

Exhibit B

Supplemental
Consultation

October 30, 2015 – November 2, 2015



October 30, 2015

The Oregon Department of Fish and Wildlife Commission
4034 Fairview Industrial Drive SE
Salem, OR 97302
Phone (503) 947-6000
odfw.comments@state.or.us

Re: Oregon Wolf Delisting Proposal

Attention: Chair Michael Finley and commission members.

Thank you for this opportunity to comment on the Oregon Wolf Delisting Proposal. On behalf of our 3,000 members and 10,000 supporters, **Klamath Siskiyou Wildlands Center recommend that you consider upgrading wolf status in Oregon to “threatened”**. Upgrading to “threatened” is consistent with scientific findings indicating upward trend and expanding range.

We have reviewed the Oregon Wolf Conservation and Management 2014 Annual Report and see no compelling reason to pursue delisting at this time. The Oregon wolf population remains below 100 and less than 10% of its historic range is occupied. There are only 6 years of data on Oregon Wolf populations. According to population biologists, the commission needs at least ten years of data to have reasonable and statistical certainty about trends and abundance. In addition there is uncertainty about recent causes of mortality and continued recruitment from Idaho’s dwindling wolf population. The short time period of data and recent uncertainties about wolf mortalities hardly warrant the extreme policy change of delisting.

Oregon wolves enjoy a high degree of voluntary protection from Oregon hunters and ranchers. We want to keep that well deserved trust of hunters and ranchers intact. There have been some recent incidents of the public shooting wolves. Despite the best intentions of the Commission and a dubious biological rationale from ODFW, delisting of Oregon wolves at this time will be viewed from a political and ideological perspective. The internationally known OR-7 remarkably roamed populated areas of Oregon, mated and raised at least two families with no intervention from unwanted shooters. Oregon is nationally or even internationally viewed as good place for wolf recovery.

Delisting wolves is extremely controversial and not merely a biological issue. As you know, the federal delisting of wolves in Idaho resulted in massive and widely publicized wolf mortality. Idaho is no longer

certain to provide new wolf immigrants to Oregon. Wolf shooters throughout the Pacific Northwest will be emboldened by delisting as a "green light" for open season on Oregon wolves, regardless of protective regulations. We must not be naïve about some people wanting to kill wolves. Oregon is currently doing a remarkable job of managing wolves with exceptional voluntary compliance. Pursuing delisting has no real benefit in the short term and huge potential for unanticipated and undesirable outcomes.

Please be prudent by recognizing the improved wolf distribution and increasing trend with consideration of uplisting to threatened.

Sincerely,

/s/ Joseph Vaile

Joseph Vaile

Executive Director



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www.defenders.org

October 29, 2015

The Oregon Department of Fish and Wildlife Commission
4034 Fairview Industrial Drive SE
Salem, OR 97302
Phone (503) 947-6000
odfw.comments@state.or.us

Re: "Comments on Oregon Wolf Delisting Proposal"

Attention: The honorable Chair Michael Finley and ODFW commission members,

I'm writing today to express Defenders of Wildlife's concern regarding the proposed delisting of wolves in Oregon currently under consideration.

Defenders of Wildlife (Defenders) is a national non-profit membership organization dedicated to the protection of all native animals and plants in their natural communities. We have more than 1.1 million members and supporters nationwide and over 16,000 members and supporters in Oregon today. Founded in 1947, Defenders of Wildlife is one of the country's leaders in science-based, results-oriented wildlife conservation. We stand out in our commitment to protecting and restoring America's native wildlife, safeguarding habitat, resolving conflicts, and educating the public.

Defenders has played an active role in the reintroduction of wolves to the Northern Rockies and has also been highly active in Oregon wolf restoration including: sponsoring the first Oregon wolf management planning workshop in 1999; serving as a member of the initial state wolf management plan committee in 2005; privately funding compensation to livestock operators for livestock losses due to wolves until 2011; and helping Oregon establish its own statewide compensation and coexistence program. We have assisted the Oregon Department of Fish and Wildlife (Department) with nonlethal training workshops, provided livestock depredation deterrent funding and equipment, and together cosponsored the first wolf coexistence range rider project in the state. This summer, we worked with the Department to help reduce sheep and wolf conflicts and provided the Department with Foxlights, a new deterrent that we brought to the region from Australia wildlife and livestock managers. These Foxlights are credited with successfully minimizing losses of sheep to wolves in the conflict area this grazing season.

National Headquarters | 1130 17th Street, N.W. | Washington, D.C. 20036-4604 | tel 202.682.9400 | www.defenders.org

Defenders recognizes the Department's strong track record on wolf management and readily acknowledge that the Department's wolf management team is comprised of courageous, dedicated wildlife professionals. The Department's trust in their excellent staff and adherence to science and regulations as well as its steadfast commitment to addressing conflicts fairly and transparently has led to the public's greater trust in the agency itself. The Department has demonstrated that wolf management can be done effectively with a strong emphasis on nonlethal and proactive measures to prevent conflicts or greatly minimize them. You have every reason to be proud of these achievements.

We greatly appreciate the opportunity to participate in this public comment period and to submit our comments for consideration.

Defenders of Wildlife Summary of Comments and Concerns

The Oregon Wolf Conservation and Management Plan calls for initiating *consideration* of statewide wolf delisting under the state Endangered Species Act when Oregon reaches the conservation objective of four breeding pairs for three consecutive years in eastern Oregon. At the end of 2014, the minimum Oregon wolf population was estimated at 81 wolves statewide. This included 9 breeding pairs but only 4 of which had bred three consecutive years – the minimum required to initiate consideration of delisting. In addition, 6 new groups of wolves were documented in January 2015, and of these, 5 are known to be male-female pairs. Since that time, some wolves have been killed or have died of uncertain cause of death and some packs have produced pups. While the overall trajectory is steady growth of the population, the wolf population is still very small and tenuous in comparison to the more than 6,000 mountain lions, 25,000 black bears, 40,000 coyotes, 70,000 elk and 200,000 deer statewide. While these common species are not threatened or endangered, also consider that there are thousands of Washington Ground Squirrels in Oregon, which are listed currently as endangered. No other species has been removed from the state's endangered species list with a population of fewer than 100 individuals statewide or when they are absent from a significant portion of their range. Today, wolves in the state are almost exclusively confined to the Northeast portion, making this population still highly vulnerable.

The Commission has a responsibility to ensure that wolves are restored to significant portions of its native range in Oregon. **Instead of delisting wolves before Phase 3 is reached, Defenders feels it is time to consider downlisting the species from endangered to threatened.** This would enable wolves to continue vital state protections they need, while simultaneously recognizing the progress the state has made to recover wolves.

There are sound scientific reasons to consider downlisting or postponing delisting wolves in Oregon. Some variables have changed since the Oregon Wolf Conservation and Management Plan was adopted and revised:

- 1) US Fish and Wildlife Service has proposed national wolf delisting, which includes the state of Oregon. The wolf plan identifies that as long as the wolf remains federally listed in Oregon as endangered, federal law may preempt provisions of this Plan (and associated administrative rules) that authorize harassment or take of wolves. However, this national delisting may soon

remove all federal protection from wolves across the state leaving only state regulatory mechanisms to define wolf protection in Oregon.

- 2) There has been an increase in documented wolf mortality in northeastern Oregon including the recent mysterious cause of concurrent deaths of the Sled Springs alpha pair within 50 yards of each other in late August. This undermines breeding production in the state's current core wolf range but even more concerning is there is no known cause of death yet that would explain this mortality. Is there a new disease or greater illegal killing threat to wolves in this core wolf range than was earlier thought to exist?
- 3) There are fewer wolves in Idaho today than in 2005 when the Oregon wolf management plan was written or 2010 when it was revised. Both versions assumed connectivity with the Idaho wolf population for dispersing wolves but if the trend in Idaho continues, far fewer wolves will be able to disperse to Oregon leaving the population more isolated than originally estimated. However, the March 31, 2015 Oregon Wolf Biological Assessment Review states "Genetic sampling of captured Oregon wolves (ODFW, unpublished data) confirms genetic relatedness to the Idaho subpopulation of wolves, further indicating a biological connection between the two states. Because of this, our population analysis includes parameters for immigration and emigration and assumes that both will continue." That assumption may no longer be valid and analysis should be made based on reduced wolf dispersal from Idaho. Dismissing the threat of genetic isolation seems premature at the current population level and political landscape. As referenced in the *Scientific peer review comments on Oregon Department of Fish and Wildlife Review of the Biological Status of the Gray Wolf submitted by Carlos Carroll, Klamath Center for Conservation Research*, Oregon's wolves are still at risk of becoming genetically isolated if Idaho's hunting and trapping regime reduces immigration from the NRM population." And should Oregon wolves become isolated genetically, there are no automatic provisions in the current wolf management plan for relisting of the species under the state ESA.

While we respect the Department's need to evaluate what level of protection is warranted as wolves continue to recover in Oregon, we are concerned that moving too quickly to eliminate Oregon ESA protection could reverse the positive trends in restoration and recolonization underway in Oregon. For example, state ESA protected species have greater protection from illegal killing than those species that are not listed. Beyond this, the Oregon Wolf Management Plan was due for public review starting October 1, 2015. Eliminating ESA protections for wolves statewide before the Department adopts a new plan or formally extends the 2010 plan means that wolves could be delisted without an adequate regulatory mechanism in place. **We request, at a minimum, the Commission to complete a full review or to formally extend the 2010 plan for another five year period before removing wolves from the Oregon state ESA list.**

Under ORS 496.182(1), it is the Commission's responsibility to "manage the species and their habitats so that the status of the species improves to a point where listing is no longer necessary. While we believe that wolves may not be in danger of extinction in the northeastern portion of the state wolf range, they are also just beginning to return to other parts of their state that constitute their greater significant range. Under subsection (3)(b) or (4)(b) of this rule, and OAR 635-100-0111 (Reclassifying Species) and OAR 635-100-0112 (Removing Species from the State List),

regarding the range of the species, the Commission shall consider: (a) The total geographic area in this state used by the species for breeding, resting or foraging and the portion thereof in which the species is or is likely within the foreseeable future to become in danger of extinction; (b) The nature of the species' habitat, including any unique or distinctive characteristics of the habitat the species uses for breeding, resting or foraging; and (c) The extent to which the species habitually uses the geographic area. (6) In addition to the criteria set forth in sections (3) and (4) of this rule, in listing (or delisting) a wildlife species as endangered or threatened, the Commission shall determine that the natural reproductive potential of the species is in danger of failure due to limited population numbers, disease, predation or other natural or human actions affecting its continued existence and, to the extent possible, assess the relative impact of human actions.

Much of the recent success of wolf dispersal to the south and west regions of the state has been directly due to Oregon's emphasis on nonlethal wolf and livestock management. If wolves are delisted and this emphasis reduced, it will impact the wolf's ability to disperse to these significant portions of range. As seen, improperly managed conflicts with livestock represent the single greatest challenge to wolf conservation. And if wolf and livestock conflicts are not well managed, as frequently seen elsewhere, wolves pay a heavy toll through lethal control and illegal killing.

The Department's proactive and effective wolf management model has led to the steady recovery of the species. **And the success of your efforts is demonstrated by the fact that Oregon has maintained fewer livestock losses to wolves than any state with an equal or larger wolf population.** As we have expressed before, we are concerned that delisting could stop or slow wolf recovery in Oregon if certain vital protections are not maintained. These protections specifically include primary nonlethal approaches to managing wolves and livestock on public lands, working with landowners to reduce attractants on private lands, and promoting awareness of the tools and methods that allow wolves and people to coexist. The Commission has the ultimate responsibility to ensure that wolves are restored to significant portions of its native range in Oregon. Moving too quickly to eliminate Oregon ESA protection could reverse the positive trends in restoration and recolonization underway in Oregon.

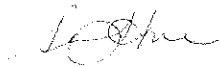
Conclusion

Defenders of Wildlife requests the Oregon Department of Fish and Wildlife Commission to:

- 1) Defer any delisting of wolves until after the 2010 Oregon Wolf Conservation and Management Plan has been updated or formally extended as the regulatory mechanism for wolves statewide.
- 2) Maintain ESA protection for wolves until Phase 3 goals are reached. If there are changes made to the status of wolves, downlist rather than delist wolves from the state endangered species list.
- 3) Maintain a strong emphasis on proactive, nonlethal wolf management and livestock protection efforts to encourage wolf recovery statewide and reduce conflicts with the livestock industry.

We appreciate the opportunity to submit our comments on the Oregon Wolf Delisting Proposal and look forward to working with the Department to support the successful restoration and conservation of wolves.

Respectfully yours,



Suzanne Asha Stone
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Background

The 2010 Oregon Wolf Plan calls for initiating *consideration* of statewide wolf delisting under the state Endangered Species Act when Oregon reaches the conservation objective of four breeding pairs for three consecutive years in eastern Oregon. A breeding pair is a male and a female that have produced at least 2 pups surviving to Dec 31. This milestone was met in Jan 2015 according to the Department's wolf management team. On March 31, 2015, Department wolf management staff presented a "Biological status review for the Gray Wolf (*Canis lupus*) in Oregon and evaluation of criteria to remove the Gray Wolf from the List of Endangered Species under the Oregon Endangered Species Act." The Commission is currently seeking public comment and has announced a decision will be made at the November 9, 2015 commission meeting or possibly later.

In order to delist wolves in Oregon, the Commission must evaluate the biological status of the species and determine if: "1. The species is not now (and is not likely in the foreseeable future to be) in danger of extinction in any significant portion of its range in Oregon or in danger of becoming endangered; and 2. The species' natural reproductive potential is not in danger of failure due to limited population numbers, disease, predation, or other natural or human-related factors affecting its continued existence; and 3. Most populations are not undergoing imminent or active deterioration of range or primary habitat; and 4. Over-utilization of the species or its habitat for commercial, recreational, scientific, or educational purposes is not occurring or likely to occur; and 5. Existing state or federal programs or regulations are adequate to protect the species and its habitat. For any determination of Criterion 1 above regarding the range of a species, OAR 635-100-0105 specifies three evaluation factors to be used by the Commission: 1. The total geographic area in this state used by the species for breeding, resting, or foraging and the portion thereof in which the species is or is likely within the foreseeable future to become in danger of extinction; and 2. The nature of the species' habitat, including any unique or distinctive characteristics of the habitat the species uses for breeding, resting, or foraging; and 3. The extent to which the species habitually uses the geographic area.

Roxann B Borisch

From: Amaroq Weiss <aweiss@biologicaldiversity.org>
Sent: Monday, November 02, 2015 1:20 AM
To: odfw.commission@state.or.us; 'Michelle Tate'
Subject: RE: Comments from the Pacific Wolf Coalition re: ODFW proposal to delist wolves and Commission's decision
Attachments: oregonpositionletteraugust5_BBEdits_Oct30.pdf

On October 29, a comment letter was submitted by the Pacific Wolf Coalition to the commission.

The attached comment letter signed by seven scientists was submitted to the commission by those scientists on Oct. 29, as well.

The comment letter from the Pacific Wolf Coalition includes a section entitled "Science Review" consisting of comment letters of which we were aware had been submitted by October 29. At the time we submitted our comment letter, we were unaware of this additional scientists' comment letter. We wish to supplement our comments with the addition of the attached scientists' letter.

Thank you,
Amaroq Weiss

Amaroq Weiss
West Coast Wolf Organizer
Center for Biological Diversity
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www.BiologicalDiversity.org

From: Amaroq Weiss [mailto:aweiss@biologicaldiversity.org]
Sent: Thursday, October 29, 2015 3:50 PM
To: 'odfw.commission@state.or.us'; 'Michelle Tate'
Subject: Comments from the Pacific Wolf Coalition re: ODFW proposal to delist wolves and Commission's decision

To the Commission:

Please find attached a comment letter and supporting documentation, submitted on behalf of the Pacific Wolf Coalition.

Please contact me immediately if you have any difficulty in receiving these materials.

Regards,
Amaroq

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"Watching wolves, they have great messages, . . . if you're not always looking at them through the scope of a rifle."

- NPS wolf biologist Doug Smith, quoted in *The Spine of the Continent* by Mary Ellen Hannibal

29 October 2015

Oregon Fish and Wildlife Commission
4034 Fairview Industrial Drive SE
Salem, OR 97302
odfw.commission@state.or.us

RE: Oregon wolf management plan and proposal to delist gray wolf

To Whom it May Concern:

We welcome the opportunity to address Oregon Department of Fish and Wildlife 's (ODFW) proposal to remove Endangered Species (ES) protection from the State's gray wolves (*Canis lupus irremotus*). The State's wolf plan emphasizes the need to employ the best peer reviewed and most current data available.

ODFW is seeking public input on three potential options for wolf management. The first would remove the wolf from the State's Endangered Species designation—ODFW's preferred option. A second option would remove the wolf from the State's Endangered Species designation in the eastern portion of the state but retain the Endangered Species designation in the western part of the state. The third option, our preference, maintains the wolf in protected status on the State's Endangered Species list. The decision by Oregon will be based on the following criteria: 1) the species is not in danger of extinction in any portion of its range; 2) the species' reproductive potential is not in danger of failure; 3) populations are not undergoing imminent or active deterioration of range or primary habitat; 4) over-utilization of the species or its habitat is not occurring or likely to occur; 5) existing state or federal programs or regulations are adequate to protect the species and its habitat. In our opinion, the five criteria for Oregon's delisting options to be met have not been achieved and/or are based on untested assumptions at this time.

Status of the Gray Wolf in Oregon

ODFW (2015) estimates there are 77 wolves in Oregon and expects to maintain this figure with four breeding pairs per annum, as a MVP (minimum viable population) size. The wolf has been in Oregon for the past eight years and occupies, by one broad-brush estimate, approximately 15% of the State, mostly in the east. However, analysis of ODFW's own data indicates that actual areas of current wolf use comprise only 12% of the suitable wolf habitat in Oregon (Weiss 2015). If delisted, wolves would be protected for three additional years with the exception that animals deemed a threat to livestock could be lethally controlled.

State Wolf Management Plans & Implementation

The U.S. Fish and Wildlife Service (FWS) began removal of the gray wolf from the protection of the Endangered Species Act (ESA) in 2009. The FWS, by implementing questionable management decisions, has abrogated its conservation obligations under the ESA for gray wolves (Alderman 2009, Bruskotter et al. 2014). In lieu of federal oversight, for a historically exploited species that remains extirpated from the majority of its range, management authority has been left to the states where the species is considered federally recovered. States are required to develop wolf management plans to maintain viable populations

Oregon considers their wolf population to be recovered in spite of evidence to the contrary, consisting of very low population count and habitat saturation. By law Oregon has been mandated to develop a management plan for the species. The plan Oregon has developed is of questionable merit to maintain a viable population. Unfortunately, many state wolf management plans have failed to meet the intent, as meant by Congress, for scientifically based recovery in the short or long term (Anderson 2004, Harbine 2009). State wildlife agencies,

which have been given broad discretion, have frequently acted to appease vocal and politically active anti-wolf interests, traditionally members of the agricultural, hunting and property rights constituencies who prefer low wolf populations through large harvests and liberal regulations to cull "problem" wolves (Anderson 2004, Bergstrom 2011, Bergstrom et al. 2009, Haber 1996, Harbine 2009). Beyond livestock interests and some ungulate focused sportsmen groups, the preponderance of the public and stakeholders have clearly expressed their sentiments to see government planning maintain long term viable wolf populations able to survive predictable and stochastic factors far beyond the foreseeable future into the next century (Alderman 2009, Anderson 2004, Harbine 2009, Kellert et al. 1996).

Conversely, several state wolf plans take a myopic view. Creel and Rotella (2010) document many shortcomings of these recent plans:

"Rocky Mountain wolves were removed from the ESA in May, 2009. Idaho and Montana immediately established hunting seasons with quotas equaling 20% of the regional wolf population [combining] ...hunting and predator control...37.1% of the Northern Rocky Mountain (NRM) wolves were killed in the first year of delisting....unprecedented for a species to move so rapidly from the ESA to direct harvest...strong association between human offtake [with] additives in total mortality....in North American [wolves]...".

Creel and Rotella (2010) explain that even substantially lower harvests than allowed by the government have been detrimental to wolves. Liberal wolf harvest quotas by Idaho's Department of Fish and Game have killed at least 1,100 wolves. Such a magnitude of removal has surpassed the number considered necessary to maintain the MVP, yet Idaho continues its unabated hunting and culling leading to the conclusion that, "open hostility toward wolves is official state policy" (Harbine 2009).

Idaho's actions are blatantly not focused on maintaining wolves, but it is by no means an outlier among the states with wolf management plans. The Northern Rocky Mountain states exemplify several worst case scenarios of unscientifically and politically motivated wolf management. These attitudes, enabled by some state governments, extirpated the western wolf by the 1930's. Given tolerance for legal and illegal killings of wolves, the lack of repercussions for poaching and weakly written and unenforced recovery goals, the wolf's recovery remains uncertain in some states (Anderson 2004, Bruskotter et al. 2014, Harbine 2009) .

Recognizing the weakness of some state plans, the judiciary has intervened on behalf of wolves. Federal courts in Wyoming and Michigan have ordered protection reinstated for gray wolves within their jurisdictions. The courts have described management in those States as being characterized by, "lack of planning" and "reckless[ness]" (Alderman 2009).

A weakness in many of these recent state management plans is that the political process and special interest groups have promoted and fostered limited recovery actions for the species. For many years, the FWS and states have discounted the concerns expressed by many scientists about the inadequacies and perils of the government's wolf management plans (Bergstrom 2011, Bergstrom et al. 2009, Haber 1996, Morrell 2008). Most plans remain unchanged and several are characterized by unrealistically low MVPs (Alderman 2009, Harbine 2009, Reed et al. 2003). It is important that Oregon in its planning and implementation avoid many of these problems exhibited by other states and regions, including removing protected status too early.

Criterion 1: "Species is Not Endangered in Any Portion of its Range."

The gray wolf in Oregon is more than "endangered" in significant portions of its range; it is in fact absent from 88% of suitable wolf habitat in the state of Oregon (Weiss 2015). Oregon's

suggested MVP not only is inadequate to protect the species, but if kept this low it will not serve as an effective source of dispersers to fill the rest of the suitable wolf range in Oregon. Well established principles of conservation biology hold that populations need robust numbers of individuals for long-term viability. Recovery, as defined by ODFW, appears premature considering that the gray wolf's return to Oregon has been for an unusually brief time and that it has not in this brief time repopulated most of the suitable habitat available.

In contrast to the current situation in Oregon, the neighboring NRM had populations established for 13 years before delisting, consisting of at least several hundred animals and at least 45 breeding pairs (Fallon 2008, Reed et al. 2003). These animals had been repatriated into almost ideal conditions consisting of large tracts of wilderness and sparsely human inhabited ecosystems and optimal prey, the vast Northern Range elk (*Cervus elaphus*) herd, which had been so unchecked that they were instrumental agents of habitat destruction. The Upper Midwest (Minnesota, Wisconsin and Michigan) is characterized by healthy, functional and ecologically viable wolf populations of approximately 3,700 animals, which were established in a protected status for at least several decades (Bruskotter et al. 2014, Fallon 2008, Leonard and Wayne 2008, FWS 2014). Their range includes large tracts of protected lands that stretches into Canada. The present status of Oregon's wolf population is significantly less secure than in these cases.

Canid populations of fewer than 100 are insufficient to sustain a long term viable population. Alaska's Alexander Archipelago subspecies (*Canis lupus ligoni*) suffered a major population crash, which in one year cut its size from 221 to 89 (Edwards and Noblin 2015, Person and Larson 2013). Their fate is contingent upon whether or not the FWS lists them as protected. At Alaska's Denali National Park, the National Park Service (NPS) was forced

prematurely to terminate wolf harvests, also due to a precipitous population decline (Arthur 2015). The Southwest's Mexican gray wolves (*Canis lupus baileyi*) had been subject to significant levels of illegal take necessitating at times recapture to protect them (Povilitis et al. 2006, U.S. Fish and Wildlife Service 2008).

Use of MVP as a strict conservation tool for species has value but should not be employed as an absolute for precise population targets; the limitations of modeling and the information they are based on require that we err on the side of caution when setting population objectives for rare species (Brook et al. 2006, Vucetich et al. 2000). Very few wildlife and plant species would be considered for delisting that have populations below 100 (Brook et al. 2006, Bergstrom et al. 2009, Morrell 2008, Thomas 1990, Traill et al. 2007, Vucetich et al. 1997, Wabakken et al. 2001).

Criterion 2: “Species’ Reproductive Potential is Not in Danger of Failure.”

Just as the examples cited above for long-established wolf populations, the future reproductive potential of Oregon’s wolf population and its ability to increase is unknown. Examples from some other areas/regions have demonstrated conditions where recovering populations have not increased or declined largely due to anthropogenic factors (Liberg et al. 2011, Morrell 2008, Murray et al 2015, Povilitis et al. 2006, U.S. FWS 2008, Vucetich and Paquet 2000). At this stage of recovery for the population in Oregon, it is too early to determine or predict its future reproductive potential with any certainty as well as the key factors that may influence it.

If removal from protection occurs for Oregon wolves, potential culling/harvest will affect the species’ reproductive potential. Culling and harvest, which will likely transpire upon

delisting, is a documented stress factor to packs. The concomitant physiological increase in cortisol levels hampers fecundity in surviving animals (Bryan et al. 2014). Reproductively viable wolf populations are characterized by a stable social hierarchy in a known territory with an adequate prey base. Culling and harvest disrupts this social behavior and structure (Borg et al. 2015). Adult wolves that are killed are unavailable to teach hunting techniques and maintain control over their pack structure, leading to a reduction in reproductive output and young adult wolves that disperse prematurely, entering unknown areas, which may increase mortality particularly from anthropogenic sources.

It is not known with certainty if the species' reproductive potential is secure enough to maintain a viable population and how that may change if protected status is eliminated. Wolf populations elsewhere have exhibited significant volatility due to legal take, illegal take, disease and habitat loss (Haber 1996, Haydon et al. 2002, Liberg et al. 2012, Sparkman et al. 2011, Wilmers et al. 2006).

Recovery and protection planning require a goal of maintaining not only a minimum population number, but also adequate genetic diversity (Wayne and Hedrick 2011). Larger populations can avoid the deleterious effects of inbreeding, which in certain cases can be a precursor to extinction (Liberg et al. 2005, Peterson and Krumenaker 1989, Wayne et al. 1991). On Isle Royale a population of over 50 wolves is now down to three, a partial result of inbreeding effects. Low populations of other large predators have demonstrated the impacts of the loss of genetic diversity to population vitality (Florida panthers, *Puma concolor* and cheetahs, *Acinonyx jubatus*) (Hedrick and Fredrickson 2010, Johnson 2010, O'Brien et al. 1985).

Wayne and Hedrick (2011) state that, "isolated populations of less than 100 individuals...have a high chance of extinction...genetic loss could be consequential...these

populations could lose 2.5% [genetic heterozygosity] per generation.” A generally accepted number of 500 animals is considered an acceptable baseline estimate for a Minimum Viable Population (MVP) to avoid inbreeding depression in the short term (Brook et al. 2006). Preferably, the MVP would be 1,200-2,500 (Fallon 2008). Wolves in the NRM specifically should have 1,403 individuals with a goal of 6,332 at 40 generations to better ensure a genetically diverse, robust population to last for a century (Reed et al. 2003).

Oregon's option for removal of the gray wolf from protection at this time does not provide safeguards for the genetic diversity of the population, which could have deleterious drift effects and inbreeding depression, nor a large enough population for maintaining reproductive potential in the long-term.

Criterion 3: “Populations are Not Undergoing Imminent or Active Deterioration of Range or Primary Habitat.”

A diverse array of suitable prey and habitat exists for wolves in Oregon (Larsen and Ripple undated), yet only about 12% of it is currently occupied by wolves (Weiss 2015). Western Oregon is heavily urbanized with a continuously growing human population, a frequent deterrent for many of the West's exploited wolves as well as a potential for increased cause of mortality due to transportation infrastructure and potential for higher levels of human disturbance. Conversely, rural Eastern Oregon is characterized by agricultural and timber resources where those interests frequently view wolves in a negative manner, which in some circumstances results in unregulated take (Anderson 2004, Liberg et al. 2011).

The importance of travel corridors between subpopulations of wolves in the State is also not well known or documented at this time due to their limited number. Travel corridors are

considered essential for maintaining disjunct wolf populations (Haight et al. 1998). Paquet et al. (2009) stress the significance of avoiding anthropogenic impacts to wildlife movement. Wolves are what Paquet et al. (2009) refers to as "passage species," which "need corridors to allow individuals to pass directly between two areas in discrete events of brief duration (e.g. dispersal of a juvenile, seasonal migration, or moving between parts of a large home range)." Oregon is considered to have less contiguous habitat and more patches spread out than in the NRM, which would require wolves to cross areas of unsuitable habitats (Larsen and Ripple undated). Essential corridors for wolf populations and habitat patches within Oregon are poorly known and understood, because the species is still in an early stage of recovery.

Criterion 4: "Over-utilization of the Species or its Habitat is not Occurring or Likely to Occur."

Wolves were efficiently extirpated in the contiguous U.S. by the 1930s. FWS describes the event as, "wolves were hunted and killed with more passion and zeal than any other animal in U.S. history" (FWS 1998). Given our modern technology and increased network of roads even in protected lands, anyone can access wolf habitat and cause the take of wolves. Many individuals have access to year-round use of off-road vehicles, aircraft, drones, traps and high-powered guns. As just one example of the ability for rapid reductions, in Canada, the government permitted the taking of several hundred wolves in several days by hunters on snowmobiles with firearms, indicating the ease of making large reductions in a short period of time (Cluff 2003). Key habitat areas and components, as well as essential travel corridors and their level of protection, are poorly understood and should be addressed before delisting occurs.

Poaching has been estimated to comprise 30% of known mortality in some wolf populations (Liberg et al. 2012), and roadkill as much as 11% (Fuller 1989).

Criterion 5: “Existing State or Federal Programs or Regulations are Adequate to Protect the Species and its Habitat.”

The gray wolf has only recently returned to Oregon. It still occurs in isolated populations and occupies only a fraction of its former range. Eliminating existing state protection under its current status is not justified at this stage. Setting the regulatory environment to increase “take” or modifying the current status of protected habitat when the population is at an early stage of recovery is not justified for meeting a goal of maintaining a viable population. There are many examples where wolf populations have declined or where recovery has been delayed/slowed due to a lack of or limited government protection (Bergstrom 2011, Bruskotter et al. 2014, Edwards and Noblin 2015, Liberg et al. 2011, Morrell 2008, Murray et al. 2015, Polivitis et al. 2006, Vucetich and Paquet 2000).

Comments on the population viability analysis (PVA)

Although we have not examined the PVA in great detail, we do have a few concerns and questions about the reliability of some assumptions made about wolf vital rates, and the lack of application of the best and most recent science on these specific issues. First, it appears that the modelers assumed that current population growth rates of the Oregon wolf population, which are indicative of an expanding population filling vacant habitat, will continue indefinitely. If so, that is unrealistically optimistic. The reality for the gray wolf population of Yellowstone National Park (YNP) after reintroduction was that density peaked at > 170 animals in the early-mid 2000s,

and then fell to around 100 or fewer for the last 5 years

(<http://www.nps.gov/yell/learn/nature/wolfingnt.htm>). In other words, density dependent self-regulation took control some years after establishment (demonstrated in a statistical analysis of this population; Cubaynes et al. 2014), causing first a negative population growth rate and ultimately an equilibrium density that was considerably lower than peak density. The latter would constitute a more realistic model of what happens to wolf population dynamics when the habitat fills up.

Second, we think that 88% adult survival is unrealistically high, given that the most recent analysis of the un hunted YNP population revealed a natural mortality rate of 20% (95% C.I. ranging from 5-50%, and with higher mortalities at higher densities when inter-pack aggression increased). The same study also indicated an 8.4% mortality due to roadkill. To the extent that the PVA incorporates human-caused mortality, it should not be assumed that such mortality is largely compensatory (i.e., trades off with natural mortality, or is compensated for by increased recruitment as a response). Any rigorous sensitivity analysis within PVA would be remiss if it did not model the effects on wolf population growth rates of human-caused mortality acting in an *additive* and even *super-additive* manner. Creel and Rotella (2010) found that in the Northern Rocky Mountain (NRM) metapopulation, human offtake was indeed super-additive. Similarly, Ausband et al. (2015) found for NRM wolf populations that not only did recruitment not increase to compensate for human-caused mortality, but it actually decreased (again, the super-additive effect).

Finally, poaching is likely to be a significant source of mortality, which is often overlooked or underestimated, and therefore must be modeled. Although difficult to determine, 2 recent estimates of the proportion of total mortality in wolf populations that is due to poaching

are 30% for Sweden (Liberg et al. 2012) and 34% for Wisconsin (Natural Resources Board 2012).

Our Recommendations

Even though we feel that the USFWS-imposed threshold for listing (relisting) of the gray wolf in each of the three neighboring NRM states—150 wolves and 15 breeding pairs sustained for at least 3 consecutive years—is unjustifiably low given the science we have briefly reviewed above, Oregon’s current population is only half that. Therefore, it would be preferable if Oregon not entertain the prospect of delisting the gray wolf at least until that landmark was achieved for 3 or more consecutive years. That should also allow the gray wolf to increase its utilization of suitable habitat in the state beyond its current 12%. In the meantime, the species should be closely monitored and information collected to aid in the continuing refinement of the state’s wolf management plan, specifically identifying and protecting key habitat and travel corridors, developing innovative policy and guidance for agricultural interests to reduce the need for removal/culling (Niemeyer 2012, Shivik 2006, Wielgus and Peebles 2014), and providing a focus on maintaining a population at a level for a functional ecosystem role (Licht et al. 2010).

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