

**Comments by the North American Section of the Society for
Conservation Biology on Proposed Rule to Delist the Northern Rocky
Mountain Population of Gray Wolf (50 CFR Part 17, 72 FR 6106)**

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Executive Summary

The Society for Conservation Biology (SCB) is an international professional organization dedicated to promoting the scientific study of the phenomena that affect the maintenance, loss, and restoration of biological diversity. Our peer-reviewed journal, *Conservation Biology*, has published dozens of articles addressing both the Endangered Species Act and wolf restoration in the United States. Here, we draw upon fundamental principles of conservation biology and specific information on wolf biology to evaluate the proposal for delisting wolves in the U.S. Northern Rockies (50 CFR Part 17, 72 FR 6106).

We do not believe the proposed rule to designate the Northern Rocky Mountain (NRM) Population of gray wolf as a Distinct Population Segment (DPS) and remove this Distinct Population Segment from the Federal List of Endangered and Threatened Wildlife is warranted at this time. Our concerns about the proposed rule can be summarized into the following specific areas:

1. Inadequate state management plans to protect the long-term viability of the regional metapopulation
2. Inadequate consideration of what constitutes a significant portion of range, connectivity between high quality habitat in adjacent regions, and the historic range of the taxon
3. Inadequate consideration of threats due to increasing loss of habitat and natural- and human-caused mortality

4. Outdated recovery goals that do not reflect the realized carrying capacity of wolves in the U.S. Northern Rockies
5. Inappropriate interpretation of habitat models (e.g., Carroll et al. 2006)
6. Inadequate consideration of gray wolf taxonomy

The proposed state wolf management plans (excluding Montana) will not protect viable metapopulations. The proposed delisting rule does not address a significant portion of the wolf's range, would eliminate connectivity between high quality habitats in several states, and would leave a significant gap in the historic range of the species. The proposed delisting rule does not adequately consider long-term threats in the region. Furthermore, the proposed delisting rule inappropriately interprets recent regional-scale habitat models and does not adequately consider which subspecies of gray wolf is being restored. The recovery goals set forth in the rule are outdated. We therefore ask that the proposed rule be replaced by one that better ensures the long-term viability of the Northern Rocky Mountain population as part of a connected metapopulation of wolves throughout the U.S. Rocky Mountains.

The Ecological Role of Wolves

Wolves play an important role in ecosystems as a strongly interacting species (Soulé et al. 2005). Complex interactions between wolves, other predators, prey, and vegetative communities have been documented in Yellowstone National Park (Smith et al. 2003, Robbins 2004, Ripple and Beschta 2004, Campbell et al. 2006) and Isle Royale National Park (Peterson 1995, Peterson et al. 1998). Hebblewhite et al. (2005) recently documented that wolf exclusion in Canada indirectly led to decreased aspen recruitment and willow production, resulting in lower songbird species richness and abundance. Wolves may also help mediate the effects of global warming on scavenger communities in Yellowstone National Park (Wilmers and Post 2006). Wilmers and Post (2006) found that wolf-killed carcasses in Yellowstone provided a key wintertime food source that otherwise would not be available due to warming winters.

In order for the beneficial effects of wolves to be realized, they must persist at a certain density or population level that maintains their interaction effectiveness (Soulé et al. 2005). Soulé et al. (2005) label this threshold as an “ecologically effective” density defined as “the population level that prevents undesired changes in a defined ecological setting” (p. 171). The ecologically effective population is usually much greater than the threshold for short-term persistence (i.e., minimum viable population). Estimating the density required for ecological effectiveness depends on locality, season, productivity, and other factors (Estes and Duggins 1995, Soulé et al. 2003). For example, the ecological effectiveness of wolves is reduced when prey are subject to other sources of mortality such as hunters, other large carnivores, or severe weather events (Soulé et al. 2005). In Yellowstone, signs of ecological effectiveness were documented seven years after wolf reintroduction when there was a population of 148 wolves spread over 2.2 million acres (Ripple and Beschta 2004).

Strengths of the Proposed Rule

The reintroduction of wolves into the U.S. Northern Rockies has been successful, and populations have expanded into former, unoccupied habitat. The impacts of reintroducing wolves into ecosystems where they have been absent for 60 years have been significant. Where wolves have become established, their presence in the ecological community has increased biodiversity and enhanced ecosystem integrity. Depredations to livestock have been lower than expected and economic benefits from tourism have been positive (White et al. 2005).

The proposed delisting rule (50 CFR Part 17, 72 FR 6106) gives an excellent background into the efforts of the USFWS and their partners in recovering a once extirpated species. We recognize the tireless efforts of all the partners working to restore a species whose presence is so controversial. The proposal clearly outlines the justification for designating a Distinct Population Segment (DPS) and delisting the proposed DPS, reasons for not accepting Wyoming's state plan, and potential threats to the species viability. We agree that Montana has created a plan sufficient to maintain its portion of the regional metapopulation, with a goal of managing a population of 328 to 657 wolves within its borders.

Weaknesses of the Proposed Rule

1. The proposed delisting rule does not adequately address whether state management plans will protect the long-term viability of the species or will have adequate funding to manage wolves

In order for wolves to be delisted in the NRM DPS, state management plans will need to be developed for the management and conservation of wolves. Idaho, Montana, and Wyoming (if an acceptable plan is developed) state wolf management plans would be charged with maintaining a minimum of 15 breeding pairs (Federal Register pg. 6129) in each state in order to “maintain a substantial margin of safety over the 10 breeding pair minimum” (Federal Register pg. 6128).

Both the Idaho Wolf Conservation and Management Plan and the Wyoming Wolf Management Plan (while still not approved) call for reducing wolf populations to 15 breeding pairs in each state. Currently, there are at least 25 wolf breeding pairs in Wyoming and 40 breeding pairs in Idaho (USFWS et al. 2006). Only the Montana Gray Wolf Conservation and Management Plan has set an objective greater than 15 breeding pairs. The Montana plan estimates a population between 328 and 657 with approximately 27 to 54 breeding pairs by 2015 (MWMAC 2003). As discussed later in this document, setting such low population objectives in Idaho and Wyoming will not protect the long-term viability of the species.

Additionally, the proposed rule does not demonstrate that the management efforts by the states will be guaranteed adequate funding and staff. State management will likely cost three million dollars annually, especially with ESA mandated monitoring for five years

after delisting. This is a critical issue since wolf management requires significant management costs for minimizing conflicts between humans and wolves. For example, Montana state law requires that wolves that depredate livestock must be radio-collared, but there is no guarantee that this activity will be funded after delisting. Compensation and enforcement costs should also be considered as part of the management costs. This was not adequately discussed in the proposed rule.

By failing to address these uncertainties in funding, the proposed rule does not reflect the full intent of the 1988 amendment to the recovery plan and other provisions of the ESA. The 1988 amendment requires a system for monitoring effectively, for not less than five years, the status of all species that have ostensibly recovered. This requirement would provide information adequate to trigger relisting in the event of a significant risk to recovered species (ESA sections (4)(f)(1), (g)(1) and (2) respectively).

2. The proposed delisting rule does not adequately consider what constitutes a significant portion of range, does not ensure connectivity between high quality habitat within the Northern Rockies and to adjacent regions, and leaves a significant gap in the range of the taxon

The Endangered Species Act outlines key objectives in determining if a species is considered “recovered.” Among them is the objective that a recovered species “is not in danger of extinction throughout all or a significant portion of its range and not likely to become so in the foreseeable future.” We do not believe adequate consideration has been given to the existence of suitable, but unoccupied habitat in Utah and Colorado; the rule could eliminate connectivity linking the Northern Rockies wolf populations to high quality habitat in these states. Additionally, there would still remain a significant gap in the historic range of the species if populations are not established in Utah and Colorado.

Wolves historically ranged throughout most of North America (Goldman 1944). Today they occupy just 5% of their historic range in the continental United States. In the U.S. Rocky Mountains, gray wolves (*Canis lupus*) currently inhabit the U.S. Northern Rockies and Mexican gray wolves (*Canis lupus baileyi*) are established in portions of Arizona and New Mexico. Once, however, wolves freely roamed between these reintroduced populations and inhabited Colorado and Utah. The proposed rule does not consider effects of delisting on the likelihood of establishment of wolf populations in Utah and Colorado, which form a significant portion of the species’ historic range.

Modeling has identified vast amounts of suitable, but unoccupied wolf habitat in Utah and Colorado. Switalski et al. (2002) predicted that there are up to 36,000 km² of suitable habitat in Utah that could support more than 700 wolves. This included several core habitat areas including the Book Cliffs, which could potentially support approximately 100 wolves (Switalski et al. 2002). Modeling by Carroll et al. (2006) similarly estimated that Utah had a potential wolf population of about 700. The proposed DPS only includes a small portion of this habitat in northern Utah. Modeling in Colorado has identified large blocks of public land that could serve as potential wolf habitat. Bennett (1994) predicted a potential carrying capacity of 1,128 wolves in Colorado.

More recently, Carroll et al. (2006) estimated a potential population of 900 wolves in Colorado. Both models identified large core areas of habitat that would act as source populations throughout the region.

Without ESA protection, it will be very difficult for wolves to disperse into Utah and Colorado because of lost protections along key habitat corridors in Wyoming. Under ESA protection, several wolves have dispersed into Utah and Colorado, which are reported in the proposed rule (Federal Register pg. 6114). Jones and Tingey (2001) identified high levels of habitat connectivity between the Greater Yellowstone Ecosystem and both the Bear River Range of northern Utah and Flaming Gorge National Recreational Area. Oakleaf et al. (2006) also identified a possible dispersal corridor into the Bear River Range (the Flaming Gorge National Recreational Area was beyond the scope of their model). If wolves were delisted, they would lose all protection in southern Wyoming in key habitat corridors, potentially eliminating connectivity to and among areas of high quality habitat in Utah and Colorado.

Delisting of the proposed NRM DPS would not account for wolf habitat in Colorado and Utah and would leave an 800-km gap in the range of wolves in the U.S. Rockies. Historically, Montana wolves were genetically and demographically dependent on wolf populations in Canada and Idaho (Pletscher et al. 1991, Boyd and Pletscher 1999). Similarly, wolves in Utah and Colorado would be dependent on populations in the U.S. Northern Rockies and U.S. Southwest wolf recovery areas. Additionally, demographic and genetic interchange between these populations may help wolves adapt to global climate change, other periodic disturbances, and environmental variability.

Delisting of the proposed NRM DPS, by allowing reductions of NRM wolf populations to levels specified in the 1987 recovery plan, may threaten connectivity within the NRM metapopulation itself. Wolf populations in the western United States were characterized historically by high levels of interpopulation dispersal (Leonard et al. 2005). Reestablishment of such dispersal may be necessary, not only to facilitate natural recolonization of vacant but suitable habitat, but also to ensure continued genetic diversity within the NRM wolf populations. The proposed rule also fails to assess the effects on interpopulation connectivity of likely future habitat loss due to human population growth and consequent development pressure in the Northern Rockies. Simulations of the effects of such threats on NRM wolf populations suggest that the effects on connectivity may be substantial. In a study using the model PATCH (an individual-based, spatially explicit population model), “landscape change trends move[d] the U.S. Northern Rockies landscape towards a condition where the wolf subpopulations would also become increasingly isolated...This is due not only to increasing barriers to movement (e.g., highways) but also to degradation of source habitat and consequent reduction in the numbers of dispersers and the area of sink habitat that can be sustained by this dispersal...” (Carroll 2006; 377).

3. The proposed delisting rule does not adequately address threats due to increasing loss of habitat and natural- and human-caused mortality

The population goals set forth in the 1987 are orders of magnitude below the historic wolf population levels in the region, as documented by genetic research (Leonard et al. 2005). Currently occupiable habitat within the region could also support a regional population of several thousand wolves (Carroll et al. 2006). Carroll et al. (2006) identified 277,377 km² of suitable wolf habitat with the potential for 2,750 wolves in the proposed NRM DPS. Oakleaf's more conservative model identified 170,228 km² of suitable habitat in the proposed NRM DPS (Oakleaf et al. 2006). Managing for a population of wolves in the hundreds instead of thousands, as envisioned in the Idaho and Wyoming state plans, may increase the risk of rapid population declines and loss of connectivity between populations due to environmental stochasticity, loss of genetic variability, increased regional development, human-caused mortality, disease, and climate change. The cumulative impacts of these threats were not significantly addressed in the proposed rule and will threaten the future viability of wolves in the proposed NRM DPS.

The 1987 recovery goals are also much lower than goals established in wolf recovery plans in other regions of the United States, such as Minnesota. The Eastern Gray Wolf Recovery Plan's population goal for Minnesota, 1,250 to 1,400 animals, is more than an order of magnitude higher than state-level populations for the NRM (USFWS 1992). The 1987 plan justifies this discrepancy by claiming that connectivity between wolf population in the U.S. Northern Rocky Mountains and larger wolf populations in Canada ensure continued viability of U.S. populations that might be too small to be viable if isolated. However, the sanguine assumption of continued dispersal from Canadian populations to support U.S. population viability is unfounded because 1) wolf populations in areas of southern Alberta and British Columbia adjacent to the United States border are not protected, but rather are subject to hunting and active control efforts, which have led to their extirpation from some areas, and 2) although a recovery plan can consider the effects of actions by other nations to conserve the species, they should not rely largely on actions that may or may not be taken by other nations. Related to this point, the proposed rule does not evaluate whether the proposed actions adequately meet federal obligations under the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, as noted in the ESA Section 2(a)(4)(C).

Human-caused mortality is the leading source of mortality for wolves in the proposed NRM DPS and is responsible for more than 75% of all deaths of radio-collared wolves (Federal Register pg. 6125). Although wolves can quickly recover from high levels of mortality, 26 percent of the population has been killed each year from legal and illegal killing under ESA protection (Federal Register pg. 6125). Keith (1983) and Fuller et al. (2003) estimate that wolves can persist with human-caused mortality of 30% or greater, but there are several natural and human factors that could increase wolf mortality beyond that threshold in the near future, even if they remain listed.

Of particular concern are the effects of poaching on wolf populations: illegal killing is one of the major causes of wolf mortality (USFWS 1989-2005). For example, several incidents of wolf poaching were reported in the Flathead system (Montana) in the last few years despite the fact that wolf abundance is relatively low there (See: Daily

InterLake November 30, 2005 for three separate wolf poaching incidents). In addition, increased human population and development in the region may lead to an increase in the number of road-kills, which is already a cause of mortality for wolves (Bangs et al. 2005).

Yellowstone's wolf population dropped from 171 in 16 breeding pairs in 2004 to 118 wolves with only seven breeding pairs in 2005 due to disease (USFWS et al. 2006). Warming temperatures due to global climate change have been shown to increase the development and spread of disease with negative effects on host populations (Kiesecker et al. 2001, Harvell et al. 2002). Recent research found that a presumably climate-induced outbreak of canine parvo-virus (CPV) on wolves on Isle Royale led to a shift in moose population dynamics from top-down to bottom-up regulation (Wilmers et al. 2006).

4. Recovery goals are outdated and do not reflect the realized carrying capacity of wolves in the U.S. Northern Rockies

The Idaho and Wyoming state management objectives to reduce populations to 15 breeding pairs in each state would result in a significant reduction in the current and potential NRM wolf population. Recovery goals for wolves should be updated to incorporate new information about numbers of wolves that each state could potentially support. The recovery goal of 15 breeding pairs is based on data that do not reflect the realized carrying capacity of wolves in these regions. Current numbers of breeding pairs are almost three times the 15-pair goal in Idaho and two times that goal in Wyoming. Also, more suitable, yet currently unoccupied habitat is available in both states for the formation of additional breeding pairs (Carroll et al. 2006, Oakleaf et al. 2006). If delisting allows Idaho and Wyoming to limit wolf populations to such low breeding pair objectives, these states could become population sinks for Montana's wolves. Under these conditions, with high mortality of wolves dispersing from Montana into neighboring states, the ability of the Montana state plan to maintain a viable subpopulation may be compromised.

Recent advances in the field of conservation biology and the methods of population viability analysis post-date the 1987 Wolf Recovery Plan. The focus on a single number (e.g., 15 breeding pairs) representing a purported minimum viable population threshold does not adequately consider recent research concerning the temporal (demographic) and spatial dynamics of wolves within their ecosystems (Fuller and Cochrane 2003). As pointed out earlier, Soulé et al. (2005) argued that keystone species such as wolves should be managed to support populations that retain ecological effectiveness. The proposed rule does not adequately address or cite data that address effective population sizes. Without an ecologically effective population of wolves, many of the ecological services that wolves provide may not be realized, resulting in a loss of biological diversity or ecosystem function where wolves are absent.

In Yellowstone, signs of ecological effectiveness were observed when there was population of 148 wolves over 8,983 km² (Ripple and Beschta 2004). Thus, assuming an

even distribution of wolves, a population of roughly 16 wolves per 1000 km² may approximate a density threshold for a wolf population necessary to prevent undesired changes. The state management plans would manage for approximately one wolf per 1000 km² using Oakleaf's (2006) more conservative habitat model. A wolf population that only numbers in the hundreds may not be ecologically effective across such a large geographic area. Additionally, focusing on numbers (15 breeding pairs) excludes adequate consideration of the temporal (demographic) and spatial dynamics of wolves within their ecosystems.

5. The proposed delisting rule inappropriately interprets regional-scale habitat models (e.g., Carroll et al. 2006)

Estimating the extent of suitable habitat for large carnivores is challenging when compared to other species more closely associated with specific ecological features (e.g., vegetation types). Habitat for large carnivores is constrained by both prey availability and human-associated mortality. Because the latter factor is a function of both fixed landscape features such as roads and human attitudes and policies, it can be measured only indirectly in wildlife habitat models. Despite this, recent peer-reviewed regional-scale habitat models (Oakleaf et al. 2006, Carroll et al. 2006) provide a valuable tool for incorporating quantitative information on habitat factors into recovery planning, supplementing previous qualitative analysis methods dependent on expert judgment.

However, the proposed rule interprets the results of recent studies in a fashion that contradicts the context in which they were presented in the literature. The proposed rule inappropriately discounts Carroll et al.'s (2006) model as too "liberal" and not "realistic" based upon "field experience" and "locations of persistent wolf packs." Other models have identified similar amounts of habitat in the region as Carroll et al. (2006) delineated. Switalski et al. (2002) identified almost identical amounts of habitat and population potential for Utah as Carroll's model. Additionally, Carroll et al.'s (2006) model is more conservative than estimates of potential populations in Colorado (see Bennett 1994). Furthermore, a 10-year post-reintroduction period may not be long enough to gauge the potential dispersal abilities and expansion of this growing wolf population for determining the DPS boundaries. Because wolf populations are still increasing, it may be premature to place a boundary on these populations.

Additionally, the ESA does not limit the scope of recovery goals to habitat quality as it exists at the time of listing, but may mandate habitat restoration (i.e., road closures or other measures) where current habitat potential is inadequate to secure a well-distributed and viable population. Therefore, equating "current habitat condition" with range may not be appropriate. Carroll et al. (2006) also estimated potential wolf habitat, which the ESA mandates the U.S. Fish and Wildlife Service to consider.

6. The proposed delisting rule does not adequately address the gray wolf's taxonomy

Genetic analysis has demonstrated that gene flow among wolf populations in North America is high and that many of the previous subspecies classifications may have been

spurious, except for the Mexican wolf (*Canis lupus baileyi*; Wayne et al. 1992). The last morphological review of the species' taxonomy suggests that most gray wolves in the contiguous United States are classified as the plains wolf (*Canis lupus nubilus*; Nowak 1995). This proposed rule doesn't clarify what wolf subspecies the Service is considering as its basis for the DPS.

The two main criteria under the DPS policy are the discreteness of the population segment in relation to the remainder of the species to which it belongs and the significance of the population segment to the species to which it belongs (USFWS 1996). If the Service is considering recovering the currently recognized taxon known as the plains wolf, then the NRM DPS does not adequately recover wolf populations in the contiguous United States. Large areas of suitable remain with minimal human presence occur in other states that were formerly occupied by the gray wolf, including Colorado and Utah, as noted, but also Oregon, Washington, and California. Recovery efforts for the gray wolf have been successful in a portion of this species' range and should serve as a model for how to recover wolves throughout other significant portions of the range, where vast areas of suitable habitat still exists.

Conclusion

The reintroduction of wolves into the U.S. Northern Rockies has been a great success. However, we do not believe that wolf populations are adequately recovered in the U.S. Rockies and argue that significant threats persist. Specifically, the proposed state wolf management plans (excluding Montana) will not protect viable metapopulations. The proposed delisting rule does not consider a significant portion of their range, eliminates connectivity between high quality habitat in other regions, and would leave a significant gap in the historic range of the species. The proposed delisting rule does not adequately consider long-term threats in the region. The recovery goals in the rule are outdated. Furthermore, the proposed delisting rule inappropriately interprets relevant regional-scale habitat models and does not adequately consider which taxon of gray wolf is being restored. Thus, we do not support designating the NRM DPS and delisting wolves at this point and urge that our comments be addressed.

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