

Draft Mexican Wolf Conservation Assessment

Peer Review: David Parsons

Submitted March 10, 2009

I appreciate the opportunity to provide a peer review of this document. My comments follow.

Introduction.

This document represents a relatively thorough and useful compilation of scientific information for future consideration by a formal recovery team in their development of a recovery plan for the Mexican gray wolf and possibly other subspecies of gray wolf depending on the ESA listing authority in effect at that time. I could offer many comments about the excellent content in this document, but as is the general nature of reviews, I will focus my comments mostly on what I perceive as its shortcomings or deficiencies.

In my opinion, an overarching shortcoming of this document is the lack of specific guidance or recommendations for immediate actions that can and should be taken to protect, conserve, and recover the existing wild population of Mexican gray wolves in the Blue Range Wolf Recovery Area (BRWRA). This population currently suffers from significant demographic and genetic impairment that could threaten its integrity and viability within the time required to develop a revised recovery plan and associated NEPA documents and federal regulations. The BRWRA population of Mexican wolves must be considered a critical component of any future recovery strategy for gray wolves in the Southwest; and its success must be given the highest priority by agency decision/policy makers and managers concurrently with the development of a full recovery strategy.

The lack of a full recovery goal for Mexican gray wolves should not preclude or delay immediate and ongoing management decisions and actions necessary to ensure the success of the BRWRA Mexican wolf reintroduction project and rapid achievement of its 100+ wolf population objective.

I am not privy to the terms of the contract between the US Fish and Wildlife Service (USFWS) and Ms. Tracy Melbihess for the preparation of this document. Thus, comments I have made or issues I have raised that fall outside the contract terms are directed to the USFWS, not to Ms. Melbihess, and should not reflect upon the quality of her work.

All comments are offered in the collegial spirit of the peer review process.

Specific Comments.

Acknowledgments.

Page 3, Para 2: The complete name of the current recovery team should be used: **Southwestern Gray Wolf Distinct Population Segment Recovery Team (emphasis on Mexican gray wolf, *Canis lupus baileyi*)**.

The official name of the Recovery Team acknowledged that the primary emphasis of the team's deliberations and the recovery plan it was charged to produce was on recovery of the Mexican gray wolf subspecies (*Canis lupus baileyi*).

Re: This document intends to capture the scientific concepts and information that they discussed before the planning process was put on hold by the Service in 2005 due to litigation. Their work has not been resumed, although the agency maintains its intent to develop a revised plan when circumstances permit.

I am aware of no litigation or regulatory impediment that forced suspension of recovery planning for the Mexican gray wolf or is currently prohibiting such recovery planning. The plain fact is that the current authority for gray wolf recovery planning is the 1978 listing rule—the same rule that was in effect when the original *Mexican Wolf Recovery Plan* (1982) was developed and approved by the USFWS.

The document should simply state that suspension of recovery planning for the Mexican gray wolf or any other gray wolf subspecies in the Southwest is a policy decision made by the USFWS in early 2005.

FORWARD

Page 5, Para 1: *It has been over 20 years since the completion of the 1982 Mexican Wolf Recovery Plan, and an up-to-date description and assessment of the gray wolf (*Canis lupus*) recovery effort **and relevant technical literature** in the Southwest is needed.*

Note: Highlighted text as above will be my convention throughout these comments for suggested edits.

Page 5, Para 3: *Re: Since this program, from a policy standpoint, is a regional program for gray wolf recovery, the assessment refers to “gray wolf recovery in the Southwest.”*

I am not aware of any formal policy decision establishing a “regional program” for gray wolf recovery in the Southwest. Since early 2005 the USFWS has avowed that it has no formal program of any scope for gray wolf recovery in the Southwest, except continuation of the BRWRA reintroduction project. However, under the prevailing 1978 listing authority for gray wolves, the USFWS has the authority to establish a recovery program for gray wolves (at the species or subspecies taxonomic level) anywhere within the lower 48 United States. The accepted process for establishing a recovery program is the development and approval of a recovery plan for the taxonomic entity being recovered.

Page 5, Para 4: Re: *overturned by court decisions*. See comment above. It is true that the court vacated a listing rule that sought to establish a Southwestern Distinct Population Segment of gray wolves, but the court's action reinstated the 1978 listing rule for gray wolves throughout the lower 48 United States, which, as I point out above, confers authority to the USFWS to establish recovery programs for gray wolves or subspecies of gray wolves wherever it so chooses.

EXECUTIVE SUMMARY

I am offering no comments on this section of the report. It should be revised to reflect any changes made to the full document.

The Road to Recovery.

Page 18, Para 2: Re: *The Final Rule established the Mexican Wolf Experimental Population Area (MWEPA) in central Arizona and New Mexico, which and designated the reintroduction effort reintroduced population as a non-essential experimental population under section 10(j) of the ESA (Figure 1). This designation was made justified because wolves released to the wild would represent excess redundant genetic material produced from the captive breeding program and because it allowed for regulatory flexibility in managing released wolves and their progeny, an important consideration at the time for public support of the reintroduction (Brown and Parsons 2001; 63 FR 1752-1772, January 12, 1998).* [I suggest adding the following precaution from page 1755 (FR 63:7) of the non-essential experimental population rule (referred to hereafter as the "10(j)" rule):] *"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."*

Re: *Within the BRWRA, a Primary Recovery Zone in the Apache National Forest was designated for release (initial release and translocation) of Mexican wolves, with a Secondary Recovery Zone in the Gila National Forest providing dispersal habitat for released wolves (Figure 1). The secondary recovery zone includes portions of both the Apache and Gila National Forests.*

Re: *This analysis determined that such translocation of wolves into the Secondary Recovery Zone of the BRWRA would not create significant new impacts beyond those analyzed in the EIS (USFWS 2000), which assumed occupancy of the entire BRWRA by a population of at least 100 Mexican gray wolves.*

Page 19, Para 1: Re: (*"Blue Range population" refers to wolves in the BRWRA, as well as those on FAIR and surrounding lands*). I disagree with this general definition of the "Blue Range population." The EIS and 10(j) rule establish an objective of a population of at least 100 wolves within the BRWRA, an area that is legally defined in the 10(j) rule as the entirety of the Apache and Gila National Forests. It is true that the 10(j) rule allows adjacent land owners, including Native American tribes, to accept wolves that establish residency on their property; but this provision does not change the definition of the BRWRA, nor does it change the objective of establishing at least 100 wolves within the BRWRA. Wolves on property adjacent to the BRWRA are essentially "bonus animals"

relative to the formal, legally established population objective for the BRWRA. Owners of adjacent properties currently supporting occupancy by Mexican wolves could, under provisions of the 10(j) rule require the USFWS to remove those wolves at any time.

Page 19, Para 3: Re: *six lead agencies*. I find this terminology confusing. Elsewhere the document describes the AMOC and refers to the two states and the WMAT as having the “lead” authority under the Memorandum of Understanding that establishes the AMOC.

Page 19, Para 4: Re: *As of December 2007 the Blue Range wolf population consisted of approximately 52 wolves and a minimum of 4 breeding pairs (USFWS 2008: Population Statistics). Although the population has grown steadily since 1998 from both the direct release of wolves and natural reproduction (AMOC and IFT: TC-11), the population target of at least 100 wolves has not been reached.*

I note that one of the four “breeding pairs” claimed in the end of 2007 count did not meet the legally established definition of breeding pairs set forth in the 10(j) rule.

Furthermore, it is a gross misstatement to claim that the population has “grown steadily since 1998.” The population grew steadily through 2003 and has declined by an estimated 3 wolves over the past 5 years. Thus, the population has experienced 5 initial years of growth, and 5 subsequent years of stagnation resulting a slight decline over the past 5 years.

Page 19, Para 5: Re: *Success of Mexican wolves has been more comparable to the success of red wolves than the Northern Rockies gray wolves (AMOC and IFT 2005: TC-18).* I suggest replacing the word “success” with a more value neutral term such as “population dynamics.”

Page 20, Para 1: I suggest replacing *moderate growth of the population* with “failure to achieve the population objective.”

Page 20, Para 2: *They concluded that the project was proceeding reasonably well from a biological standpoint and that continued application of existing management would eventually result in the establishment of a wild, self-sustaining population of wolves.*

On page 60, authors of the Paquet report include a general conclusion similar to the underlined excerpt above. However, on page 27 of the report, after having assessed reproductive success of the wild population of Mexican wolves, they issue the following contradictory conclusion: “Survival and recruitment rates, however are far too low to ensure population growth or persistence. Without dramatic improvement in these vital rates, the wolf population will fall short of predictions for the upcoming years.”

Authors of the 3-Year Review could not have anticipated the implementation of SOP 13 and the effects it would have on the rate of lethally controlled and permanently removed wolves in the years following completion of their review. Nevertheless, they warned that “vital rates” for the BRWRA population needed “dramatic improvement” for the

reintroduction objective to be met. Thus, the underlined statement is the more prescient conclusion of the 3-Year Review.

Page 20, Para 3: Re: *In the few years between the 3- and 5-Year reviews, the Service and its State, Federal, and tribal partners sought to implement the recommendations of the 3-Year Review. However, due to a variety of circumstances that are detailed in the 5-Year Review, many of the recommendations were not implemented, or not to the degree desired and expected by interested parties (AMOC and IFT 2005: AC).*

I am aware of no hard evidence that “State, Federal, and tribal partners sought to implement the recommendations of the 3-Year Review.” Setting aside whether any efforts were made to implement the 3-Year Review, the two sentences above are nothing more than an excuse for inaction by the USFWS. They add no value to the content of the Conservation Assessment; and I recommend they be deleted.

Page 21, Para 1: Re: *The 5-Year Review was conducted by AMOC, the IFT, and a socioeconomic consulting firm, and incorporated extensive public input.*

While the USFWS offered extensive opportunities for public input on drafts of the 5-Year Review and its 37 recommendations, precious little of that input, at least from the conservation science community, was “incorporated” as stated above. As evidence, I offer the fact that all 37 draft recommendations were adopted as the final recommendations with no substantive changes despite extensive comments recommending changes to and deletions of draft proposed recommendations from commenters and endorsers with conservation science credentials.

Status and Implications of National Gray Wolf Recovery for the Mexican Wolf.

Page 23, Para 1: Re: *The ongoing struggle between the Service’s delisting actions and related legal challenges in the Great Lakes and Northern Rockies has been ongoing for several years and has delayed efforts to develop an up-to-date gray wolf recovery plan in the Southwest to replace the 1982 Mexican Wolf Recovery Plan.*

See earlier comments that the delays in recovery planning in the Southwest result from policy choices made by the USFWS and were not forced by court decisions or standing regulations as this assessment repeatedly states.

Page 23, Para 2: Re: *As a result of this litigation, which invalidated the team’s charge to develop a plan for the SWDPS because the SWDPS was no longer a listed entity, the Service put the recovery planning process on hold while the agency determined how to respond.*

True, the SWDPS was no longer a listed entity; but gray wolves remain a listed entity throughout the lower 48 states, and the suspended recovery planning effort was emphasizing recovery of the Mexican gray wolf. I reiterate my recommendation to remove portions of this document, like the excerpt above, that serve only to excuse the USFWS for its failures or policy choices and offer no content of value for the future recovery of Mexican wolves or other gray wolves in the Southwest.

Taxonomy and Range

Pages 26-27, Overlapping Sentence: Re: *This research has also shown that there are some genetic markers more typical of Canadian and Alaskan wolves in Mexican wolves, providing evidence of some historical contact between Mexican wolves and northern subspecies (Leonard et al. 2004).*

I question this interpretation of Leonard et al. (2005). All gray wolves began as “northern gray wolves” that crossed the Bering Land Bridge during successive ice ages. They radiated throughout most of North America and northern Mexico, adapting to new environments over time and space. This process led to the eventual evolution of the Mexican gray wolf in the US Southwest and Mexico. Leonard et al. (2005) speculate that “The area south of the ice sheets in the southern cUS and Mexico was likely a refugium for grey wolves during the last glaciation and consequently served as a source of grey wolf colonists for deglaciated Canada.” They suggested that present day “northern gray wolves” may be the result of a final northward radiation of gray wolves from this southern population. However, this northward radiation must have been incomplete because a number of the haplotypes examined by Leonard et al. (2005) were found historically in the cUS and Mexico but not in Canada and Alaska. Successive north to south and south to north radiations could easily explain how “southern gray wolves” could retain some “northern” genetic markers and how gray wolves in the mid latitudes of the coterminous United States could retain some “southern” markers without direct “historical contact between Mexican wolves and northern subspecies” as is suggested in the excerpt.

Another explanation, of course, is the see-saw nature of genetic exchange along the fuzzy borders of subspecies boundaries that can result in the eventual transport of a gene much farther in distance than the individual or individuals contributing the gene actually dispersed. For example, a Mexican wolf could disperse 200 miles northward and successfully breed with a mate from that more northerly region, and offspring from that reproductive event could then disperse another 200 miles northward and successfully breed with a mate from that even more northerly region, moving a Mexican wolf genetic marker even further north. I posed this potential explanation of the discovery of Mexican wolf genetic markers in more northern regions (e.g., Utah, Colorado, and Nebraska) to one of the authors of Leonard et al. (2005), who agreed that it was a plausible explanation of their findings. Of course this scenario could play out just as easily from north to south eventually transporting northern gray wolf genes into southern gray wolf populations. Thus the presence of a genetic marker for a particular subspecies of gray wolf in a specific location does not imply with any certainty that the original source animal for that marker actually occupied that geographic location.

In my opinion, the notion of past direct historical contact between Mexican wolves and northern subspecies (except subspecies immediately adjacent to the Mexican wolf's historic range) is not supported by the findings of Leonard et al. (2005).

Ecology and Habitat Description

Page 31, Para 3: Re: *Wolves may also impact ecosystem diversity beyond that of their immediate prey source in areas where their abundance is numerous enough to affect the distribution and abundance of other species (sometimes referred to as “ecologically effective densities” (Soule et al. 2003)) (Soule et al. 2005). This may occur through two mechanisms: 1) wolf predation may decrease the population of an herbivore that otherwise would competitively exclude other herbivores; and, 2) wolf predation on an herbivore may result in increases or decreases to lower trophic levels, cascading to the autotrophs at the bottom of the food web (i.e., “trophic cascade”) (Terbough et al. 1999). Such effects have been attributed to gray wolf reintroduction in Yellowstone National Park and elsewhere (e.g., Ripple and Bescheta 2003, Ripple and Bescheta 2004, Hebblewhite et al. 2005).*

I'm not sure what “increases or decreases to lower trophic levels” means. It would be more informative to give specific examples of what might be changing within a trophic level (e.g., species diversity, population size, energy flow, etc.).

Add: *Hebblewhite, M., CA White, CG Nietvelt, JA McKenzie, TE Hurd, JM Fryxell, SE Bayley, and PC Paquet. 2005. Human activity mediates a trophic cascade caused by wolves. Ecology 86(8):2135-2144.*

Wolf-Human Interactions

Page 33, Para 4: Re: *However, one recent human death in Canada has been attributed to wolves (International Wolf Center 2008).*

It is important to note that this conclusion was reached by a jury of non-scientists in a court of inquiry. Dr. Paul Paquet, who investigated the scene, presented findings at the 2008 North American Wolf Conference refuting the jury's finding. Dr. Paquet believes that the preponderance of the evidence suggests that the man was killed by a black bear. He was not allowed to present his evidence at the official inquiry.

I suggest soliciting a statement from Dr. Paquet regarding this human mortality.

Threats to the Gray Wolf in the Southwest

Page 37, Para 1: Re: *The 3-Year Review hypothesized that ~~based on the author's estimation of prey base,~~ the BRWRA could support a ~~minimum of over 200~~ a range of 213 to 468 wolves, based on agency estimates of elk and deer populations (Paquet et al. 2001).*

Page 37, Para 2: Re: *Thus, it has been recommended that areas targeted for wolf recovery have low road density of ~~approximately~~ not more than 1 mile of road per square mile of area, or 1.6 km of road per 2.56 square kilometer (Thiel 1985).*

Page 39, Para 2: Re: *Threats related to habitat destruction, modification, or curtailment do not likely threaten the Blue Range Population at the current time, based on an increase in the*

area available to reintroduced wolves since the project began, lack of indication that wolves are food-limited, and a relatively small number of vehicular-related wolf deaths each year.

See previous comment on Mexican wolves outside the BRWRA not counting toward the 100+ wolf objective for the BRWRA.

Page 43, Para 3: Re: *The efficacy of the configuration of the internal and external boundaries of the BRWRA has been questioned in both the 3-Year and 5-Year reviews, as well as internally within the agencies responsible for the reintroduction and recovery effort. Paquet et al. (2001:61) stated that the small size of the Primary Recovery Zone (the Apache National Forest, the zone designated for release of wolves) was hindering rapid establishment of the wild population and recommended that the Final Rule be modified to allow releases in the Secondary Recovery Zone (the Gila National Forest). In a follow-up to this recommendation, AMOC provided a detailed explanation in the 5-Year Review of why modification of the internal boundaries of the BRWRA had not yet occurred by 2005. In short, initial progress toward revising the Final Rule between 2001 and 2003 was eclipsed by the Service's subsequent intent to revise the 1982 Mexican Wolf Recovery Plan to provide big picture guidance for the recovery program before proceeding with revision to the reintroduction project. After the SWDPS recovery team was put on hold due to litigation in 2005, the Service indicated that AMOC should resume consideration of necessary modifications to the reintroduction project, including boundary modifications (AMOC and IFT 2005: AC-14-17). AMOC concluded in the 5-Year Review that the provision governing release of wolves solely into the Primary Recovery Zone restricts the pool of available release candidates, restricts release of wolves for management purposes such as genetic augmentation, and causes public perception issues between the states of Arizona and New Mexico (AMOC and IFT 2005: AC-14-15). Thus, the 5-Year Review recommended that the Final Rule be modified to expand the area in which wolves could be released and translocated.*

See previous comments regarding underlined text.

Page 45, Para 1: Re: *At the end of 2007, the lead agencies acknowledged that the aggressive removal rate of wolves by management due to depredation, nuisance, and boundary issues was hindering population growth, although they also reiterated the importance of demonstrating a high level of responsiveness to conflicts (AGFD et al. 2007). Two lawsuits currently challenge the Service's adoption of SOP 13 for failure to comply with NEPA (Defenders of Wildlife et al. v. Tuggle et al., Civil No. 4:08-cv-280-DCB (D. Ariz.)) and on the grounds that SOP13 does not "further the conservation of" the Mexican wolf as required by section 10(j) of the ESA and is therefore arbitrary and capricious under the Administrative Procedures Act (APA) (WildEarth Guardians et al. v. USFWS et al., Civil No. 2:08-cv-820-DCB (D. Ariz.)). These challenges have not yet been resolved, but resolution of the second case in particular will provide insight into whether SOP 13 contributes to the adequacy of existing regulatory mechanisms for the Mexican wolf.*

Nearly all permanent removals are in response to livestock depredation and dictated by the provisions of SOP 13. While the referenced litigation may provide additional insights, the USFWS has already admitted that excessive management removals are

preventing attainment of the BRWRA Mexican wolf population objective (see first sentence of above text from the Conservation Assessment).

Page 45, Para 3: Re: *A revised recovery plan has still not been finalized, for complex logical reasons (see Status and Implications of National Gray Wolf Recovery for the Mexican Wolf, above, as well as AMOC and IFT 2005: AC-10).*

See previous comments on stated justification for suspending recovery planning.

Page 45, Para 4: Re: *While a number of substantial concerns have been raised related to the adequacy of the ESA's regulatory mechanisms for the Mexican wolf reintroduction project and gray wolf recovery program in the Southwest, the concerns (including those being resolved through litigation) are aimed at the interpretation and implementation of available mechanisms by the Service and its interagency partners rather than the adequacy of the mechanisms themselves.*

If the court finds or the USFWS admits (as it has in this document and elsewhere) that the USFWS's or AMOC's interpretation and implementation of existing regulatory mechanisms (i.e., 10(j) rule, MOA establishing AMOC, and SOP 13) are precluding recovery of the Mexican wolf as mandated by the ESA, then by logical extension those regulatory mechanisms are inadequate to protect and conserve the Mexican gray wolf. The plain facts are that progress toward recovery of the Mexican wolf has not occurred over the past five years under existing regulatory mechanisms as interpreted and implemented by the AMOC and accepted by the USFWS, a participating member of the AMOC.

Page 46, Para 1: Re: *While the conservation assessment reiterates prior findings that several of the ESA's provisions have not been implemented in a manner or to the degree that information now suggests is necessary, the assessment acknowledges the ongoing efforts of the Service and the lead agencies to address these inadequacies. Specifically, these efforts include the quarterly meetings of the Adaptive Management Working Group, which includes AMOC and other State and county governments, to gather input and address issues of concern (AGFD 2008); the intent of the Service to modify the Final Rule as demonstrated by a recent public scoping process, including a series of public meetings held in November and December 2007 to consider modifications to the Final Rule (72 FR 44065-44069, August 7, 2007; and see USFWS 2008: Rule Modification); multiple attempted revisions of the 1982 Mexican Wolf Recovery Plan; and the development of a Mexican-wolf-specific incentives program and application of existing incentives available through State programs to address socioeconomic issues related to wolf conflicts.*

There is no hard evidence to suggest that “ongoing efforts of the Service and the lead agencies to address these inadequacies” have had or likely will have any positive effect on progress toward recovery of the Mexican wolf. The primary evidence is that the wild population of Mexican wolves is lower today than it was five years ago, as is the number of breeding pairs.

I am aware of no effective program changes resulting from meetings of the Adaptive Management Working Group. If positive results from these meetings exist, they should be described in this assessment.

The FWS's intent to modify the Final Rule was based on recommendations adopted in the 5-Year Review that many expert reviewers believed would be antithetical to recovery of the Mexican wolf. The fact that FWS has opened a rule revision process and solicited scoping comments from the public does not demonstrate that the rule revision process will be completed or that the revised rule will overcome current regulatory and implementation inadequacies.

Multiple attempts to revise the 1982 Mexican Wolf Recovery Plan have no bearing on whether or not the plan will eventually be revised.

And finally, the "development" of an incentive program does not guarantee the "implementation" of such a program. To my knowledge the proposed program has not yet been finalized. And future "implementation" of the proposed incentives program, if it occurs, does not guarantee progress toward recovery of the Mexican wolf. Members of the conservation science community have pointed out to the USFWS potential "fatal flaws" in the proposed "interdiction" program.

I see little value to this content relative to the purpose of this assessment.

Page 46, Para 2: Re: **Summary statement:** *Current interpretation and implementation of several regulatory mechanisms are not adequately supporting the reintroduction and recovery effort. Modifications to the implementation of these mechanisms that will support the reintroduction and recovery effort have been identified and are actively being pursued.*

The first sentence of this summary statement is an accurate "assessment" of the current status of efforts to conserve and recover the Mexican wolf.

The second sentence is subjective and speculative. I suggest it be deleted.

Page 46, Para 4: Re: *Some ranchers, hunters and outfitters, and tribes in and near the BRWRA have experienced, and may continue to experience, negative social and economic impacts due to wolves, such as loss of revenue due to livestock depredation, fear for the safety of family members that may come into contact with wolves, stress due to the uncertainty of future economic losses wolves may cause, and anger at the government (Unsworth et al. 2005).*

I suggest giving equal coverage to the positive social, economic, and ecological effects of the restoration of wolves or simply deleting the above passage.

Page 47, Para 3: Re: *However, the degree to which a wolf population is able to withstand a given level mortality depends on the population's productivity, including factors such as the level of reproduction, and whether breeding animals are killed (Fuller 1989, Fuller et al. 2003, Ballard et al. 1987, Ballard et al. 1997).*

An important citation to add here is: *Brainerd, SM et al. 2008. The effects of breeder loss on wolves. Journal of Wildlife Management 72(89-98.*

The Conservation Principles of Resiliency, Redundancy, and Representation

Page 49, Para 1: Re: *With several factors hindering the progress of the Blue Range population in achieving the objective of at least 100 wolves in the wild, the population is not ~~as~~ secure or self-sustaining ~~as it could be.~~*

I suggest deleting the struck through words.

Page 53, Para 2: Re: *Noticeably, estimations of viability vary not only between previous gray wolf recovery plans but also between those recovery plans and the scientific literature. There may be several reasons for this variability, including site-specific considerations, advances in analytical techniques and data availability used to explore viability over the last 3 decades, and the range of perceived notions of viability that exist within the professional community relative to wolf conservation and the ESA.*

I believe that another legitimate explanation for this variability is an inherent tendency within government agencies toward establishing minimal standards for species recovery.

Page 58, Para Last: Re: *On a much broader scale, representation also suggests that a species should be conserved in the variety of habitats in which it occurs in order to maintain the structure and function of ecosystems, i.e., ecosystem representation (Shaffer and Stein 2000).*

I am pleased to see this important aspect of representation included. I suggest expanding this discussion to include the important emerging concept of “ecological effectiveness” and the importance of establishing and maintaining ecologically effective densities of “strongly interacting species” such as wolves. Two important papers on this topic are Soule et al. (2003, 2005) both of which are cited elsewhere in this document. And, of course, there is a growing body of literature documenting the role of top predators in maintaining biological diversity and ecosystem health. The keystone role of wolves in their ecosystems is referenced elsewhere in the assessment.

In my opinion, recognition of the concept of ecologically effective population densities in establishing recovery goals is critical to achieving the ESA purpose of conserving ecosystems upon which endangered and threatened species depend.

If my recollection serves me correctly, the Recovery Team (prior to its suspension) accepted a recommendation to incorporate the concept of ecological effectiveness in its establishment of recovery goals and objectives.

Page 59, Para 4: Re: *Effective population size for the Mexican gray wolf has been estimated at 0.28 times the census population (range of 0.19 to 0.34) (USFWS 2002b, USFWS 2003, USFWS 2004, USFWS 2005, USFWS 2006a, AGFD et al. 2007), which falls*

within the range of general estimates of effective population size for wildlife populations (0.2-0.3, see Mills 2007: 185). With a census population size of 100, effective population size would be about 28 wolves.

I am quite surprised at and suspicious of the calculated N_e/N_c ratio of 0.28 for the BRWRA population, which is similar to the estimate I have seen for the Yellowstone National Park population. I have not gone to the publications you cite to examine how the ratio was calculated. But, given the genetics issues, consistent reproductive failures, and high loss of breeders in the wild population, I would expect a much lower ratio. I suggest you solicit an expert opinion from someone like Dr. Philip Hedrick or Dr. Rich Fredrickson on the probable N_e/N_c ratio for the BRWRA population.

Other reasons to be suspicious of this reported N_e/N_c ratio are that calculations of genetically effective population size consider only breeding age adults and exclude immature animals, that the Mexican wolf population experienced a severe bottleneck in recent time, and that breeding adults (i.e., alpha pack members) are frequently poached or removed by agency managers. The BRWRA population is far from the “idealized population” represented by the conceptualized “genetically effective population.”

With regard to the second underlined passage above, please see the following meta-analysis on this topic: *Frankham R. 1995. Effective population size/adult population size ratios in wildlife: a review. Genetical Research 66:95-107.*

Frankham concludes that wildlife populations have “much smaller effective population sizes than previously recognized” averaging only 0.1 to 0.11.

Page 61, Para 4: A discussion of the genetic viability of the captive population should include a review of the relevant literature on the effects of captivity over time on the evolution of the population’s genome, and the potential effects of evolutionary selection in a captive environment on the ability of captive animals to survive when returned to the wild. Traits that are adaptive in a captive environment are likely maladaptive in a wild environment.

Frankham (2008) provides a comprehensive review of this topic in: *Frankham R. 2008. Genetic adaptation to captivity in species conservation programs. Molecular Ecology 17(1):325-333.* His findings and conclusions should be incorporated into this assessment.

Frankham concludes that “[g]enetic adaptation to captivity is expected to have major effects on reintroduction success for species that have spent many generations in captivity.” This issue must receive serious consideration in future recovery planning for the Mexican gray wolf. Time is running out for considering the captive population to be a safeguard for failed reintroduction attempts or the long-term persistence of this highly endangered subspecies.

Page 62, Para 2: Re: *The goal of 80-10-10 ancestry of McBride, Aragon, and Ghost Ranch wolves in the captive population has been applied to the reintroduced population (Siminski*

and Spevak 2007), with the representation of the three lineages at 77.13 percent McBride, 12.9 percent Aragon, and 9.96 percent Ghost Ranch (as of July 28, 2007) (Siminski and Spevak 2007).

The assessment should note that Fredrickson et al. (2007) recommend adjusting the ancestry representation in the Mexican wolf population to 50-25-25. Achieving this goal in the wild population will require aggressive, targeted management actions by the USFWS and cooperating agencies. These actions should not wait for a rule change or a revised recovery plan; they need to be implemented now while the population is small, as is noted in the assessment.

This is one example of how I think the Conservation Assessment could be made into a much more effective and currently useful document by providing direct guidance on how to improve the genetic composition of the wild population under current authorities.

I recommend that this assessment call for the immediate development and rapid implementation of a Genetics SOP (as was recommended in January 2008 by the Association of Zoos and Aquariums in a letter to Regional Director Tuggle). The development of a Genetics SOP should include the involvement of recognized genetics experts, such as Drs. Hedrick and Fredrickson.

Page 62, Para 3: Re: *Management of released wolves may not always fully support genetic considerations; for example, standard operating procedures may stipulate removal of a wolf because of its behavior, regardless of its genetic value to the population.*

Rather than simply identify the problem, the assessment should recommend solutions such as revising or rescinding SOP 13 and developing and implementing a Genetics SOP, as I have recommended above. Implementation of SOP 13 has caused the wild population to decline and has been detrimental to its genetic integrity.

Rather than making excuses for agency inaction or failure to meet reintroduction objectives, this assessment needs to be honest in assessing the adverse effects of management procedures like SOP 13 and recommend effective solutions to be implemented immediately.

Page 63, Para 2: This content is excellent and well supported by modern scientific findings and thought regarding the conservation of species and biological diversity. I recommend that this discussion be expanded to include the importance of establishing ecologically effective population densities of wolves across multiple habitat types per my comments above on page 58, last paragraph.

Page 63, Para 4: Re: **Summary statement:** *Short-term objectives for the appropriate balance of representation by each of the three founding lineages in the captive and reintroduced Mexican wolf populations have been determined and are actively being implemented through captive wolf pairings and selection of wolves for release to the wild. Maximization of long-term (several generations) genetic retention is a priority for the captive breeding program.*

See comments above on page 62, paragraphs 2 and 3 regarding the need to expedite genetic augmentation and management of the wild population. This summary statement should reflect the urgency of this issue and the need for immediate management decisions and actions to enhance the genetic integrity of the wild population. In addition, the summary statement should recognize the potential for genetic deterioration over time in captive populations.

Page 64, Para 2: Re: *Although the progress of the Blue Range population in achieving the population objective of at least 100 wolves has been more moderate than expected and has not yet been achieved, the population has steadily increased in size since wolves were initially released in 1998. Intensive management provides considerable security that any specific threat as discussed herein does not likely pose an immediate extinction risk to the population due to the existence of over 300 wolves in captivity and the ability of management to bolster the Blue Range population with captive wolves in response to a major population decline or noticeable decline in fitness. However, individual threats (including aspects of the current management regime), and more so the combination of threats, still have the potential to decrease population size and growth rate, causing it to remain at a level at which it is more susceptible to stochastic events and to further hinder progress toward the population objective to establish a population of at least 100 wolves.*

The first underlined statement above is simply not true. See comments above on page 19, paragraph 4.

In my opinion, the most understated threat in this assessment to the long term security and viability of Mexican gray wolves is the threat of genetic deterioration in both the captive and wild populations. Population geneticists warn about the potential adverse effects of severe population bottlenecks and recommend rapid expansion of the population following bottlenecks to avoid additional loss of genetic variation. Additionally, they warn about the deleterious genetic effects of holding populations in captivity over multiple generations. When assessing the genetic viability of the reintroduced BRWRA population, the establishment of that population from a relatively small number of released animals from the captive population that survived, reproduced, and eventually contributed to the gene pool of the wild population should be considered a second bottleneck event for the Mexican gray wolf.

Re: “Intensive management...”: It could be argued that intensive management in the form of excessive lethal control and permanent removal of wolves is posing some level of extinction risk to the population. Furthermore, dipping into the captive population to correct for management failures or other causes of population decline or diminished genetic fitness in the wild population cannot be considered a long-term solution for reasons discussed above and elsewhere in these comments.

The goal of Mexican wolf recovery should be to eliminate the need for a permanent captive population by securing the long-term viability of Mexican gray wolves in the wild. Defining the parameters of long-term viability for Mexican wolves in the wild is the job of a Recovery Team.

I believe ample justification and authority exists for this assessment to recommend immediate resumption of formal recovery planning for Mexican gray wolves.

Page 64, Para 3: Re: *The intent of the ESA is to recover species such that they are able to sustain themselves in the wild.*

I am glad to see this recognition that the intent of the ESA is recovery “in the wild.”

Page 64, Last partial sentence: Re: *Ecosystem representation suggests that the distribution of the gray wolf in a variety of habitats in the Southwest is an important consideration for ecosystem health and diversity.*

END OF COMMENTS