Public Comment:

50 CFR Part 17

[Docket No. FWS–R6–ES–2017–0089; FXES11130900000C6–178–FF09E42000]

Endangered and Threatened Wildlife and Plants; Possible Effects of Court Decision on Grizzly Bear Recovery in the Conterminous United States

by

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On December 7th the US Fish & Wildlife Service (the Service hereafter) requested comments from the public "…on a recent D.C. Circuit Court of Appeals ruling…that may impact our June 30, 2017, final rule delisting the Greater Yellowstone Ecosystem (GYE) grizzly bear Distinct Population Segment (DPS)." In its Federal Register notice, the Service exclusively featured the portion of this ruling that pertained to the Service's illegal decision, in the case of gray wolves (*Canis lupus*), to parse out and then delist a DPS from a much larger entity that was originally listed under the Endangered Species Act (ESA).

This request for public comment is bizarre on several counts. On the face of it, the Service is apparently expecting "the public" to render an opinion on a highly technical ruling by a Federal Court of Appeals, and the relevance of that ruling to highly technical litigation currently contesting the Service's recent rule removing ESA protections for Yellowstone's grizzly bear population. Barring the very few well-informed lawyers who may be inclined to comment, "the public" is not qualified to judge legal aspects of this specific issue.

Moreover, in its request for comments, the Service failed to both adequately describe the appellate court ruling or note other key issues highlighted by the Court. To quote the ruling (*Humane Society of the United States, et al. v. Zinke et al.*, 865 F.3d 585 [D.C. Cir. 2017]): "In this case, the agency's analysis (i) wholly failed to address the effect on the remnant population of carving out the Western Great Lakes segment, and in doing so (ii) misapplied the Service's own discreteness and significance tests, and also (iii) turned its back on the implications of historical range loss. Those are major shortcomings that go to the heart of the Service's delisting rule."

Nowhere in the request for comments does the Service offer the public a useful description of how it addressed the effects of delisting the GYE DPS on recovery in other ecosystems; how it applied the discreteness and significance tests to differentiate the GYE DPS; or how it addressed the implications of historical range loss. In fact, the Service makes no reference to factor (iii) of the appellate court's judgement. It is not clear exactly what the Service is hoping to obtain from "the public," and to what effect.

This lack of clarity and comprehensiveness by the Service begs the question of motives and intended outcomes. I am left to conclude that this request for comments by the Service is a cynical attempt to retrospectively develop a paper trail to remedy a patently deficient and overly hasty decision process,

and flush out key elements of arguments that might be made by plaintiffs in litigation focused on removal of ESA protections for the GYE DPS.

In my comments, I intend to honor the spirit and content of the D.C. Circuit Court of Appeals ruling rather than conform to the incomplete and uninformative frame offered by the Service in its Federal Register notice. Specifically, (1) effects of delisting the GYE grizzly bear population on recovery in other ecosystems, and (2) implications of historical range loss, are issues suited to input from a scientist invoking scientific evidence, which is the stance I take. In what follows, I organize my comments according to specific failures in the Service's deliberations leading to removal of ESA protections for Yellowstone's grizzly bear population that are of relevance to the D.C. Appellate Court ruling along with potential remedy for these failings.

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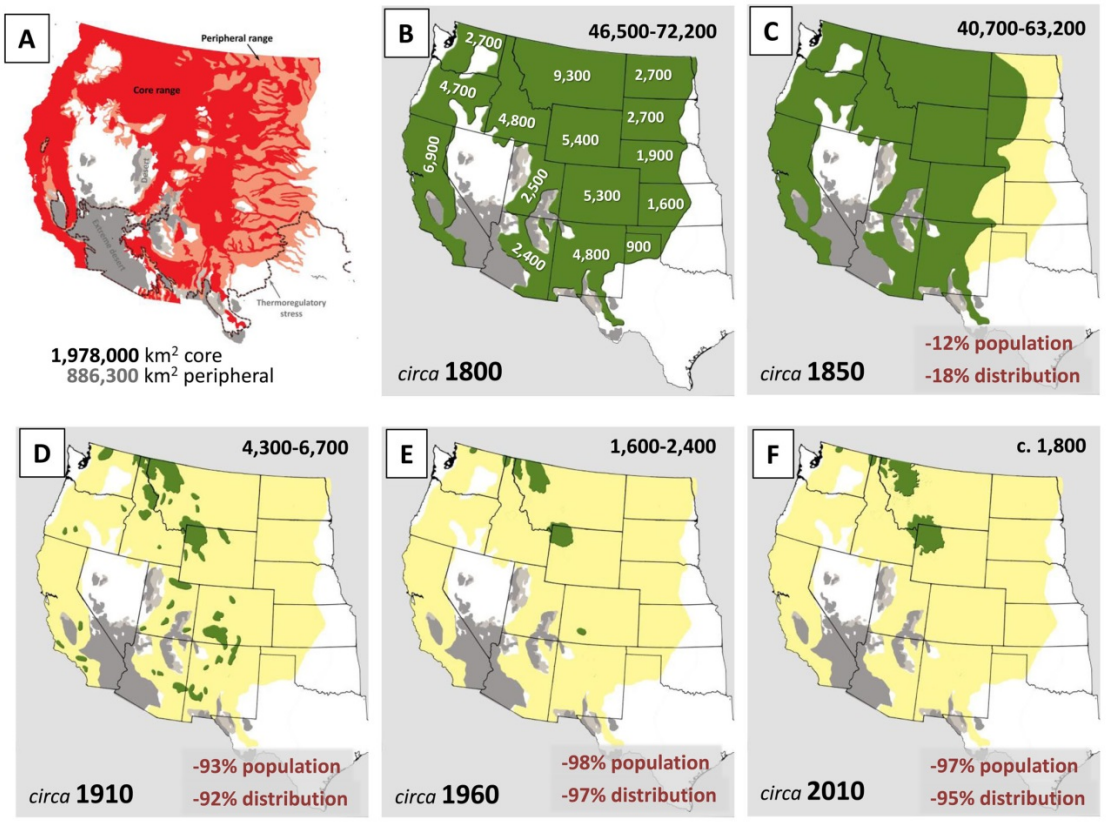
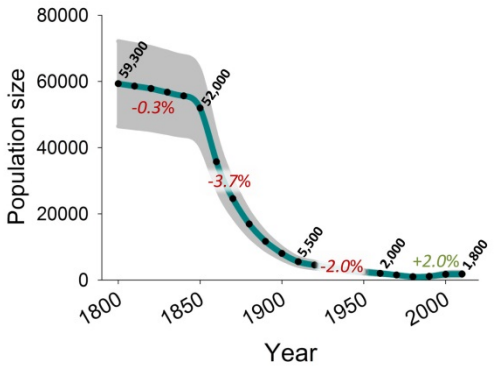
1. The Service adopts a standard for recovery of grizzly bears in the contiguous United States that, in toto, enshrines the loss of roughly 97% of historic grizzly bear distributions and numbers. This standard does not ensure adequate representation of ecosystems or adequate connectivity among populations, and is unnecessary given ample potential habitat provisionally identified by researchers.

The Service does not adequately address the magnitude of historical grizzly bear losses in the contiguous United States, the paucity of current "recovery" relative to those historical losses, the lack of representation of historical ecosystems in current Recovery Areas, or the considerable potential prospects for recovering this species both near and far from current grizzly bear populations in the northern US Rocky Mountains.

The figure immediately below (panels B-E), based largely on research reported by Mattson and Merrill (2002), shows the pace and magnitude of grizzly bear extirpations in the western United States between roughly 1800 and 1960. Additional information includes state by state population estimates circa 1800 as well as total grizzly bear population estimates for each time step. I based these estimates on a detailed reconstruction of historical grizzly bear habitat (panel A) to which I applied a range of grizzly bear densities derived from contemporary research differentiating core from peripheral habitat. Panel F shows the extent of grizzly bear distributions circa 2010, which correspond with what the Service contends is full recovery for the GYE and NCDE populations. The figure next below simply recasts this spatial depiction in graphical form.



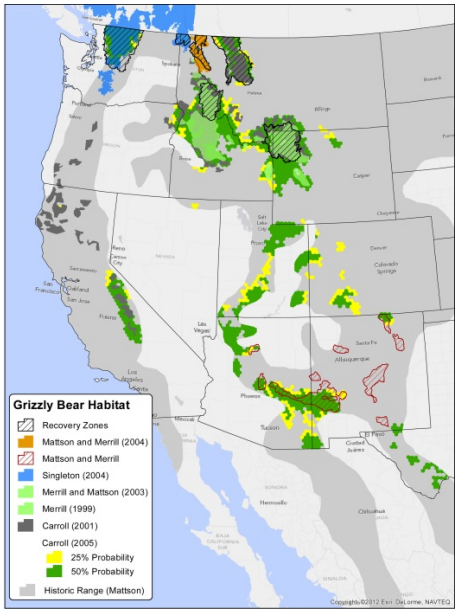
Losses of grizzly bear numbers and distributions in the western contiguous United States between 1800 and 1960 (B-E) along with the extent of gains since roughly 1970, largely under ESA protection. The extent of grizzly bear distributions at each time step are shown in green and the extent of losses in yellow. Estimated total populations are shown in the upper right corner of each figure and estimated cumulative losses of populations and distributions in red in the lower right-hand corner. Panel A shows estimated core and peripheral historical range relative to the extent of extreme desert and hot climates that would have imposed thermoregulatory limits on the distributions of grizzly bears.



Historical declines and more recent growth of total grizzly bear populations in the western contiguous United States along with estimated annual rates of change (in red) during intervals between population estimates. The range of estimated population sizes throughout are shown in gray.

The take-away points from this history are (1) that we lost roughly 98% of former grizzly bear numbers and 97% of historical distributions in a short 150-year period and that (2) "recovery" in our two largest Recovery Areas mounts to recouping very little of former historical populations and only 2% of former distributions. This is truly an impoverished vision of recovery, especially given the extent of habitat near current ecosystems as well as in other regions potentially suitable for restoration and recovery of grizzly bears.

The figure immediately below shows the extent of suitable but largely as-yet unoccupied habitat for grizzly bears in the western contiguous United States. Each color or cross-hatching scheme denotes results reported by different researchers. All results include not only the effects of current habitat productivity, but also the effects of habitat security vis-à-vis humans. All but two of the assessments are published (Merrill et al. 1999; Carroll et al. 2001a, 2001b, 2003; Boyce and Waller 2003; Merrill and Mattson 2003; Singleton et al. 2004; Mattson & Merrill 2004; Merrill 2005; Schwartz et al. 2010, Mowat 2013; Lyons et al. 2016). The assessment of habitat suitability in the southwestern US by Mattson and Merrill is in preparation. The west-wide assessment by Carroll is unpublished but for this map.



Map of potential grizzly bear habitat in the western contiguous United States based on a compilation of research dating back to 1999. Different colors or cross-hatching schemes denote the results of different researchers. Black cross-hatched polygons denote current recovery areas.

The take-away point here is that the best available science suggests there is ample potential but currently unoccupied habitat for grizzly bears in the western US, including extensive areas adjacent to but outside of current Primary Conservation Areas/Demographic Monitoring Areas. Whether the Service takes these results at face value is irrelevant. At a minimum they show that the Service incurs a burden to undertake its own thorough analysis of potential grizzly bear habitat in the western United States as part of a revised comprehensive recovery strategy.

The Service needs to abandon its de facto adoption of 2-3% as sufficient for recovery of grizzly bear distributions and populations, and reconcile any new standards with a thorough analysis of potential habitat within historical distributions.

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2. The Service adopts a standard for recovery of grizzly bear populations within ecosystems that is inadequate for insuring long-term genetic health, evolutionary potential, and resilience to catastrophic environmental change, and is at odds with the best available scientific information.

Research dating back to the 1980s amply demonstrates the need for populations numbering in the thousands, not hundreds, to ensure long-term genetic health and demographic resilience of vertebrate mammalian populations. Lande (1995), Brook et al. (2006), and Triall et al. (2007, 2010) have all emphasized this consensus based on genetic as well as long-term demographic evidence. More specifically for *Ursus arctos*, Reed et al. (2003) estimated that Minimum Viable Populations need to be around 5000 animals to ensure 99% probability of persistence for 40 generations which, in the case of grizzly bears, roughly equates to 400 years. Of particular relevance to grizzly bears in the northern US Rocky Mountains, Reed et al. (2003) estimated that this number needs to be even higher, around 8900, if bear managers are managing for little or no population increase. Such numbers far exceed recovery targets set by the Service and States for any Rocky Mountain grizzly bear population.

The Service recognizes the inadequacy of the current population recovery target for ensuring long-term genetic health of Yellowstone's grizzly bears in its final recovery rule, consistent with previous statements by the now-retired Grizzly Bear Recovery Coordinator, Dr. Chris Servheen. For example, Servheen et al. (2001) state that "If carnivores such as grizzly bears…are to survive and recover to healthy population levels in the Rocky Mountains, the issue of fragmentation needs to be addressed in a proactive and effective manner." Likewise, in Proctor et al. (2012), of whom Dr. Servheen was a co-author, state that "Without female connectivity, small populations are not viable over the long term." More authoritatively yet, the Service states in numerous places of its 2011 review of grizzly bear recovery that a connected metapopulation comprised of current northern Rocky Mountains grizzly bear populations will be critical to ensuring long-term recovery and persistence of this species in the contiguous United States (US Fish & Wildlife Service 2011). Proctor et al. (2005) make much the same point relative to small trans-boundary populations in the Selkirk and Cabinet-Yaak Recovery Areas.

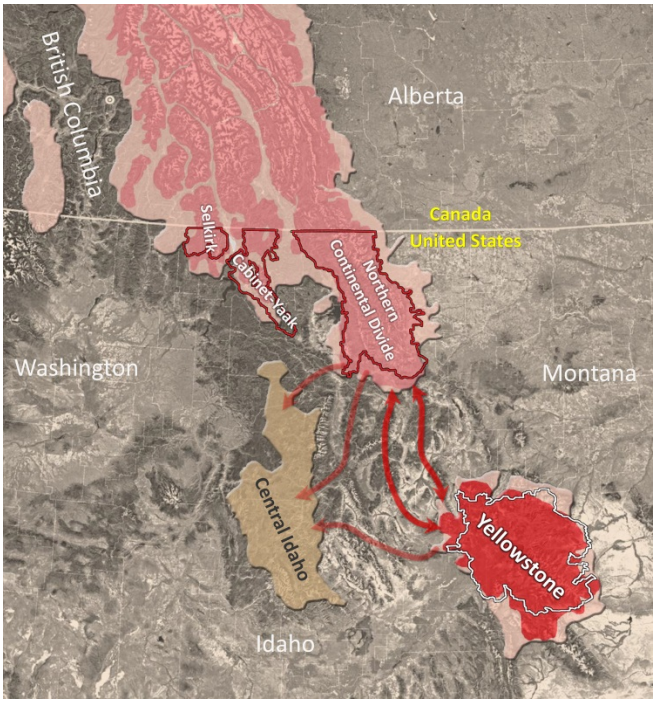
Amplifying these concerns, numerous researchers have observed the heightened vulnerability of large-bodied wide-ranging carnivores such as grizzly bears to endangerment, extirpation, and extinction. For example, Cardillo et al. (2005, 2006) note not only that extinction risk increases dramatically for mammals averaging larger than 10 kg, but also that latent risk of extinction at a community level is highest in North America at not only high latitudes, but also mid latitudes coincident with all of the extant grizzly bear populations of the contiguous United States. Similarly, Mattson (2004) emphasizes that "Carnivore size is perhaps the single most important biological factor governing the nature of interactions with humans and related levels of endangerment." Consistent with Cardillo et al. (2005), Mattson (2004) also showed that carnivores >8 kg in size have substantially higher odds of being endangered globally.

The Service needs to design and implement a recovery program that provides for contiguous populations of grizzly bears of a size that comports with the best available science, sustains evolutionary potential, and ensures resilience to potential catastrophic environmental changes.

3. The Service has failed to consider the importance of potential emigration from the Greater Yellowstone and Northern Continental Divide ecosystems to natural recovery of grizzly bears in the Selway-Bitterroot, Cabinet-Yaak, and Selkirk ecosystems.

Connectivity among current grizzly bear populations in the northern Rocky Mountains will almost certainly increase odds of persistence for the original demographic/geographic entity listed under the Endangered Species Act in 1975, and contribute to reaching population sizes needed to ensure long-term genetic health and demographic resilience (as per Point 2 immediately above). As I also noted immediately above, Servheen et al. (2001), Proctor et al. (2005), US Fish & Wildlife Service (2011) and others such as Craighead and Vyse (1996) have unequivocally stated that, not only will connectivity increase odds of persistence, but more emphatically be necessary to ensure that end. Likewise, authors such as Carroll et al. (2004) have shown that a doubling of connectivity among bear populations occupying protected areas "…corresponded to a 81% and 350% increase in population persistence…" for populations in semi-developed and developed landscapes (respectively) typical of the northern US Rocky Mountains. Of particular relevance to the Selway-Bitterroot Recovery Area, absent active reintroduction efforts, natural recovery in this area will be wholly contingent on immigration of grizzly bears from other ecosystems, most likely from the GYE and NCDE Recovery Areas.

Given this imperative to connect ecosystems, there is ample research showing ample potential for achieving this end. In fact, substantial potential connective habitat exists among all existing Recovery Areas. Most notably, Walker and Craighead (1997), Merrill et al. (1999), Carroll et al. (2001, 2003, 2004), Servheen et al. (2001), Merrill and Mattson (2003), Mattson and Merrill (2004), Merrill (2005), Cushman et al. (2009), Proctor et al. (2012, 2015), and Peck et al. (2017) have replicated results using different data and methods showing the same potential corridors and connective habitat, amounting to one of the most robust bodies of evidence for such potential independent of actual occupancy by bears. The figure immediately below shows this connective habitat for grizzly bears in the US-Canadian Rockies, including potential connectivity to central Idaho.



Map showing the current distribution of grizzly bears in the US-Canadian Rocky Mountains(dark pink or red shows core; light pink peripheral), current US Recovery Areas (red delineations), potential habitat in central Idaho (tan) and major potential connective habitat/corridors among ecosystems with an emphasis on the GYE and central Idaho (red arrows).

However, even with such potential, it can be an agonizingly slow process for especially female grizzly bears to colonize far-distant areas. Averaged across relevant studies (Blanchard and Knight 1991, McLellan and Hovey 2001, Proctor et al. 2004, Stoen et al. 2006, Zedrosser et al. 2007, Norman and Spong 2015), female brown/grizzly bears disperse only around 7 miles from their natal ranges, in contrast to 26 miles for male brown/grizzly bears. Assuming that annual survival rates equal to those documented for grizzly bears occupying northern Rocky Mountain Recovery Areas apply to bears colonizing connective habitat, it would take female grizzlies roughly 80 years to colonize areas 100 miles distant. For male grizzly bear it would take roughly 50 years. The pace of colonization is slower than might be expected for males given that their advance is pegged to the advance of reproductive females, barring the next to last generational step.

But this prognosis for progress only holds if survival rates for grizzly bears in connective habitat are comparable to those for bears in current Recovery Areas, which would only be likely if protections in connective habitat were comparable to those in source areas and if land uses in this connective habitat remain hospitable to grizzly bears. Given these concerns, the on-going rapid growth of human populations in the interstitia between northern Rocky Mountain grizzly bear populations is a major threat which the Service did not adequately address in its final rule delisting Yellowstone's grizzly bear population, but nonetheless recognized and highlighted in its 2011 status review of grizzly bear recovery (US Fish & Wildlife Service 2011). This, then, raises the question of whether security for grizzlies in potential connective habitat can be achieved and maintained under state management in the absence of ESA-related protections and resources, which brings me to my last point.

The Service needs to design and implement a recovery program that ensures successful natural colonization of the Selway-Bitterroot and natural augmentation of the Cabinet-Yaak ecosystems through immigration of grizzly bears from the GYE and NCDE.

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4. The Service errs in its reliance upon vague and non-binding indications by the State of Montana, and none by the State of Idaho, to "maintain the option" to promote connectivity among existing grizzly bear populations in the northern U.S. Rocky Mountains and furthermore has signed off on a management regime designed to prevent growth of the Yellowstone grizzly bear population.

In stark contradiction to implications of the research summarized here, the Service dismisses the need for, even benefits of, connectivity among ecosystems throughout the final rule delisting Yellowstone's grizzly bear population. Much of this language is the apparent result of changes demanded/requested by the states of Wyoming, Montana, and Idaho. The best that the rule can offer is non-binding vague language suggesting that the state of Montana may or may not manage to promote connectivity between the NCDE and GYE ecosystems. More specifically the final rule states that "the State of Montana has indicated they [*sic*] will manage discretionary mortality in this area [between the GYE and NCDE ecosystems] in order to retain the opportunity for natural movements of bears between ecosystems."

As problematic for achieving connectivity and reaching population goals needed to ensure long-term viability, the rule specifies a post-delisting management regime designed to prevent appreciable, if any, growth of the Yellowstone population. The key protocols are codified in the Memorandum of Agreement (MOA) developed and adopted by the three involved states, emphasizing management of grizzly bear mortality. This MOA and the rule itself specify that any growth of the population will be met with an increase in allowable mortality designed to bring numbers down again. For example, the rule states that the adjustable mortality rates adopted in the MOA "…were calculated as those necessary to manage the population to the modeled average Chao2 population estimate of 674 bears, which occurred during the time period that this population had a relatively flat population trajectory." This is unambiguously a recipe for preventing any long-term growth in the Yellowstone grizzly bear population.

As an upshot, the current rule is designed to prevent the kind of population growth needed to attain connectivity, colonize the Selway-Bitterroot ecosystem, and reach numbers needed to ensure population viability, and furthermore offers no enforceable assurance that management in areas between currently-occupied ecosystems will proactively promote connectivity and colonization.

The Service needs to ensure connectivity of grizzly bear populations in accord with a revised Recovery Plan prior to removing ESA protections, and then include authoritative binding provisions in any delisting rule that require the relevant States to maintain connectivity for the indefinite future.

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