. Fish and Wildlife Service (FWS) for 24 years and served as the FWS’s first Mexican Wolf Recovery Coordinator from 1990-1999. He was the primary author of the original rule (1998) that established a *Nonessential Experimental Population of the Mexican gray wolf in Arizona and New Mexico*. Mr. Parsons has continued to follow the progress of the Mexican wolf recovery program to the present day.

TRI and PC have consistently supported full recovery of Mexican gray wolves throughout suitable habitats in US Southwest and Mexico. And we have consistently opposed proposals to weakening Mexican wolf recovery efforts and reduce their chance of recovery and long-term survival. We provided substantial science-based comments at every stage of the development of the 2015 Section 10(j) rule and the 2017 Mexican Wolf Recovery Plan, First Revision. We view this opportunity to greatly improve protections and recovery prospects for this still critically endangered gray wolf subspecies as pivotal in the in the 40+ year history of Mexican wolf recovery efforts. We fear that if the FWS doesn’t seize this opportunity to significantly improve recovery

prospects for the Lobos of the Southwest, they will be doomed to a path toward eventual extinction.

This situation is unique in that the proposed revisions to the 2015 ESA Section 10(j) rule for the wild population of Mexican gray wolves¹ are in response to litigation² resulting in a court ordered remedy (herein referred to as the Court Order or Order)³. The Order requires the FWS to remedy “deficiencies” that the Court identified in the current 2015 Section 10 (j) rule for the wild population of Mexican gray wolves in the US Southwest.⁴

Before we offer our specific comments, we take issue with the FWS’s identification and interpretation of deficiencies identified in the Court Order, which require remedies in the revised Section 10(j) rule.

A pre-decisional mistake replicated throughout the scoping notice (Notice of Intent) is the frequent mention of the FWS’s intent to link the revised Section 10(j) rule to the Mexican Wolf Recovery Plan, First Revision (USFWS 2017) as the FWS’s “roadmap for the long-term conservation and recovery of the Mexican wolf.” The Court Order specifically separates the requirement under ESA Section 10(j) for furthering recovery solely through enforceable provisions of the revised Section 10(j) rule from any non-binding recovery aspirations contained in the 2017 recovery plan. Below are specific excerpts from the Order that are relevant to this requirement:

- ✓ *The Court concludes that the substance or terms of future recovery actions, do not relieve FWS of its obligations under Section 10(j). Moreover, the provisions of a recovery plan are discretionary, not mandatory. (Order at 29:21-23.)*
- ✓ *Recovery plans do not govern all aspects of recovery under the ESA, but rather are non-binding statements of intention with regards to the agency’s long-term goal of conservation. (Order at Footnote 14)*
- ✓ *Thus, even if the recovery plan contained all terms promised by Defendants here, there is no guarantee that those terms will protect against the harms that the Court finds presented by 10(j) rule. (Order at 29:23-25.)*
- ✓ *Nor does the significant “management flexibility” afforded to the agency under Section 10(j) justify the failure to further the long-term recovery of the Mexican gray wolf. (Order at 30:11-13)*
- ✓ *The rule as a whole fails to further recovery: FWS did not create a population in the 2015 rule that would be protected against the loss of genetic diversity, and there are no other viable populations to cushion the subspecies from the long-term harm that is predicted to result under the 2015 rule. (Order at 32:5-8.)*

¹ Endangered and Threatened Wildlife and Plants; Revision to the Regulations for the Nonessential Experimental Population of the Mexican Wolf, 80 Fed. Reg. 2512-2567 (Jan. 16, 2015).

² *Center for Biological Diversity v. Zinke*, No. CV-15-00019-TUC-JGZ (D. Ariz., filed Jan. 16, 2015)

³ *Center for Biological Diversity v. Jewell*, No. CV-16-00094-TUC-JGZ, 2018 WL 1586651 (D. Ariz. Mar. 31, 2018)

⁴ Order at 43:26-28, 44:1-2.

The Order is clear and repeatedly asserts that the revised Section 10(j) rule must contain provisions based on the best available science that lead to the conservation and recovery of Mexican gray wolves, independent of the provisions of any non-binding, discretionary future plans for achieving recovery, such as the 2017 revised recovery plan. Especially germane to this case is the fact that the most recently revised recovery plan (USFWS 2017) delegates significant and necessary recovery requirements to a foreign country (Mexico) over which the FWS has no regulatory jurisdiction. Simply referencing a hopeful, non-binding recovery plan in the revised rule as the means by which shortfalls to achieving full recovery will be achieved is not acceptable to the Court or to the conservation community. The revised rule is the only legally enforceable means for ensuring the eventual recovery of Mexican gray wolves, and it is only legally enforceable in the United States.

On pages 5-6 of the Notice of Intent the FWS states the following:

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, which provides an overarching strategy for the long-term conservation and recovery of the Mexican wolf.

This overarching premise for the FWS's proposed revisions to the 10(j) rule flies in the face of the Judge's findings and Order, and almost certainly assures that proposed revisions to the flawed 2015 10(j) rule will not achieve the remedies imposed by the Court. It invites future litigation. Additionally, the 2017 recovery plan adopts the population that would result from implementation of the 2015 rule as the United States' contribution to recovery of Mexican wolves. The recovery plan found no need to revise the 2015 rule including the population cap of 325 wolves in the US and the prohibition of Mexican wolves dispersing to or occupying suitable habitats north of Interstate 40. The Court's finding that the 2015 Section 10(j) rule failed to use the best available science, and fails to further the conservation of the Mexican wolf, by logical extension, renders the 2017 recovery plan unscientific and insufficient for achieving its recovery under the ESA.

Thus the FWS's announced intent to align the new revised rule with the 2017 recovery plan is a misguided, pre-decisional proclamation that flies in the face of the Court Order, The Administrative Procedures Act, the National Environmental Policy Act, the ESA requirement for use of best science, and the Section 10 (j) requirement to further the conservation of the species.

The proper sequencing here would be to revise the 2015 rule in a way that addresses all the deficiencies identified in the Court Order, then revise the 2017 recovery plan accordingly. Shoehorning the revised rule to somehow fit into the scientifically flawed recovery plan is a recipe for landing FWS back in court once again.

Item 2 of the "narrow range of topics" further asserts the FWS's intent to link the revised rule to the 2017 recovery plan:

(2) We intend to align the population objective and release recommendations in the new revised rule with the recovery criteria in the revised recovery plan for the MWEPA [Mexican Wolf Experimental Area] to ensure the new revised rule supports the long-term conservation and recovery of the Mexican wolf. We are interested in feedback from the public and our partners on any information or data available since we finalized the revised recovery plan in 2017 pertinent to establishing a population objective or release recommendations for the MWEPA. We are also interested in any other considerations related to the relationship between the population objective and release recommendations for the MWEPA and the long-term conservation and recovery of the Mexican wolf. (underlining added)

In direct response to the FWS's specific request for feedback here, we offer the following comments. The recovery plan does not support or ensure long-term conservation and recovery in the Mexican Wolf Experimental Population Area (MWEPA). To achieve recovery criteria, FWS relies substantially on recovery actions in Mexico, which is outside the MWEPA and cannot be influenced, controlled, or assured by a US federal regulation. The Court Order states the recovery plan cannot be relied on for achieving recovery required by Section 10(j) of the Endangered Species Act (ESA). Thus recovery must be assured by the rule itself, which must include sufficient population objectives and release recommendations to achieve long-term conservation and recovery of the Mexican wolf in geographic areas subject to the jurisdiction of the FWS. The proposed remedies must also address the misapplication of science (specifically noted by the Order) and how that changes previous release recommendations and population objectives.

Topic for revisions number 3 states:

(3) We intend to ensure the new revised rule supports population-level genetic health for the Mexican wolf in the MWEPA as a key component of the long-term conservation and recovery of the Mexican wolf. We will ensure our management provisions facilitate our ability to achieve the genetic recovery criterion for the MWEPA, which serves as our long-term conservation and recovery target. The genetic criterion in the revised recovery plan for the MWEPA states that we will release a sufficient number of captive Mexican wolves to result in 22 released Mexican wolves surviving to breeding age in the MWEPA (USFWS 2017a, pp. 18–19). As explained in the revised recovery plan (USFWS 2017a, pp. 9, 13) and the supporting Biological Report for the Mexican Wolf (USFWS 2017b, pp. 27–29, 33–34, and 36–38), the genetic criterion ensures that the threat of continuing or accelerated loss of genetic diversity of Mexican wolves in the wild is adequately alleviated. Both of these documents are available online at <http://www.regulations.gov> in Docket No. FWS–R2–ES–2017–0036 under Supporting Documents.

We are in complete agreement with the opening sentence for this revision topic. However, the genetic health criteria and means for achieving them must lead to the recovery of Mexican wolves in suitable habitats in the US Southwest over which the FWS has jurisdiction. Moreover, the FWS must address the misinterpretation and misapplication of the data relied upon for previous genetic health criteria (See Carroll et al. 2019). This misapplication of scientific data alone renders the genetic criterion of the 2017 recovery plan invalid and requires a new science-based evaluation of measures necessary to ensure the genetic health and long-term recovery of the US population of Mexican wolves.

In describing the 4th revision item, the Notice of Intent states “[s]pecifically, we intend to modify the Purpose and Need of the 2014 EIS only as necessary to explain the role of the MWEPA in the recovery of the Mexican wolf, based on the revised recovery plan.” The Court Order clearly defines that the “role of the MWEPA” under the revised rule” is to secure recovery of Mexican wolves irrespective of provisions in the recovery plan.

We are extremely concerned with the following statement contained in the supplement to the formal scoping notice styled as “Questions and Answers: Public Scoping on supplemental Environmental Impact Statement for the remand of the Mexican Wolf 2015 Revised Nonessential Experimental Population Designation”:

The geographic boundaries of the experimental population will not be altered by this action.

This is overtly pre-decisional and violates the NEPA process. How can the FWS know that the recovery and genetic health of the population described in the, yet to be, revised Section 10(j) rule can be assured within the current Mexican Wolf Experimental Population Area (MWEPA)? It can’t be known at this point in the process. Indeed, we show below that every measure of genetic health of the wild population is in steady decline. The northern boundary at Interstate 40 was politically inspired in the 2015 rule and again in the 2017 recovery plan and cannot be justified by any credible scientific information or analyses.

We offer one important addition to the list of planned data updates. We request that updated data on the effect of private trapping be included. We provide an analysis of those data below.

Lastly, before we offer our specific comments, we take issue with the number of deficiencies requiring remedies identified by the FWS. The Notice of Intent lists four specific topics for revision; we found nine, which we identify below with specific references to the language in the Court Order.

A careful review of the Order, including findings by the Court and admissions by the FWS implicitly accepted by the Court, reveals the requirement for FWS to remedy the following deficiencies in its 2015 10(j) rule for the wild population of Mexican gray wolves:

1. The 2015 10(j) rule fails to further the conservation of the Mexican wolf. (Order at 25:13-14.)
2. 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.)
3. The FWS failed to use the best available science in developing provisions of the 2015 10(j) rule. (Order at 31:1-3, 9-12, 17-23; 35:13-17; 39:26-28; 40:1-5.)
4. Take provisions in the 2015 10(j) rule are too expansive. (Order at 29:2-3, 6-8, 11-16; 30: 11-13.)
5. FWS is not required under Section 6 of the ESA to accommodate the recommendations of states or other entities when they run counter to the ESA requirement to further the conservation of the listed species. (Order at 32:16-17, 23-27.)
6. The ESA Section 10(j) "essentiality" determination that the wild population is not essential to the continued existence of Mexican wolves in the wild is arbitrary and capricious and must be revisited in the revised rule. (Order at 25:14-15; 35:13-17, 20-23; 36: 8-10, 18-22; 37: 3-5, 18-21, 22-23; 38:1, 9-11, 14-16; 39:2-6, 7-9, 20-22, 27; 40:1-5.)
7. 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)
8. The current 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.)
9. 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, Footnote 13.)

The above nine failures of the 2015 rule must be addressed by FWS to satisfy the Order's requirement that deficiencies identified in the Order must be remedied in the revised rule (Order at 43:26-28;44: 1-2). FWS's failure to further the conservation of the Mexican wolf is directly linked to these nine specific issues and any other deficiencies identified by the Court. All remedies to the identified deficiencies must be based solely on the best available science as required by the ESA. Discussion and recommendations relevant to these issues follow.

The 2015 10(j) rule fails to further the conservation of the Mexican wolf.

Section 10(j) of the ESA states that the Secretary of the Interior may authorize the release of an experimental population of an endangered species outside the species' current range if the Secretary determines that the release will further the conservation of that species. The ESA defines "conservation" as meaning the same as "recovery" to the point of no longer meeting the definition of an endangered or threatened species. The Court has

ruled that the 2015 10(j) rule, solely by its own provisions, must lead to recovery of the Mexican gray wolf; and that the rule as written fails that test.

The Court Order states several reasons for the rule's failure to recover Mexican wolves, as listed above.

The 2015 10(j) rule fails to provide for the Mexican gray wolf population's genetic health.

This failure derives from several deficiencies in the 2015 rule. The rule's inadequate requirement for effective migrants into the wild population was based on FWS's misinterpretation and misapplication of data and recommendations set forth in papers by Carroll et al. (2014) and Wayne and Hedrick (2011). The FWS allowed this misapplication of the best available science to remain in the final version of the rule, even after they were informed of the flawed application by the very scientists (Carlos Carroll, Ph.D.; Richard J. Fredrickson, Ph.D.; Robert C. Lacy, Ph.D.; Robert K. Wayne, Ph.D.; Philip W. Hedrick, Ph.D.) whose data they relied on (Comments dated December 19, 2014 on Document FWS-R2-ES-2013-0056). The 2015 10(j) rule authorizes only one population of Mexican wolves in the US Southwest and limits that population to no more than 325 wolves. The 2015 rule states:

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.

[\(50 CFR § 17.84 \(k\)\(9\)\(iii\)\)](#)

Furthermore, the peer-reviewed science relied upon by FWS was based on a recommendation of three subpopulations of at least 200 wolves each, collectively comprising at least 750 wolves in the US Southwest (Carroll et al. 2006; Wayne and Hedrick 2011; Carroll et al. 2014; Hendricks et al. 2016; USFWS 2012). This recommended metapopulation structure and geographic distribution of Mexican wolves was also recommended in the Draft Mexican Wolf Revised Recovery Plan (USFWS 2012). That plan was not adopted by the FWS, because of objections from the Southwestern States of New Mexico, Arizona, Utah, and Colorado (hereafter the "States") and other special interests opposed to meaningful Mexican wolf recovery in the US. Opposition to meaningful recovery by the States is manifestly evident in the letter sent by the four Governors of the States to Secretary of the Interior Sally Jewell and US Fish and Wildlife Service Director Dan Ashe on November 13, 2015 (Governors Letter 2015). The letter states the Governors' opposition to any further recovery in the US and recommends further recovery actions necessary for the full recovery of Mexican gray wolves take place in the country of Mexico. Below are excerpts from the letter:

Our States oppose the expansion, release, and occupancy of Mexican wolves north of I-40 in the States of Arizona and New Mexico and into Utah and Colorado.

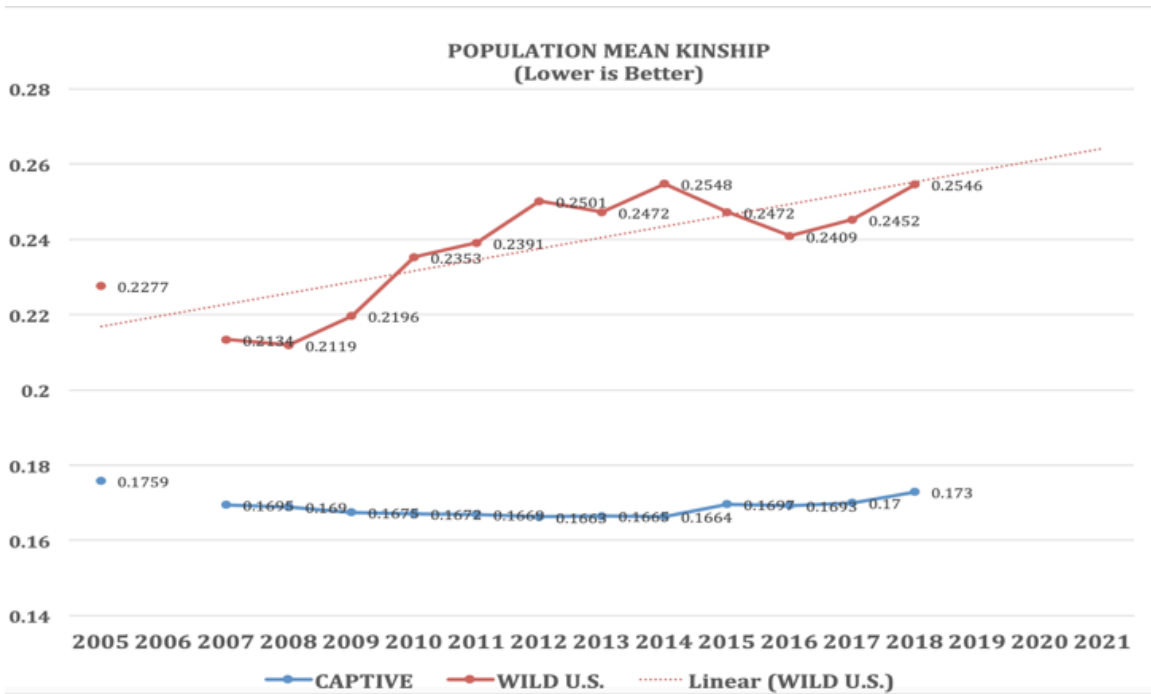
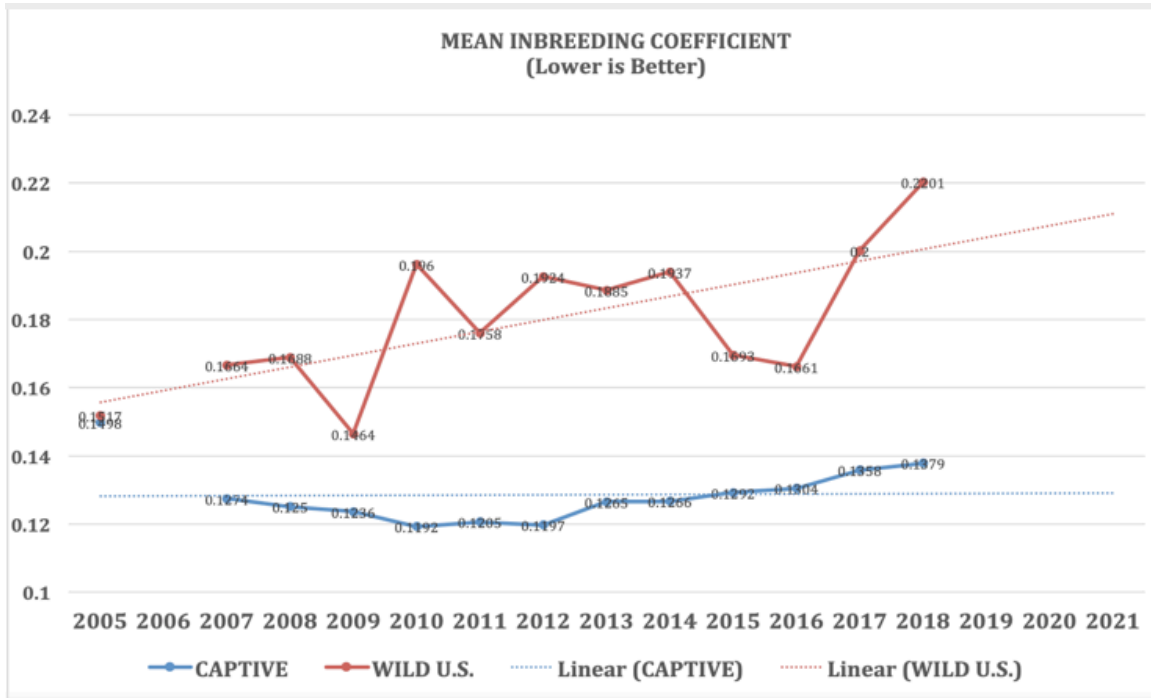
To this end, as the Service considers recovery and delisting criteria, it must ensure its efforts contemplate that significant management and recovery actions must to [sic] be taken in Mexico.

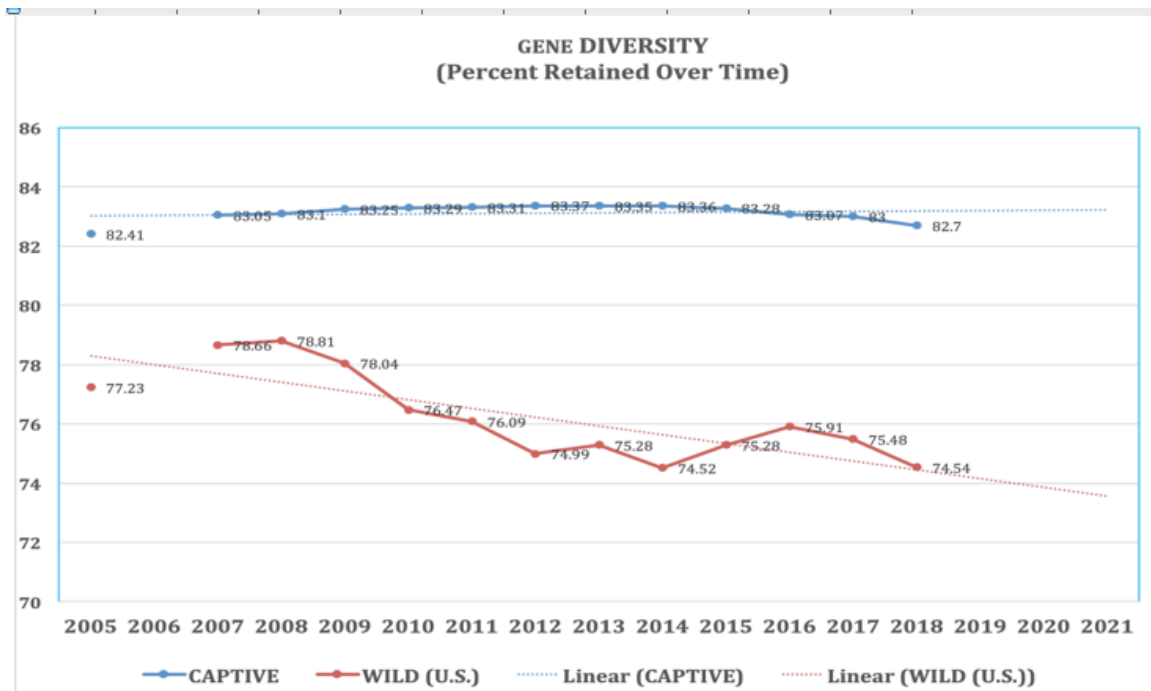
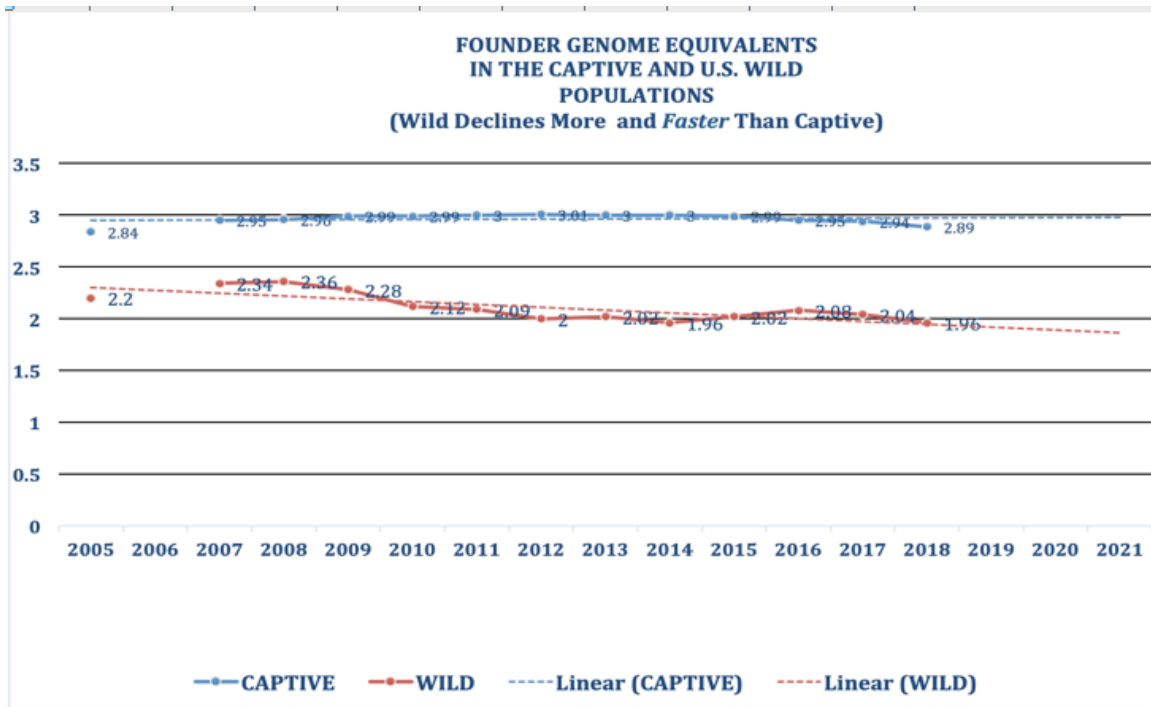
Further opposition to effective recovery of Mexican wolves can be found in a proposed alternative to the draft 2015 rule submitted by the Arizona Game and Fish Department (AGFD) and several cooperators.⁵ Their proposal would restrict wolves to habitats south of I-40 in Arizona and New Mexico. It would place a cap on the number of Mexican wolves in the U.S. Southwest of no more than 300 (preferably 200). Further, their alternative states that all wolves in excess of 300 shall be removed from the wild. The AGFD and the cooperators stated that any efforts to expand the range or numbers of Mexican wolves beyond the range and numbers set forth in their alternative (I-40 / 300) “may be aggressively litigated.” This does not reflect the Federal-State “cooperation” envisioned in Section 6 of the ESA. This is politically motivated bullying, plain and simple. The cooperation envisioned in Section 6 requires any agreement with States and other cooperators to further the conservation and recovery of the listed species.

In 2017, a subsequent recovery team assembled by FWS and comprised primarily of State scientists and policymakers produced a revised recovery plan (USFWS 2017) that required an aggregate of only 520 wolves divided between two populations, one each in the US and Mexico. The recovery plan adopted population targets of 320 wolves in the US population and 200 in Mexico. These recovery goals were defined as “management targets” by the States and were loosely guided by the imperfect concept known as “social tolerance,” which is political in nature and not grounded in the best available science, as required by the ESA.

Measures commonly used by population geneticists to characterize the “genetic health” of a population of animals include inbreeding coefficient, mean kinship, founder genome equivalents, and gene diversity. Data gleaned from the annual Master Plans compiled and issued by the Mexican Wolf Species Survival Plan committee from 2005 to 2018 were analyzed by a citizen scientist, Peter Ossorio, and are presented in the following charts.

⁵ **Mexican Wolf Management in Arizona and New Mexico: A Cooperating Agencies Alternative to the U.S. Fish and Wildlife Service Proposed Alternative in a Draft Environmental Impact Statement on a Proposed Nonessential Experimental Population Rule for the Mexican Wolf in the Southwest.** Submitted by: Various EIS Cooperating Agencies. Final: April 15, 2014.



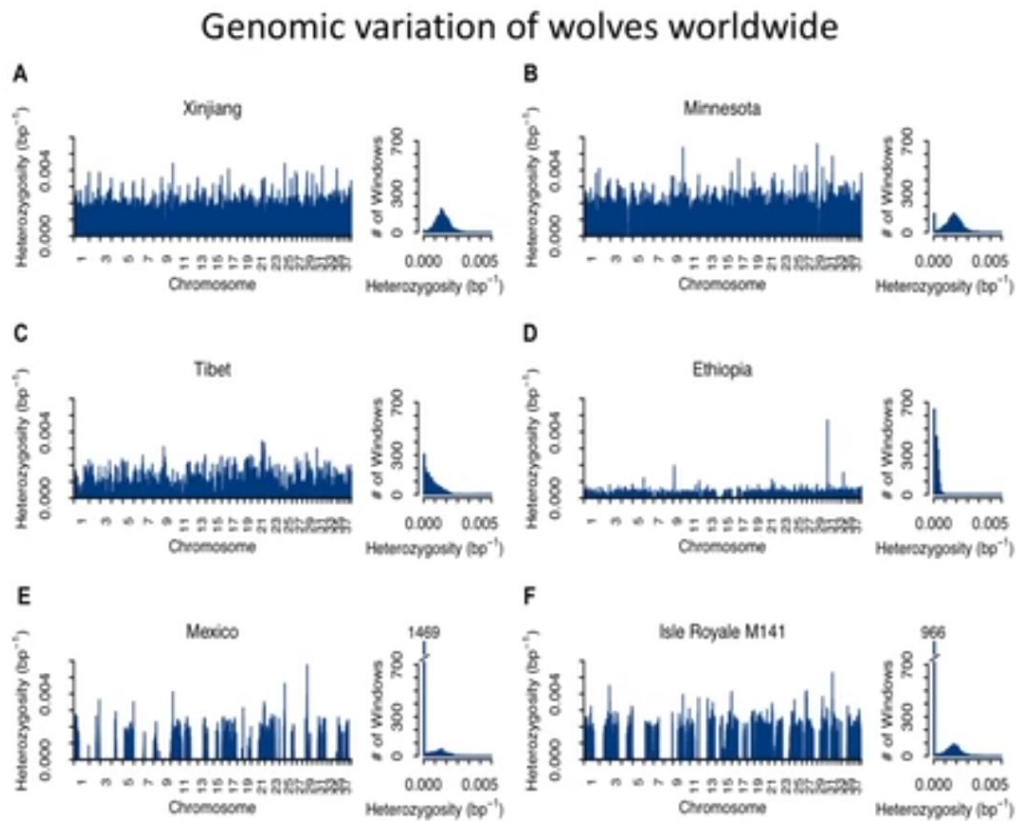


With regard to genetic health, implementation of the 2015 10(j) rule and prior management actions has failed miserably. The genetic health of the wild population is declining by every measure, and the population is on a clear trajectory to eventual

extinction. There is no reason to expect that these trends will reverse under the provisions of the 2015 rule.

Furthermore, these charts also show gradual declines in all measures of genetic health in the captive population. This is not the fault of the expert captive population managers. Rather, it is the inexorable genetic health decline expected in small populations with limited founders. The captive population was founded by only seven Mexican wolves, which were captured in the wild and bred in captivity. Already we see that the founder genome equivalent in the captive population has declined to less than three. Even worse, the founder genome equivalent of the wild population is currently less than two, resulting in the general relatedness of wild Mexican wolves to each other being on average the same as brothers and sisters.

Another ominous discovery is the degree to which gene loci have become monomorphic or “fixed” in the Mexican wolf genome. Dr. Robert Wayne presented an analysis of these data for a congressionally mandated review of the taxonomic status of the Mexican gray wolf,⁶ which is graphically illustrated in the following chart:



Robinson et al., in revision, Science Advances

⁶ National Academies of Sciences, Engineering, and Medicine. 2019. *Evaluating the Taxonomic Status of the Mexican Gray Wolf and the Red Wolf*. Washington, DC: The National Academies Press, available at <https://doi.org/10.17226/25351>.

These data have since been published (Robinson et al. 2019, Figure 2). If one visualizes these graphics as teeth in a comb, the missing teeth represent gene loci that are fixed for only one variant of the gene at that location. All other historically present variants have been permanently lost from the overall Mexican gray wolf genome. For Mexican wolves, this is the result of severe bottlenecking of the subspecies to just seven (7) founders prior to 1980 (six founders came from Mexico and the other was captured near the US-Mexico border in southern Arizona), the reality of gradual loss of genetic diversity (e.g., through genetic drift) in small populations over time, and the subsequent genetic mismanagement of the population by the FWS (Hedrick and Fredrickson 2010). Note that the number of monomorphic loci is much greater than in the severely bottlenecked Isle Royale population, which recently became functionally extinct and was rescued with the introduction of new founders from the mainland population. These missing Mexican wolf gene variants are lost to the population and can only be restored through the addition of new founders (Dr. Richard Fredrickson, personal communication), which are not known to exist within the Mexican gray wolf subspecies. The significant lack of gene diversity in Mexican wolves limits their ability to evolve and adapt to changing environmental conditions, as, for example, the effects of climate change.

The Order accurately states that “[b]y 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.)

Population geneticists have warned of this looming genetic crisis for well over a decade (Hedrick et al. 1997; Fredrickson et al. 2007; Hedrick and Fredrickson 2010; Wayne and Hedrick 2010; Hedrick Declaration 2018). Independent and academic genetic experts have repeatedly advised the FWS to address genetic deficiencies as expeditiously as possible with releases of more genetically diverse Mexican wolves from the captive population while the wild population was small, and only then growing the population rapidly. The FWS has squandered this option (Fredrickson et al. 2007; Hedrick and Fredrickson 2010) largely by submitting to pressures from the States and other special interests antithetical to successful Mexican wolf recovery to limit releases. Indeed, a decade ago in their 2010 paper, Hedrick and Fredrickson warned of the potential need to introduce northern gray wolves into the Mexican wolf population to boost its genetic health and stave off extinction of Mexican wolves:

Finally, there may not be a second chance [the first chance having been squandered by FWS’s failure to release sufficient numbers of first-generation, cross-lineage wolves from captivity] for genetic rescue here because none of [the] lineages are still maintained separately in captivity.... It was assumed that the increase in fitness from lineage crossing would be used expeditiously to enhance the numbers of wild wolves and that a second round of crosses would not be necessary. However, mainly because of non-scientific reasons, the cross-lineage wolves were not incorporated into the reintroduced population in a timely manner and this opportunity may have been lost. If the reintroduced

population does not increase soon, it may be necessary to consider extraordinary measures, such as introducing northern gray wolves, a closely related subspecies (Leonard et al. 2005), into the reintroduced Mexican wolf population.

Hedrick and Fredrickson (2010).

Such a management decision would be neither speculative nor untried. A similar drastic measure was used to save the Florida panther population, which was feared to be spiraling toward extinction.

As noted by Hedrick and Fredrickson (2010), extraordinary interventions are needed to stave off extinction of the Mexican gray wolf. These interventions are not provided by the current 2015 10(j) rule or the approved 2017 revised recovery plan. The importance of such interventions increases with the continued decline of the overall genetic health of the wild population of Mexican wolves and its continued population growth. Furthermore, Carroll et al. (2019) demonstrate that the 2017 population viability analysis, which guided recovery criteria in the 2017 revised recovery plan, was based on scientifically-flawed assumptions (such as continued supplemental feeding of wild packs) in order to mask the deleterious effects of genetic issues, and to give the misimpression that the pre-determined population cap of 320 was adequate. They suggest that significantly raising the level of genetic diversity in the 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.”

The Court Order makes it abundantly clear that the revised rule must, independently, authorize and require necessary actions that will lead to the eventual recovery of Mexican gray wolves in the wild in the US Southwest. Measures to ensure recovery of Mexican wolves enshrined in the revised 10(j) rule ordered by the Court cannot rely upon recovery criteria delegated to the country of Mexico. Indeed, in their review of the Population Viability Analysis used to inform the 2017 recovery plan, Carroll et al. (2019) found that “when connectivity between the US and Mexican populations was modeled as one scenario during the 2017 PVA, Mexico acted as a population sink which reduced the viability of the US population.”

Furthermore, the Order makes it abundantly clear that FWS cannot rely upon a discretionary, non-regulatory recovery plan (which may never be fully implemented and relies on measures taken by a foreign country) to replace the shortcomings and deficiencies in the 2015 rule (Order at 29:21-25).

Our comments on the 2017 recovery plan point out its politically motivated deficiencies and failure to apply the best science for developing recovery criteria. We concluded that

implementation of the 2017 recovery plan would lead to the eventual extinction of Mexican wolves in the wild.

Below are some relevant excerpts from the Order remanding the 2015 Mexican Wolf Section 10(j) rule:

- ✓ *It is undisputed that...the population is in genetic decline and that the present agency action will have long-term effects on the genetic health of the species. (Order at 30:8-10.)*
- ✓ *This case is unique in that the same scientists that are cited by the agency publicly communicated their concern that the agency misapplied and misinterpreted findings in such a manner that the recovery of the species is compromised. To ignore this dire warning was an egregious oversight by the agency. (Order at 31:19-23.)*
- ✓ *The Court concludes that the 2015 rule only provides for the survival of the species in the short term and therefore does not further recovery for the purposes of Section 10(j). (Order at 26:4-6.)*
- ✓ *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 2015 10(j) rule provides only for short-term survival of the species and fails to further the long-term recovery of the Mexican wolf in the wild. (Order at 26:9-10.)*
- ✓ *The rule's provision for a single, isolated population of 300-325 wolves, with one to two effective migrants per generation, does not further the conservation of the species and is arbitrary and capricious. (Order at 27:2-4.)*
- ✓ *To the extent that FWS now seeks to argue in this litigation that the population size and effective migration rate furthers the recovery of the species, the Court finds that that position is not entitled to deference. (Order at 27:18-21.)*
- ✓ *In approving the population size and effective migration rate, FWS first failed to articulate a rational connection between the facts in the record and the choice made, and second justified its deficiency on the "short-term" nature of the rule, which is legally insufficient under the ESA. (Order at 28:11-15.)*
- ✓ *The Court concludes the population size and effective migration rate, which do not further the conservation of the species, are arbitrary and capricious. (Order at 28:17-18.)*
- ✓ *The Court concludes that the substance or terms of future recovery actions, do not relieve FWS of its obligations under Section 10(j). Moreover, the provisions of a recovery plan are discretionary, not mandatory. (Order at 29:21-23.)*
- ✓ *Thus, even if the recovery plan contained all terms promised by Defendants here, there is no guarantee that those terms will protect against the harms that the Court finds presented by 10(j) rule. (Order at 29:23-25.)*
- ✓ *The rule as a whole fails to further recovery: FWS did not create a population in the 2015 rule that would be protected against the loss of genetic diversity, and there are no other viable populations to cushion the subspecies from the long-term harm that is predicted to result under the 2015 rule. (Order at 32:5-8.)*

- ✓ *Section 10(j) of the ESA does not require that the 10(j) rule be the product of an agreement with state and private stakeholders. (Order at 32:16-17.) On the contrary, the legislative history demonstrates that, although Congress anticipated Section 10(j) regulations would be implemented in consultation with affected parties, the Secretary would retain the authority and management flexibility to issue regulations that further the conservation of the species. (Order at 32:23-27.)*

To meet the Court's requirements, revisions to the 2015 10(j) rule cannot be merely cosmetic, or parrot provisions of the 2017 recovery plan, as has been suggested by FWS officials (Order at 29:21-22). The fatally flawed 2015 10 (j) Rule is already five (5) years old. Immediate and drastic action is required to protect the genetic health of Mexican gray wolves and ensure their long-term conservation and recovery.

The Court's Order reflects that under the ESA, Congress has determined the balance of hardship always tips sharply in favor of endangered or threatened species. (Order 41:16-17.)

As recommended by Carroll et al. (2019), the FWS's recovery strategy must base criteria addressing genetic threats on direct assessment of genetic metrics in the wild population over time rather than the total number of releases completed. They acknowledge that direct assessment of genetic metrics in reintroduced populations is increasingly feasible due to advances in genomics.

We conclude and recommend that the revised Mexican Wolf 10(j) rule must be based on updated genetic and population analyses and a detailed genetic rescue plan. The genetic rescue plan must specify science-based genetic recovery goals, metapopulation demographics and geography, gene flow, wolf release details and schedules including, if necessary, such details for infusing genes from a different gray wolf subspecies. These analyses must apply the best available science and be primarily conducted by independent scientists recognized by their peers as experts in the fields of population genetics and extinction risk. This process must exclude political influences.

The present northern boundary of the MWEPA at Interstate Highway 40 prohibits recovery of the Mexican gray wolf in the US and is not based on the best available science.

For the revised 10(j) rule to fully support recovery of the Mexican gray wolf in the US (as mandated by the Court Order), independent of politically motivated, discretionary recovery actions specified in the 2017 recovery plan (USFWS 2017), the revised 10(j) rule must eliminate the existing prohibition of Mexican wolves occupying habitats north of Interstate 40.

Carroll et al. (2014) produced a data-driven model for an interconnected metapopulation structure that connects northern gray wolves with Mexican gray wolves throughout the interior West. Nodes 4 and 5 (Carroll et al. 2014, Figure 4, below) were recommended as

two additional locations for establishing populations of Mexican gray wolves in a draft recovery plan (USFWS 2012) developed by a panel of independent scientists appointed by the FWS in 2010 to the Science and Planning Subgroup of the Mexican Wolf Recovery Team. [Node 6 currently supports the only extant wild population of Mexican gray wolves in the US.]

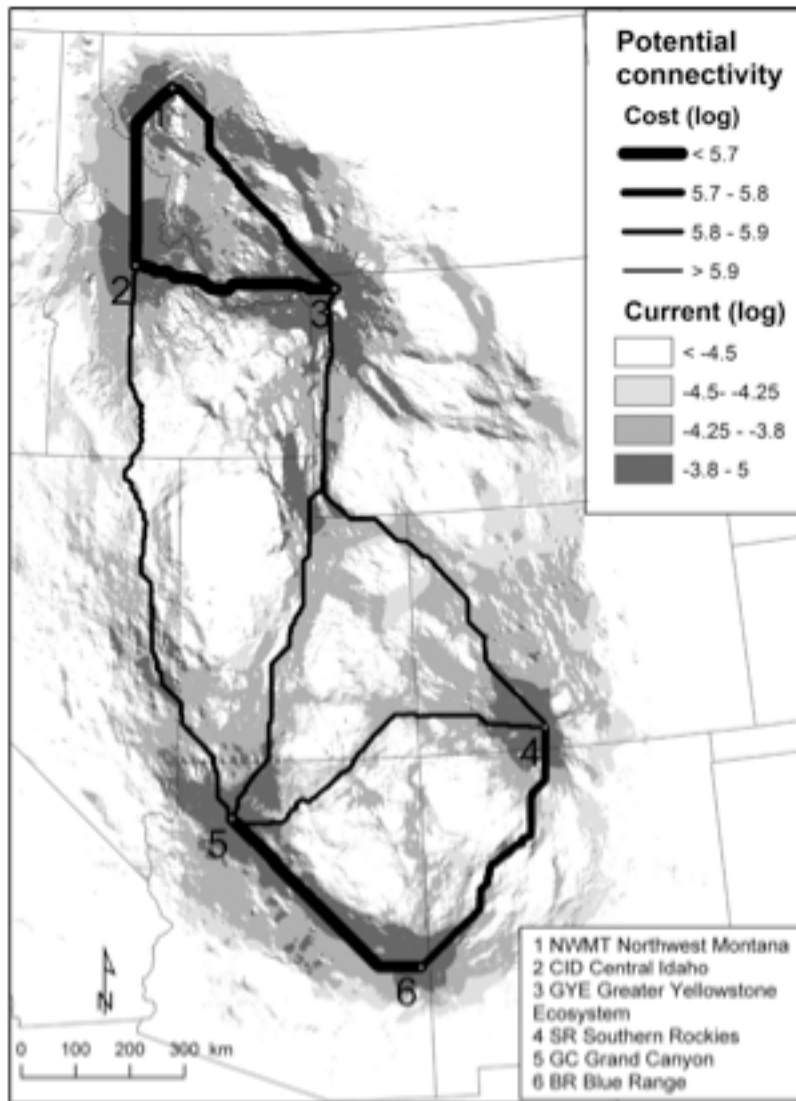


Figure 4. Potential habitat linkages between 6 existing or potential wolf-population core areas in the western United States (thickest lines, linkages with lowest least-cost distance; darkest gray shading, areas with highest importance for connectivity based on the resistance distance model; abbreviations for core areas correspond to labels in Appendix S3 in Supporting Information). (From Carroll et al. 2014.)

Carroll et al. (2014) suggested that dispersal between the northern gray wolves in habitat nodes 1, 2, and 3 and Mexican gray wolves in nodes 4, 5, and 6 (under a scenario of increased Mexican wolf numbers and distribution) may be sufficient for maintaining

adaptive connectivity, with occasional dispersal maintaining a regional cline in genetic structure similar to historic conditions (Leonard et al. 2005). They recommended that “recovery plans for formerly widely distributed species should consider how such broad-scale genetic structure can be restored via conservation of interregional linkages and stepping-stone habitat (Franklin & Frankham 1998).”

A metapopulation comprised of 3 subpopulations of Mexican gray wolves with a total population of at least 750 wolves, shown as habitat nodes 4, 5, and 6 above, was recommended by the FWS-appointed independent scientists of the 2010 Mexican Wolf Recovery Team’s Science and Planning Subgroup in 2013, but was rejected by FWS. Under political pressure from the four Southwestern States of Utah, Colorado, Arizona, and New Mexico (Letter from Four Governors 2015), the USFWS opted for limiting the recovery of Mexican gray wolves in the United States portion of their range to one wild population in Arizona and New Mexico south of Interstate 40 (Figure 1 from the proposed 2015 10(j) rule below). This decision rendered the areas depicted as habitat nodes 4 and 5 per Carroll et al. (2014) off limits to habitation by Mexican wolves.

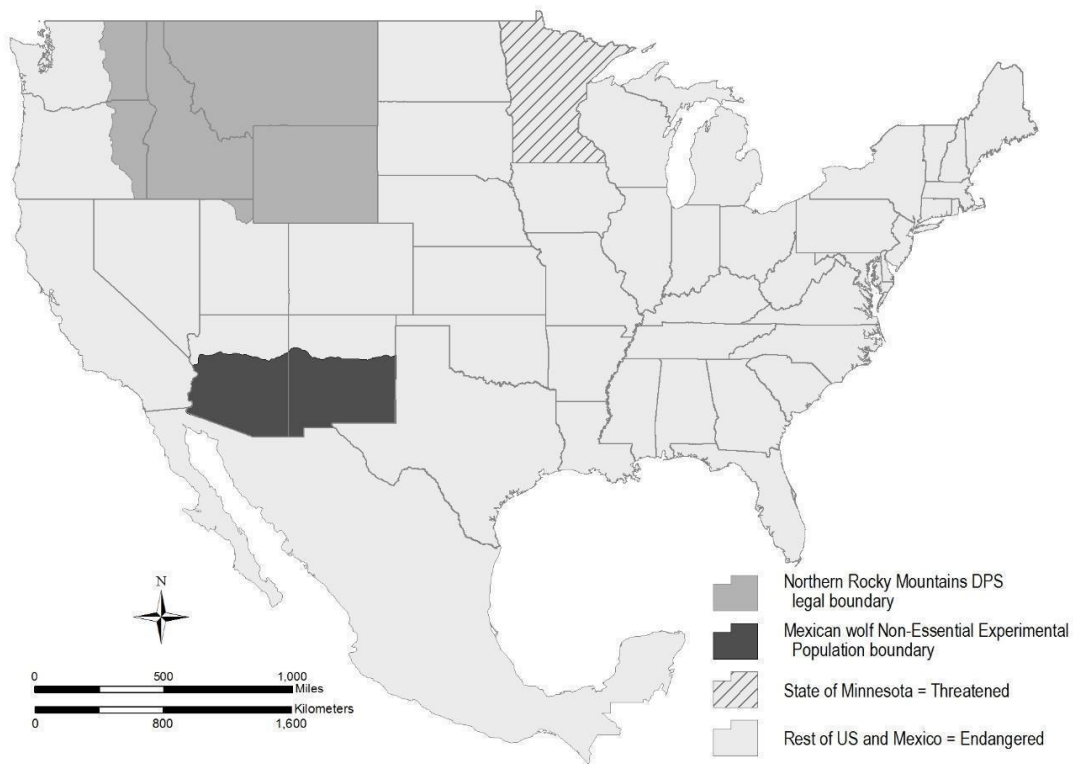


Figure 1: Current legal status of *C. lupus* under the Act. Northern Rocky Mountains DPS and Mexican wolf Non-Essential Experimental Population are not part of the listed entities. All map lines are approximations; see 50 CFR 17.11 and 17.84(k) for exact boundaries.

The stark contrast between Figure 1 from the proposed rule and Figure 4 from Carroll et al. (2014) cannot be overlooked. It shows the striking difference between science-based and politically motivated decision making.

The 2015 rule revising the regulations for the nonessential experimental population of Mexican wolves (USFWS 2015) established Interstate 40 through Arizona and New Mexico as the legal northern limit of the distribution of Mexican wolves in the US Southwest. The 2015 rule also set a cap of no more than 325 wolves within the US portion of the Mexican wolf's range – the area shaded black in Figure 1 above. Thus, the 2015 10(j) rule (USFWS 2015) and the 2017 revised recovery plan (USFWS 2017) limit Mexican wolves to habitats south of Interstate 40 in Arizona and New Mexico and limit the recovered population in the U.S. to no more than 325 wolves.

These rules and policies for Mexican wolves combined with the proposed delisting of the gray wolf entity leave a more than 500 mile wolfless gap between the southern boundary of the Northern Rocky Mountain gray wolf Distinct Population Segment and the northern boundary of the Mexican wolf experimental population area at Interstate 40 (Figure 1 above). This would significantly preclude potential genetic mixing between Mexican wolves and northern gray wolves through natural range expansions of these two populations for the foreseeable future. Such genetic mixing between northern gray wolves and Mexican gray wolves occurred historically and has been described as beneficial and possibly necessary for preserving the genetic health of the Mexican gray wolf subspecies (Leonard et al. 2005; Hedrick and Fredrickson 2010; Hendricks et al. 2016; Hendricks et al. 2019).

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).

An alternative view presented in a paper by Hefflefinger et al. (2017), and afforded great deference by the States, presents an archaic (morphological) perspective on delineating the historic range of *Canis lupus baileyi*. The paper's authors argue for limiting the range to south of Interstate 40. It is noteworthy that FWS's recovery plan peer reviewers were critical of Hefflefinger et al. (2017) and critical of setting a hard boundary for the range of Mexican gray wolves at Interstate 40.

The "hard boundary" limiting Mexican wolves to only suitable habitats south of Interstate 40 is a politically motivated decision that cannot be supported by the best available science. Notably, participants (including Mr. Hefflefinger) in the closed-door recovery planning workshops chose I-40 as the northern limit for Mexican wolf recovery analyses based on "**geopolitical**" considerations (Mexican Wolf Recovery Planning Workshop, Galleria Plaza Reforma, Mexico City, Mexico, April 11-15, 2016, Draft Notes at 4).

Also, see above excerpts addressing the I-40 boundary from the Four Governors' letter (2015).

Heffelfinger et al. (2017) is far from settled science on the subject of the historic range of the Mexican gray wolf. In their rebuttal to Heffelfinger et al. (2017), Hendricks et al. (2017) offer the following criticisms of Heffelfinger et al.'s 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 unoccupied suitable habitat exists. The draft recovery plan prepared by the independent scientists of the 2010 Mexican Wolf Recovery Team's Science and Policy Subgroup (USFWS 2012) provides extensive science-based justification for two such areas north of I-40. The revised 10(j) rule must provide a regulatory pathway for establishing subpopulations of Mexican gray wolves in habits north of I-40 as recommended in the 2012 draft recovery plan (USFWS 2012).

The 2012 draft Mexican wolf recovery plan (USFWS 2012) and Carroll et al. (2014) provide a sound, peer-reviewed, scientific basis to guide us on where Mexican wolves are needed to reach full recovery—and that basis provides that areas north of I-40 are critical. Carroll et al. (2014) state that,

“[T]he southwestern United States has 3 core areas with long-term capacity to support populations of several hundred wolves each. These 3 areas...[include the] Blue Range..., northern Arizona and southern Utah (Grand Canyon), and northern New Mexico and southern Colorado (Southern Rockies).”

Carroll et al. (2014) at 78 (referencing Carroll et al. 2006).

Further, FWS’s own appointed recovery team scientists arrived at the same conclusion. (U.S. Fish & Wildlife Service (2012), Draft Mexican Wolf Revised Recovery Plan at 49).

We oppose a “hard” boundary at I-40, prohibiting the movement to and occupation of suitable habitats existing north of I-40 by Mexican gray wolves. Denying Mexican wolves the opportunity to disperse into suitable habitats north of I-40 is inconsistent with the best available science in support of full recovery of Mexican wolves. This science, developed by the FWS-appointed Science and Planning Subgroup (SPS) of the 2010 Mexican Wolf Recovery Team identifies two areas of suitable habitat north of I-40 that are critical to the establishment of a metapopulation of Mexican wolves of sufficient size and distribution to ensure recovery of Mexican wolves in the US Southwest. Furthermore, the SPS recommends that these additional populations be interconnected with the current Blue Range Wolf Recovery Area (BRWRA) population for a total metapopulation of at least 750 wolves, with each subpopulation totaling at least 200 wolves (USFWS 2012; Carroll et al. 2014).

The Court spoke directly to this issue by stating:

[A]lthough FWS acknowledges that territory north of I-40 will likely be required for future recovery and recognized the importance of natural dispersal and expanding the species’ range, it nevertheless imposed a hard limit on dispersal north of I-40. Any wolves that venture outside the MWEPA will be captured and returned. The agency again relied on the limited scope of the rule to justify this provision, stating that the purpose of the rule is to improve the effectiveness of the reintroduction project and citing to the recovery plan as the likely means of addressing the insufficient geographic range that is provided by the present rule.

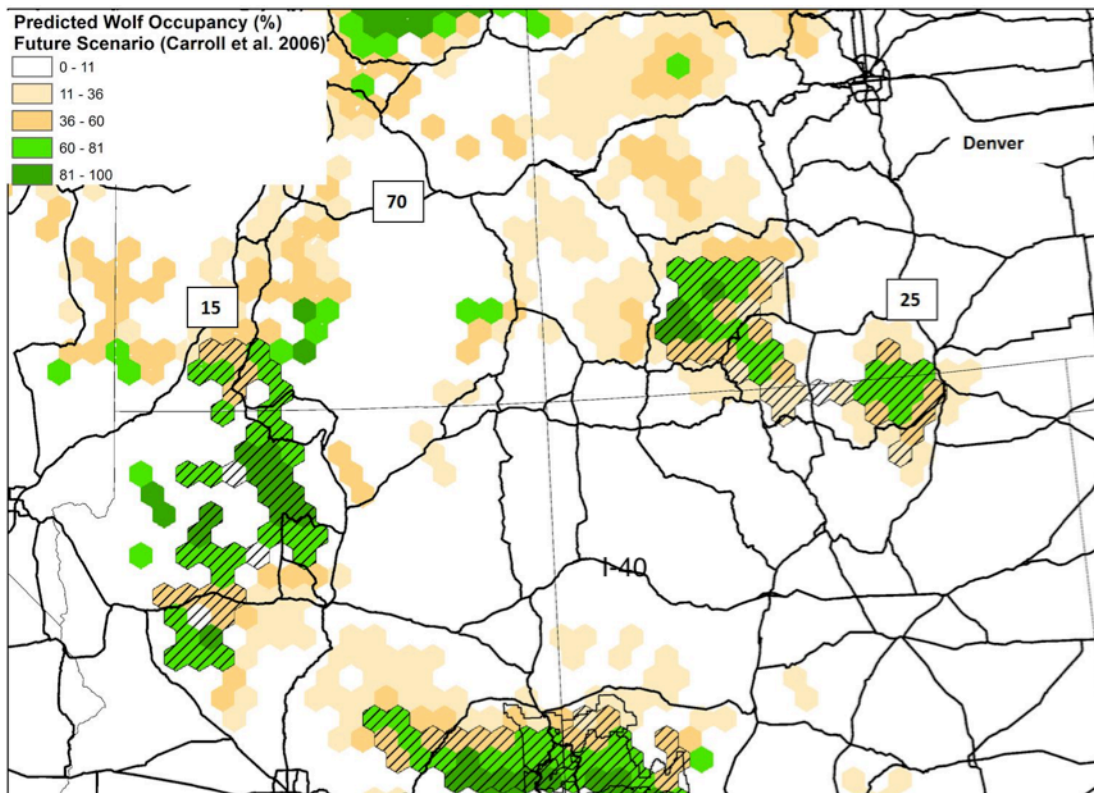
(Order at 28:Footnote 13.)

We note that the 2017 revised recovery plan does not correct this deficiency and retains the hard boundary of I-40 as the northern geographic limit of the US population of Mexican wolves.

Compliance with the Court Order requires that additional habitats in the US Southwest be made available for occupation by Mexican wolves. These habitats have already been identified and occur north of I-40 in northern Arizona/southern Utah and northern New Mexico/southern Colorado (USFWS 2012; Carroll et al. 2014). The Court Order’s requirement that the 10(j) rule must support full recovery of Mexican wolves, and cannot defer recovery actions to discretionary recovery plan that may never be fully implemented, creates the necessity to allow Mexican wolves to freely disperse to suitable habitats north of I-40 that are necessary for their eventual recovery.

This leaves FWS with two options for correcting this deficiency in the revised rule:

1. Retain the current MWEPA boundary for purposes of defining the geographic location of the Section 10(j) listed entity, but allow wild Mexican wolves to disperse outside the MWEPA without restrictions. When crossing to the north side of I-40, Mexican wolves would automatically be reclassified as “endangered” where found under their ESA listing. This mimics the provisions of the Section 10(j) rule for wolf reintroductions in the Northern Rocky Mountains; or
2. Move the northern MWEPA boundary far enough north to include the areas identified as necessary for Mexican wolf recovery by Carroll et al. (2014) and the 2012 draft recovery plan (USFWS 2012). A geographic boundary extension of the current MWEPA that would accomplish this objective is defined as Interstate 25 northward from Interstate 40 in New Mexico (at Albuquerque) to Interstate 70 in Colorado (at Denver), Interstate 70 westward through Colorado and Utah, connecting to Highway 15 (Utah) to the western border of Utah.



We recommend that the revised 10(j) rule impose no restrictions to the movements, dispersal, occupation of habitats, population size, and future reintroductions of Mexican wolves beyond the current northern MWEPA boundary at Interstate 40, consistent with recommendations by Carroll et al. (2014) and the 2012 draft recovery plan (USFWS 2012).

The present cap on the US population of Mexican gray wolves in the wild of no more than 300-325 wolves in a single population is politically derived, arbitrary, and not based on the best available science.

The Court Order states: “The rule’s provision for a single, isolated population of 300-325 wolves, with one to two effective migrants per generation, does not further the conservation of the species and is arbitrary and capricious.” (Order at 27: 2-4.)

The Court has ruled that the revised 10(j) rule must stand alone in setting forth provisions that will lead to the long-term conservation and recovery of Mexican wolves. By default, this requires that full recovery of Mexican wolves be achieved within suitable habitat areas available in the US Southwest. The rule cannot relegate future recovery actions to a discretionary recovery plan that assigns a substantial portion of critical recovery goals to a foreign country over which the FWS has no authority. Habitat suitability analyses conducted in support of the 2017 recovery plan concluded that the carrying capacity of suitable habitats in within the MWEPA in the United States was approximately 1000 wolves.⁷ The best available science has identified three areas of suitable habitat, which are shown above (Carroll et al. 2014; Figure 4) and are recommended for the establishment of subpopulations of Mexican gray wolves in the 2012 draft recovery plan (USFWS 2012).

Comments on the Draft Record of Decision and Final Environmental Impact Statement for the Proposed Revision to the Regulations for the Nonessential Experimental Population of the Mexican Wolf (USFWS 2014) submitted by five prominent scientists—including two members of the Science and Planning Subgroup of the official 2010 Mexican Wolf Recovery Team (Letter from Carroll et al., December 19, 2014)—reveal that FWS erroneously interpreted the science it relied upon in justifying the numerical cap of 325 wolves in a single US population. Carroll et al. (2014) sought “to assess what conditions would allow recovery of the [Mexican gray wolf] subspecies as a whole.” Carroll and his colleagues’ assessment of extinction risk considered the interaction between population size and dispersal rate within a metapopulation comprising three interconnected subpopulations—not a single population. Their analyses do not support or

⁷ U.S. Fish and Wildlife Service. 2017. Mexican Wolf Biological Report: Version 2. Region 2, Albuquerque, New Mexico, USA. APPENDIX A. Population Viability Analysis for the Mexican Wolf (*Canis lupus baileyi*): Integrating Wild and Captive Populations in a Metapopulation Risk Assessment Model for Recovery Planning (Miller 2017).

justify the 325-wolf cap for the Blue Range subpopulation mandated by the 2015 10(j) rule.

FWS used results of model outputs for an interconnected three-subpopulation metapopulation from Carroll et al. (2014) and applied them to the single MWEPA population with “migrants” derived from the captive population. This differs from the population scenario modeled by Carroll et al. (2014).

FWS specifically misinterprets Carroll et al. (2014) by stating “[p]opulation sizes of 300 to 325 achieved closer to a 10 percent probability of quasi-extinction regardless of the number of effective migrants per generation.” An accurate interpretation of Carroll et al. (2014) should read “[s]ubpopulation sizes of 300 to 325, **when present within a metapopulation**, achieved closer to a 10 percent probability of quasi-extinction when the number of effective migrants was at or above 0.5 per generation.” (Carroll et al., Comment Letter, December 19, 2014.) (bold emphasis added)

FWS also misinterprets the migration rate that models suggest might ensure acceptably low long-term erosion of genetic health in a recovered metapopulation of three subpopulations, and instead states that this is the optimal rate for releases from the captive population into the wild MWEPA population in the absence of two additional subpopulations. This mistake renders insufficient FWS’s claim that it only needs to release 1-2 effective migrants every 4 years into the MWEPA to alleviate genetic threats to the population and protect the Blue Range population from extinction. (Carroll et al., Comment Letter, December 19, 2014.)

Further, while FWS erroneously relies on Carroll et al. (2014) to justify a population cap for the MWEPA population, it completely ignores their recommendation of establishing a Mexican gray wolf metapopulation comprised of three subpopulations and allowing Mexican gray wolves to range north of I-40. Specifically, FWS states that “[b]ecause we do not have a sound, peer reviewed, scientific basis to guide us on where Mexican wolves are needed to reach full recovery (i.e., delisting), we are limiting the revised MWEPA to areas south of Interstate 40 in Arizona and New Mexico.” (USFWS 2014, Ch. 2 at 6). The science of Mexican wolf recovery presented by Carroll et al. (2014), and FWS’s erroneous interpretation of it, makes this blockade of dispersal north of I-40 scientifically unsupportable.

Contrary to FWS’s assertion, there indeed did, and still does, exist a “sound, peer reviewed, scientific basis to guide us on where Mexican wolves are needed to reach full recovery”—and that scientific basis provides that areas north of I-40 are critical. Carroll et al. (2014) state that “the southwestern United States has 3 core areas with long-term capacity to support populations of several hundred wolves each. These 3 areas ... [include the] Blue Range..., northern Arizona and southern Utah (Grand Canyon), and northern New Mexico and southern Colorado (Southern Rockies).” (Carroll et al. 2006, 2014.) Further, FWS’s own appointed recovery team scientists arrived at the same conclusion (USFWS 2012).

Given that FWS relied extensively on Carroll et al. (2014) when it proved convenient for the agency to do so—i.e., in attempting to justify a population cap—FWS’s inexplicable refusal to at least consider this same peer-reviewed scientific publication in discussing management measures needed to facilitate a metapopulation is irrational. FWS’s misunderstood and erroneous application of Carroll et al. (2014) is arbitrary and demonstrates the inadequacy of the 2015 Mexican wolf 10(j) rule to ensure recovery of subspecies.

There is no scientific justification for setting a cap on wild populations of Mexican wolves. Wolf populations are naturally regulated through mechanisms including prey density, territoriality, intraspecific strife, and behavioral suppression of breeding by subordinate family members (Wolff 1997, Fuller et al. 2003; Cubaynes et al. 2014; Mech and Barber-Meyer 2015; Smith et al. 2015). To carry out their important keystone role as top predators in their ecosystems, wolves must be allowed to achieve natural ecologically effective densities and be distributed throughout suitable habitats (Soulé et al. 2003, 2005).

FWS has completely ignored a primary purpose of the ESA – “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved....” The conservation of ecosystems provides the necessary platform for the following ESA purpose “to provide a program for the conservation of such endangered species and threatened species.” Is a species actually recovered if it is not allowed to establish a natural pattern of distribution and abundance at ecologically effective densities? We think not. The ecological value of a re-established wolf population is greatly diminished if it is kept below its ecologically effective density and prohibited from inhabiting suitable habitats formerly occupied by wolves (Soulé et al. 2003; 2005). The role of wolves, as apex predators, in maintaining the biological diversity and general health of ecosystems is well established in the scientific literature (see for example, Beschta and Ripple 2016; Letnic and Ripple 2017; Painter et al. 2018). FWS knows this, but chooses to ignore this knowledge and the ESA mandate to conserve ecosystems. Rather FWS has set politically motivated population limits and range restrictions well below “ecologically effective” thresholds. It is essentially establishing a second “zoo” population in natural habitats.

Recovery of the Mexican gray wolf should not be a politically motivated minimum population viability numbers game with a goal to justify the lowest possible population size to support long-term survival. Instead, science-based recovery must consider the ecological role wolves in setting recovery criteria.

The revised rule must open doors to achieve expedited, science-based recovery of the still critically endangered wild population of Mexican gray wolves in the US Southwest.

To meet the requirements of the Court Order, the revised 10(j) rule must allow for the establishment of a minimum population of at least 750 Mexican wolves comprising a metapopulation of at least three subpopulations within identified suitable habitats in the US Southwest (Carroll et al. 2014; USFWS 2012).

We oppose the setting of numerical population objectives (in the revised 10(j) rule) for Mexican gray wolves in the US Southwest at less than 750 wolves distributed among 3 subpopulations with at least 200 wolves each.

Take provisions in the revised 10(j) rule must support the conservation mandate of ESA for experimental populations.

The Court Order identifies the following deficiencies with regard to take provisions in the 2015 10(j) rule:

- ✓ The expanded take provisions contained in the new rule do not contain adequate protection for the loss of genetically valuable wolves. (Order at 29:2-3)
- ✓ In issuing take permits, “the Secretary is subject to the requirement of Section 10(d) that issuance will not operate to the disadvantage of the listed species,” (Order at 29:6-8.)
- ✓ The expanded take provisions lack protections for loss of genetic diversity. Instead, FWS justifies the expanded take provisions on the ground that they will “make reintroduction compatible with current and planned human activities, such as livestock grazing and hunting.” This explanation fails to show that FWS considered the requirements of Section 10(d), or that its decision adhered to the ESA’s conservation purpose. (Order at 29:11-16.)
- ✓ Nor does the significant “management flexibility” afforded to the agency under Section 10(j) justify the failure to further the long-term recovery of the Mexican gray wolf. (Order at 30:11-13.)
- ✓ There is no indication that that the management flexibility afforded to the agency under Section 10(j) was intended to displace the ESA’s broader conservation purpose, or that it overrides the duty to use the best available science. (Order at 30:19; 31:1-3.)
- ✓ Any effort to make the recovery effort more effective must be accomplished without undermining the scientific integrity of the agency’s findings and without subverting the statutory mandate to further recovery. The agency failed to do so here. (Order at: 31:9-12)

In the revised rule, the FWS must revise take provisions to ensure that they are consistent with the best available science and the conservation (i.e., recovery) mandate of the ESA and the Court Order. Additionally, take provisions must be consistent with the objective of enhancing the genetic health of the wild population of Mexican wolves.

When developing and finalizing the 2015 Mexican wolf 10(j) rule, FWS gave great deference to comments submitted by the States over those submitted by the public and recognized independent experts and conservation and scientific organizations.

FWS justified this deference to the state game and fish agencies by citing perceived legal constraints imposed by 50 CFR 17.81(d), which they explain in the excerpt below:

*Under 50 CFR 17.81(d), the Service must consult with appropriate State game and fish agencies, local governmental entities, affected Federal agencies, and affected private landowners in developing and implementing experimental population rules. In accordance with CFR 17.81(d), to the maximum extent practicable, this final 10(j) rule represents an agreement between the Service, the affected State and Federal agencies, and **persons holding any interest in land which may be affected by the establishment of this experimental population**. We invited 84 Federal and State agencies, local governments, and tribes to participate as cooperating agencies in the development of the EIS, 27 of which signed a Memorandum of Understanding (MOU). The purpose of this MOU was for the signatory entities to contribute to the preparation of the EIS that analyzes the proposed revision to the regulations for the Mexican Wolf Experimental Population.*

Draft Record of Decision for 2015 10(j) Rule, emphasis added.)

We assert that the most significant category of **“persons holding any interest in land which may be affected by the establishment of this experimental population”** is being completely ignored by FWS.

Most of the lands expected to be occupied by Mexican wolves are federal public lands, administered mostly by the U.S. Forest Service and to a lesser extent the Bureau of Land Management, and, potentially, the National Park Service. We contend that **the American public constitutes the “persons” holding interest in these lands**. Public opinion polls consistently show that around 70 percent of the public at large support recovery of Mexican wolves, especially on public lands, which are held in trust for the public, yet these voices were ignored in the review and revision process for the current 10(j) rule and related NEPA documents.

The FWS “invited 84 Federal and State agencies, local governments, and tribes to participate as cooperating agencies in the development of the EIS, 27 of which signed a Memorandum of Understanding (MOU). The purpose of this MOU was for the signatory entities to contribute to the preparation of the EIS that analyzes the proposed revision to the regulations for the Mexican Wolf Experimental Population.” (Draft Record of Decision). These entities were given special insider negotiation privileges not offered to the American public or citizen interest groups and scientific societies that support Mexican wolf recovery and the mission of the FWS, and which hold an equal interest in the lands designated for recovery and the fate of the federally endangered Mexican wolves. Yet, the FWS consistently views the conservation and independent scientific communities as less privileged citizens and participants in their planning and policy-making processes. This is wrong. It is common knowledge that most of the entities in the elite 27 cooperating agencies either outright oppose recovery of Mexican wolves or support far less than full recovery of this critically endangered gray wolf subspecies. The FWS gave special access and deference to the views and recommendations of the cooperating entities, while choosing to largely ignore or misinterpret the findings and recommendations of its own Recovery Team scientists (USFWS 2012).

While the FWS has a legal obligation to consult with these special interests, it is not obliged to carry out their wishes or demands, when those wishes or demands will subvert the ESA requirement to further the recovery of the listed entity. The Court affirmed this important distinction. The Court Order states:

- ✓ *Section 10(j) of the ESA does not require that the 10(j) rule be the product of an agreement with state and private stakeholders. (Order at 32:16-17.)*
- ✓ *On the contrary, the legislative history demonstrates that, although Congress anticipated Section 10(j) regulations would be implemented in consultation with affected parties, the Secretary would retain the authority and management flexibility to issue regulations that further the conservation of the species. (Order at 32:23-27.)*

Take provisions in the court ordered revision of the 10(j) rule must be consistent with science-based assessments of the effect of proposed take on the genetic health and progress toward recovery of the wild population. A requirement and criteria for these assessments must be included in the revised rule.

A letter signed by 41 representatives of conservation organizations and 38 scientists and sent to the Secretary of the Interior and FWS officials on October 16, 2019, recommended (in part) the following actions to limit the taking of Mexican wolves from the wild under provisions in the revised 10(j) rule:

- There shall be no cap or maximum number of Mexican wolves allowed in the wild.
- Wolves shall not be removed from the wild for their predation on wildlife such as elk or deer.
- Authorization for either the government or private individuals to kill wolves is restricted to cases in which they pose a likely threat to human health or safety.
- Wolves shall not be removed from the wild for preying on livestock on public lands while the permittee or permittee's agent was not present on the grazing allotment in which such predation occurred, after the permittee was cognizant of the nearby presence of wolves.
- Wolves shall not be removed from the wild for preying on livestock where carcasses of non-wolf-killed livestock attracted the wolves to the vicinity of livestock.
- Any wolf that has previously fed on non-wolf-killed livestock shall not be removed from the wild due to subsequent predation on livestock.
- Wolves shall not be removed from the wild for preying on livestock south of Interstate Highway 10 in Arizona and New Mexico, in order to facilitate natural connectivity between wolves in the U.S. and in Mexico.
- Wolves shall not be removed from the wild as a consequence of breaching any specific geographic boundary, and in particular wolves shall not be removed from the wild for traveling into or inhabiting regions north of Interstate Highway 40.

We endorse these recommendations and other recommendations included in the letter, which is incorporated into these comments as Appendix A.

To further reduce take of Mexican wolves, additional take provisions set forth in Section 17.84 (k)(7) and (k)(9) of the 2015 10(j) rule need revision.

- Non-feral domestic dogs should be removed from the definition of “domestic animals.”
- Trapping (except as authorized for non-lethal scientific purposes and management activities in support of the recovery of Mexican wolves) should be prohibited in the designated MWEPA. According to FWS data⁸, from 2/6/2002 to 3/9/2020 a known total of at least 54 Mexican wolves were caught in traps set by private trappers. Of these trapped wolves, 7 were either killed by the trapper or subsequently died from their injuries within a few days of being trapped. Four trapped wolves required limb amputations. Of the 44 Mexican wolves that survived being caught in traps, 33 were released by the trapper or agency personnel or were assumed to have self-released. The fate of 11 wolves cannot be determined from the agency data. Because of ongoing law enforcement investigations, the fate of 5 of these trapped wolves was redacted from the data. We are unable to determine if these 5 wolves are dead or alive. We believe it can be reasonably assumed that the remaining 6 wolves whose fates were not revealed by FWS were likely placed in captivity and, thus, lost to the wild population. Of course, the number of unreported trapping incidents cannot be known, but is highly unlikely to be zero. **The prohibition of private trapping within the MWEPA is necessary to adhere to the Court Order’s requirement for provisions that will provide “adequate protection for the loss of genetically valuable wolves.” (Order at 29:2-3.)**
- Section (k)(7)(vi): *Take in response to unacceptable impacts to a wild ungulate herd.* Wolves are natural predators of ungulates. Through this role they maintain the health of ungulate herds and help keep their populations within the carrying capacity of the ecosystem. This evolutionary balancing act serves to maintain the health and biodiversity of ecosystems. By regulating their own populations, wolves avoid “decimating” their prey populations. We see no credible scientific justifications for keeping this take provision in the revised rule, and recommend it be eliminated.
- Section (k)(7)(viii)(C): *Unintentional take.* We remain opposed to this provision, which preemptively exonerates Wildlife Services employees for “unintentional” or “coincidental” take of Mexican wolves while conducting their official duties. Federal employees are not “above the law.” All Mexican wolf mortalities not specifically authorized by FWS, whether caused by private citizens or agency employees should be subjected to investigations by federal law enforcement authorities for potential ESA violations.
- Section (k)(9) *Management* at (k)(9)(iii) states that FWS will manage for a population objective of 300 to 325 Mexican wolves in the MWEPA in Arizona

⁸ Data provided to David Parsons by USFWS in emails dated April 3, 2020 and May 20, 2020.

and New Mexico and authorizes “all management options” so as not to exceed this population objective. **We explain above why this provision must be eliminated.**

FWS’s duty to conserve Mexican wolves must trump any concession or “regulatory flexibility” included in the proposed 10(j) rule that would prevent progress toward recovery. This failed to happen under the regulatory flexibility of the 1998 rule for a period of 6 years (over half the life span of the reintroduction project at the time) when FWS delegated management decision authority to the States. And progress toward science-based recovery of Mexican wolves under the current 2015 rule has been insufficient, as articulated in the Court Order. Were it not for citizen intervention by litigation, these failures to conserve would likely have continued for much longer. Relying on citizen-initiated lawsuits to correct FWS’s failure to conserve Mexican wolves is not an acceptable agency strategy for fulfilling its duty to conserve listed species under the ESA. This duty must be deliberately, constantly, and effectively pursued by FWS.

The Court has held that under section 4(d) of the ESA, FWS must ensure that its actions always provide sufficient protection to ensure continued progress towards recovery of the species, and removal from the list of threatened and endangered species (*Sierra Club v. Clark*, 755 F.2d 608, 612 (8th Cir. 1985)).

To provide this assurance, we recommend the following simple “recovery firewall” provision in the formal body of the rule:

Annual population growth of at least 10% must be documented before any provisions in this rule resulting in 1) lethal control by the agencies, 2) permitted lethal take by anyone for any reason (except direct threats to human safety), or 3) removal of wolves from the wild population (except temporary removal for legitimate management purposes for no more than 6 months) can be authorized by the U.S. Fish and Wildlife Service. This provision applies to any entity granted decision authority under this rule. When any annual population count fails to document at least 10% growth of the wild population, the above restrictions would remain in effect for the entire following year. This provision will remain in effect until the current MWEPA population reaches at least 350 wolves and two additional populations of at least 200 wolves have been established in the US Southwest.

We note that FWS expects to achieve at least a 10% annual rate of growth of the expanded BRWRA population. (“The 12 year projection for the wolf population at a 10% annual groth [sic] rate will be 287 wolves in year 2026.”) (DEIS for proposed revision to the 10(j) rule (USFWS 2014 at page 4-19.)

The science of reintroduction of severely genetically bottlenecked populations calls for minimum time spent in captivity and rapid expansion of the reintroduced population (Frankham 2008). The 10% population growth requirement should be considered as the

“worst case scenario” for growing the Blue Range population. Population growth at twice this rate should be achievable (and was achieved in 2019) if human-caused mortality, including management take, is kept to a minimum. **We support and recommend measures leading to improved genetic health and rapid growth of the wild population.**

Our “recovery firewall” provision would simply add an extra layer of assurance that this planned rate of population growth is achieved. Since population growth over the past 16 years has fallen far short of established goals at times, such assurance as provided in this recommendation seems both necessary and appropriate. As the agencies already conduct annual population counts, this provision would require no additional management or monitoring efforts by the agencies.

Phased implementation of the rule.

Section (k)(9) *Management*, at (k)(9)(iv), which guides the three phases of implementation of the rule, must be revised to reflect changes to the MWEPA boundary and the need for at least two additional wild populations of Mexican wolves within the US Southwest.

Existing and future wild populations of Mexican gray wolves must be designated “essential” experimental populations under provisions of Section 10(j) of the ESA.

The Court Order is unambiguous and emphatic in directing the FWS to conduct a new “essentiality” determination for the expanded wild population. Relevant excerpts from the Court Order follow:

- ✓ *The Court concludes that because the effect of the 2015 rulemaking was to authorize the release of an experimental population outside its current range, a new essentiality determination was required and the agency’s decision to maintain the population’s nonessential status without consideration of the best available information was arbitrary and capricious. (Order at 35:13-17.)*
- ✓ *Section 10(j)(2) of the ESA requires the Secretary to perform an essentiality determination prior to authorizing the release of any population of an endangered species outside the current range of such species. (Order at 35:20-23.)*
- ✓ *Because the 2015 rule authorizes releases outside of the current range of the species, the Court finds that an essentiality determination was required under the plain language of Section 10(j). (16 U.S.C. § 1539(j)(2)(A), (B). (Order at 36:8-10.)*
- ✓ *First, the Court rejects Defendants’ argument that the statute is ambiguous as to when an essentiality determination is required. As discussed above, the ESA is clear that an essentiality determination is required prior to authorizing the release of any population of an endangered species outside the current range of such species. (Order at 36:18-22.)*

- ✓ *[A] court need not accept an agency’s interpretation of its own regulations if that interpretation is inconsistent with the statute under which the regulations were promulgated. (Order at 37:3-5)*
- ✓ *The Mexican wolf’s range is greatly expanded under the new rule, from 6,854 square miles to 153,871 square miles, without the opportunity for public comment on the decision to retain the population’s nonessential status. (Order at 3:18-21)*
- ✓ *the Court concludes that FWS was required to perform a new essentiality determination when it issued the 2015 10(j) rule, which authorized the release of an experimental population outside the species’ current range. (Order at 37:22-23; 38:1)*
- ✓ *FWS’s failure to perform this requirement under the ESA prior to authorizing the release of the population under the 2015 10(j) rule was arbitrary and capricious. (Order at 38:9-11)*
- ✓ *Under Section 10(j), the Secretary’s determination of whether a population is essential to the continued existence of the species in the wild must be made “on the basis of the best available information.” (Order at 38:14-16)*
- ✓ *The Secretary must consider whether the loss of the experimental population “would be likely to appreciably reduce the likelihood of the survival of the species in the wild.” (50 C.F.R. §§ 17.80(b), 17.81(c)(2)). This is a fundamentally biological inquiry and requires the agency to consider existing circumstances and science. FWS failed to do so here. (Order at 38:2-6)*
- ✓ *FWS made no findings regarding the current state of the Mexican wolf experimental population. Rather, it relied on findings it made in 1998, when circumstances were markedly different than they are today. (Order at 39:7-9)*
- ✓ *Although in the 17 years since the wolf was first introduced the captive population has grown to approximately 250 wolves, that population is aging and has lost much of its genetic diversity. (Order at 39:20-22)*
- ✓ *In sum, in deciding to maintain the 1998 essentiality determination, FWS failed to account for or consider the present circumstances of the experimental population. (Order at 39:26-27)*
- ✓ *Adopting a decision made 17 years prior without explanation does not satisfy the agency’s duty to base its decision on the best available science and information or to articulate a rational connection between the facts found and the conclusion reached. (Order at 39: 27; 40:1-3)*
- ✓ *Accordingly the Court finds that the agency’s decision to maintain the Mexican wolf’s nonessential status in the 2015 rulemaking was arbitrary and capricious. (Order at 40:3-5)*

Beginning with the initial releases of 11 captive reared Mexican gray wolves into the Blue Range Wolf Recovery Area in 1998, subsequent releases and population growth have resulted in a current wild wolf population comprised of an estimated 163 animals, as of the official end of 2019 count. All wolves in the population are either wild born or wild reared from the age of approximately one week as captive-born pups cross-fostered into wild dens. The adverse genetic effects of the 7-founder bottleneck are progressing and, as presented above, all measures of genetic health in both the wild and captive populations are steadily declining. The founder genome equivalent of the wild

population is now less than 2, and is less than 3 in the captive population. There are no known sources of new founders for the Mexican gray wolf subspecies (*Canis lupus baileyi*).

The situation for Mexican wolves is dire; and time is running out for rescuing the wild population with more genetically diverse wolves from the captive population. Under pressure from the States, FWS has limited releases from the captive to the wild population to only cross-fostered captive-born pups placed in wild dens for the past 5 years.

Thus, existing established wild family groups (i.e., “packs”) are essential to the continued existence of Mexican wolves in the wild because they are the foster parents of the primary source of Mexican wolves being released from the captive population – cross-fostered pups. And the current wild population occupying the MWEPA remains the only wild population of Mexican wolves in the US Southwest.

The test for determining “essentiality” under Section 10(j) of the ESA is whether the loss of the experimental population **“would be likely to appreciably reduce the likelihood of the survival of the species in the wild.”** (50 C.F.R. §§ 17.80(b), 17.81(c)(2) (emphasis added).

Given the facts presented and summarized in these comments, the answer to the question should be intuitively obvious even without a rigorous science-based determination – **of course present and future Mexican gray wolves in the wild are “essential” to the continued existence of the endangered subspecies in the wild and their loss would most definitely “appreciably reduce the likelihood of the survival of the [sub]species in the wild.”**

Indeed, the loss of the existing wild population of Mexican gray wolves in the US Southwest would most certainly lead to their extinction – forever.

A key argument in support of revising the classification of the experimental population to “essential” derives from the 2017 Mexican Wolf Recovery Plan, First Revision (USFWS 2017). Recovery criteria set forth in the plan require the establishment of two populations of Mexican wolves in the wild to achieve (along with other criteria) recovery and support a decision to delist Mexican wolves. One population is the existing population in the United States when it’s size has stabilized at or above 320 wolves, and the other population is to be established in Mexico and number at least 200 wolves. Thus, about 62% of the recovery standard set forth in the 2017 revised recovery plan is supported by the US population. Loss of the US population would almost certainly render recovery unachievable for many decades, and likely render recovery impossible. To declare the US population expendable is to render the 2017 recovery plan invalid (which we believe is already the case). This alone should justify the classification change to essential experimental.

Below we resubmit our comments on the Proposed Revision to the Nonessential Experimental Population of the Mexican Wolf (USFWS 2014), which remain relevant to the essentiality determination ordered by the Court (The Rewilding Institute and Project Coyote 2014: pages 10-15):

The proposed rule states with no specific justification that the only wild population of Mexican gray wolves in existence (numbering 83 at the beginning of 2014) will retain its original classification as a Non-essential Experimental Population (NEP) under provisions set forth in Section 10(j) of the Endangered Species Act (ESA) following the official listing of *Canis lupus baileyi* as an endangered subspecies.

We recommend at a minimum that the only existing wild population be reclassified as an Essential Experimental Population (EEP) under Section 10(j) of the ESA. The only remaining appropriate classification would be full “endangered” status, and we would support and prefer that classification.

The Congressional Record sheds considerable light on this determination. It says that in making the determination of essential or non-essential. “the Secretary shall consider whether the loss of the experimental population would be likely to appreciably reduce the likelihood of survival of that species in the wild. If the Secretary determines that it would, the population will be considered essential to the continued existence of the species.” [H. Conf. Rep. No. 97-835, at 33-34 (1982), reprinted in 1982 U.S.C.C.A.N., 2860, 2874-75]

We will demonstrate below that the NEP classification can no longer be supported by the best available science for both the wild and captive populations of Mexican gray wolves.

In 1998 the USFWS justified the determination that the BRWRA population of Mexican gray wolves was nonessential to the continued existence of the subspecies on the basis that the genetic integrity of the subspecies was being protected in the captive population. In promulgating the 1998 rule, the FWS concluded that “even if the entire experimental population died, this would not appreciably reduce the prospects for future survival of the subspecies in the wild. That is, the captive population could produce more genetically fit surplus wolves and future reintroductions still would be feasible if the reasons for the initial failure are understood.”

While such a conclusion may have been justified in 1998 and for a short time thereafter, it cannot be justified today as a safe harbor for allowing excessive removal of wolves in the wild to the point that the wild population is extirpated (USFWS 2010). The FWS (USFWS 1998) also asserted that “[r]eleasing captive-raised Mexican wolves furthers the objective of the Mexican Wolf Recovery Plan;” and that “This reintroduction will establish a wild population of at least 100 Mexican wolves and reduce the potential effects of keeping them in captivity in

perpetuity. If captive Mexican wolves are not reintroduced to the wild within a reasonable period of time, genetic, physical, or behavioral changes resulting from prolonged captivity could diminish their prospects for recovery.” A review of research by Frankham (2007) entitled *Genetic Adaptation to Captivity in Species Conservation Programs* confirms this cautionary prediction and raises serious concerns about genetic deterioration leading to maladaptive traits in captive populations.

The process of evolution causes animals to adapt to their environment. Frankham (2007), citing several peer-reviewed studies, states that “[c]haracteristics selected for under captive conditions are overwhelmingly disadvantageous in the natural environment,” and that these adverse evolutionary changes “jeopardize the ability of captive populations to reproduce and survive when returned to the wild.” He advises that “genetic adaptation to captivity should be minimized for populations likely to be used for reintroduction,” and that the most effective way to minimize genetic adaptation to captivity is to “minimize the number of generations in captivity” and return the species to the wild “as rapidly as possible.” Mexican wolves have been bred in captivity for approximately 35-50 years or possibly longer (records of the establishment of the Aragon Lineage are not available), depending upon the lineage. This research reconfirms the FWS’s cautionary concern in the 1998 rule about prolonged captivity cited above.

Endangered species recovery takes place in the wild, not in captivity (50 CFR §17.80(b)). Both the wild and captive populations face critical genetic issues. The wild population is dangerously inbred and the captive population has lost substantial gene diversity present in the initial seven founders. FWS has been aware of this looming genetic problem for many years and describes the dire genetic status of wild and captive populations in elaborate science-supported detail in a section titled *Inbreeding, Loss of Heterozygosity, and Loss of Adaptive Potential—Canis lupus baileyi* (USFWS 2013a; Docket No. FWS- HQ-ES-2013-0073).

Here are some excerpts from that FWS document (*Endangered and Threatened Wildlife and Plants; Removing the Gray Wolf (Canis lupus) From the List of Endangered and Threatened Wildlife and Maintaining Protections for the Mexican Wolf (Canis lupus baileyi) by Listing It as Endangered*):⁹

As of October 2012, the captive population of Mexican wolves consisted of 258 wolves, of which 33 are reproductively compromised or have very high inbreeding coefficients, leaving 225 wolves as the managed population (Siminski and Spevak 2012). The age structure of the population, however, is heavily skewed, with wolves 7 years old and older comprising about 62 percent of the population—meaning that most of the population is comprised of old wolves who will die within a few years.

⁹ **Federal Register**/Vol. 84, No. 51/Friday, March 15, 2019/Proposed Rules

This age structure has resulted from the high reproductive output of the F1 wolves and their descendants in captivity, the combination of few releases of captive-born wolves to the wild in recent years, removal of wolves from the wild population to captivity, and limited pen space for pairings, and means that additional gene diversity will be lost as the captive population continues to age.

The SSP strives to minimize and slow the loss of gene diversity of the captive population but (due to the limited number of founders) cannot increase it. As of 2012, the gene diversity of the captive program was 83.37 percent of the founding population, which falls below the average mammal SSP (93 percent) and below the recognized SSP standard to maintain 90 percent of the founding population diversity. Below 90 percent, the SSP states that reproduction may be compromised by low birth weight, smaller litter sizes, and related issues.

Representation of the Aragon and Ghost Range lineages in 2012 was 18.80 percent and 17.65 percent, respectively (Siminski and Spevak 2012, p. 6). More specifically, the representation of the seven founders is very unequal in the captive population, ranging from about 30 percent for the McBride founding female to 4 percent for the Ghost Ranch founding male. Unequal founder contributions lead to faster inbreeding accumulation and loss of founder alleles. The captive population is estimated to retain only 3.01 founder genome equivalents, suggesting that more than half of the alleles (gene variants) from the seven founders have been lost from the population.

The genetically effective population size (N_e) of the captive population is estimated to be 20 wolves and the ratio of effective to census size (N_e / N ; that is, the number of breeding animals as a percentage of the overall population size) is estimated to be 0.0846 (Siminski and Spevak 2012, p. 7). The genetically effective population size is defined as the size of an ideal population that would result in the rate of inbreeding accumulation or heterozygosity loss as the population being considered. The effective sizes of populations are almost always smaller than census sizes of populations. A rule of thumb for conservation of small populations holds N_e should be maintained above 50 to prevent substantial inbreeding accumulation, and that small populations should be grown quickly to much larger sizes ($N_e \geq 500$) to maintain evolutionary potential (Franklin 1980, entire). The low ratio of effective to census population sizes in the captive population reflects the limitations on breeding (due to a lack of cage space) over the last several years, while the low effective population size is another indicator of the potential for inbreeding and loss of heterozygosity.

The gene diversity of the reintroduced population of C. l. baileyi can only be as good as the diversity of the captive population from which it is established. Based on information available on July 11, 2012, the genetic diversity of the wild population was 74.99 percent of the founding population (Siminski and Spevak 2012, pp. 6–7), with 4.97 percent and 13.80 percent representation of Aragon and Ghost Range lineages, respectively. Although C. l. baileyi (in the reintroduced population) reached an all-time high population size in 2012 (minimum estimate of 75 wolves), it is currently a poor representation of the genetic variation remaining in the captive population. Founder representation in the reintroduced population is more strongly skewed than in the captive population. Mean inbreeding levels are 61 percent greater (0.1924 versus 0.1197), and founder genome equivalents are 33 percent lower (2 vs. 3.01) than in the captive population. In addition, the estimated relatedness of C. l. baileyi in the reintroduced population is on average 50 percent greater than that in the captive population (population mean kinship: 0.2501 vs. 0.1663; Siminski & Spevak 2012, p. 8). This suggests that C. l. baileyi in the reintroduced population are on average as related to one another as outbred full siblings are related to each other. Without substantial management action to improve the genetic composition of the population, inbreeding will accumulate and heterozygosity and alleles will be lost much faster than in the captive population.

There is evidence of strong inbreeding depression in the reintroduced population. Fredrickson et al. (2007, pp. 2365–2371) estimated that the mean observed litter size (4.8 pups for pairs producing pups with no inbreeding) was reduced on average by 0.8 pups for each 0.1 increase in the inbreeding coefficient of the pups. For pairs producing pups with inbreeding coefficients of 0.20, the mean litter size was estimated to be 3.2 pups. Computer simulations of the Blue Range population incorporating the Mexican wolf pedigree suggest that this level of inbreeding depression may substantially reduce the viability of the population (Carroll et al. in prep ; Fredrickson et al. in prep).

The recent history of Mexican wolves can be characterized as a severe genetic bottleneck that began no later than the founding of the Ghost Ranch lineage in 1960. The founding of the three lineages along with their initial isolation likely resulted in the loss of most rare alleles and perhaps even some moderately common alleles. Heterozygosity loss was accelerated as a result of rapid inbreeding accumulation. The merging of the captive lineages likely slowed the loss of alleles and heterozygosity, but did not end it. The consequences to Mexican wolves of the current genetic bottleneck will be future populations that have reduced fitness (for example, smaller litter sizes, lower pup survival) due to inbreeding accumulation and the full expression of deleterious alleles. The loss of

alleles will limit the ability of future Mexican wolf populations to adapt to environmental challenges.

*Based on data from the SSP documenting loss of genetic variation, research documenting viability-related inbreeding effects in *C. l. baileyi*, and our awareness that the wild population is at risk of inbreeding due to its small size, we conclude that inbreeding, and loss of heterozygosity, and loss of adaptive potential are significantly affecting *C. l. baileyi* and are likely to continue to do so in the future. If *C. l. baileyi* was not protected by the Act, these risks would remain, and may increase if states or other parties did not actively promote genetic diversity in the reintroduced population by releasing wolves with appropriate genetic ancestry to the population.*

The DEIS on page 1-4 provides the following information: *The small number of founders upon which the existing Mexican wolf population was established has resulted in pronounced genetic challenges, including inbreeding (mating of related individuals), loss of heterozygosity (a decrease in the proportion of individuals in a population that have two different alleles for a specific gene), and loss of adaptive potential (the ability of populations to maintain their viability when confronted with environmental variations) (Fredrickson et. al 2007, 78 FR 35664, June 13, 2013).*

We commend FWS for presenting the best available science on the critical genetic issues present in both the captive and reintroduced populations. This information alone justifies a protective classification of at least Essential Experimental for the expanded BRWRA reintroduced population, and we believe would support listing the Mexican wolf as “endangered” wherever found.

Additionally, this information should be an immediate call to action for FWS to take extraordinary measures to improve the genetic composition of the BRWRA population. Indeed, FWS admits, disingenuously, (USFWS 2010; p. 73) that “intensive management of genetic variation is an integral component of the recovery effort.” The urgency of such intensive genetic management of the BRWRA population and the FWS’s squandering of opportunities to implement such management are described in Hedrick and Fredrickson (2010). Both the 3-Year Review (Paquet et al. 2001) and the 5-Year Review (AMOC and IFT 2005) recommended that the 1998 rule be revised to allow wolves from captivity to be released throughout the BRWRA, rather than only within the Primary Recovery Zone. FWS refused to take action on that critical recommendation, and the genetic makeup of the BRWRA population has deteriorated as a result.

The independent Species Survival Plan (SSP) Management Group has followed state-of-the-art science, modeling, and planning in its genetic management of the captive population, but the steady loss of genetic diversity in the population cannot be avoided

Further justification for EEP classification comes from the leaked recommendations of the 2010 Recovery Team Science and Planning Subgroup (SPS 2011) of the current Mexican Wolf Recovery Team and their presentation at the 2013 International Wolf Symposium. We note that the scientists on the SPS were appointed by FWS for their recognized expertise in scientific disciplines relevant to Mexican wolf recovery. As we point out above, the SPS scientists have recommended three interconnected subpopulations averaging at least 250 wolves each with not less than 200 wolves in any of the three subpopulations (SPS 2011). One of these populations is identified as the existing BRWRA population. Clearly, the SPS has determined that the BRWRA population is essential to the survival and recovery of Mexican gray wolves in the wild.

Indeed FWS admits in the previous draft of this proposed rule on pages 35732-35733 (USFWS 2013b) that the BRWRA population is essential to Mexican wolf recovery:

Continuing the effort to reestablish the nonessential experimental population, and making modifications to improve it, will substantially contribute to the recovery of the species, as it is currently extirpated in the wild except for the nonessential experimental population in the United States and a fledgling reestablishment effort in Mexico. We recognize that more than one population of Mexican wolves will need to be established for recovery (Service 2010, pp. 68-70); therefore, achieving the objective of at least 100 wolves for this population serves as a fundamentally necessary component of Mexican wolf recovery.

This admission is a fundamental component of our argument, as well, in support of a more protective classification for the BRWRA population of Mexican gray wolves – either essential experimental or full endangered. We note that Webster’s Dictionary lists “necessary” as a synonym for “essential” (www.Merriamwebster.com/dictionary/essential).

The opportunity for revising the classification of the BRWRA population of Mexican wolf is ripe because FWS is proposing to list Mexican gray wolves (*Canis lupus baileyi*) separately as an endangered subspecies; whereas, the previously listed entity was *Canis lupus*. Fifteen years following its initial establishment, an argument that the BRWRA population (the only US population) of *Canis lupus baileyi* is not essential to the continued existence of *Canis lupus baileyi* is not supported by material scientific facts fully admitted to by the FWS.

Furthermore, this determination is not supported by any references to published literature or modern scientific analyses. Not only is the “nonessential” determination not based on the best science, it is not based on any science or any other available information, including substantial information made available in various documents by FWS itself.

The best available information and science makes an irrefutable case in support of classifying the expanded BRWRA population of Mexican wolves as an “essential” experimental population or “endangered” population under Section 10(j) of the ESA.

(The Rewilding Institute and Project Coyote 2014: pages 10-15)

This justification supporting an “essential experimental population” status under Section 10(j) of the ESA remains even more compelling today than it was six years ago. We resubmit and reaffirm our previous recommendation regarding the most appropriate classification for the wild population of Mexican gray wolves: **The best available information and science makes an irrefutable case in support of classifying the expanded BRWRA population of Mexican wolves as an “essential” experimental population under Section 10(j) of the ESA.**

If FWS decides to continue the nonessential determination, then we request that a peer-reviewed, science-based justification conducted by qualified independent scientists be provided in support of that determination.

Thank you for this opportunity to comment.

Sincerely,



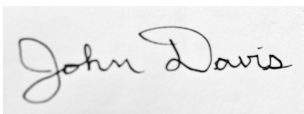
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Appendix A: Group Pre-Scoping Letter to the Secretary of the Interior et al.

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October 16, 2019

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Re: Request for a science-based and humane 'preferred alternative' in upcoming Mexican gray wolf management rule-making.

Dear Secretary Bernhardt, Acting Director Everson, Regional Director Lueders, and Recovery Coordinator McGee:

On March 31, 2018, the Federal District Court in Tucson ruled that the U.S. Fish and Wildlife Service's 2015 Mexican wolf management rule, 80 Fed. Reg. 2512 (January 16, 2015), violates the Endangered Species Act by failing to conserve the endangered Mexican gray wolf and not relying on the best available science. The Service has until May 17, 2021 to revise the rule. This letter from 48 organizations representing hundreds of thousands of members, and 32 scientists, requests that, in rewriting the rule, the Fish and Wildlife Service ("Service") adopt an entirely new approach to management and recovery of Mexican wolves – an approach based on science, acknowledgement of past shortcomings, humaneness, and a precautionary approach to management of a genetically unique and genetically depleted regional subspecies.

The Service's loss in court was the latest flashing-red warning light for these highly endangered wolves. The invalidated 2015 management rule replaced a 1998 reintroduction rule that itself was revised as a consequence of litigation after the Service

failed to meet its own demographic predictions for population growth.¹⁰ And in the four-and-a-half years since promulgation of the 2015 rule, which was intended in large part to improve the genetic diversity in a wolf population that under previous management had become dangerously inbred, genetic diversity has declined further.¹¹

We urge the Service to engage in a robust, fully-participatory, and democratic National Environmental Policy Act process in revising the management rule. We request that the process include a scoping period, development of a wide range of management alternatives based on the best science, thorough exploration of those alternatives in a draft environmental impact statement (EIS), and public comment periods and public hearings accessible to a broad range of the public throughout the Southwest, before finalization of the EIS and promulgation of a final rule.

We request that the “preferred alternative” in the EIS embody the approach and incorporate the elements that we outline below. That approach would go beyond cross-fostering to include the release of wolf families into the wild together in the same way that these social mammals were first successfully reintroduced. It would establish benchmarks to measure short-term success in ameliorating the genetic crisis, requiring the recurring releases of family packs until those benchmarks are met. Equally important, our requested preferred-alternative would provide stringent on-the-ground protections for the wolves. That approach contrasts sharply with the Service’s long-term policies and management that have consistently minimized the number of wolves released into the wild and provided multiple opportunities to remove wolves.

One of the fundamental changes that we request is that the Service designate the wild U.S. population as *experimental-essential* instead of non-essential.¹² Whatever the status of the U.S. population when first reintroduced in 1998, complete loss of the same population during the present era would likely doom this unique subspecies to extinction. The population would never be reconstituted and could never be replaced, while habitat and a prey base for the remaining wolves in Mexico is likely not sufficient to sustain a genetically-resilient population with no connectivity to U.S. wolves. That precious U.S. wild population must be designated as essential to afford it greater protections to prevent its loss. After over two decades of uneven demographic growth, slower than the Service’s repeated projections, and after more than two decades of declining genetic health, essential designation is key to reversing the U.S. wild population’s deterioration and ensuring overall survival in the wild and recovery of the Mexican wolf.

¹⁰ The Service projected 102 wolves in the wild and 18 breeding pairs by 2005; see U.S. Fish and Wildlife Service, Reintroduction of the Mexican Wolf within its Historic Range in the Southwestern United States Final Environmental Impact Statement (Nov. 6, 1996), p. 2-8. However, it was not until 2014 that 102 wolves roamed the Southwest and the Service has still not documented 18 breeding pairs on the landscape; see <https://www.fws.gov/southwest/es/mexicanwolf/pdf/pop.estimate.web.98-17.pdf>.

¹¹ Mexican Wolf Experimental Population Area Initial Release and Translocation Proposal for 2017 (Feb. 2, 2017), p. 1; Mexican Wolf Experimental Population Area Initial Release and Translocation Proposal for 2019 (Sept. 30, 2018), p. 2.

¹² While some of our organizations think that the U.S. wild Mexican wolf population should be fully protected with 'Endangered' status, we are asking here that you designate that population as 'Experimental-essential.'

Our requested ‘preferred alternative’ as outlined below addresses four areas of Service authority in wolf management: (1) Releasing wolves from captivity, (2) removing wolves from the wild, (3) protecting wolves from killings and injuries, and (4) preventing wolf predation on livestock. Our suggested approach offers a science-based road map for establishing a viable Mexican wolf population through reversal of the Service’s management philosophy and practices that it has followed since 1998. For a new era that will begin in May 2021, we request incorporation of the following elements into the preferred alternative in the draft EIS and their inclusion in the final rule:

Releasing wolves from captivity

- The Service and/or cooperating agencies shall annually release from captivity into the wild the maximum feasible number of well-bonded male/female Mexican wolf pairs with pups, until the average gene diversity has increased to halfway between that in the captive population and the wild population.¹³

Removing wolves from the wild

- There shall be no cap or maximum number of Mexican wolves allowed in the wild.
- Wolves shall not be removed from the wild for their predation on wildlife such as elk or deer.
- Authorization for either the government or private individuals to kill wolves is restricted to cases in which they pose a likely threat to human health or safety.
- Wolves shall not be removed from the wild for preying on livestock on public lands while the permittee or permittee’s agent was not present on the grazing allotment in which such predation occurred, after the permittee was cognizant of the nearby presence of wolves.
- Wolves shall not be removed from the wild for preying on livestock where carcasses of non-wolf-killed livestock attracted the wolves to the vicinity of livestock.
- Any wolf that has previously fed on non-wolf-killed livestock shall not be removed from the wild due to subsequent predation on livestock.
- Wolves shall not be removed from the wild for preying on livestock south of Interstate Highway 10 in Arizona and New Mexico, in order to facilitate natural connectivity between wolves in the U.S. and in Mexico.
- Wolves shall not be removed from the wild as a consequence of breaching any specific geographic boundary, and in particular wolves shall not be removed from the wild for traveling into or inhabiting regions north of Interstate Highway 40.

¹³ The target level of gene diversity of 0.725 is half-way between projected levels in 100 years of the gene diversity in the wild population without releases (0.67) as compared to the projected level in the captive population (0.78). Geneticist Philip W. Hedrick, Ph.D. advised such a near-term metric in a declaration submitted on July 20, 2018 to the U.S. District Court in Tucson while the Court pondered the remedy in its finding that the 2015 management rule was illegal. It is vital that the Service institute objective, results-based benchmarks that determine action.

Protecting wolves from killings and injuries

- The Service shall request that land-management agencies revoke livestock grazing permits of any permittee found guilty of the illegal killing or injuring of a Mexican wolf.
- Only employees of government wolf-management agencies, scientists engaged in scientific research, and persons under the supervision of such government employees or scientists shall have access to wolf-programmed telemetry receivers or the real-time information from GPS collars.
- To the extent feasible, every wolf that is found to have been or is reasonably presumed to have been killed unlawfully in the wild shall be replaced within a year through the release to the wild of a wolf born in captivity, selected so as to increase genetic diversity, in addition to the releases of well-bonded pairs as required in the section on “Releases from captivity” above.

Preventing predation on livestock

- To enhance cooperation and reduce conflicts in Mexican wolf recovery, management agencies shall proactively conduct outreach to and education of citizens, associations, local governments and tribal governments about wolf behavior, life history, ecology, non-injurious protection of domestic animals, and current distribution including on or near grazing allotments.
- The U.S. population of the Mexican wolf shall be designated as an experimental, *essential* population, and all federal actions within the experimental population area, including the issuance of public-land grazing permits, shall be analyzed for their effects on the survival and recovery of the Mexican wolf.
- All wolf-management agencies shall document every known instance of wolves feeding on livestock along with conclusions as to what killed such stock based on a necropsy and/or other evidence.
- All livestock permittees who lease public lands must remove or render inedible the carcasses of any of their livestock that die of non-wolf causes before wolves begin scavenging on such carrion and then persist near vulnerable livestock.¹⁴
- All livestock permittees with knowledge that wolves are on or near public lands that they lease must ensure the presence on each such grazing allotment at all times of a person equipped to chase and harass (but not injure or kill) wolves to deter hunting of livestock.

These provisions are based on science and in particular the importance of enhancing genetic diversity through wolf releases and through binational connectivity of wolf populations. In addition, through combining family-pack releases with stringent restrictions on wolf removals and common-sense measures to lessen the number of wolves killed illegally, our suggested approach is also humane.

¹⁴ Similarly, in reintroducing wolves to Yellowstone National Park and central Idaho, the Service required that “If livestock carrion or carcasses are not being used as bait for an authorized control action on Federal lands, it must be removed or otherwise disposed of so that they will not attract wolves.” 59 Fed. Reg. 60252 (Nov. 22, 1994).

The Mexican gray wolf is a beautiful, intelligent, social animal that is unique among gray wolves. Endemic to the southwestern United States and northern Mexico, Mexican wolves play a vital role in maintaining the natural balance in an arid landscape with different distributions of prey than found in more northern habitats. The Mexican wolf is beloved by millions of people in the U.S. and Mexico, many of whom have been thrilled by reintroduction programs in both nations but also gravely disappointed in the uneven pace of population establishment. Recovery of the Mexican wolf is a promise established by the U.S. Endangered Species Act and with it, conservation of the ecosystems on which Mexican wolves depend. Please do not keep going in the same fruitless direction that has not even met your own metrics, but instead chart a new path that will actually recover the Mexican gray wolf.

Thank you for your consideration.

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