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November 20, 2008

First Class Mail / Electronic Mail

Public Comments Processing, Attn:[FWS-R6-ES-2008-0026]
Division of Policy and Directives Management
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive, Suite 222
Arlington, VA 22203

Re: Comments on the U.S. Fish and Wildlife Service's Revised Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx (*Lynx canadensis*), Revised Proposed Rule. 73 Fed. Reg. 62,450 (October 21, 2008)

Please accept these comments on behalf of our respective organizations[1] in response to the U.S. Fish and Wildlife Service's ("FWS" or "Service") Revised Proposed Rule for the Revised Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx (*Lynx canadensis*) ("Proposal"). 73 Fed. Reg. 62,450 (October 21, 2008). These comments supplement our initial letter submitted to FWS dated April 28, 2008. We appreciate the additional opportunity to provide comment.

These supplemental comments are organized as follows:

1. Comments regarding the economic impacts of Critical Habitat designation for lynx;
2. Comments in support of designating lynx Critical Habitat irrespective of other regulations in place;
3. Comments in support of designating lynx Critical Habitat on private lands;
4. Comments in support of designating specific places as lynx Critical Habitat;
5. Comments to strengthen the proposal to ensure its effectiveness under predicted climate change scenarios,
6. Comments that further justify the expansion of this Proposal to include lynx habitat in the Southern Rocky Mountains, and
7. Comments in response to the Draft Environmental Assessment for the Proposal.

1. The economic impacts of designating Critical Habitat for lynx

[1] Defenders of Wildlife and Center for Native Ecosystems (lead authors), plus Alliance for the Wild Rockies, American Wildlands, Biodiversity Conservation Alliance, Center for Biological Diversity, Colorado Wild, Friends of the Clearwater, Friends of the Wild Swan, Greater Yellowstone Coalition, High Country Citizen's Alliance, The Humane Society of the United States (HSUS), The HSUS Wildlife Land Trust, Idaho Conservation League, The Lands Council, Klamath-Siskiyou Wildlands Center, Rocky Mountain Recreation Initiative, Sierra Club, Sierra Club Rocky Mountain Chapter, Spokane Mountaineers, Swan View Coalition, WildEarth Guardians, Wilderness Workshop, and Wyoming Outdoor Council.

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Note: all page numbers referenced in this section refer to the draft Economic Analysis (EA) of October 2, 2008.

A. Updated EA finally distinguishes between baseline and incremental, Critical Habitat-related impacts.

We are pleased to see that in this economic analysis (EA), the Fish and Wildlife Service finally acknowledges that an EA of critical habitat designation (CHD) must distinguish between the impacts associated specifically with the CHD on the one hand and any impacts that result from any other conservation measure (e.g., listing, Habitat Conservation Plans) for the species in question on the other hand. Previous EAs failed to make this crucial distinction, which Defenders of Wildlife and others have pointed out in numerous comments submitted on EAs of CHDs for the lynx and many other species, and incorrectly attributed all costs associated with species protection measures to the CHD for the species in question. This often led to dramatic overestimations of the actual costs of CHD.[2] Not surprisingly, in the current EA, the expected present value costs of lynx CHD are estimated to be $1.49 million over the next 20 years, compared to the total costs of an estimated $123-$135 million over 20 years for all lynx protection measures. (Note: These total costs are substantially overestimated for reasons pointed out under Point C below).

B. Economic Benefits of CHD are still omitted from analysis.

Nevertheless, another principal concern raised in our previous comment letters still remains unaddressed in the current EA: The analysis focuses exclusively on the expected costs of CHD, neglecting to include any expected benefits associated with the proposed lynx CHD. The analysis thus is not a true economic impact analysis but rather a cost analysis as it focuses only on one side of total impacts. This one-sided analysis has a distorting effect as inevitably readers of the analysis will tend to interpret the results as indicating that lynx protection (CHD as well as any of the other protection measures) is "costly" in a net sense, that is, on balance impacts society negatively, when in fact no such conclusion is warranted based on the EA because the economic benefits of the CHD are excluded from the analysis.

The EA correctly states that "[u]nder Executive Order 12866, Office of Management and Budget ("OMB") directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions" (p. 2-15). However, the EA then goes on to state that "*[r]ather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking"* (italics in original), without providing any justification for this decision.

The EA states that "[i]n its guidance for implementing Executive Order 12866, the OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research" (pp. 2-15 - 2-16), but no discussion is provided as to whether any efforts were expended to review the literature or generate benefit estimates for lynx CHD. Furthermore, no argument is provided as to why is was *not feasible* to develop such benefit estimates, when clearly considerable effort was devoted by the EA to developing cost estimates associated with lynx conservation (baseline) and CHD. It is unlikely that with a similar research and analysis effort, benefit estimates could not also have been

[2] *See also* Duane, T.P., G. Carnefix, S. Chattopadhyay, C. Davidson, D.A. DellaSala, J. Duffield, C. Frissell, M.P. Hayes, M. Jennings, J. Kerkvliet, G. LeBuhn, P. Morton, E. Niemi, Deanna Spooner and M. Weber. 2008. *Economics of Critical Habitat Designation and Species Recovery*. Consensus statement of a workshop sponsored by the Pacific Rivers Council, Environmental Studies Program at San Francisco State University, Ecotrust and the National Center for Conservation Science and Policy. 8 pp.

developed. A recent study demonstrated that indeed it is possible to develop benefit estimates associated with increased lynx populations.[3]

The quoted passages from the EA thus clearly show that the decision to not develop estimates of the economic benefits of increased lynx populations as a result of lynx CHD was based on a "belief" on the part of the Service. Such a "belief" clearly is not an acceptable justification for ignoring OMB guidance and basic rules for balanced economic analysis.

With respect to the "ancillary" benefits of lynx CHD, defined by the EA as the "maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species" (p. 2-16), the Analysis Framework suggests that these benefits, where they result in observable impacts on markets such as open space premiums from development restrictions, are included in this analysis. However, none of the impact sections mention any benefits; thus, it is doubtful that these positive impacts indeed were included. For example, the EA estimates the potential welfare losses from lynx CHD impacts on snowmobiling (losses in utility due to increased crowding) but fails to include welfare gains for participants in non-motorized recreation activities. Such positive impacts would be expected to result from the reductions in the exposure to engine noise and air pollution that cross-country skiers or snowshoers are exposed to and that reduce the utility these individuals receive from their activities. The EA also correctly states that an increase in undeveloped lands may increase property values of nearby residential units, but nowhere in the analysis is it indicated that such positive economic impacts were actually quantified. This stands in stark contrast to the economic costs lynx CHD is expected to result in for potentially developable parcels whose development is restricted due to lynx CHD, which the analysis goes to considerable lengths to quantify (pp. 5-5 – 5-17). The economic literature that documents property value increases as a result of nearby open space is extensive, including over 55 original quantitative studies for the U.S. Several authoritative reviews of the literature have been conducted.[4] Sixteen of these studies focus specifically on the property value impacts of forested open spaces.[5] A recent meta-analysis of the literature develops a regression-based model that allows the estimation of the property value premium generated by a specific open space of a particular type, as a function of the size of the open space, land cover type, land ownership

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[3] Kroeger, T. and F. Casey. 2006. Economic impacts of designating critical habitat under the U.S. Endangered Species Act: Case study of the Canada lynx (*Lynx Canadensis*). *Human Dimensions of Wildlife* 11(6):437-453.

[4] Banzhaf, H.S. and P. Jawahar. 2005. Public benefits of undeveloped lands on urban outskirts: Non-market valuation studies and their role in land use plans. Washington, DC: Resources for the Future. June 2005. 47 pp; Boyer, T. and S. Polasky. 2004. Valuing urban wetlands: A review of non-market valuation studies. *Wetlands* 24(4):744-755; Brander, L.M., J.G.M. Florax, and J.E. Vermaat. 2006. The empirics of wetland valuation: A comprehensive summary and meta-analysis of the literature. *Environmental and Resource Economics* 33(2):223-250; Crompton, J.L. 2001a. The impact of parks on property values: A review of the empirical literature. *Journal of Leisure Research* 33(1):1-31; Crompton, J.L. 2001b. Parks and open space: The highest and best use of public land? *Journal of Park and Recreation Administration* 19(3):133-154; Fausold, C. and R. Lilieholm. 1999. The economic value of open space: A review and synthesis. *Environmental Management* 23(3):307-20; Heimlich, R. and W. Anderson. 2001. Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land. Agricultural Economics Report No. 803. Washington, D.C.: USDA Economic Research Service; Heimlich, R., K.D. Wiebe, R. Classen, D. Gadsby and R.M. House. 1998. Wetlands and agriculture: Private interests and public benefits. USDA Economic Research Service Report 765 (September). Washington, DC. 94 pp; McConnell, V. and M. Walls. 2005. The value of open space: Evidence from studies of nonmarket benefits. Washington, DC: Resources for the Future. January 2005. 78 pp.

[5] Kroeger, T. 2008. Open Space Property Value Premium Analysis. Report prepared for the National Council for Science and the Environment as part of the project "Development of an Operational Benefits Estimation Tool for the U.S." Washington DC: Defenders of Wildlife. June 2008. 77 pp.

and whether or not the space is protected.[6] The EA should include the open space benefits for nearby properties in the baseline analysis of the impacts of lynx conservation on development for its analysis of the Moosehead development (Maine) in order to present a balanced analysis of the economic impacts.

To reiterate, inclusion of the economic benefits associated with CHD is a crucial condition for a balanced analysis.[7]

C. Baseline (not CHD-related) costs are overestimated due to assigning of all development restrictions at Moosehead Lake (Maine) to lynx conservation.

The single largest estimated cost of lynx protection (baseline cost, not CHD-related cost) is associated with a single large proposed development along Moosehead Lake in Maine. In fact, the loss from expected development restrictions for this project accounts for 74%-75% (low and high cost scenarios, respectively) of total projected baseline (non-CHD-related) costs of lynx protection in all analysis units combined. However, as the EA points out, these costs are expected as the result of:

> "conservation efforts recommended by LURC [Maine Land Use Regulatory Committee] and the Service as a result of multiple issues, including species other than the lynx, environmental factors, and public sentiment. These impacts are therefore considered baseline as they are the joint result of multiple issues, and are expected to be implemented regardless of the critical habitat designation." (Draft EA, p. ES-3)

Thus, as clearly stated in the EA, these costs may be incurred even in the absence of lynx protections as a result of conservation measures aimed at other species, and thus cannot reasonably be attributed entirely to lynx conservation. Rather, to determine which part of these projected costs are due to baseline (non-CHD-related) lynx conservation measures, the EA would need to identify those development restrictions proposed by LURC and the Service that are specifically and exclusively designed to protect the lynx, and estimate the development restrictions and resulting costs and benefits associated with those restrictions. In the extreme case, if all of the development restrictions for the Moosehead project were also put into place absent the lynx, total combined estimated "baseline post-designation" costs attributable to lynx conservation across all analysis units would be reduced from the EA's $123-$135 million to $32.1-$34 million (present value at 7% discount rate over 20 years).[8]

2. The importance of designating Critical Habitat for lynx regardless of other regulations in place.

As we stated in our initial comments, we greatly appreciate FWS acknowledging in the current proposed rule its obligation to designate Critical habitat regardless of other regulatory mechanisms in place. We believe this is essential for legal, scientific, and management reasons, which we describe as follows.

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[6] *Ibid.*

[7] Duane, T.P., G. Carnefix, S. Chattopadhyay, C. Davidson, D.A. DellaSala, J. Duffield, C. Frissell, M.P. Hayes, M. Jennings, J. Kerkvliet, G. LeBuhn, P. Morton, E. Niemi, Deanna Spooner and M. Weber. 2008. *Economics of Critical Habitat Designation and Species Recovery*. Consensus statement of a workshop sponsored by the Pacific Rivers Council, Environmental Studies Program at San Francisco State University, Ecotrust and the National Center for Conservation Science and Policy. 8 pp.

[8] "Note that lynx conservation was only one of several factors that both LURC and the Service considered in developing their recommendations and that some, if not all, of the recommendations considered in this analysis may have been present absent the lynx" (p. 5-10).

A. Failure to do so is illegal

We incorporate by reference our comments submitted in our April 28, 2008 letter on this issue, which describe in detail that to exclude lands from Critical Habitat designation due to other regulations in place is to violate the Endangered Species Act.

B. Failure to do so is contrary to the best available scientific information

Letters submitted from two leading Forest Service lynx researchers expressed strong concerns about excluding national forest lands in the U.S. Northern Rocky Mountains region from lynx Critical Habitat designation because of Forest Service regulations to protect lynx habitat already in place. Here are some excerpts from those letters that describe these concerns:

> "We… do not know, from a scientific basis, if LCAS [Lynx Conservation Assessment and Strategy] standards are adequate for maintaining persistent lynx populations… The LCAS guidelines are best viewed as untested hypotheses that should be evaluated over time… LCAS guidelines are also limited in scope… Thus, it seems unlikely that LCAS guidelines provide a similar conservation standard as formally declaring these lands as critical habitat under the [Endangered Species] Act."[9]

> "The LCAS… though a thoughtful and well-reasoned set of guidelines, cannot be said to be equivalent or superior [to Critical Habitat designation]… Because the LCAS is mutable, and has no statuatory [*sic*] authority, provides no external oversight, and only provides equivalent protection if FWS oversight causes no changes in management behavior, it does not appear to be equivalent to Critical Habitat designation."[10]

C. Failure to do so is contrary to sound management and policy of lynx habitat

Here, we simply update the researcher's comments above with more current information regarding the limited and changeable scope of the current Forest Service regulations. The Lynx Conservation Assessment and Strategy referred to above is still implemented in portions of lynx habitat in the Pacific Northwest and the U.S. Southern Rocky Mountains, yet in the Northern Rockies it has been replaced by the Northern Rockies Lynx Management Direction ("NRLMD"), signed in March 2007. This document incorporated many standards and guidelines from the LCAS, but dropped others, and added some new ones based on biological and management considerations. Like the LCAS that preceded it, the NRLMD can perhaps best be described as a set of updated hypotheses for how to maintain and restore lynx habitat that should be evaluated over time. This document, like the LCAS that preceded it, can be amended or revoked at any time, and its implementation and enforcement is uncertain given current changes to the National Forest Management Act and its implementing regulations proposed by the Bush Administration. Furthermore, the NRLMD is under administrative appeal and the resolution is still pending. One issue under appeal is the definition of "occupied habitat," because it uses 1999 as the cut-off date for determining occupancy. It also allows those forests not considered to be "occupied" discretion as to whether they use any of the standards and guidelines. Given these and other questions and uncertainties regarding the NRLMD and other lynx-related plans and policies already in place on public lands, the best way to ensure that lynx habitat is managed compatibly with lynx recovery over the long term is through Critical Habitat designation.

3. The importance of designating Critical Habitat for lynx on private lands

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[9] Letter from Dr. John Squires, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, February 28, 2006, (p. 2).

[10] Letter from Dr. Kevin McKelvey, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, March 13, 2006, (pp. 2, 3).

A. Overall importance of including private lands in the designation

Regardless of land ownership, Critical Habitat designation should start with currently occupied habitat, and include additional habitat required by a recovered population. Significant portions of private lands are known to be occupied by lynx across their current range in the lower-48 states, such that the survival and recovery of lynx in these areas depends upon the management of these lands. The clearest example of this is Maine, where more than 90% of the current lynx range is privately owned. This is reinforced in the following paragraph that concludes a recent paper focused on lynx habitat in Maine (emphasis added).

> "Maintenance of lynx populations in eastern North America must include nonfederal forestlands. Almost all potential lynx habitat in the eastern United States occurs on privately owned, commercial forestlands. Further, most lynx habitat in the region straddles the United States–Canada border. Thus, successful recovery of the federally threatened lynx population in the eastern United States will require international cooperation and efforts to maintain large areas dominated by conifer and mixed forests on private lands."[11]

There is important lynx habitat on private lands in each of the other units of lynx habitat in the lower 48 besides Maine, including portions of the Seeley/Swan and Yaak River Valleys of northwestern Montana (Figures 1 and 2), and the Okanagan Valley in Washington State. In Montana, fortunately some of these parcels are included in a major conservation purchase of Plum Creek lands by The Nature Conservancy and Trust for Public Lands called The Montana Legacy Project (see figures below). Unfortunately, the remaining parcels of Plum Creek's lands will continue to be managed for timber production, and/or are proposed for subdivision and development, since the company has recently changed from a lumber company to a Real Estate Investment Trust.[12] Plum Creek lands outside of the Montana Legacy Project include a block of lynx habitat near Whitefish, Montana that is ripe for development given its proximity to that resort community. Ongoing management of private lands to maximize timber production, and especially conversion to residential or recreational developments will clearly harm their ability to provide habitat for lynx.

[11] Excerpted from Hoving, C.L., D.L. Harrison, W.B. Krohn, R.A. Joseph, and M. O'Brien. 2005. Broad-scale predictors of Canada lynx occurrence in eastern North America. *Journal of Wildlife Management* 69(2):739-751.
[12] See http://www.plumcreek.com/

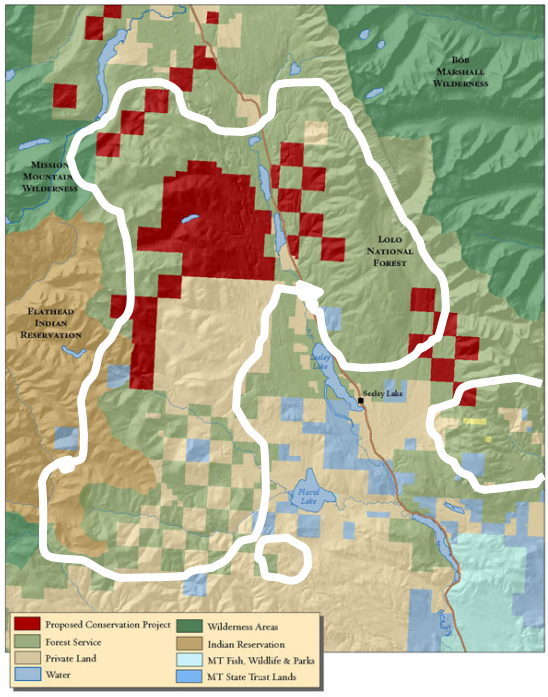

Figure 1. Clearwater area, Montana.[13] *Known occupied lynx habitat is circled in white (J. Kolbe, Montana Dept. of Fish, Wildlife and Parks, Seeley Lake, Montana, personal communication, December 2007). While the areas in red are proposed for conservation, private lands throughout the southern portion of this lynx habitat are proposed for ongoing timber production, and/or subdivision and development.*

[13] Map source: http://www.themontanalegacyproject.org/map.html

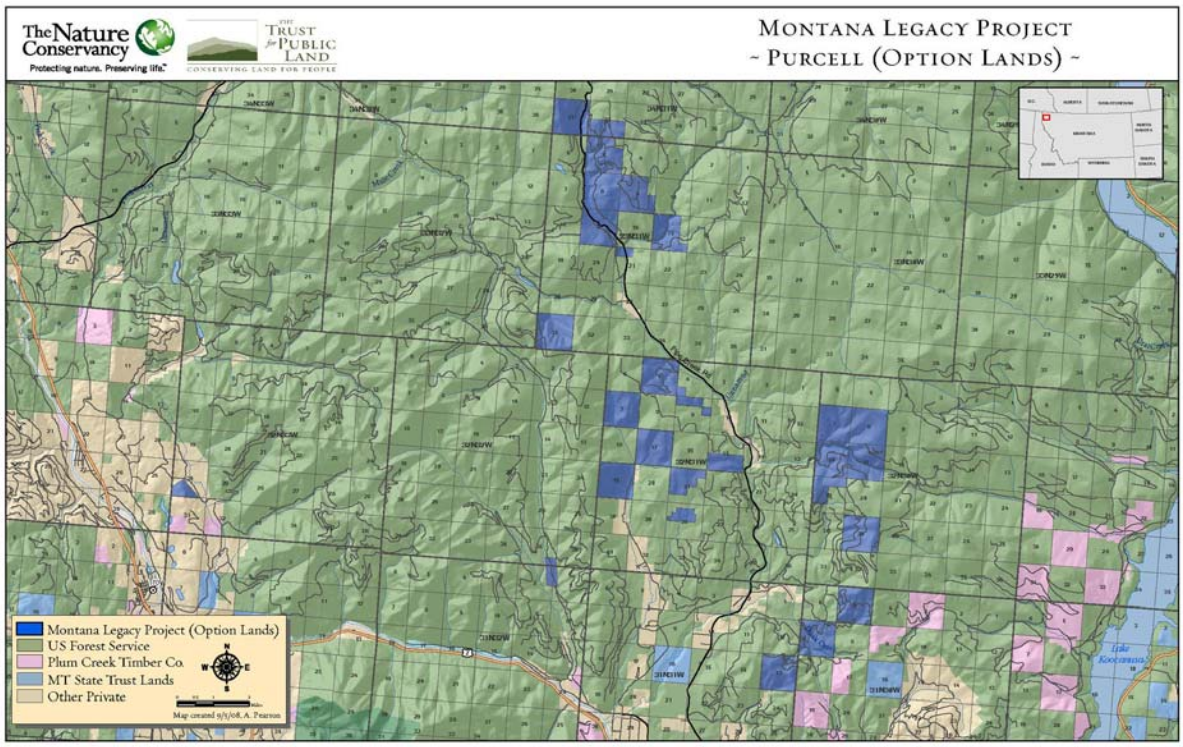

Figure 2. Purcell/Yaak area, Montana.[14] *While the areas in blue are "Option Lands" for conservation, they are not yet signed for purchase, plus other private land parcels in pink and beige that provide important lynx habitat may be managed for timber production, and/or subdivision and development.*

B. The proposed "conservation agreements" with certain timber companies in Maine and Montana are no substitute for Critical Habitat designation on the lands owned by those companies.

The proposed timber agreements in Maine and Montana are no substitute for Critical Habitat designation on private lands. The reason is clear, they accomplish very different things. The Montana agreement is an impressive effort, promising a variety of good faith actions focused on sharing important information about lynx habitat needs. Yet that is not the same as Critical Habitat designation, which specifically ensures that no federal action will result in the destruction of those elements of lynx habitat that are important to lynx. The Montana agreement prescribes no management practices needed to protect lynx. Instead, it promises that voluntary management guidelines will be developed. Similarly, the Maine agreement details important contributions to lynx research and monitoring, and lynx information and education exchange. Yet regarding habitat management it only pledges that planning "guidelines" will be developed and may be eventually incorporated into management. Also, both agreements will be terminated in ten years, unless all parties sign extensions, and any party can back out of either agreement at any time with 30 days notice. These agreements could be a great step toward managing private forests for lynx, which could nicely complement and streamline the Critical Habitat consultation process, but they are not a suitable replacement for the designation itself. What we seek and what the law requires is the Critical Habitat "filter" that if a project in lynx habitat requires a federal action, it must be managed in a manner that maintains that habitat for lynx.

[14] Map source: http://www.themontanalegacyproject.org/map.html

4. Comments in support of Critical Habitat designation in specific places

As we stated in our initial comments, as recently as the 1970's, significant resident lynx populations were known to occur in Minnesota, Montana, and Washington. These states plus the two other areas known to still support resident lynx populations—Maine and Colorado—should form the core of a national lynx recovery program, with additional habitat secured for dispersal and travel corridors in adjacent states with suitable habitat, with an emphasis on those areas that can connect the current lynx populations. We will begin this section with our concerns of why the current FWS approach fails to include sufficient habitat because of its reliance on an arbitrary definition of "occupied habitat" and an arbitrary policy to only designate Critical Habitat within these areas, and then we will go through each of these areas in detail.

A. Lynx Critical Habitat versus "Occupied" lynx habitat

In its proposal FWS has thus far chosen to limit its designation of Critical Habitat to areas that are already occupied by lynx, "We are not currently proposing any areas outside the geographical area presently occupied by the species..."[15] FWS claims that currently occupied lynx habitat is sufficient to support a recovered lynx population in the lower 48 not through a rigorous scientific analysis, but through a cursory discussion filled with unsupported assertions:

> "… we have determined that occupied areas are sufficient for the conservation of the species because these areas adequately address the concepts of representation, resiliency, and redundancy necessary for conservation of a species…"[16]

Thus, FWS borrows the "3 R's" component of its own regulations concerning what constitutes a "significant portion of range" for a species to be considered for listing under the Endangered Species Act and arbitrarily applies that concept here, instead of fulfilling its obligation to consider the best available information as to what constitutes a recovered lynx population in the lower 48 and the areas of habitat necessary to support this population.

Furthermore, FWS has chosen to use an arbitrary definition of "occupied habitat": verified evidence of occupancy and evidence of reproduction since 1995:

> "In evaluating areas for proposal as revised critical habitat, we first determined the geographic area occupied by the species. We used data providing verified evidence of the occurrence of lynx and evidence of the presence of breeding lynx populations as represented by records of lynx reproduction. We focused on records since 1995 to ensure that this critical habitat designation is based on the data that most closely represents the current status of lynx in the contiguous United States and the geographic area occupied by the species at the time of listing."[17]

As stated in our April 28 letter, we believe these choices exclude many areas of important current or potential lynx habitat from the Critical Habitat designation, such as the Selkirk Mountains in northern Idaho and northeastern Washington, for example. Lynx researchers share that concern, as indicated in the following excerpts from their comments.

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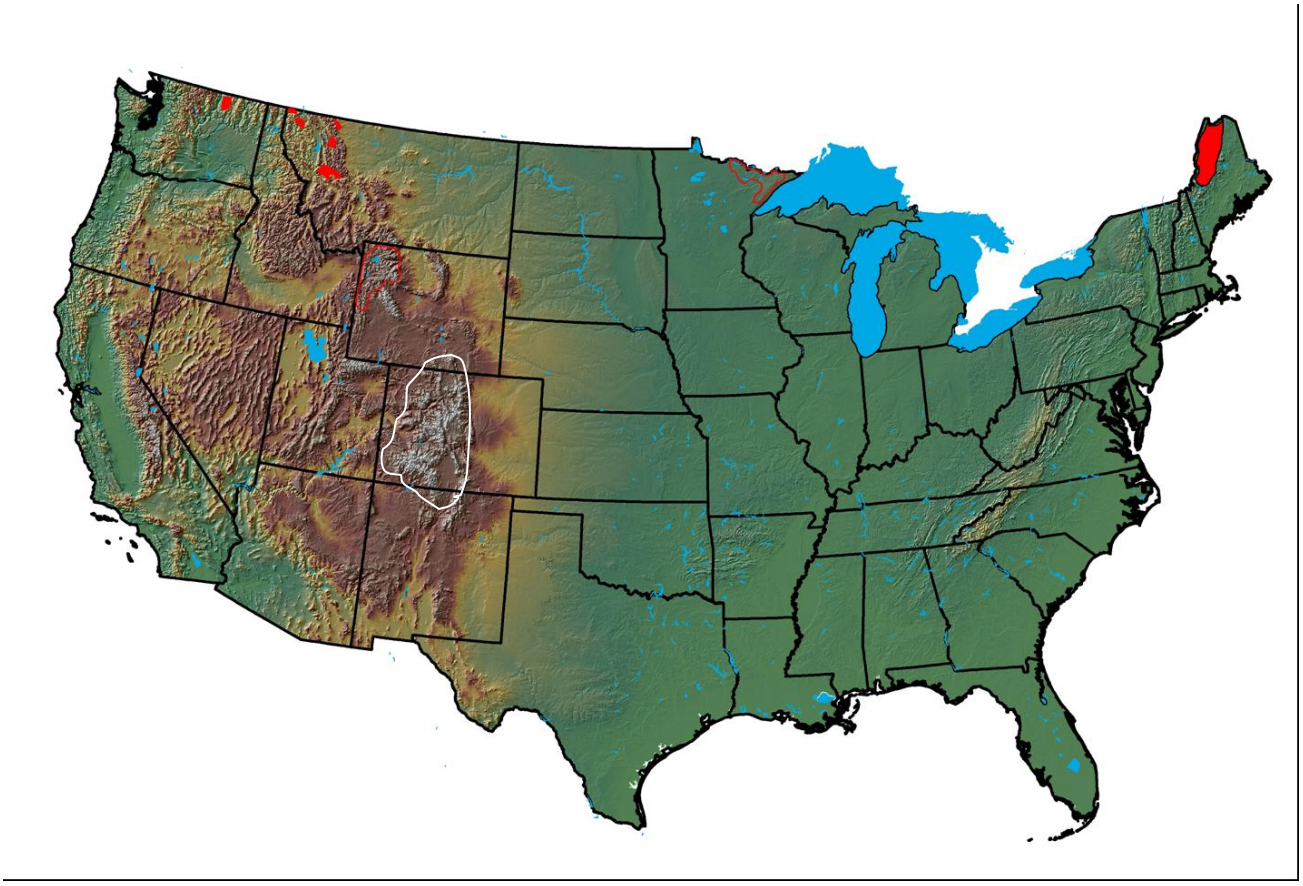
[15] 73 Fed Reg at 10871
[16] *Ibid*
[17] *Ibid* at 10869

> "These stipulations appear to be quite stringent as 1) unless there have been repeated surveys, consistent occupancy cannot be demonstrated and 2) evidence of reproduction is difficult to obtain; many survey methods that detect lynx do not produce it. Some areas, identified as core areas, have received no valid survey efforts within this time period. Thus, for these reasons, it is impossible to meet these criteria regardless of the current status of lynx populations. Examples of this are the Kettle Range in northeastern Washington and the Idaho Panhandle. For these areas, this rule is primarily based on past survey effort rather than any biological or ecological principles."[18]

> "It is troubling that throughout the document the definition of critical habitat seems arbitrary. For example, the tests that a population must pass before being considered for critical habitat included: proof of reproduction, lack of management plans, a minimum but undetermined population number, and certainty of persistence. Few truly rare species could meet these stringent criteria for assigning critical habitat…"[19]

Again, an adequate Critical Habitat proposal would start with currently occupied habitat, but supplement this with additional habitat required by a recovered population. To limit lynx protections to its current range is to risk perpetuating its Threatened status at best, and this proposal is even worse because it omits the Southern Rockies and other portions of habitat currently occupied by the Threatened lynx. Instead, Critical Habitat designation should be grounded in a habitat-based population viability analysis so we have a good idea of how many lynx are needed to achieve recovery, and then we designate sufficient habitat to support that many lynx, including connections between subpopulations. This proposal is deficient because it fails to do this.

[18] Letter from Dr. Kevin McKelvey, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, March 13, 2006, (p. 1).
[19] Letter from Dr. John Squires, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, February 28, 2006, (p. 3).



Solid red denotes known, resident breeding populations; White denotes lynx reintroduced to Colorado
Figure 3. Areas of known, current range occupied by lynx in the contiguous U.S.[20]

As also stated in our April 28 letter, trapping and other observation data compiled by McKelvey et al. (2000) may provide the best indication of the potential abundance and distribution of a recovered lynx population in the contiguous United States. Much of the area encompassed by these records was omitted from the current FWS Critical Habitat proposal (see Figures 4 and 5).

[20] Map source: U.S.D.A. Forest Service Rocky Mountain Research Station, and incorporating data from the Forest Service Pacific Northwest Research Station, Colorado Division of Wildlife, University of Minnesota Natural Resources Research Institute, and Maine Department of Inland Fisheries and Wildlife.

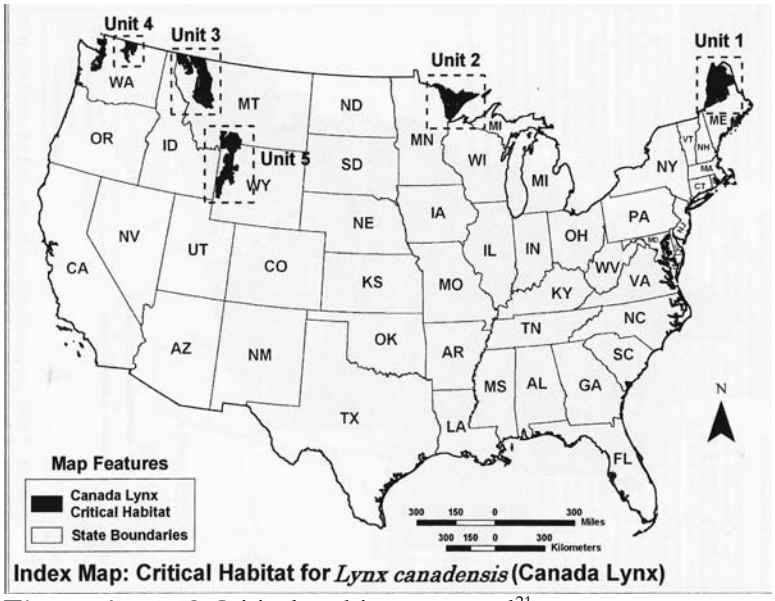


Figure 4. FWS Critical Habitat proposal[21]

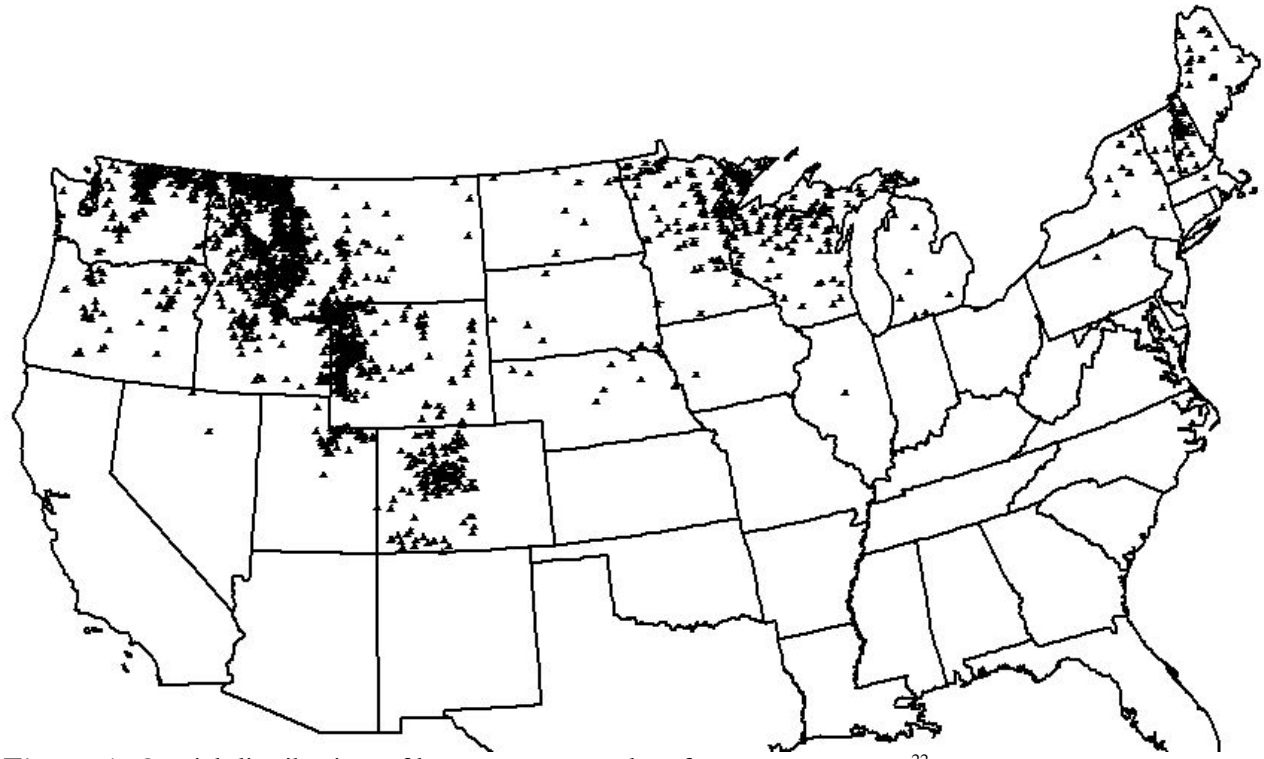


Figure 5. Spatial distribution of lynx occurrence data from 1842 to 1998[22]

[21] 73 Fed Reg at 10883

[22] Map Source: McKelvey, K.S., K. B. Aubry, and Y.K. Ortega. 2000. History and distribution of lynx in the contiguous United States. *Chapter 8 in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk et al. Ecology and conservation of

B. Northern Rockies

We appreciate the fact that the proposed FWS lynx Critical Habitat boundary appears to encompass the areas of known, resident, breeding lynx populations in northwestern Montana, as illustrated in the following figures.

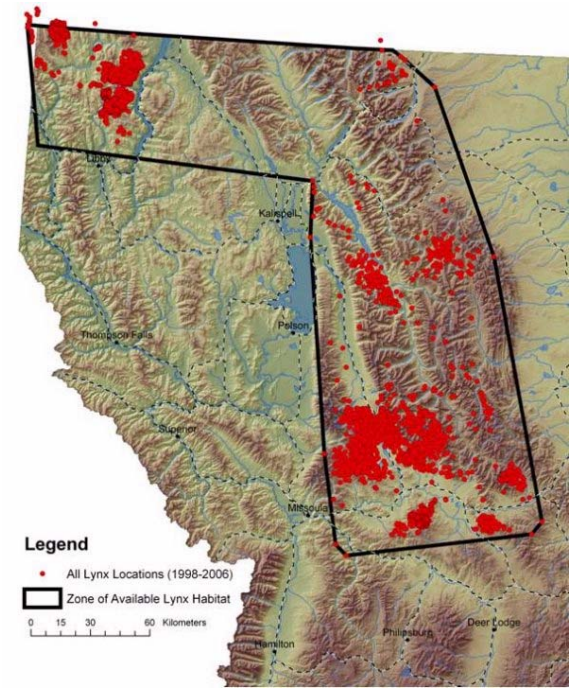


Figure 6. Distribution of lynx locations in western Montana (1998 - 2005). These locations defined occupied lynx habitat for landscape scale habitat modeling.[23]

lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

[23] Map Source: U.S. Forest Service Rocky Mountain Research Station, http://www.fs.fed.us/rm/wildlife/forest_carnivores/lynx/predicting_habitat.php

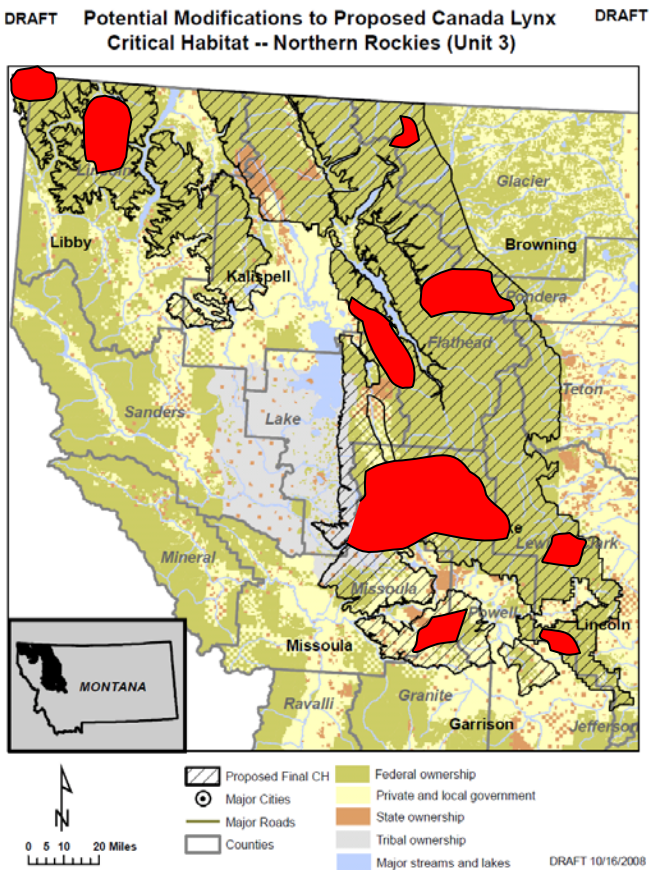


Figure 7. Approximate boundary of occupied lynx habitat in NW Montana. To create this map, we superimposed the areas of occupied lynx habitat from the previous figure onto Unit 3 of the FWS proposal.

The following figure provides justification for the Critical Habitat designation at the southernmost extent of the Northern Rockies Unit, and in fact indicates the designation should be expanded to include additional habitat south of Highway 12 along the Continental Divide west of Helena, Montana.

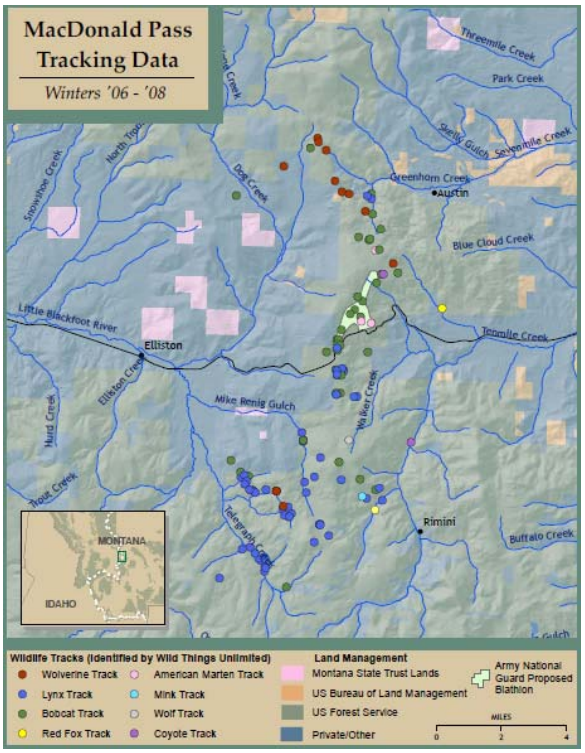


Figure 8. MacDonald Pass Tracking Data, Winters 2006-2008. Unpublished data by Wild Things Unlimited, Bozeman, Montana, 406-522-9825, Fall 2008.

Yet the proposed rule excludes other areas of occupied lynx habitat in the Northern Rockies where lynx are known to occur, but perhaps it has not been verified or breeding has not been confirmed according to the arbitrary standards of the FWS. Examples of occupied lynx habitat recognized by the U.S. Forest Service outside of the FWS proposal include all or portions of the Lolo and Kootenai National Forests in Montana (e.g., the Bitterroot and Cabinet Mountains), the Selkirk Mountains and adjacent habitat managed by the Colville and Idaho Panhandle National Forests, plus the Clearwater, Nez Perce and Caribou-Targhee National Forests in central and eastern Idaho.[24]

A recent interagency report (USDI et al. 1999)[25] documents that lynx inhabit Idaho and have been residents in parts northern Idaho (see also McCord and Cardoza 1982, and Koehler and Aubry 1994 cited therein). There is no evidence that Idaho's lynx are not "capable of long-term persistence" as defined by the ESA.

A signatory to this letter, Friends of the Clearwater, obtained information via the Freedom of Information Act ("FOIA") about lynx sightings on the Clearwater and Nez Perce National Forests. These two forests are located in north-central Idaho and are the northern half of what is commonly called the greater Salmon-Selway ecosystem (or "Big Wild"). The information we obtained shows these two forests to be crucial for lynx and that lynx are indeed residents of Idaho. Indeed, a lynx and her kittens were found illegally killed on

[24] U.S.D.A. 2007. Northern Rockies Lynx Management Direction Record of Decision. U.S. Department of Agriculture Forest Service. National Forests in Montana, and parts of Idaho, Wyoming and Utah. March 2007.
[25] USDI et al. 1999. Canada lynx in Idaho, species conservation assessment. Unpublished interagency report by U.S. Department of Interior Bureau of Land Management, Idaho Department of Fish and Game, Idaho Department of Parks and Recreation, U.S. Department of Interior Fish and Wildlife Service, and U.S. Department of Agriculture Forest Service, 96 pp. [*Copy available upon request*]

the Palouse Ranger District of the Clearwater National Forest (an area erroneously labeled non-lynx habitat by both FWS and the U.S. Forest Service), and a Clearwater National Forest wildlife biologist recently photographed a lynx on the Lochsa River.

The detailed information provided by the Nez Perce National Forest shows a disproportionate number of lynx reports coming from within or immediately adjacent to roadless areas (including designated Wilderness). USDI et al. (1999) documents lynx sightings within designated Wilderness and/or roadless areas in the Clearwater and Nez Perce National Forests, including a lynx trapped in 1987 deep inside the Selway-Bitterroot Wilderness. Given that people spend more time in developed areas, lynx in Idaho are likely to use and need secure roadless habitat undisturbed by humans.

USDI et al. (1999) shows 29 reports of probable or confirmed lynx in Idaho since 1990. Those recent reports are not limited to adults but also include kittens. Three of the twenty-nine reports were confirmed (dead lynx), including one on the Nez Perce and one on the Clearwater National Forests. Due to the confirmed presence of lynx on the Nez Perce and Clearwater National Forests and the fact they both contain large undeveloped areas, their importance for lynx recovery must not be overlooked.

It is disturbing to see the inconsistency among the agencies in compiling their own reports of lynx. Six of the lynx reports documented by the Nez Perce National Forest since 1991 were not included in USDI et al. (1999) despite the fact that the U.S. Forest Service co-authored that report. What is even more puzzling is that one report in USDI et al. (1999) was originally reported to the Nez Perce National Forest; yet, the Nez Perce National Forest failed to include that report in its response to Friends of the Clearwater's FOIA request.

The 4,000-foot elevation criterion is not accurate for the wetter forests of the Northern Rocky Mountains, specifically the Clearwater and Nez Perce National Forests. The lynx photographed by the Forest Service biologist on the Lochsa River was well below 4,000 feet and it was in abundant snow. As such, these two national forests should all be included within the Critical Habitat designation.

The FWS proposal also excludes important dispersal and connecting habitats in Idaho and Montana outside these areas of known current range. The next two figures show lynx observations across much of western Montana and nearly all of Idaho documented by the two state wildlife agencies, which indicate that lynx may have been using these areas as recently as a decade ago. Besides expanding the current proposal to include all areas of current lynx range in the Northern Rockies, FWS should designate Critical Habitat outside of known current habitat to include linkages or "stepping stones" of suitable, formerly occupied lynx habitat between these areas to ensure lynx can safely travel between them as necessary to function as a metapopulation across the Northern Rockies region.

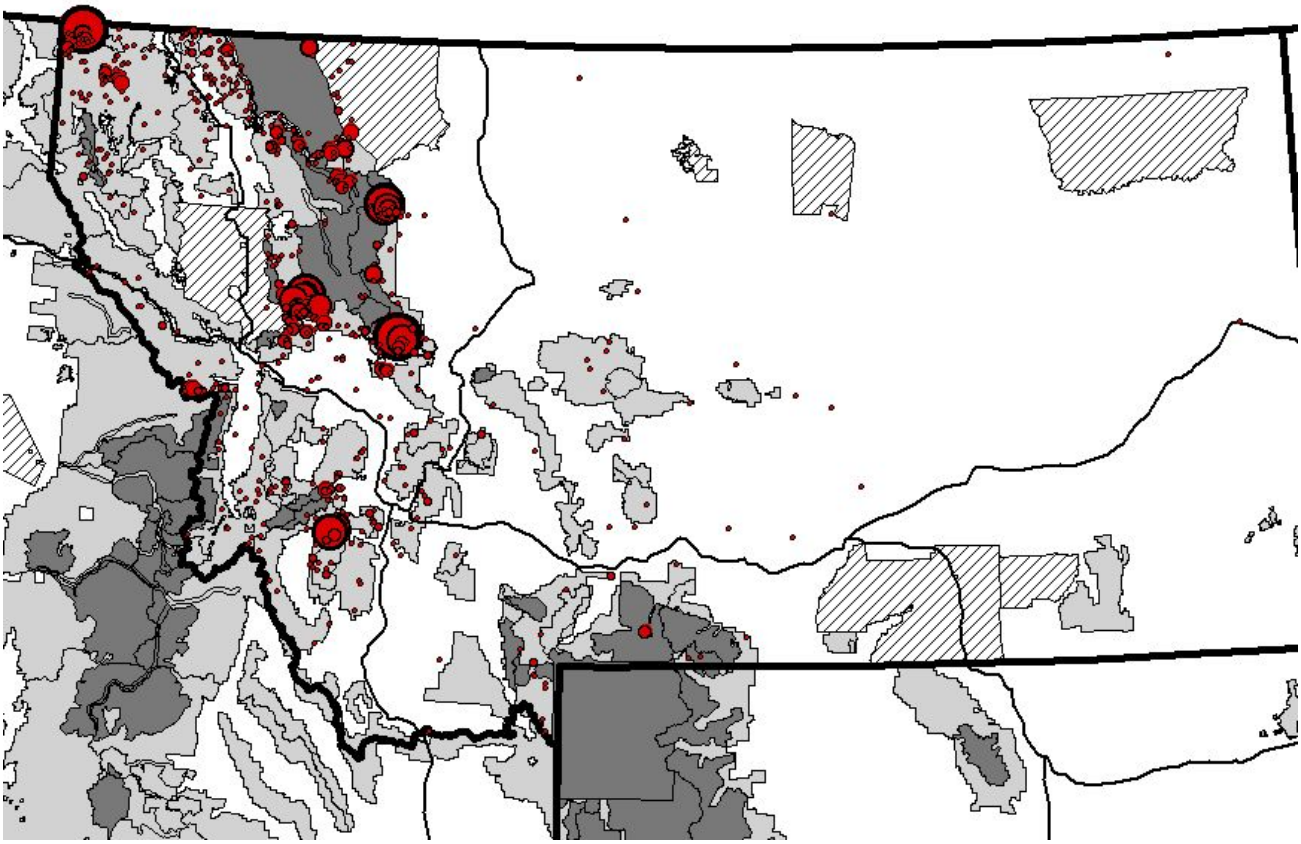


Figure 9. Lynx records in Montana. The red circles indicate lynx observations, with the larger circles indicating multiple records. The dark grey areas are national parks and Wilderness areas, light grey indicates other areas of national forest lands, and the hashed areas are American Indian reservations.[26]

[26] Source of lynx observation data: Montana Department of Fish, Wildlife and Parks, Helena, 1998.

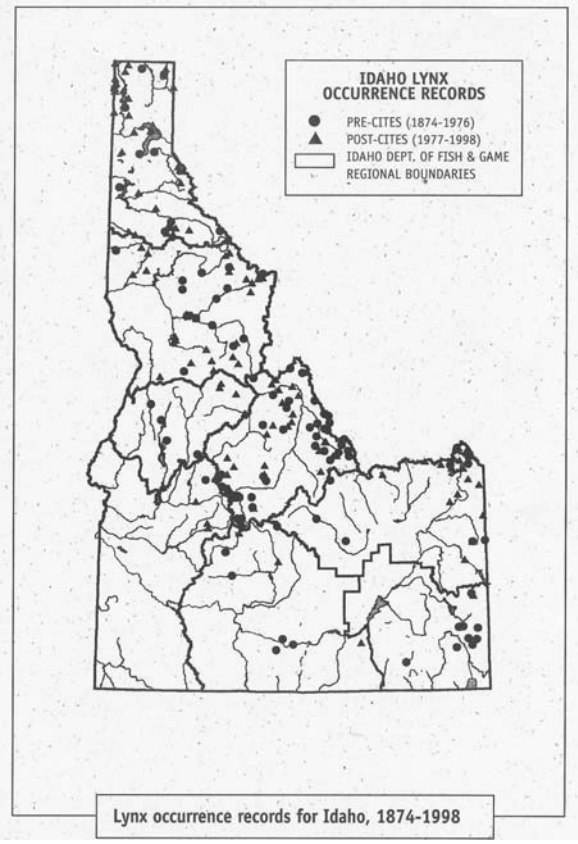


Figure 10. Lynx records in Idaho through 1998[27]

Also, we appreciate that the Proposal includes important lynx habitat within the Flathead Indian Reservation, where an agreement has been negotiated with the Salish Kootenai Tribe to maintain key habitat elements for lynx on those areas. We urge FWS to expand the Critical Habitat designation east of Glacier National Park to include important lynx habitat on the Blackfeet Reservation, and negotiate with the Blackfeet tribe to ensure lynx habitat is maintained in these areas as well.[28]

C. Greater Yellowstone

Similar to northwestern Montana, we appreciate that the FWS' proposed Critical Habitat Unit 5 in the Greater Yellowstone area reflects a core area of known current lynx range, yet we are concerned that it excludes other important areas of occupied lynx habitat in the western portion of Teton County, Wyoming, in the Caribou-Targhee National Forest in Idaho, the Gallatin National Forest in Montana, the Bridger-Teton National Forest in Wyoming, and Bureau of Land Management lands adjacent to the Wyoming Range (see map below). As we stated in our April 28, 2008 comments, the Forest Service has already designated these areas as occupied lynx habitat,[29] and they include areas with recent confirmed lynx

[27] Map source: Lewis, Lyle and C. Richard Wenger. 1998. Idaho's Canada Lynx: pieces of the puzzle. Idaho Bureau of Land Management Tech. Bull. 98-11, October 1998 (inside back cover).
[28] See testimony by Mr. Doug Chadwick, Lynx Critical Habitat hearing, Kalispell, MT, Nov. 7, 2008.
[29] U.S.D.A. 2007. Northern Rockies Lynx Management Direction Record of Decision. U.S. Department of Agriculture Forest Service. National Forests in Montana, and parts of Idaho, Wyoming and Utah. March 2007.

observations, such as the lynx scat found east of Jackson Lake on the Grand Teton NP/Bridger Teton NF boundary in Winter 2006-2007.[30] Also, we are concerned with the following statement in the Proposal:

> "… on the east side of Unit 5… information submitted by the Forest Service indicates that much of the mapped lynx habitat in this area is insufficient to support snowshoe hares in the numbers required for lynx survival and reproduction. For this reason, we would not incorporate all mapped lynx habitat in this unit…"[31]

We urge FWS to include mapped lynx habitat even if it currently supports inadequate snowshoe hares required for lynx survival and reproduction. Prey populations fluctuate so much and vegetative conditions can change so much that an area that currently doesn't support big numbers of snowshoe hares could do so in the future. If this habitat has other important habitat components like adequate large woody debris for denning or could serve as dispersal or movement corridors, these areas are still appropriate for the lynx Critical Habitat designation regardless of current snowshoe hare populations. In this proposal it is important for FWS to consider future habitat/prey conditions and not just current prey populations in areas that have been mapped as lynx habitat.

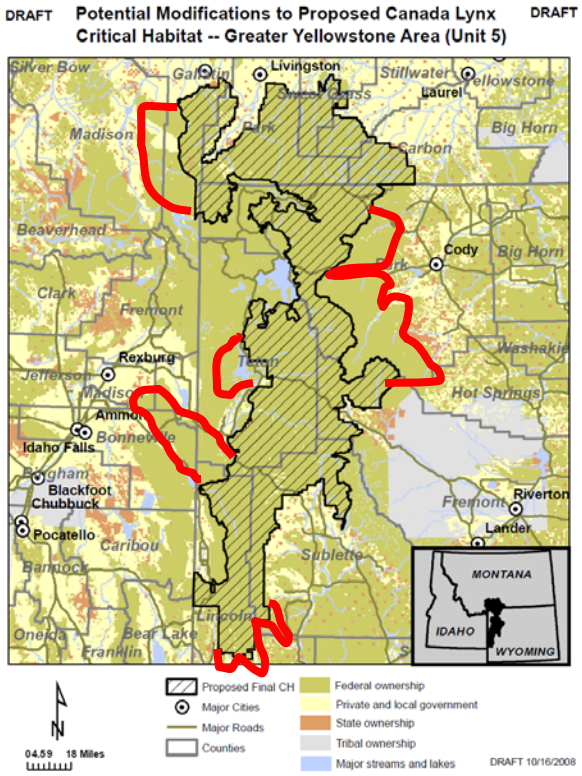


Figure 11. Current Greater Yellowstone Unit of the FWS proposed rule in black with diagonal hash lines. Our recommended additions are marked in red.

[30] Nate Berg, personal communication, November 2008.
[31] 73 Fed Reg at 62457

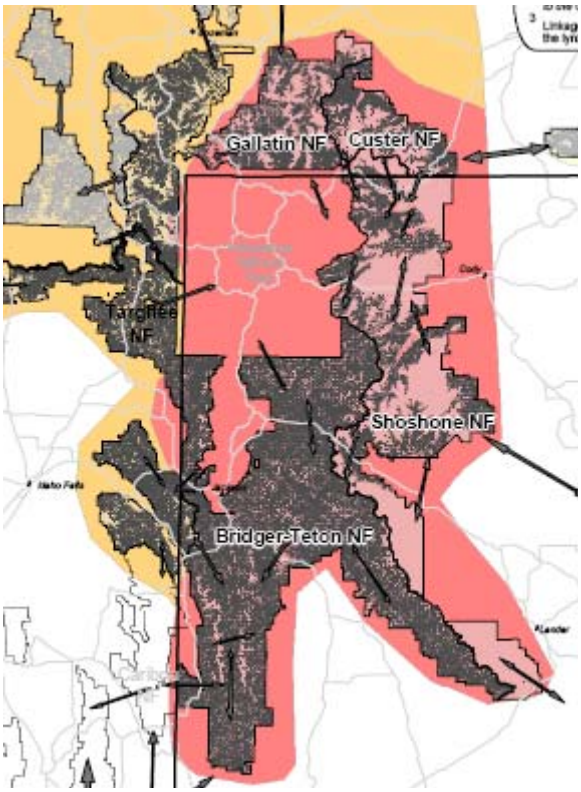


Figure 12. Occupied lynx habitat and linkage areas in Greater Yellowstone designated by the U.S. Forest Service
(dark gray = occupied; light gray = unoccupied; red and yellow refer to "Core" and "Secondary" habitat, respectively).

Lynx researchers have emphasized the importance of including the Greater Yellowstone Area within the Critical Habitat designation, as indicated in the following excerpts.

> "Basic principles of conservation biology would suggest a small population of lynx in Wyoming that persist in a patchy habitat may be most vulnerable to habitat alterations and arguably could require the greatest management attention. Most potential lynx habitat in the GYA has not been surveyed."[32]

> "Suitable federal lands in the Yellowstone Ecosystem should be designated lynx critical habitat… wet boreal forests and select other habitats in this ecosystem, considered at a broad spatial scale, contain the requisite primary constituent elements; and are known to currently support lynx presence, reproduction, and recruitment to breeding age. Critical habitat should be specified to the maximum extent prudent and determinable (50CFR424.12). As the intent of the Act is to recover listed species, and considering that this region contains the primary constituent elements, designating critical habitat in the Yellowstone Ecosystem is prudent. Based on well-documented habitat affinities of lynx, critical habitat species is also reliably determinable."[33]

Thus, the Greater Yellowstone Area is vital to lynx recovery in the lower-48 states, and clearly belongs within the Critical Habitat proposal. We urge FWS to expand its current boundary to include all areas of occupied lynx habitat in the GYA, plus dispersal and connecting habitats north and south to ensure these areas are managed to allow for safe lynx travel across the entire U.S. Rocky Mountain region.

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[32] Letter from Dr. John Squires, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, February 28, 2006, (p. 2).
[33] Comments on FWS Lynx Critical Habitat Proposed Rule submitted by Kerry Murphy, Wildlife Biologist, Yellowstone National Park, February 15, 2006 (p. 1).

Climate change provides added justification to include the Greater Yellowstone Area within the Critical Habitat designation. Analysis by Gonzalez et al. (2007)[34] indicates that a portion of the Bridger-Teton National Forest in northwestern Wyoming may retain snowpack better than any other lynx habitat in the U.S. Northern Rockies region, "Potential conservation priority areas for lynx include areas in the Bridger-Teton National Forest (Wyoming) and Superior National Forest (Minnesota), which lie in potential refugia" (Abstract).

Also relevant to the Greater Yellowstone area, FWS cites a 2005 study (Hodges and Mills) regarding snowshoe hare habitats and abundance in the region,[35] and cites a 2007 study (Kolbe et al.) regarding the effects of snowmobiles on lynx: both of these issues—snowshoe hare abundance and distribution in Wyoming, and the effects of snowmobiles on lynx—are currently under research in the Bridger-Teton National Forest and we urge FWS to contact the Forest Supervisor for how to obtain the latest information from these studies and incorporate that into its analysis.

D. Northwestern U.S.

We appreciate that the current FWS proposal includes the area known to be occupied by ongoing lynx field research in Washington, but rather than limiting the designation to this area, FWS should expand its proposal to include all areas of important lynx habitat designated for lynx recovery by Washington Department of Fish and Wildlife.

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[34] Gonzalez, Patrick, Ronald P. Neilson, Kevin S. McKelvey, James M. Lenihan, and Raymond J. Drapek. 2007. Potential impacts of climate change on habitat and conservation priority areas for *Lynx Canadensis* (Canada Lynx). Report to: Watershed, Fish, Wildlife, Air, and Rare Plants Staff, National Forest System, U.S. Department of Agriculture, Forest Service, Washington, DC.

[35] 73 Fed Reg at 10866

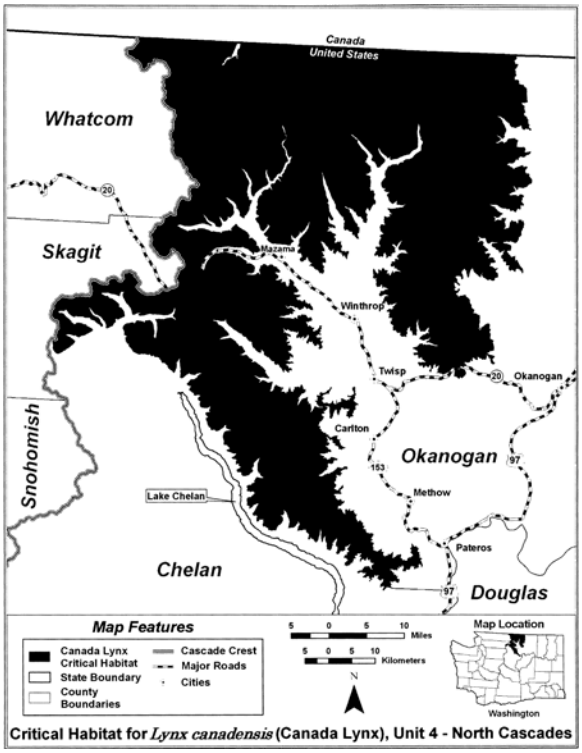

Figure 13. Current North Cascades Unit of the FWS proposed rule.

The following figure, excerpted from the Washington Dept. of Fish and Wildlife's state recovery plan for the lynx shows additional lynx habitat in the North Cascades, plus five other lynx recovery areas in northeastern Washington. The FWS proposed rule should follow the state's lead and include these areas in its critical habitat designation.

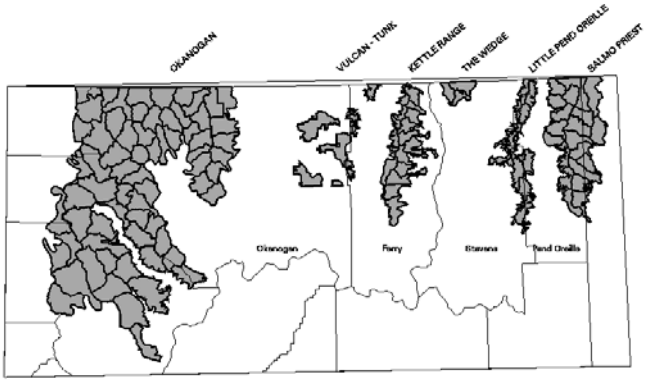

Figure 14. Lynx Management Zones in Washington, 2001.[36]

Furthermore, this next figure from the same document shows evidence of recent occupancy (since 1995) of three of the five Lynx Management Zones excluded from the FWS proposed rule, plus some areas of the North Cascades Unit outside of the current FWS Unit 4 boundary.

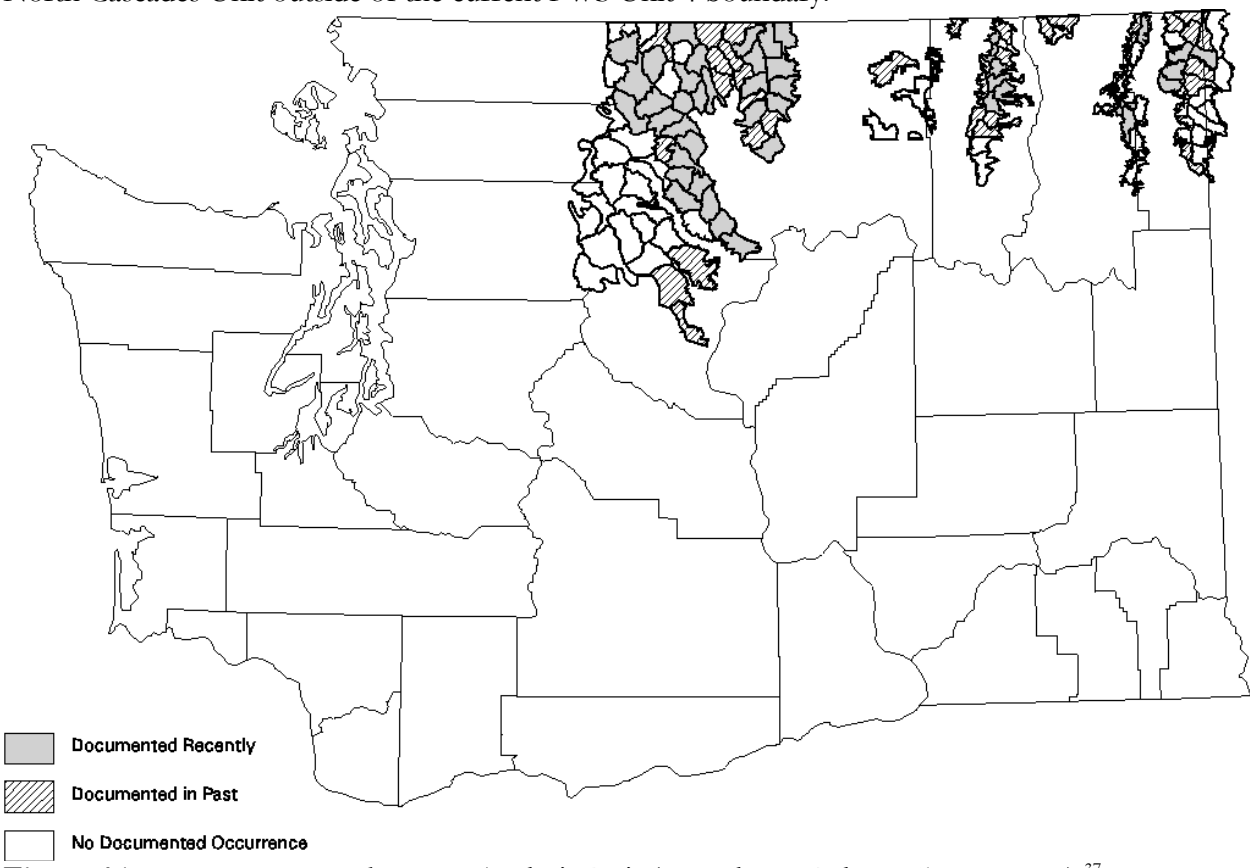

Figure 15. Lynx occurrence by Lynx Analysis Unit (recently = 1 July 1995- Mar 2001).[37]

[36] Map source: Stinson, D. W. 2001. Washington state recovery plan for the lynx. Washington Department of Fish and Wildlife, Olympia, Washington. 78 pp. + 5 maps (p. 14).
[37] *Ibid* (p. 15).

Letters submitted from lynx researchers support expanding the Critical Habitat designation to include the Kettle Range in northeastern Washington in particular. Here are some excerpts (emphasis added):

> "I question the decision to exclude the Kettle Range in Ferry Co. from critical habitat designation. There are large expanses of subalpine fir forests in the Kettle Range, and a very strong historical record of lynx occurrence in that region, including numerous museum specimens, trapping records, and other documented accounts… Although I know of no evidence of lynx reproduction in the Kettle Range during the last 10 years, this area was an important component of lynx range in Washington as recently as the 1980s. In my opinion, the most likely explanation for the dramatic reduction or possible extirpation of the Kettle Range lynx population is related to habitat loss or degradation. Thus, I would argue that the designation of critical habitat or any other measures aimed at restoring suitable habitat conditions for lynx to critical areas within their historical range, such as the Kettle Range (especially areas that were known to be occupied by self-sustaining populations in the latter half of the 20th century) would be particularly appropriate from a conservation perspective. In addition, the Kettle Range is located about midway between extant resident populations in the northern Cascade Range in Washington and the northern Rocky Mountains in Idaho and Montana and, thus, may provide important habitat connectivity between these populations; this would seem to provide further justification for such conservation measures. Thus, it seems to me that there are unique and compelling reasons to include the Kettle Range in Washington in the designation of critical habitat for lynx, even though reproduction has not been documented there within the last 10 years."[38]

> "Although the Kettle Crest in Washington is not listed as Critical Habitat in the Proposed Rule… the area may provide a potential to support reproducing lynx populations of lynx in the near future… if lynx do colonize the area, either from immigration from Canada or artificial translocation to the area, lynx may reproduce and populations may persist as long as habitat conditions remain favorable and their populations are protected… Once established the population may serve to assure persistence of lynx within the Washington State; which is a significant portion of lynx range in the contiguous United States."[39]

There is also ample justification to expand the Critical Habitat to include portions of the Cascade Range in Oregon. Figure 5 of the 1999 Forest Service and Bureau of Land Management Lynx Biological Assessment[40] clearly identified the Oregon Cascades as an area with moderate to high likelihood of supporting lynx conservation due to the extensive coverage of conifer forest, as does the following text from the BA (p. 59):

> "landscape capabilities to provide areas of at least 1800 km2 (695 mi2) of contiguous suitable habitat... In summary, Plan direction continues to support lynx conservation in much of the Cascades and provides a foundation for a connected network of primary habitat along the length of the Cascades. However, compared to historical times, the Plans have contributed to a reduction of the total area in which natural ecological processes are emphasized."

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[38] Letter from Dr. Keith Aubry, Ph.D. of the U.S. Forest Service Pacific Northwest Research Station, Olympia, Washington to the U.S. Fish and Wildlife Service, Helena, Montana, May 2, 2006, (pp. 2-3).
[39] Letter from Dr. Gary Koehler, Ph.D. of the Washington Department of Fish and Wildlife, Olympia, Washington to the U.S. Fish and Wildlife Service, Helena, Montana, January 21, 2006, (p. 2).
[40] USDA and USDI 1999. Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx. U.S. Department of Agriculture Forest Service and U.S. Department of Interior Bureau of Land Management report by J. Randal Hickenbottom (Initial Team Leader), Bob Summerfield (Final Team Leader), Jeff Aardahl, George Halekas, Mark Hilliard, Lynn Jackson, David Prevedel and John Rupe, Available online at: http://www.fs.fed.us/r1/planning/lynx/reports/ba/ba.pdf

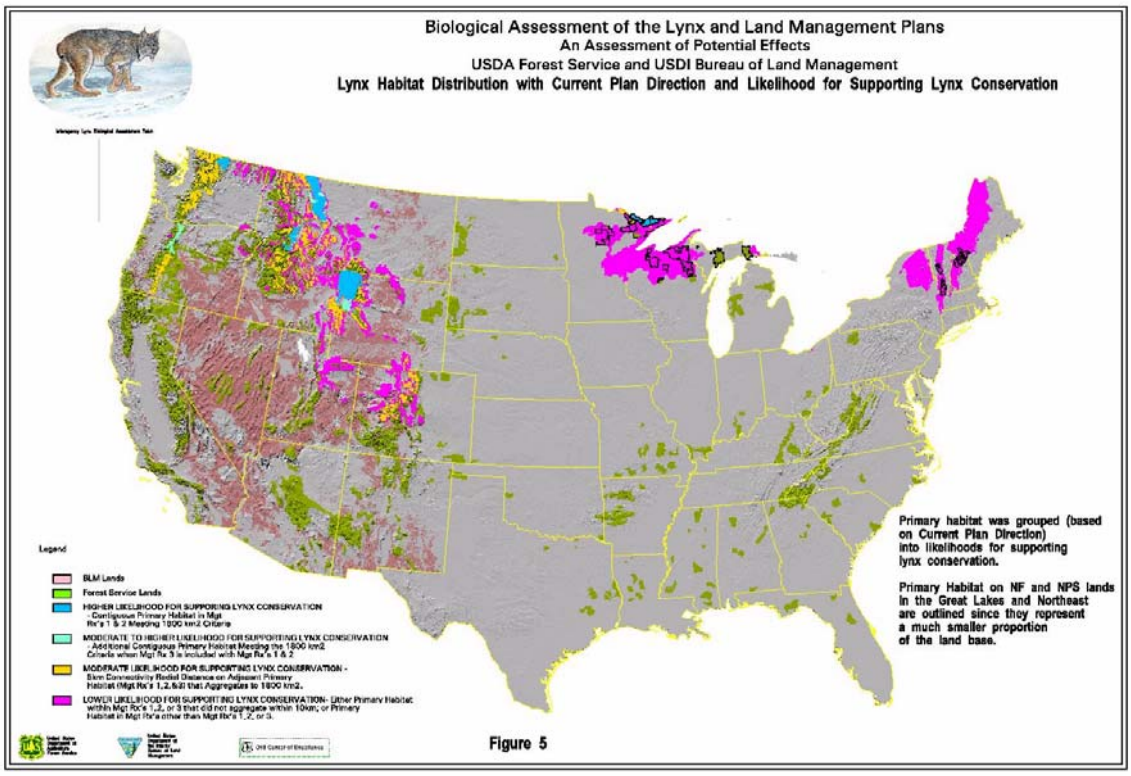

Figure 16. Lynx habitat distribution with current plan direction and likelihood for supporting lynx conservation.[41]

The following excerpts from a recent U.S. Fish and Wildlife Service document recommend special management of certain areas of Oregon where lynx are likely to occur:[42]

> "In Oregon, areas that warrant management as "Evaluation Areas" include: 1) the high elevation flats starting just west of the Mount Jefferson Wilderness area and extending south to the Sky Lakes Wilderness Area. This zone contains a number of reliable recent lynx reports and trapping records, as well as the topography, vegetation, prey, and climatic conditions favorable for lynx; 2) the habitat and connectivity corridor joining the Cascades and Blue Mountains on the Deschutes, Ochoco and Malheur National Forests. Because the I-84 corridor and dams on the Columbia are considered to be a movement barrier, this is the only way for genetic exchange to occur to the southern Cascades; 3) the area around Mt. Hood and Bennett Pass due to a cluster of 14 lynx sightings in the area and proposed ski area developments; and 4) previously mapped habitat on the Winema and Fremont National Forests due to clusters of recent reliable sightings, confirmed specimens in/or south of these clusters, and past records indicating a presence…"
>
> "Current and historical sighting records, historical documents, and anecdotal evidence suggest that lynx occurred on both sides of the Cascade Mountains in Oregon and Washington. These records show that lynx may have been more widespread and abundant than was previously considered and

[41] *Ibid*, Figure 5, p. 47.
[42] USDI 2001. Management of Canada Lynx in the Cascades Geographic Areas of Oregon and Washington. A White Paper Prepared by the Offices of Region 1 of the U.S. Department of Interior, Fish and Wildlife Service, April 10, 2001.

indicate that it is likely that both resident as well as transient animals occurred in both states. While there is insufficient data to ascertain population size or trends in Oregon or Washington, this is also true of all of the other geographic regions where lynx occur. It is important to recognize that the Endangered Species Act (ESA) does not differentiate between resident and transient individuals nor does it require "resident, reproductive populations" as the threshold for consideration during ESA consultation. Thus the obligation to minimize effects and the potential for incidental take applies where the species is documented or suspected to occur. This is particularly important in areas where the vegetation types, prey availability, and climatic conditions resemble those conditions found in areas where lynx are known to occur."

The following links provide additional justification for an expanded Critical Habitat designation in the Pacific Northwest.

- Lynx BA: Lynx Records in Five Time Periods
  http://www.fs.fed.us/r1/planning/lynx/reports/ba/figure2.jpg
  This map (and the four below) show historic and current lynx records in the Oregon Cascades and the Blue/Wallowas of NE Oregon.

- USFS: historic lynx distribution:
  http://www.fs.fed.us/r1/planning/lynx/maps/HistoricLynxOccurances1842_1998.jpg

- Lynx BA: Lynx Potential Habitat and Primary Areas of Occurrence (Primary Habitat) in the Conterminous United States
  http://www.fs.fed.us/r1/planning/lynx/reports/ba/figure3.jpg
  This map shows lynx habitat (possibly unoccupied but suitable for recovery) in the Oregon Cascades and the Blue/Wallowas of NE Oregon.

- Lynx BA: Likelihood of Supporting Lynx
  http://www.fs.fed.us/r1/planning/lynx/reports/ba/figure4.jpg
  This map (and the one below) show moderate and higher likelihood of supporting lynx in the Cascades and lower likelihood in the Blue/Wallowas (but the forests of NE Oregon are a likely migratory pathway to support movement of lynx from Idaho into the Cascades (far more likely than moving from the Washington Cascades across the Columbia River, two highways, and two railroads) so the Blue/Wallowas should also be included in the critical habitat designation.)

- Lynx BA: Current plan direction and likelihood of supporting lynx
  http://mountain-prairie.fws.gov/species/mammals/lynx/BA%20Figure%205%20current%20plan%20direction.jpg

- Lynx BA: connectivity potential
  http://mountain-prairie.fws.gov/species/mammals/lynx/BA%20Figure%206%20connectivity%20potential.jpg
  This map shows the critical important of NE Oregon forest for lynx connectivity, especially considering the connectivity problems for lynx attempting to move from the southern Washington Cascades to the northern Oregon Cascades across the Columbia River, two highways, two rail lines, and also an area of high density recreation use.

- FWS Lynx map:
  http://mountain-prairie.fws.gov/species/mammals/lynx/lynx_map.pdf
  This FWS map shows the Oregon Cascades as an area of primary lynx occurrence.

- USFS: vegetation and elevation associated with lynx:
  http://www.fs.fed.us/r1/planning/lynx/maps/Veg_lg.jpg
  This map shows lynx habitat associations in the Oregon Cascades and NE Oregon.

E. Southern Rockies

The exclusion of the Southern Rockies is perhaps the greatest flaw in the current FWS proposal.

Several lynx researchers oppose this exclusion, as indicated in the following excerpts.

> "From a scientific standpoint, there is no logical basis to believe that in 20 years the probability of lynx occurring in Colorado is less than in Minnesota or Maine. Thus there is no consistency in the application of this criterion or basis for singling out Colorado. Additionally, and similar to the GYA, if the Colorado population were, in fact, in greater danger of extirpation than other populations, logic would dictate increased protection measures rather than the reverse."[43]

> "… using uncertainty of sustainability as a criterion for excluding Colorado from critical habitat seems arbitrary, especially relative to lynx in Minnesota and Maine… the long-term fate of any lynx population is unknown regardless if populations are in Colorado, Minnesota, or Maine."[44]

The following figure from the Colorado Division of Wildlife provides a strong empirical basis for where to designate Critical Habitat boundaries for lynx in the Southern Rockies.

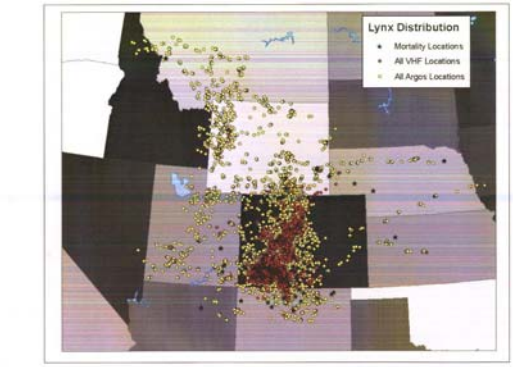

Figure 2. All documented lynx locations (non-truncated datasets) obtained from either aerial (yellow circles) or satellite (red circles) tracking from February 1999 through June 30, 2007. All known lynx mortality locations ($n = 97$) are displayed as stars.

Figure 17. Locations of collared lynx reintroduced into Colorado.[45]

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[43] Letter from Dr. Kevin McKelvey, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, March 13, 2006, (p. 2).
[44] Letter from Dr. John Squires, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, February 28, 2006, (p. 3).
[45] Map source: Shenk, Tanya M. 2007. Post-release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. Period covered: July 1 2006 – June 30, 2007. Wildlife research report, Colorado Division of Wildlife, p. 29. Available online at: http://wildlife.state.co.us/WildlifeSpecies/SpeciesofConcern/Mammals/Lynx

Furthermore, data from Colorado lynx dispersing north into Wyoming provides empirical basis to expand the Critical Habitat proposal to include dispersal and connecting habitat between the Greater Yellowstone area and Southern Rockies.

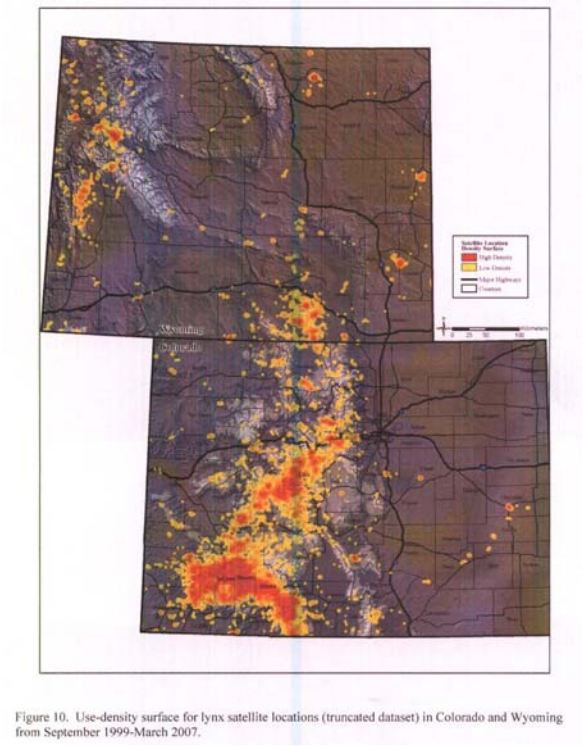

Figure 10. Use-density surface for lynx satellite locations (truncated dataset) in Colorado and Wyoming from September 1999-March 2007.

Figure 18. Location density index for Colorado and Wyoming of lynx reintroduced into Colorado.[46]

We provide a significantly more detailed justification for expanding the lynx Critical Habitat proposal to include the Southern Rocky Mountains in Section 6 of these comments below.

F. Great Lakes states

We appreciate that the FWS proposed Unit 2 includes core lynx habitat on the Superior National Forest and adjacent lands, but we are concerned that it omits important, occupied lynx habitat east of Highway 53 on state and private lands, as well as the Chippewa National Forest.

[46] *Ibid*, p. 37.

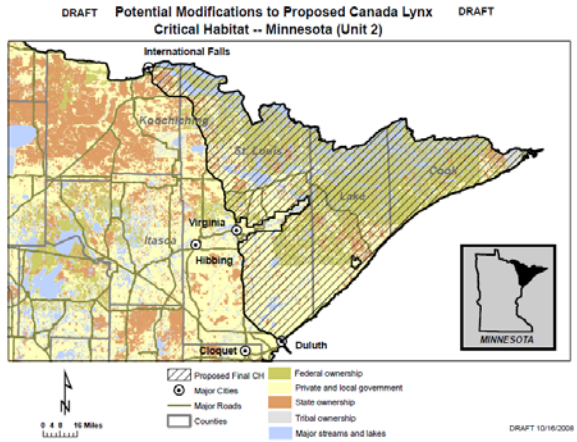

Figure 19. Current "Minnesota Unit" of the FWS proposed rule.

The following figure by Minnesota DNR shows that lynx occupy a much broader area than what is currently proposed for Critical Habitat designation.

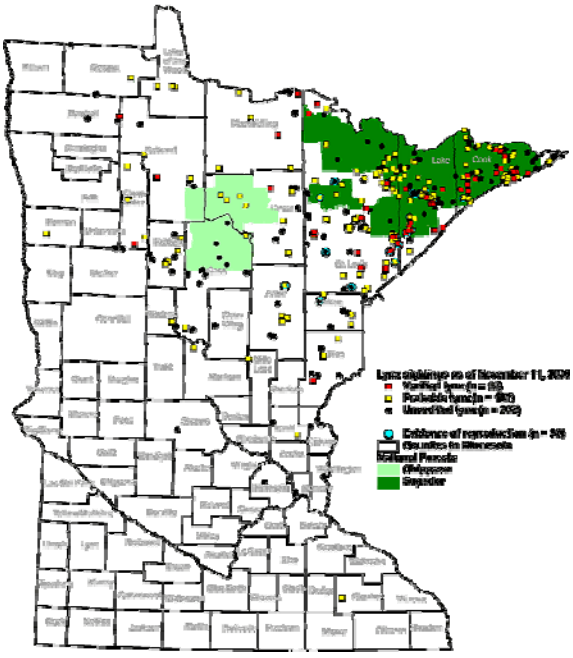

Figure 20. Minnesota lynx sighting records, March 2000 – November 2006.[47]

Given the relative isolation of lynx in this area from outside populations, FWS should adopt a precautionary approach and manage habitat for lynx over an area sufficiently large to support a viable population.

Similar to the Greater Yellowstone Area mentioned above, climate change provides added justification to designate ample Critical Habitat in northern Minnesota. Analysis by Gonzalez et al. (2007)[48] indicates that

[47] Minnesota Department of Natural Resources. 2008. The Minnesota Department of Natural Resources Web Site (online). Accessed 2008-8-13 at http://www.dnr.state.mn.us/sitetools/copyright.html

[48] Gonzalez, Patrick, Ronald P. Neilson, Kevin S. McKelvey, James M. Lenihan, and Raymond J. Drapek. 2007. Potential impacts of climate change on habitat and conservation priority areas for *Lynx Canadensis* (Canada Lynx).

alongside northwestern Wyoming, northern Minnesota may retain snowpack better than any other lynx habitat in the lower-48 states, "Potential conservation priority areas for lynx include areas in the Bridger-Teton National Forest (Wyoming) and Superior National Forest (Minnesota), which lie in potential refugia" (Abstract).

Northeastern U.S.

We appreciate that the FWS current proposal incorporates most of the known occupied lynx range in Maine as defined by FWS.

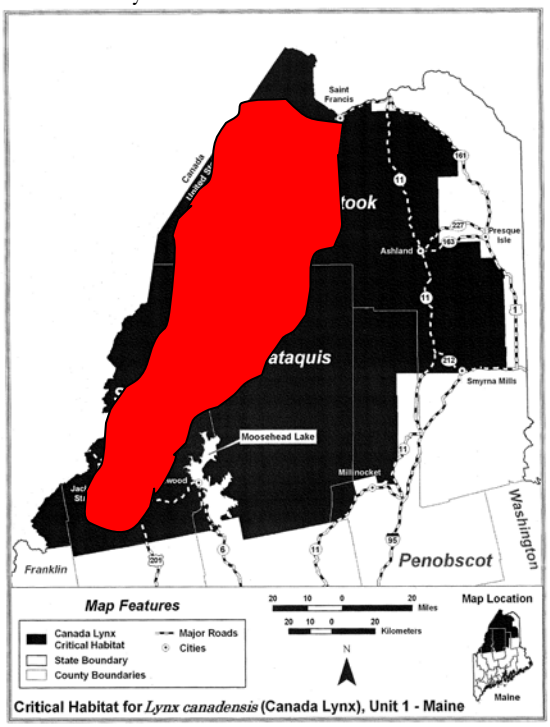

Figure 21. Approximate boundary of known occupied lynx habitat in the Maine. To create this map we superimposed the Maine boundary from Figure 3 of these comments onto Unit 1 of the FWS proposal.

Yet it fails include many other areas of important lynx dispersal habitat with lynx observations, such as those documented in the following figure.

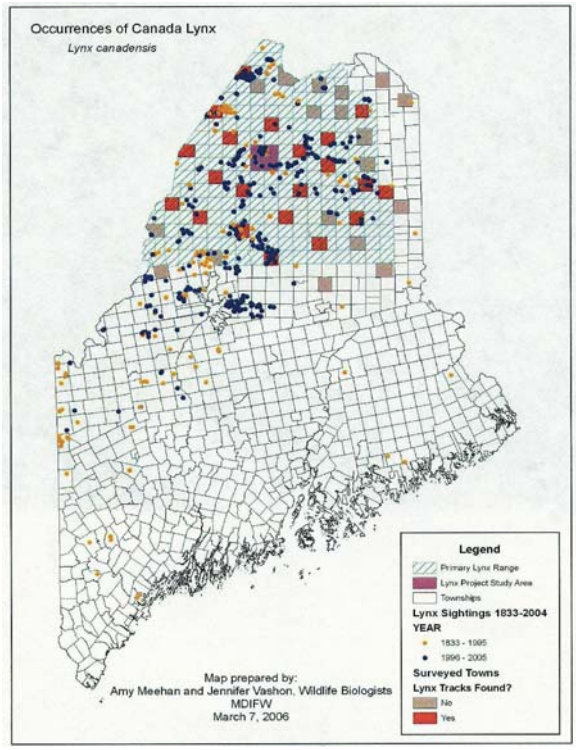

Figure 22. Lynx sightings in Maine, 1833 – 2004[49]

5. Supplemental comments on the proposed rule specific to the issue of climate change.

As we stated in our initial comment letter, the threat of climate change throughout lynx habitat in the lower-48 states provides added justification for FWS to designate large areas (which allows for changes in habitat conditions within these areas), and to ensure that lynx can travel safely between areas of suitable habitat (in case certain areas lose their suitability over time and lynx need to disperse from those areas). FWS should also ensure areas of lynx Critical Habitat will be monitored over time and that it will implement changes as necessary to reflect shifts in suitable habitat. For the current proposal, areas of suitable lynx habitat should be assessed for their ability to retain high levels of snowfall under various climate change scenarios. Those areas that are the most likely to do so should receive a high priority for designation, even if those areas not currently occupied by lynx. Currently unoccupied areas that are disjunct from currently occupied range should be strongly considered for designation, since they could be important for future reintroductions. Defenders of Wildlife would be happy to share its expertise and resources to help FWS conduct this type of analysis.

In the meantime, we offer the following recommendations specific to the issue of climate change. Given that spatial analyses of climate, snow, and vegetation indicate climate change may decrease potential lynx habitat across wide parts of the continental United States and Canada, we urge FWS to—

1) Adopt precautionary conservation measures through designation of critical habitat for key priority refugia areas in which lynx populations still appear to be robust: the Teton-Bridger National Forest (Wyoming) and Superior National Forest (Minnesota).

[49] Map source: Maine Dept. of Inland Fisheries and Wildlife

2) Intervene with intensive natural resource management to conserve lynx habitat that is vulnerable to losses over the long term due to climate change: Southern Rockies, northern Maine, parts of the Bridger-Teton (Wyoming), Idaho Panhandle (Idaho), Kootenai (Montana), Okanogan (Washington), Wenatchee (Washington), and White Mountains (New Hampshire) National Forests, high-altitude areas in Colorado, and Yellowstone and Grand Teton National Parks (Wyoming). We remind FWS that per the Endangered Species Act, Critical Habitat consists of the "specific areas within the geographical area occupied by the species that may require special management considerations or protection."

6. Detailed justification for expanding the Critical Habitat designation to include lynx habitat in the Southern Rocky Mountains.

This section of our comments details FWS' obligation to designate critical habitat in the Southern Rockies. Identified as a "provisional core" area in the Recovery Outline,[50] this area is clearly inhabited by a breeding population of lynx and contains suitable lynx habitat. Verified historical records of lynx in Colorado date back to the late 1800's.[51] Native lynx were widely believed to be functionally extirpated in the Southern Rockies by the mid-1970s, though reliable reports of native lynx tracks exist into the 1990's.[52, 53] In an effort to restore a viable population of Canada lynx to Colorado, the Colorado Division of Wildlife (CDOW) initiated a reintroduction effort in 1997, with the first lynx released in Colorado in February of 1999. From 1999 to 2007, 218 lynx were released in Colorado.[54] CDOW has intensively monitored the reintroduced lynx and their offspring since the first release in 1999. The results of this monitoring effort to date have demonstrated that the reintroduction effort has resulted in high initial post-release survival, followed by long-term survival, site fidelity, reproduction, and recruitment of Colorado-born lynx into the breeding population.[55] CDOW is engaged in ongoing monitoring to determine whether Colorado can support sufficient recruitment to offset annual mortality for a viable lynx over time.[56]

Here, FWS fails to even attempt to apply its unlawful interpretation of what constitutes "occupied" habitat when defending its decision to avoid designating critical habitat in Colorado. Rather, FWS gives two primary justifications for its decision to avoid designating critical habitat in the Southern Rocky Mountains (in Colorado, Utah and Wyoming). First, the FWS states that, "the Southern Rocky Mountains are disjunct from other lynx habitats in the United States and Canada."[57] Second, FWS states that, "[a]lthough

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[50] U.S.D.I. 2005. Contiguous United States Distinct Population Segment of the Canada Lynx Recovery Outline. USDI Fish and Wildlife Service. Sept. 14, 2005. Available online at: [http://mountainprairie.fws.gov/species/mammals/lynx/final%20lynx%20RecoveryOutline9-05.pdf]

[51] Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 1999. Ecology and Conservation of Lynx in the United States. U.S.D.A. Forest Service, Rocky Mountain Research Station, General Technical Report, RMRS –GTR-30WWW.

[52] Thompson, R. W. and J. C. Halfpenny. 1989. Canada lynx presence on the Vail ski area and proposed expansion areas. Unpubl. Rep. Western Ecosystems, Inc. Lafayette, CO. 29 pp. *cited in* Ruediger et al. 2000. Canada lynx conservation assessment and strategy. Available online at: [http://www.fs.fed.us/r2/projects/lynx/documents/]

[53] Thompson, R. W. and J. C. Halfpenny. 1991. Canada lynx presence on the proposed East and Fork ski area. Unpubl. Rep. 35 pp. *cited in* Ruediger et al. 2000. Canada lynx conservation assessment and strategy. Available online at: [http://www.fs.fed.us/r2/projects/lynx/documents/]

[54] Shenk, T.M. 2007. Post-release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. Period covered: July 1 2006 – June 30, 2007. Wildlife research report, Colorado Division of Wildlife. Available online at: [http://wildlife.state.co.us/WildlifeSpecies/SpeciesofConcern/Mammals/Lynx]

[55] *Ibid*

[56] *Ibid*

[57] 73 Fed Reg at 10860

Colorado's reintroduction effort is an important step toward the recovery of lynx, we are not proposing revised critical habitat in the Southern Rockies because of the current uncertainty that a self-sustaining lynx population will become established."[58] Neither of the above reasons constitutes acceptable rationale for the Service's failure to designate critical habitat in the Southern Rocky Mountains, which currently support a breeding population of Canada lynx.

A. The FWS exclusion of large amounts of critical habitat violates the ESA's recovery standard.

The entire purpose of the Endangered Species Act (ESA) is to restore species facing extinction to healthy population levels. Recognizing that habitat loss was the primary threat to most endangered species, Congress amended the ESA in 1978 to require the designation of mapped critical habitat areas for all listed species. The Act's stated policy is to "conserve" threatened and endangered species, 16 U.S.C. § 1531(c)(1). "Conservation" is defined as the use of "all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided [under the ESA] are no longer necessary." 16 U.S.C. § 1532(3). The clearest expression of that goal is through the designation of critical habitat, which Congress explicitly defined in terms of "conservation." 16 U.S.C. § 1532(5)(A).

Congress envisioned critical habitat as a recovery tool, requiring that it encompass all habitat (land and water) essential to the recovery of listed species. See Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service, 378 F.3d 1059 (9th Cir. 2004). Congress clearly intended that critical habitat do more than simply prevent extinction.

> It is the Committee's view that classifying a species as endangered or threatened is only the first step in insuring its survival. Of equal or more importance is the determination of the habitat necessary for that species' continued existence . . . If the protection of the endangered and threatened species depends in large measure on the preservation of the species' habitat, then the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat.

H.R. Rep. No. 887, at 3 (1976); see also 124 CONG. REC. 575 (1978) ("[T]he designation of critical habitat is more important than the designation of an endangered species itself.").

Courts have consistently heeded this legislative intent: "[T]he designation of critical habitat serves as 'the principal means for conserving an endangered species, by protecting not simply the species, but also the ecosystem upon which the species depends.'" Center for Biological Diversity v. Norton, 240 F. Supp.2d 1090, 1101 (D. Ariz. 2003) (citation omitted). The court further noted that three other courts had rejected the Service's argument that other provisions of the ESA provide equivalent protection to critical habitat. Id. at 1102-03. According to the Ninth Circuit:

> The ESA was enacted not merely to forestall the extinction of species (i.e., promote a species survival), but to allow a species to recover to the point where it may be delisted. See 16 U.S.C. § 1532(3) (defining conservation as all methods that can be employed to "bring any endangered species or threatened species to the point at which the measures provided pursuant to this [Act] are no longer necessary"). The ESA also defines critical habitat as including "the specific areas . . . occupied by the species . . . which are . . .essential to the conservation of the species" and the "specific areas outside the geographical area occupied by the species . . . that . . . are essential for the conservation of the species . . . " 16 U.S.C. § 1532(5)(A) (emphases added). By these definitions, it is clear that

[58] *Ibid* at 10861

> Congress intended that conservation and survival be two different (though complementary) goals of the ESA. See 16 U.S.C. § 1533(f)(1) ("The Secretary shall develop and implement plans . . . for the conservation and survival of endangered species and threatened species.") (emphasis added). Clearly, then, the purpose of establishing "critical habitat" is for the government to carve out territory that is not only necessary for the species' survival but also essential for the species' recovery.

Gifford Pinchot, 378 F.3d at 1070. (internal citations omitted).

Designation of critical habitat adds a level of protection not otherwise available to a species. The ESA's Section 7 mandate prohibiting destruction or adverse modification of critical habitat forbids any agency actions that are likely to threaten either the survival or the recovery of listed species. While the Service is free to consider, as 16 U.S.C. § 1533(b)(2) states, "other impacts," it cannot do so to the detriment of the governing survival and recovery mandate of critical habitat. See Gifford Pinchot, 378 F.3d at 1070 (The ESA "was enacted not merely to forestall the extinction of species (i.e., promote a species survival), but to allow a species to recover to the point that it may be delisted."). The Service cannot use exclusions to undermine the very purpose Congress established for designating critical habitat. See Center for Biological Diversity, 240 F. Supp.2d at 1108 (determining that exclusion of "essential" unoccupied lands was arbitrary and capricious).

By proposing to exclude vast amounts of eligible habitat, the Service has both refused to meet its legal obligations and ignored the practical benefits of critical habitat. These failings have resulted in a proposed rule that will not fulfill the goal of Canada lynx recovery.

B. The ESA contains no provision for excluding habitat that supports disjunct populations from critical habitat designation.

The ESA contains no provision for eliminating habitat that supports disjunct populations of a species as critical habitat. Disjunct populations may contribute to species persistence through a number of mechanisms, and FWS has often designated critical habitat in areas that support disjunct populations in the past. Further, lynx can move long distances, and the FWS has not clearly established that the Southern Rockies population is actually isolated from populations further north (see Section C below). The 2007 CDOW report on the status of the lynx reintroduction effort suggests that several lynx have dispersed into the Greater Yellowstone Area (GYA) and Montana. [59]

Additionally, the FWS is using the "disjunct from Canada" argument inconsistently. The FWS states that the GYA is also disjunct from Canada[60] and, according to McKelvey et al. (2000a), "…the lynx in the northeastern United States are effectively isolated from the main Canadian populations by the St. Lawrence Seaway…and from the Great Lake States by agricultural conversion and urban development."[61] This argument should not be mistaken as one advocating for the removal of the GYA from critical habitat designation; it is important to have both the Greater Yellowstone and Southern Rockies areas protected because then a corridor will be maintained that connects the northern- and southernmost extents of lynx

[59] See Shenk, T.M. 2007.

[60] 73 Fed Reg at 10860

[61] McKelvey, K.S., S.W. Buskirk, and C.J. Krebs. 2000a. Theorectical Insights into the Population Viability of Lynx. *Chapter 2 in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

habitat. Instead, we are showing that populations other than the Southern Rocky Mountain population may be disjunct from Canadian populations, yet the Southern Rockies population is the only core area that is being excluded from critical habitat designation. Therefore, the use of this criterion by the FWS is arbitrary and capricious.

C. There is no evidence that this population is completely isolated from northern lynx populations.

There is verified evidence of long-term historical presence of lynx populations in the Southern Rocky Mountain area.[62,63,64,65] If the Southern Rockies population is, in fact, isolated from other populations in the U.S. and Canada, as asserted by FWS in the proposed rule, this suggests that a self-sustaining population existed in the Southern Rockies without substantial immigration from other populations in the U.S. and Canada. If the Southern Rockies did not have habitat in sufficient quantity and quality to support a self-sustaining population without immigration, then the existence of long-term records suggests that there must have been substantial immigration from other populations in the U.S. and Canada. Already there is evidence of several animals from the Southern Rockies population migrating as far north as Montana, and several Southern Rocky Mountain lynx have moved into and continue to use the northwest corner of Wyoming including Yellowstone and Teton National Parks and the Laramie Range.[66] Therefore, the FWS needs to disclose their reasoning behind saying the Southern Rocky Mountain population is isolated from northern populations. The assumption that, because the population in the Southern Rockies is not directly connected to northern populations, it does not receive sufficient immigration to persist is not supported by any evidence in the record. There is much evidence that lynx are dispersing into the GYA, and there is no reason to believe that lynx would not travel southward. This reasoning is, therefore, arbitrary and capricious. Therefore, the FWS should reconsider their criteria that designated critical habitat needs to be directly connected with the lynx populations in Canada.[67] In addition, we agree that retaining connectivity with Canada is important for the persistence of the species in United States, but lack of connectivity should not be a criterion for excluding an area from critical habitat.

D. Whether a population is self-sustaining is not a legitimate rationale for not designating critical habitat under the ESA. The Southern Rocky Mountain population is being held to higher standards than other Canada lynx populations in the contiguous United States.

Nowhere in the ESA does it state that critical habitat will be designated only in the areas where populations are found to be viable over the long-term. Species that are listed under the Endangered Species Act are, by definition, at risk of extinction, and thus not currently self-sustaining or viable over the long-term. The intent of listing a species under the ESA, and subsequent designation of critical habitat, is to address threats

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62 See U.S.D.I. 2005.

63 65 Fed Reg at 16052

64 McKelvey, K.S., K.B. Aubry, and Y.K. Ortega. 2000b. History and Distribution of Lynx in the Contiguous United States. *Chapter 8 in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

65 U.S.D.A. 2008a. Southern Rockies Lynx Management Direction Record of Decision. USDA Forest Service. National Forests in Colorado and southern Wyoming. October 2008. Available online at: [http://www.fs.fed.us/r2/projects/lynx/documents/]

66 See Shenk, T.M. 2007.

67 73 Fed Reg 10870

to the viability of populations of threatened and endangered species, so that population declines are reversed, and populations are restored to levels that are viable over the long-term, thus recovering the species. Limiting designation of critical habitat only to those areas that contain populations that are currently self-sustaining, would undermine the purpose of the Endangered Species Act, and make it impossible to recover endangered species.

The FWS is obviously using the fact that the population in the Southern Rocky Mountains is reintroduced as a criterion to not designate critical habitat in the area, stating that the population must first prove to be established. The fact that this "viability" criterion completely goes against the purpose of the ESA has already been established. Further, this action is arbitrary and capricious based on past FWS behavior. To begin, because the reintroduced lynx population was brought to Colorado before the lynx were listed in 2000, this population is not designated as experimental under section 10(j) of the Act. Therefore, the fact that they were reintroduced should not be part of the consideration for designating critical habitat. In addition, the FWS has had no trouble designating critical habitat for species in areas where the species has been reintroduced in the past. For example, the razorback sucker (Xyrauchen texanus) was extirpated from the Salt and Verde Rivers in Arizona. A reintroduction and monitoring program was begun in 1981 to try and reestablish the fish in these habitats.[68] The reintroduction was not as successful as hoped since only a few fish survived.[69,70] The razorback sucker was then listed in 1991.[71] In 1994, the FWS included habitat on the Salt and Verde Rivers in its critical habitat designation.[72] At the time of this designation, it was unknown whether a viable population of razorback suckers existed in these rivers even though reintroduction efforts had occurred.[73] The Service did not use the reasoning that it was unknown whether the reintroduced population was self-sustaining when they designated critical habitat for the razorback sucker. Yet the FWS still designated critical habitat on rivers with reintroduced populations. Therefore, the FWS is being arbitrary and capricious by using the "self-sustaining" argument to exclude the Southern Rockies from critical habitat designation in the case of the Canada lynx.

Further, determining a population's long-term viability requires long-term monitoring of a number of demographic parameters, and is particularly difficult in the case of rare species. If FWS required that the long-term probability of persistence of a population be determined prior to critical habitat designation, then FWS would be unable to designate critical habitat for the large majority of listed species. In fact, the Recovery Outline states that, "[a]t the present time, there are inadequate methods available to develop lynx population estimates for each of the six core areas. Without methods to assess population size or trends, it is not yet possible to develop demographic criteria for delisting the species."[74] This statement suggests that FWS does not know whether the populations in any of the core areas are viable over the long term because they don't know how to effectively assess the populations. Yet, the main core areas described in the Recovery Outline (i.e. Northeast, Great Lakes, Northern Rockies/Cascades)[75] are in some way addressed by

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[68] 56 Fed Reg 54957. Endangered and Threatened Wildlife and Plants; the Razorback Sucker (Xyrauchen texanus) Determined To Be an Endangered Species, Final Rule.
[69] Arizona Game and Fish Department. 2008. Razorback Sucker Recovery on the Lower Colorado River. Available online at: [http://www.azgfd.gov/w_c/research_razorback.shtml]
[70] 59 Fed Reg. Endangered and Threatened Wildlife and Plants: Determination of Critical Habitat for Four Colorado River Endangered Fishes, Final Rule.
[71] See 56 Fed Reg 54957
[72] See 59 Fed Reg
[73] *Ibid*
[74] See U.S.D.I. 2005.
[75] *Ibid*

the critical habitat designation (though some areas are more or less represented – See Section 4 above). The major exception is the provisional core Southern Rockies area which is entirely excluded because of uncertainty regarding whether the region's population will be viable over the long-term. This is clearly arbitrary and capricious.

Several reviewers from the scientific community, in comments requested by the FWS, reiterated the idea that few populations could actually fulfill all of the criteria that the FWS has established to define critical habitat. As documented earlier in these comments, John Squires, Research Wildlife Biologist for the Forest Service (FS), states:

> "It is troubling that throughout the document the definition of critical habitat seems arbitrary. For example, the tests that a population must pass before being considered for critical habitat included: proof of reproduction, lack of management plans, a minimum but undefined population number, and certainty of persistence. Few truly rare species could meet these criteria when a species is reduced to a few individuals such as the original black-footed ferrets detected near Meeteetse, Wyoming or recent putative observations of an Ivory-billed woodpecker in Arkansas."[76]

Kevin McKelvey, Research Ecologist for the Forest Service, continues this idea:

> "These stipulations indeed appear to be quite stringent as 1) unless there have been repeated surveys, consistent occupancy cannot be demonstrated and 2) evidence of reproduction is difficult to obtain; many survey methods that detect lynx do not produce it. Some areas, identified as core areas, have received no valid survey efforts within this time period. Thus, for these areas, it is impossible to meet these criteria regardless of the current status of lynx populations."[77]

Given that few populations could actually hold up to the criteria put forth by the FWS, it is arbitrary and capricious to only require the Southern Rockies population to meet all of these standards. Because it is reintroduced, a lot more is known about the Southern Rockies population (i.e. reproduction rates, mortality rates, etc.) because CDOW has the capability to do an annual census of radiocollared cats (though as the years go by and CDOW continues to track fewer lynx, this data is getting sparser). CDOW is monitoring the lynx population in the Southern Rockies for evidence of recruitment, something that few other states have the capability of doing. It is arbitrary and capricious for the FWS to require recruitment data be collected on the Southern Rocky Mountain population in order for critical habitat to be designated, when no other states are required to do the same.

In addition, when data collected on the lynx population in the Southern Rockies is compared to a similar data set collected on lynx in Maine, it again highlights that the FWS is being arbitrary and capricious in its rationale for not designating critical habitat in the Southern Rockies. For instance, in the Wildlife Division Research and Management Report from 2007,[78] they report starting a monitoring program on Maine's lynx population in 1999, the same year lynx were reintroduced to Colorado. Through 2007, Maine wildlife researchers were able to collar 64 lynx compared to the 218 reintroduced cats collared since 1999 and not including any collared in subsequent years in the Southern Rockies. In the eight years of the program,

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[76] Letter from Dr. John Squires, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, February 28, 2006, (p. 3).
[77] Letter from Dr. Kevin McKelvey, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula,Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, March 13, 2006, (p. 1).
[78] Maine Department of Inland Fisheries and Wildlife. 2007. Wildlife Division Research and Management Report. Available online at: [http://www.state.me.us/ifw/wildlife/surveys_reports/research_management/index.htm]

Maine reports documenting 37 litters of kittens. This is similar to the 38 dens found by CDOW researchers in the four years from 2003-2007. Litter sizes were roughly the same in each state (just under 3 kittens). In 2003, Maine reports a peak in kitten production per female. Colorado reached its peak kitten per female rate in 2004 and its peak kitten total in 2005. Both states have experienced a decline in reproductive success since the peak.[79, 80] These are two states with monitoring programs underway, and they are getting similar results in several areas. The FWS has designated critical habitat in Maine, while habitat in the Southern Rockies has been excluded. This action by the FWS is arbitrary and capricious.

Thus, the FWS is being arbitrary and capricious by using more stringent criteria for the lynx population in the Southern Rockies, especially since areas were designated that have just as fragile a population as the Southern Rockies. Again, as stated by reviewers from the scientific community:

> "The fate of lynx in Maine, for instance, is extremely tenuous given the narrow range of stand types and ages in which they occur in and given that current siliviculture is not producing stands of these types. In Minnesota, lynx were either absent or present in undetectably low numbers from 1993-1999. Currently there appear to be decent numbers of lynx in Minnesota, but the reasons for their resurgence are unknown and therefore the persistence of the population is equally speculative. From a scientific standpoint, there is no logical basis to believe that in 20 years the probability of lynx occurring in Colorado is less than in Minnesota or Maine. Thus there is no consistency in the application of this criterion or basis for singling out Colorado. Additionally…if the Colorado population were, in fact, in greater danger of extirpation than other populations, logic would dictate increased protection measures rather than the reverse."[81]

> "However, using uncertainty of sustainability as a criterion for excluding Colorado from critical habitat seems arbitrary, especially relative to lynx in Minnesota and Maine. Lynx were present in Minnesota in 1962-63 then subsided within a few years before increasing again in 1973. Lynx detection then returned to very low throughout the 1980-mid 90s, and now have increased from 2000 to the present as confirmed with radio telemetry. Lynx in Maine have a limited distribution in habitat that requires active management to be maintained. Thus, the long-term fate of any lynx population is unknown regardless if populations are in Colorado, Minnesota, or Maine."[82]

Obviously, the FWS is using different standards for areas where they are proposing to designate critical habitat, such as northeastern Minnesota and northern Maine, and the Southern Rockies even though the population stability in each area is equally tenuous. Further, as discussed in Sections B. and C. above, there is little evidence that the Southern Rocky Mountain population is completely isolated from the populations in the north, nor is it the only disjunct population. Currently, the FWS's rationale is arbitrary and capricious, and the agency needs to give a better explanation of why the Southern Rocky Mountain unit was left out of the critical habitat proposal based on the argument that the fate of the population in the Southern Rockies is unknown. Further, the FWS has not offered any reason why critical habitat should not be designated in the Southern Rocky Mountains; therefore, such habitat should be designated in this region.

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[79] *Ibid*

[80] See Shenk, T.M. 2007.

[81] Letter from Dr. Kevin McKelvey, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, March 13, 2006, (p. 2).

[82] Letter from Dr. John Squires, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, February 28, 2006, (p. 3).

E. There is no conclusive evidence that the Southern Rocky Mountain population will not be self-sustaining. It is too much of a risk for this population to wait for the FWS to determine whether it is stable.

Though there is no conclusive evidence that the reintroduced lynx population in the Southern Rockies will be self-sustaining, there is also no conclusive evidence that they will not. In fact, there is much evidence in the Southern Rockies indicates that the population is succeeding. To date, the reintroduced population has met six of the seven criteria put in place by the CDOW to determine when a viable population is achieved. In 2006, there was documentation of the first lynx born in Colorado having a litter of her own; thus signifying successful recruitment into the breeding population - criteria number six. The one remaining criterion is recruitment equal to or greater than mortality over an extended period of time.[83] Though it is promising that the lynx population in Colorado is meeting the criteria for successful establishment thus far, now is not the time to wait and see what happens with this population. The population in the Southern Rocky Mountains, now more than ever, needs the protections afforded to it through critical habitat designation. A third or more of all known lynx mortalities in Colorado are human caused (i.e. shooting or animal vehicle collisions).[84] In addition, as outlined in Section F. below, there are significant threats to lynx habitat in Colorado. Without the protection of critical habitat, projects will be allowed to expand into habitat that is critical for the survival of these animals more often, thus, in all likelihood, increasing the number of direct human caused mortalities. Further, the more human presence there is in lynx habitat (i.e. roads, increased recreation, etc.), the greater chance there is for indirect or cumulative impacts to survival. For instance, denning sites may be disturbed by recreation, thus affecting reproduction, or roads could divide important habitat types causing lynx to be separated from important food sources resulting in malnutrition or starvation (see Section F. below).

It is true that CDOW reported no new dens found in 2007 and 2008, but CDOW is not discouraged by these results.[85] CDOW reported, in a press release dated July 2008,[86] that the absence of new reproduction could be due to the natural cycle between the lynx and their primary prey, snowshoe hares. This is not a new idea to the FWS as they stated that "reproduction or recruitment into the lynx population may not occur every year because of natural cyclic or fluctuating populations that are tied to snowshoe hare population levels" under the "Core Area Criteria" in the 2005 Recovery Outline.[87] Regardless, CDOW, in the same press release from July 2008, states that survival of reintroduced and Colorado born lynx is stable and recaptured lynx are in good condition. Researchers believe that adult lynx are finding enough food to sustain themselves, but most likely because of a low in hare numbers, female lynx are not finding enough food for successful reproduction. So even though there has been a lull in reproduction, CDOW researchers believe that the Colorado lynx population is healthy and stable.[88]

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[83] Shenk, T.M. 2006. Post-release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. Period covered: July 1 2005 – June 30, 2006. Wildlife research report, Colorado Division of Wildlife. Available online at: [http://wildlife.state.co.us/WildlifeSpecies/SpeciesofConcern/Mammals/Lynx]

[84] Shenk, T.M. 2008. Lynx Update. August 27, 2008. Colorado Division of Wildlife. Available online at: [http://wildlife.state.co.us/WildlifeSpecies/SpeciesofConcern/Mammals/Lynx]

[85] *Ibid*

[86] Colorado Department of Natural Resources. 2008. No Lynx Kittens Found in Annual Search by Division of Wildlife; Adult Cat Populations Stable. Colorado Division of Wildlife. July 11, 2008. Available online at: [http://dnr.state.co.us/newsapp/press.asp?pressid=5194]

[87] See U.S.D.I. 2005.

[88] See Colorado Department of Natural Resources. 2008.

In addition, it is also entirely possible that reproduction has occurred in the last two years, but that the lynx having kittens are no longer being tracked, making it much more difficult for CDOW researchers to find dens. In fact, in the annual report from 2006-2007 and in a press release from July 2008, CDOW reports that several of the transmitters used to track the lynx are no longer working and a large number of Colorado-born kittens have never been collared. Therefore, censuses of lynx survival as well as dens and kittens more likely represent a minimum number of animals because a large portion of the reproductively active lynx are no longer being, or have never been, tracked.[89, 90] In fact, CDOW has reported instances of collaring young adult lynx that were never counted the year they were born.[91]

Further, the FWS will consider the Southern Rocky Mountain population as established when it "has demonstrated robustness to natural fluctuations due to oscillations in prey abundance…"[92] However, very little is known about hare population dynamics in its southern range, and it is unclear to what extent hare density cycles exist in the Southern Rockies Mountains.[93, 94] Therefore, the FWS is being arbitrary and capricious for using this as a criterion to assess whether this population has become established. They need to give more evidence as to why this is an appropriate criterion for the Southern Rocky Mountain population given the lack of available data on snowshoe hare population dynamics in the region. Also, given that it is very difficult to get information on reproduction (and will continue to become more difficult for the Southern Rockies population as CDOW tracks fewer and fewer animals each year), it is arbitrary and capricious for the FWS to require that the Southern Rockies population demonstrate this before critical habitat will be designated.

Additionally, the FWS needs to elaborate on how they will distinguish between human impacts to the population from the natural capacity of the ecosystem to support a self-sustaining population of lynx. CDOW reported in 2008 that a third or more of known lynx mortalities are human caused (i.e. gunshot or animal-vehicle collisions) while only around a fifth are from natural causes such as malnutrition and disease/illness.[95] With more known lynx deaths caused by humans than natural causes, the FWS needs to explain why they will base their future decision on whether or not to designate critical habitat in the Southern Rockies on biological factors (i.e. natural capacity of the ecosystem) when those factors are obviously being affected by other non-natural factors (i.e. man-caused mortality) which could be mitigated by critical habitat designation. Failure to designate critical habitat may compromise the viability of this population because impacts due to human activities would not be reduced.

Except for their "establishment" criteria, the FWS does not lay out any measures in the proposal for determining if and when the population has become self-sustaining. Site specific criteria would be in the recovery plan, another of the Secretary's duties as described in the ESA. 16 U.S.C.A. § 1533 (f) (1) states: "The Secretary shall develop and implement plans…for the conservation and survival of endangered species

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89 *Ibid*

90 See Shenk, T.M. 2007.

91 *Ibid* (p. 13).

92 73 Fed Reg at 10872

93 Hodges, K.E. 2000. Ecology of Snowshoe Hares in Southern Boreal and Montane Forests. *Chapter 7in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

94 Zahratka, J.L., and T.M. Shenk. 2008. Population Estimates of Snowshoe Hares in the Southern Rocky Mountains. Journal of Wildlife Management 74(4):906-912.

95 See Shenk, T.M. 2008.

and threatened species listed…unless he finds that such a plan will not promote the conservation of the species." In 16 U.S.C.A. § 1533 (f) (1) (B), it says the Secretary shall "incorporate in each plan—(i) a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species," and "(ii) objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list." As of yet, no such plan has been developed for the Canada lynx in the contiguous United States.

The USFWS has, however, come up with a recovery outline.[96] The purpose of this outline is to guide recovery efforts and "inform the critical habitat designation process for the contiguous United States population of the Canada lynx" until the draft recovery plan is developed. The recovery outline states the Southern Rockies region is a "provisional core" area but gives no criteria for it to become a core area. The outline defines a core area as one with "both persistent verified records of lynx occurrence over time and recent evidence of reproduction." The reason the Southern Rockies are a provisional core is because, again, it can not yet be determined whether the population is self-sustaining.

The recovery outline does, however, go into detail about the next category listing which is called "secondary areas." These areas are classified as areas with historical records of lynx but no evidence of reproduction or no recent surveys recording presence of lynx or reproduction. The outline continues to say that "[i]f future surveys document presence and reproduction in a secondary area, the area could be considered for elevation to core."[97] So, the provisional core of the Southern Rockies region is provisional because it is not yet proven to be self-sustaining even though there is evidence of presence and reproduction of Canada lynx. Yet, the criteria of presence and reproduction are the basis for which a secondary core area could be elevated to core. Therefore, the USFWS is being inconsistent and has not clearly defined the criteria for what it means for the Southern Rockies to be self-sustaining.

In D.C. "Jasper" Carlton v. Babbitt, Biodiversity Legal Foundation v. Babbitt,[98] the court found the USFWS decision not reclassify the Selkirk grizzly population as endangered arbitrary and capricious because they "failed to sufficiently explain how they exercised their discretion with regard to the statutory listing factors and drew conclusions that cannot be supported by the evidence in the record." Similarly, the FWS in the current case is acting in an arbitrary and capricious manner because they have failed to adequately define the guidelines by which the Southern Rocky Mountain lynx population can be defined as self-sustaining and how the geographic area can be moved from "provisional core" to "core" status.

No matter what, waiting until the population is proven stable is too long to wait for the lynx in Colorado. Since the cat was listed as threatened in 2000,[99] several projects have been proposed in lynx habitat in the Southern Rockies. Given that it has taken the FWS eight plus years to designate critical habitat for this listed species, we can only assume that it will take the FWS many more years to designate critical habitat in the Southern Rocky Mountain area after they find that the population is viable. This population can not wait that long for this much needed protection.

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[96] See U.S.D.I. 2005.

[97] *Ibid*

[98] D.C. "Jasper" Carlton v. Babbitt, Biodiversity Legal Foundation v. Babbitt, 900 F.Supp. 526, C.A. No. 93-1174 (PLF), C.A. No. 93-1788 (PLF) (D.C. Dis. Ct. 1995).

[99] 65 Fed Reg 16052

F. The Southern Rocky Mountain unit requires special management considerations and protections.

It is clear that the remaining suitable lynx habitat in Colorado must be protected because it has been, and will continue to be, impaired by a variety of human activities.[100] CDOW data indicates that human-caused mortality accounts for 30.6% of all lynx mortality in the Southern Rockies.[101] This includes significant mortality from motor vehicle collisions. As the regional population continues to grow and its associated infiltration into the mountain habitat of the lynx continues, pressures on lynx habitat and the opportunities for human disturbance of lynx and their habitat will only grow. As development, including infrastructure to support oil and gas drilling and development associated with ski area expansion, continues to encroach on lynx habitat in the Southern Rockies, the opportunities for collisions with vehicles and other human-related mortality will only grow. As development continues to encroach, the secondary negative effects such as increased access to lynx habitat for competitors like coyotes will only grow.

In the case of listed species, the question of whether or not populations will be self-sustaining is inextricably linked to how such populations are managed, and particularly to how existing threats to the species are addressed. This region, especially the core reintroduction area, is in need of special management because threats to the lynx are coming from many directions (i.e. development, recreation, I-70 improvements, etc.). For instance, Off-Highway Vehicle (OHV) registrations have increased 154% in Colorado since 1991,[102] and the ski industry saw an increase of 30,000 skiers from 2005 to the 2006-2007 season.[103] These threats cross many land ownership boundaries, and it is crucial to the recovery of the lynx in the Southern Rockies that we ensure lynx habitat connectivity across these different land ownerships. As eighty-two percent of land in the Southern Rocky Mountains is federal land,[104] lynx habitat in the region is definitely in need of a consistent management direction across land management entities. This consistency would be afforded through critical habitat designation. Protection of lynx habitat connectivity across land ownership boundaries would contribute significantly to the likelihood that the Southern Rocky Mountain population will be viable over the long-term.

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[100] 68 Fed Reg at 40093 (acknowledging that in the "Southern Rocky Mountains 77 percent" of lynx habitat is in "developmental allocations," and that "[a]ctivities that may be detrimental to lynx or lynx habitat, such as some timber harvest regimes and fire suppression, can occur in developmental allocations"); *ibin* at 40097 (acknowledging that "[i]n local areas, lynx may be negatively influenced by high traffic volume on roads that bisect suitable lynx habitat and associated suburban developments that contribute to the loss of habitat connectivity" and that this risk is "higher" in Colorado than elsewhere).

[101] See Shenk, T.M. 2007.

[102] Metsa, T. 2007. Registrations for OHV, Boat, and Snows. [E-mail] April 9, 2008. *cited in* State of Colorado. 2008. Executive Summary, Colorado Statewide Comprehensive Outdoor Recreation Plan. Colorado Department of Natural Resources, Colorado State Parks, Land and Water Conservation Fund. Available online at: [http://parks.state.co.us/NR/rdonlyres/B7F30BDC-6DE2-4557-B058-AB95AED6C98F/0/2008_SCORP_Exec_Summary.pdf]

[103] Colorado Ski Country USA. 2008. Current News. April 15, 2008. Available online at: [http://media-coloradoski.com/CurrentNews/] *cited in* State of Colorado. 2008. Executive Summary, Colorado Statewide Comprehensive Outdoor Recreation Plan. Colorado Department of Natural Resources, Colorado State Parks, Land and Water Conservation Fund. Available online at: [http://parks.state.co.us/NR/rdonlyres/B7F30BDC-6DE2-4557-B058-AB95AED6C98F/0/2008_SCORP_Exec_Summary.pdf]

[104] Defenders of Wildlife v. Norton, 239 F.Supp.2d 9. No. 00CV2996. (D.C. Dis. Ct. 2002)

The Canada Lynx Conservation Assessment and Strategy (LCAS),[105]and the 1999 Biological Assessment[106] and 2000 Biological Opinion[107] on FS and BLM plans (see description below) identify a total of 18 lynx risk factors for Canada lynx, 15 of which were identified in the Biological Assessment (BA) and 3 in the LCAS. The following description of these risk factors was taken from the LCAS, BA/BO, and citations therein, as well as from information in the CDOW 2007 Research Report[108]:

> Loss of Denning Habitat: The critical component for suitable denning habitat appears to be the availability of coarse woody debris, although other factors (e.g., cover type, age class) are probably also important. Reductions in coarse woody debris, increases in distance between denning and foraging habitat, cover type conversion, and reductions in seral stage can all adversely impact denning habitat. Disturbance during the denning period may also present a serious problem. The LCAS notes: "Minimizing disturbance around denning habitat is important from May to August."[109] Further, management activities should leave "substantial amounts of woody material in representative size classes, regardless of treatment."[110]
>
> Loss of Foraging Habitat: Dense horizontal cover, at both ground level and just above the snow level (for winter foraging), appears to be the most important habitat component for hares; for squirrels it appears to be high cone production (usually associated with mature forest types). Loss or reduction in multi-level understories, increases in distance between denning and foraging habitat, and cover type conversion can all adversely impact foraging habitat.
>
> Habitat Conversions: Cover type conversions can have a serious impact for obvious reasons.
>
> Inappropriate Landscape Patterns: In addition to sufficient availability of denning and foraging habitat, lynx persistence is also dependent on an appropriate spatial arrangement of those habitats and sufficient connectivity (i.e., a sufficiently low presence of movement and dispersal barriers) across the landscape. Any activities that increase habitat fragmentation or movement barriers pose a risk
>
> Forest Roads: There is not much evidence that low densities of low-traffic roads pose a significant direct threat to most lynx populations, but they are a significant concern because they can facilitate access to lynx habitat by competing species (e.g., coyote, mountain lion). Such species can also prey directly on lynx, posing yet another mortality factor. The LCAS notes that "[c]ompetition with or predation by coyotes (Canis latrans), gray wolves (Canis lupus), mountain lions (Puma concolor), bobcats (Lynx rufus), and birds of prey

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[105] Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Missoula, MT. Available online at: [http://www.fs.fed.us/r2/projects/lynx/documents/]

[106] Hickenbottom, J.R., Summerfield, B., Aardahl, J., Halekas, G., Hilliard, M., Jackson, L., Prevedel, D., and J. Rupe. 1999. Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx. USDA Forest Service, USDI Bureau of Land Management.

[107] U.S.D.I. 2000a. Biological Opinion. U.S. Department of the Interior Fish and Wildlfe Service. Mountain-Prairie Region. Denver, CO. October 25, 2000. Available online at: [http://www.fs.fed.us/r2/projects/lynx/documents/]

[108] See Shenk, T.M. 2007.

[109] See Ruediger et al. 2000 (p. 83).

[110] McKelvey, K.S., K.B. Aubry, J.K. Agee, S.W. Buskirk, L.F. Ruggiero, and J.M. Koehler. 2000c. Lynx Conservation in an Ecosystem Management Context. *Chapter 15 (p.433) in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

have been inferred or documented throughout the range of lynx."[111] This is of particular concern during the winter months[112] (see "Winter Dispersed Recreation" below).

High-traffic roads are thought to pose a significant movement barrier and mortality risk. Moreover, translocated lynx appear to be highly susceptible to vehicle collision mortality, even at low road densities: "Paved roads have been a mortality factor in lynx translocation efforts within historical lynx range."[113] The CDOW 2007 Research Report,[114] suggests that mortality from vehicle collision is one of the major causes of mortality of reintroduced Canada lynx. Additionally, there is abundant evidence of the detrimental impacts of medium and high road densities on other large carnivores, including grizzly bears, mountain lions, and wolves. The thresholds for negative effects vary from 0.4 to 1.2 miles per square mile.[115] Closed but not obliterated roads can still contribute to these adverse road densities impacts.[116]

Developed Recreation: Although lynx appear to be generally tolerant of human activity, there is concern that human activity in denning areas can cause den abandonment (presumably affecting kitten survival). Additionally, developed recreation sites can result in habitat degradation and conversion, movement barriers, and increases in dispersed recreation (see "Winter Dispersed Recreation"). The development and expansion of ski areas and other resorts generally pose the greatest risk.

Non-Winter Dispersed Recreation: Non-winter dispersed recreation is not thought to pose a serious risk except for potential disturbance to denning lynx.

Winter Dispersed Recreation: The most significant potential impact associated with winter dispersed recreation is the facilitation of access to lynx habitat by competitors or predators. The compaction of snow that commonly occurs with snowmobile use and trail grooming allows competing species (and lynx predators) to travel through the deep snow that would otherwise exclude them from lynx habitat.

Minerals and Energy: The construction of roads and packed-snow travelways are the greatest concerns associated with mineral and energy development. New roads providing for increased human access are also a significant concern, as they can result in increased mortality due to incidental shooting and illegal trapping and hunting. The human disturbance and habitat degradation associated with such activities may also be a concern.

Land Ownership Patterns and Insufficient Connectivity: Land ownership fragmentation, when it results in inappropriate management of lynx habitat and linkages, can pose a serious risk. Any land management activities that impede connectivity between lynx habitat areas (for both lynx movement and dispersal) pose such a risk. This includes habitat loss (e.g., conversion) and other movement barriers (e.g., large openings, highways).

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[111] See Ruediger et al. 2000 (p. 30).
[112] Buskirk, S.W, L.F. Ruggiero, and C.J. Krebs. 2000. Habitat Fragmentation and Interspecific Competition: Implications for Lynx Conservation. *Chapter 4 in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.
[113] See U.S.D.I. 2000a (p. 9).
[114] See Shenk, T.M. 2007.
[115] Forman, R.T.T., and Anna M. Hersperger. 1996. Road ecology and road density in different landscapes with international planning and mitigation solutions. *In* Proceedings of the Florida Department of Transportation/Federal Highway Administration transportation-related wildlife mortality seminar. Orlando, Florida. 23 pp.
[116] Ruediger, Bill. 1996. The relationship between rare carnivores and highways. *In* Proceedings of the Florida Department of Transportation/Federal Highway Administration transportation-related wildlife mortality seminar. Orlando, Florida. 14 pp.

Poor Coordination Among Agencies: Poor coordination among land management and other agencies (including agencies such as the Colorado Department of Transportation and the Federal Highway Administration) can be a significant problem in assuring appropriate lynx management across the region.

Insufficient Monitoring: The BA correctly noted that the lack of monitoring would make it difficult or impossible to identify and respond to adverse impacts.

Trapping, Predator Control, and Shooting: Incidental or illegal killing of lynx can be a serious risk. Reducing vehicular access (on- and off-road) is an important strategy.

Habitat Degradation by Non-Native Invasive Plant Species: The LCAS expresses concerns about the potential for invasive plant species to have significant effects on lynx habitat.

i. There is a need for special management on Forest Service and Bureau of Land Management lands.

In December 1999, the FS and Bureau of Land Management (BLM) prepared a Biological Assessment[117] that found that FS and BLM land management plans throughout the range of the lynx in the contiguous United States were likely to adversely affect lynx. This was because the plans allowed a variety of activities that were inconsistent with conservation of lynx. In 2000, the FS and BLM, separately, signed a Lynx Conservation Agreement with the FWS (FS CA; BLM CA) [118, 119] to promote the conservation of lynx and its habitat. The CAs committed the agencies to consider the information and recommendations in Ecology and Conservation of Lynx in the United States,[120] the LCAS,[121] and the Service's final listing document as projects are evaluated, selected, and implemented. The CAs indicate that the agencies agree that Plans should include measures necessary to conserve lynx for all administrative units identified as having lynx habitat, considering the information and recommendations in the above mentioned documents. The CAs identify actions that will be taken to reduce or eliminate adverse effects or risks to the lynx and its habitat, and maintain the ecosystems on which this species depends. Formal consultation on the impacts of implementing existing FS Land and Resource Management Plans, and BLM Resource Management Plans, as required by the Endangered Species Act, was completed in October of 2000, when the FWS issued its Biological Opinion[122]on the plans. In the opinion, the FWS concluded that the plans are not likely to jeopardize the continued existence of the lynx. The FWS no jeopardy conclusion was based upon continued implementation of the BLM and FS Lynx Conservation Agreements, until such time that the Forest Service Land and Resource Management Plans and BLM Resource management plans are amended or revised to

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[117] See Hickenbottom et al. 1999.
[118] U.S.D.A. and U.S.D.I. 2000. Canada Lynx Conservation Agreement. USDA Forest Service, USDI Fish and Wildlife Service. USFS Agreement #00-MU-11015600-013. February 7, 2000. Available online at: [http://www.fs.fed.us/r1/planning/lynx/reports/consagreement.pdf]
[119] U.S.D.I. 2000b. Canada Lynx Conservation Agreement. USDI Bureau of Land Management, USDI Fish and Wildlife Service. August 11, 2000. Available online at: [http://www.fs.fed.us/rl/planning/lynx/reports/BLM_CA.htm]
[120] Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 2000. Ecology and Conservation of Lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.
[121] See Ruediger et al. 2000.
[122] See U.S.D.I. 2000a.

consider the needs of the lynx. In 2008, the FS came out with the final draft of the Southern Rockies Lynx Amendment (SRLA)[123] which will take place of the CA with FWS.

Without critical habitat in the Southern Rocky Mountains, the lynx management will only be guided through the aforementioned agency conservation agreements and plans. We are concerned about this. The FWS stated in the critical habitat proposal:

When we evaluate the existence of a conservation plan when considering the benefits of exclusion, we consider a variety of factors, including but not limited to, whether the plan is finalized; how it provides for the conservation of the essential physical and biological features; whether there is a reasonable expectation that the conservation management strategies and actions contained in a management plan will be implemented into the future; whether the conservation strategies in the plan are likely to be effective; and whether the plan contains a monitoring program or adaptive management to ensure that the conservation measures are effective and can be adapted in the future in response to new information.[124]

However, the conservation plans that are currently in place in the Southern Rockies would not hold up to the FWS criteria, cited above, for several reasons and not limited to: 1) the SRLA was not final at the time of the proposed critical habitat rule, 2) the BLM's CA has expired and they have not moved forward on an amendment plan, and 3) the BLM's CA has expired so there is not a reasonable expectation that the conservation strategies will be implemented in the future, considering they are not being implemented in the present (see below). The 2003 report "Lynx Conservation in the Southern Rocky Mountains: Agency Neglect Threatens Lynx Recovery," Center for Native Ecosystems (CNE) and other Southern Rocky regional non-profit groups outline several promises made by the FS and the BLM through the signing of the "Lynx Conservation Agreement" that had yet to be fulfilled[125] (Appendix 3). Therefore, the FWS needs to reevaluate the benefits of exclusion of Southern Rocky Mountain unit based on the existing conservation plans for lynx in the area.

We realize that agencies must manage for several mandates under their missions, a position which oftentimes puts the agency under pressure to approve projects, despite adverse impacts to endangered and threatened species. The purpose of the ESA is to "require agencies to afford first priority to the declared national policy of saving endangered species" and "give endangered species priority over the 'primary missions' of federal agencies."[126] Because the FS and BLM must manage its lands for multiple uses, protecting endangered species may not always be their top priority. Unlike the discretionary guidelines contained in the SLRA or the LCAS, critical habitat designation imposes a strict standard of 'no adverse modification' of lynx habitat, thus giving agencies clear direction to prioritize protection of critical habitat over other land uses.

ii. Forest Service lands

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123 U.S.D.A. 2008b. Southern Rockies Lynx Management Direction Final Environmental Impact Statement. USDA Forest Service. National Forests in Colorado and southern Wyoming. October 2008. Available online at: [http://www.fs.fed.us/r2/projects/lynx/documents/]

124 73 Fed Reg at 62452

125 Center for Native Ecosystems (CNE). 2003. Lynx Conservation in the Southern Rocky Mountains: Agency Neglect Threatens Lynx Recovery. November 4, 2003.

126 *TVA v. Hill*, 437 U.S. 153 at 185; see also 174, 194

As mentioned above, the FS recently came out with its Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for the SRLA[127, 128] which will now take the place of the LCAS guidance for projects in lynx habitat in seven National Forests in Colorado and southern Wyoming. Under the SRLA, several key management areas are now only directed by guidelines including recreation, grazing and over-snow access for other human developments (e.g. oil and gas leasing, mining, etc.). These management areas were formerly standards under the LCAS. In the critical habitat proposal, the FWS supports the lack of the above standards in regards to snow compaction and denning habitat in the Northern Rockies Lynx Amendment (NRLA) which serves the same purpose as the SRLA in the Northern Rockies.[129] We assume the FWS would have a similar argument in support of the lack of standards in the SRLA.

According to the critical habitat proposal, Federal agency activities that may adversely affect critical habitat and should result in consultation include:

> (1) Actions that would reduce or remove understory vegetation within boreal forest stands. Such activities could include, but are not limited to, pre-commercial thinning or fuels treatment of forest stands. These activities could significantly reduce the quality of snowshoe hare habitat such that the landscape's ability to produce adequate densities of snowshoe hares to support persistent lynx populations is at least temporarily diminished…
>
> (2) Actions that would cause permanent loss or conversion of the boreal forest. Such activities could include, but are not limited to, recreational area developments, certain types of mining activities and associated developments, and road building. Such activities would eliminate and fragment lynx and snowshoe hare habitat…
>
> (3) Actions that would increase traffic volume and speed on roads that divide lynx critical habitat. Such activities could include, but are not limited to, transportation projects to upgrade roads or development of a new tourist destination. These activities could reduce connectivity within the boreal forest landscape for lynx and could result in increased mortality of lynx within the proposed revised critical habitat units as lynx are highly mobile and frequently cross roads during dispersal, exploratory movements, or travel within their home ranges.[130]

Currently there are several projects proposed or approved in important lynx habitat either on FS land or on private land within FS land (and requiring some form of Federal agency approval) in the Southern Rockies. The following are just a few examples:

- The Handkerchief Mesa Timber Sale is a recently approved 3,400 acre spruce-fir timber sale in lynx habitat and much of the project lies within the Wolf Creek Pass Lynx Linkage area on the east side of Wolf Creek Pass.[131]

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[127] See U.S.D.A. 2008a.
[128] See U.S.D.A. 2008b.
[129] 73 Fed Reg at 10868-69
[130] 73 Fed Reg at 10876
[131] U.S.D.A. 2008c. Handkerchief Mesa Timber Environmental Assessment Decision Notice and Finding of No Significant Impact. USDA Forest Service, Rocky Mountain Region, Rio Grande National Forest. April 2008. Available online at: [http://www.fs.fed.us/r2/riogrande/projects/decisions/index.shtml]

- The Village at Wolf Creek is a proposed real estate development of up to 10,000 people near the continental divide at Wolf Creek Pass. This project would occur in lynx habitat and within the Wolf Creek Pass Lynx Linkage.
- The Battle Mountain Development is a 5,300 acre private ski area and real estate development, much of which is in lynx habitat and which is entirely within the greater Tennessee Pass / Vail Pass linkage area.
- Breckenridge Peak 6 Ski Area Expansion is a proposed 450 acre ski area expansion on the north side of the existing Breckenridge Ski Area which is in important spruce-fir lynx habitat and an important movement corridor over the Ten Mile Range.
- The Big Moose, County Line, Burro/Blowout, Rock Creek, and Handkerchief Mesa Timber Sales (cumulatively) represent more than 12,000 acres of proposed and/or approved spruce-fir logging on the Rio Grande National Forest. All of these projects occur in lynx habitat.

In the citation referenced above, the FWS has highlighted just these sorts of projects as those that could be detrimental to lynx habitat and lynx habitat connectivity. Timber sales in prime lynx habitat (i.e. spruce-fir forests), if not properly managed, could result in loss of snowshoe hare habitat; recreational developments such as ski area expansions could fragment lynx and snowshoe hare habitat; and large tourist destinations such as the Village at Wolf Creek could increase traffic volume in a key movement corridor and increase lynx mortality. The above examples emphasize the fact that using the SRLA as the main management guideline for lynx habitat in the Southern Rockies does not give the lynx the protection they need to recover as is mandated by the ESA. Giving the agency so much discretion through the guidelines of the SRLA may make them susceptible to pressure from the very industries, like recreation, they are expected to regulate.

The importance of winter recreation in Colorado cannot be denied. Skiing contributes an estimated $2.5 billion to Colorado's economy annually,[132] and the ski industry continues to grow in Colorado with 30,000 more skier visits during the 2006-2007 season compared to 2005.[133] In Colorado, OHV registrations have grown in by 154% since 1991.[134] The Vail Pass Winter Recreation Area in Colorado has seen a steady increase in winter recreational users with 27,000 users estimated in the 55,000 acre area for 2007.[135] Snow sports are noted throughout the LCAS as one of the primary causes of lynx habitat degradation. The compaction of snow that results from winter activities, such as skiing and snowmobiling, effectively removes the lynx's morphological advantages in deep snow and provides access to potential competitors into areas they would normally be unable to infiltrate. There is little in the FS SRLA to manage for this.

In the least, more research needs to be done on the nexus of recreation, especially during the winter, and lynx habitat. Diurnal security areas, which provide secure daytime bedding habitat, are recognized as a key component for lynx conservation particularly in areas adjacent to developed recreation[136, 137] (Appendix 4). Within the Vail Pass Winter Recreation Area, noise and disruptions caused by snowmobiles, in addition to snow compaction, may have negative impacts for lynx. In addition, human presence near denning sites in

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132 Kelley, J. 2006. Number of visits piling up at Colorado's ski resorts. *Rocky Mountain News*. March 14, 2006.
133 See Colorado Ski Country USA. 2008.
134 See Metsa, T. 2007.
135 Roberts, E. 2008. Biological Assessment for Federally Listed Threatened, Endangered, and Proposed Species for Additional Outfitter Guide User Days within Vail Pass Winter Recreation Area, Holy Cross and Dillon Ranger Districts. White River National Forest, Eagle and Summit Counties, Colorado. Available online at: [http://www.newwest.net/pdfs/COPYVailPass_BA.pdf]
136 See Ruediger et al. 2000.
137 See Roberts, E. 2008.

the late spring can result in den abandonment with a negative effect on kitten survival.[138] Roberts[139] notes that no threshold has been defined regarding the impacts of winter recreation on lynx, and the volume or intensity of winter recreation activities could affect the functionality of lynx movement corridors. Roberts[140] assessment concludes that although sufficient habitat is managed to support lynx movement through the Vail Pass Winter Recreation Area, current levels of recreation activities may hinder lynx movement through the area and use of diurnal security areas. We urge the FWS to take a precautionary approach to this issue since there is obviously still much uncertainty surrounding this issue.[141]

In addition, in the critical habitat proposal, the FWS states their belief that snow compaction does not "increase competition from other species to levels that adversely impact lynx populations…"[142] However, the FWS needs to state more evidence as to why this is so. Buskirk et al.[143] reported that deep snow ecologically separates various competitors and predators, such as mountain lion, bobcat, and coyote, from lynx in the winter because the lynx are morphologically designed better for deep snow conditions. Research into whether or not snow compaction through winter recreation such as snowmobile use increases the likelihood that these competitors, especially coyotes, can more readily access deep snow areas is oftentimes contradictory. Buskirk et al.[144] reported on studies that find coyotes to be able to access high elevation, deep snow areas, though the studies referenced do not look into how the animals are getting into these areas. The authors also discuss several studies that suggest that coyotes are more likely to use areas with minimal or more compact snow conditions. In the ROD for the NRLA, the FS states that they were unwilling to completely forgo guidelines restricting snow compaction because "there is evidence competing predators use packed trails, suggesting a potential effect on individual lynx."[145]

Finally, the two studies cited by the FWS in the critical habitat proposal are similarly incongruous. Bunnell et al.[146] suggest that "restrictions placed on snowmobiles in lynx conservation areas by land management agencies because of the potential impacts of coyotes may be appropriate" while Kolbe et al.[147] reported that "it is unlikely that limiting compacted snowmobile trails on our study area would significantly reduce exploitation competition between coyotes and lynx during winter." Therefore, the FWS needs to give a better explanation of why they "determined that the best information available did not indicate that compacted snow routes increase competition from other species to levels that adversely impact lynx populations in the NRLA area."[148] This is especially true because earlier in the same document the FWS states "Lynx are morphologically and physiologically adapted for hunting snowshoe hares and surviving in

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138 Claar, J.J., N. Anderson, D. Boyd, M. Cherry, B. Conrad, R. Hompesch, S. Miller, G. Olson, H. Ihsle Pac, J. Waller, T. Wittinger, and H. Youmans. 1999. Carnivores. Pages 7.1-7.63 in G. Joslin and H. Youmans (eds.). Effects of recreation on Rocky Mountain wildlife: A review for Montana. Committee on Effects of Recreation on Wildlife. Montana Chapter of the Wildlife Society.

139 See Roberts, E. 2008.

140 *Ibid*

141 Murray, D.L., T.D. Steury and J.D. Roth. 2008. Assessment of Canada Lynx Research and Conservation Needs in the Southern Range: Another Kick at the Cat. Journal of Wildlife Management 72(7):1463-1472.

142 73 Fed Reg at 10869

143 See Buskirk et al. 2000.

144 *Ibid*

145 See U.S.D.A. 2007.

146 Bunnell, K.D., J.T. Flinders and M.L. Wolfe. 2006. Potential Impacts of Coyotes and Snowmobiles on Lynx Conservation in the Intermountain West. Wildlife Society Bulletin 34(3):828-838.

147 Kolbe, J.A., J.R. Squires, D.H. Pletscher and L.F. Ruggiero. 2007. The Effect of Snowmobile Trails on Coyote Movements Within Lynx Home Ranges. Journal of Wildlife Management 71(5):1409-1418.

148 73 Fed Reg at 10869

areas that have cold winters with deep, fluffy snow for extended periods. These adaptations provide lynx a competitive advantage over potential competitors, such as bobcats (Lynx rufus) or coyotes (Canis latrans)."[149]

There are not enough regulatory standards in the SRLA to protect the lynx from all the threats that exist on FS land, and therefore, lynx habitat in the Southern Rockies needs the protection of critical habitat. In addition, in the critical habitat designation, the FWS has included lands in the Northern Rockies that are covered by the Northern Rockies Lynx Amendment.[150] This means that the FWS agrees that lands in the region that are covered by the FS plans are still in need of additional management. Similarly, we find that lands in the Southern Rockies region are in need of management in addition to the SRLA and should, therefore, be designated as critical habitat.

iii. Bureau of Land Management lands

Though a majority of lynx habitat in the Southern Rocky Mountain area is on FS lands, BLM lands do contain lynx habitat - habitat which is particularly important for connectivity. As mentioned above, the BLM signed a Conservation Agreement ("CA") with the FWS in 2000. The BLM let their CA expire in 2004 and never renewed it. In addition, the BLM has not begun the process of amending all of its Resource Management Plans in the Southern Rocky Mountains to consider the needs of the lynx as the FS did with the SRLA. Thus, there is currently no existing conservation agreement which affords protection to lynx habitat on BLM lands (the SRLA applies only to FS lands).

In the critical habitat proposal, the FWS states that "the BLM continues to adhere to their original [lynx conservation] agreement although it expired in December 2004."[151] However, in the Southern Rockies, there is much evidence to the contrary. Oil and gas development projects are increasingly being proposed in lynx habitat, both on FS lands where the BLM owns the mineral estate, and on BLM lands. There is clearly no certainty that BLM will abide by the terms of an expired conservation agreement. In fact, contrary to the assertion in the proposed rule referenced above, BLM is not currently abiding by the terms of the CA.

For instance, in May 2008, BLM proposed leasing numerous parcels on the Rio Grande National Forest (where the BLM owns the mineral estate) and/or BLM San Juan Resource Area that completely or partially overlap with habitat for the threatened Canada lynx.[152] The majority of these parcels were within or adjacent to the area that the Colorado Division of Wildlife identifies as the 'lynx release core area' which may be particularly important to the reintroduced population. In addition, the majority of the parcels overlapped with one or more of the following: Lynx Analysis Units mapped by the Forest Service, denning, winter or other types of lynx habitat mapped by the Forest Service within these Lynx Analysis Units, or potential lynx habitat mapped by CDOW.

Neither BLM or FS conducted the required Section 7 consultation prior to issuing the protested parcels for oil and gas leasing. In addition, the no jeopardy determinations that FWS made in its biological opinion,

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[149] *Ibid at 10862*

[150] U.S.D.A. 2007. Northern Rockies Lynx Management Direction Record of Decision. U.S. Department of Agriculture Forest Service. National Forests in Montana, and parts of Idaho, Wyoming and Utah. March 2007. Available online at: [http://www.fs.fed.us/r1/planning/lynx/documents.htm]

[151] *Ibid* at 10868

[152] U.S.D.I. 2008. Notice of Competitive Lease Sale Oil and Gas. USDI Bureau of Land Management, Colorado State Office. March 7, 2008. Available online at: [http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/leasing.html]

were predicated on the following assumptions: 1) that both the BLM and FS would continue to implement the BLM and FS CAs, until such time that the FS and BLM management plans are updated or revised to consider the needs of the lynx, 2) that both BLM and FS would conduct Section 7 consultation with FWS at each stage of the process of approving any activity that could jeopardize lynx, and 3) that BLM and FS would continue to take new information into account in its NEPA analysis of activities that could jeopardize lynx. The fact that BLM and FS proposed to issue oil and gas leases in such a large amount of important lynx habitat, without conducting the required NEPA analysis, or the required Section 7 consultation with FWS, and without taking into account significant new information, makes it clear that BLM and FS have not consistently abided by the terms of their respective Conservation Agreements. Though the parcels located on FS land were deferred from this leasing cycle, this was only done after a large number of protests were filed by nonprofit environmental organizations, private citizens and other entities, including Center for Native Ecosystems (CNE)[153] (Appendix 5). Also, just because the parcels on FS land have been deferred for additional analysis at this time, doesn't mean they won't be leased at a later date. The parcels on BLM lands were leased for oil and gas development.

There are many other examples of oil and gas projects moving forward in lynx habitat on BLM lands such as the Bull Mountain Pipeline and the Hightower Development Project. Further, this is not the only time that the BLM has failed in its duty to consult when proposing lease sales in lynx habitat. In 2007, the Wilderness Workshop went to the Interior Board of Land Appeals (IBLA) after protesting the BLM leasing of parcels in lynx habitat. The IBLA ruled that the BLM has to consult before leasing[154] (Appendix 6).

Oil and gas development and exploration in the Southern Rockies may have substantial direct, indirect and cumulative impacts on lynx. Oil and gas exploration and development may result in loss of denning habitat, disturbance in denning habitat during critical time periods, cover type conversions, an increase in movement barriers and fragmentation, increased road densities, increased vehicular traffic and human disturbance, facilitation of increased access to lynx habitat by competitors or predators, increased illegal trapping or shooting of lynx, and increased potential for invasion of non-native plant species. We are still learning a lot about the best management practices for lynx, and the guidelines behind the LCAS and SRLA are still mainly untested hypotheses.[155]

iv. There is a need for special management on lands under other ownership.

In the Recovery Outline, the FWS states that "habitat patches must be sufficiently large and connected to enable movement within and between patches within a core area."[156] Issues in lynx habitat management arise when land ownership patterns result in insufficient connectivity between lynx habitat areas (for both lynx movement and dispersal) due to habitat loss (e.g., conversion) and other movement barriers (e.g., large openings, highways). This is most likely caused by poor coordination among land management and other agencies (including agencies such as the Colorado Department of Transportation and the Federal Highway Administration). In order to insure that what habitat connectivity exists today will remain in the future, land from many jurisdictions needs to be managed consistently which would be afforded by critical habitat

153 Center for Native Ecosystems. 2008. Protest of BLM's Notice of Competitive Oil and Gas Lease Sale of Parcels with High Conservation Value. April 23, 2008.
154 U.S.D.I. 2007. Board of Commissioners of Pitkin County and Wilderness Workshop, et al. 173 IBLA 173. USDI Office of Hearings and Appeals, Interior Board of Land Appeals. Decided December 20, 2007.
155 Letter from Dr. John Squires, Ph.D. of the U.S. Forest Service Rocky Mountain Research Station, Missoula, Montana to Mr. Mark Wilson, U.S. Fish and Wildlife Service, Helena, Montana, February 28, 2006, (p. 2).
156 See U.S.D.I. 2005.

designation. This consistency could contribute significantly to the recovery of the Southern Rocky Mountain lynx population.

CDOW noted in their comments on the draft I-70 PEIS that, based on radio collar data, I-70 represents a barrier to lynx movement through central Colorado and expansion of the interstate would have inevitable impacts on lynx. The lynx mortality rate on I-70 is significant at 4-7% of total mortalities of the reintroduced population, but this barrier is not insurmountable as a number of the collared lynx have successfully crossed the interstate.[157] Lynx may cross openings greater than 100m (300 ft) wide, but both human-made and natural open areas discourage use and disrupt travel movements,[158] suggesting that just the footprint of a highway can substantially disrupt lynx travel and hunting patterns. As this new population grows and expands, animals will continue moving north from the reintroduction sites in the southern part of the state. Nine lynx have been killed by vehicle collisions from 1999-2005, two of which occurred on West Vail Pass. These mortalities may affect the reintroduced population as it struggles to gain a foothold in the Southern Rockies. Forman et al.[159] state that roadkill rates are a major factor in reducing populations of rare species. Brocke et al.[160] notes that translocated populations may be more susceptible to animal-vehicle collisions than native populations as they attempt to establish themselves in a new location. This illustrates that other agencies, such as the Colorado Department of Transportation and the Federal Highways Administration, need to part of the collaborative effort to protect important lynx habitat and habitat connectivity.

Given the nature and magnitude of the primary threats to lynx habitat in the Southern Rockies, such as logging, conversion through residential and industrial development, recreation, and fragmentation and degradation from roads, we must take a landscape-level approach to identifying and protecting the most important patches of core lynx habitat in the Southern Rockies while also having the ability to significantly mitigate or deny truly inappropriate activities in those crucial patches. Critical habitat designation offers the opportunity to appropriately scale, refine, and redirect such future development to maintain the viability of the most crucial segments of habitat and minimize its contribution to individual mortality as well as habitat fragmentation, degradation, and loss. Currently, a significant amount of new development activity is approved in lynx habitat, even after consultation under Section 7 of the ESA, which is incompatible with maintaining habitat usability and connectivity. This indicates that the current mechanisms available to effect preservation of crucial habitat for lynx in the Southern Rockies are inadequate. With critical habitat designation, every Federal agency, not just the Forest Service and the BLM, and private land owners with a Federal nexus will be required to "insure that any action authorized, funded, or carried out by such agency…is not likely to…result in the destruction or adverse modification of habitat of such species…"[161] Thus, critical habitat designation will afford the lynx in the Southern Rockies stricter and less amendable protections which will be adjusted as the lynx reach yet to be determined recovery goals.

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[157] Shenk, T.M. 2005. Post-release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. Period covered: July 1, 2004 – June 30, 2005. Wildlife research report, Colorado Division of Wildlife. Available online at: [http://wildlife.state.co.us/WildlifeSpecies/SpeciesofConcern/Mammals/Lynx]

[158] Koehler, G.M. and J.D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. Journal of Forestry 88:10-14.

[159] Forman, R.T.T., D.S. Friedman, D. Fitzhenry, J.D. Martin, A.S. Chen, and L.E. Alexander. 1997. Ecological effects of roads: toward three summary indices and an overview for North America. Pages 40-54 in K. Canters (ed.). Habitat Fragmentation and Infrastructure. Ministry of Transport, Public Works and Water Management. Delft, Netherlands.

[160] Brocke, R.J., K.A. Gustafsen, and A.R. Major. 1990. Restoration of the lynx in New York: biopolitical lessons. Trans. North American Wildlife and Natural Resources Conference 55:590-598.

[161] 16 U.S.C. § 1536(a)(2)

Designating critical habitat in the Southern Rockies would positively contribute toward ensuring the long-term viability of the Southern Rockies lynx population, and therefore would contribute toward the long-term survival and recovery of the species. Colorado contains no less than eight percent of remaining lynx habitat in the contiguous United States. Critical habitat designation would be an effective regulatory mechanism to address several of the most critical factors affecting lynx survival in the Southern Rockies as well as several of the greatest sources of habitat fragmentation, degradation, and loss.

G. The Southern Rocky Mountains contain the physical and biological features that are essential for the conservation of the species.

In the critical habitat proposal, the FWS requested comments specifically on: "Whether lands the Southern Rocky Mountains contain the physical and biological features that are essential for the conservation of the species and the basis for why that might be so."[162] According to the FWS's own definition, the southern Rockies contain habitat that meets the criteria for critical habitat designation: 1) the area was occupied by lynx at the time of listing; 2) the area currently supports one of the most abundant, reproducing lynx populations in the contiguous United States; and 3) the area contains the physical and biological features essential to the conservation of the lynx and that may require special management (the second part of this last criterion is covered under Section F. above).[163] The Southern Rocky Mountain unit fits all of these criteria.

The reintroduction effort started in Colorado in 1999 [164] so there were definitely documented animals present at the time of listing. Because the reintroduced lynx population was brought to Colorado before the lynx were listed in 2000, this population is not designated as experimental under section 10(j) of the Act. Even so, it is unclear how many animals were in the area before the reintroduction effort began. The last legal taking was recorded in the winter of 1973 to 1974. However, evidence of native lynx had been recorded as late as 1998.[165] Thus, there is a strong indication that lynx did inhabit the southern Rockies in Colorado at the time of listing.

There is also strong evidence that lynx are widely distributed throughout the southern Rockies region. The most recent report on the status of the lynx reintroduction effort suggests that lynx are well distributed throughout large parts of Colorado, and have also dispersed into Utah, Wyoming, New Mexico, Nebraska and Montana.[166] The Southern Rockies geographical area is mainly in Colorado, extending into northern New Mexico and southern Wyoming.[167] Thus, there is evidence that the lynx populations are distributed throughout this region.

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162 73 Fed Reg at 10860

163 *Ibid* at 10873

164 Colorado Department of Natural Resources. 2002. Colorado Lynx Reintroduction and Augmentation Program. December 2002. Available online at: [http://wildlife.state.co.us/NR/rdonlyres/D8976105-8D2C-4788-A82A-08CD0961E74A/0/reintro_augmentation.pdf]

165 See Ruediger et al. 2000

166 See Shenk, T.M. 2007

167 Partners in Flight. Southern Rocky Mountains. Accessed 2008. [http://www.blm.gov/wildlife/pl_62sum.htm].

Within the southern Rockies unit, breeding and recruitment have been documented at multiple locations, and over several years.[168] It is also likely that there are undocumented births by females that are no longer being tracked or were born in Colorado and have never been collared.[169]

Additionally, the FWS has "determined that the primary constituent element [PCE] essential to the conservation of the lynx is: (1) Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing [snowshoe hare and hare habitat, adequate snow conditions, denning sites, and matrix habitat]."[170]

The Southern Rocky Mountains do indeed contain the necessary components of the primary constituent element essential for the conservation of the species. To begin, as mentioned above, the major primary constituent element the FWS describes is "boreal forest landscapes supporting a mosaic of differing successional forest stages."[171] In the Northern Rocky Mountains, according to the FWS proposal, lynx occurrences are usually associated with subalpine fir, Engelmann spruce, and lodgepole pine and are above 1,250 m (4,101 ft). Similarly, lynx occurrences in the GYA are usually within subalpine fir, Engelmann spruce and lodgepole pine at elevations usually, though not limited to, between 2,250 and 3,000m (7,382 and 9,843 ft).

Likewise, the lynx in the Southern Rocky Mountains are usually associated Engelmann spruce and subalpine fir vegetation types at elevations greater than 2900m (9514 ft).[172] Additionally, the requisite "mosaic of differing successional forest stages" exists in the Southern Rockies.[173] The San Juan and Medicine Bow National Forests are two examples of forest habitats in Colorado supporting a variety of successional forest stages. According to the most current resource management plan for the San Juan National Forest, 54% of the spruce-fir forest type is in the late structural stage, 30% is mature/old growth, and 10 and 6% of the spruce-fir forest type is in the intermediate and early structural stage.[174] Similarly, in the Medicine Bow National Forest, 3% of the spruce/fir forestwide habitat is in the early structural stages, 5% in the intermediate, 13% in the late, 52% in the mature, and 27% is in the old growth stage.[175] Similarly, the SRLA FEIS states "[d]ata from all forests in the Rocky Mountain Region indicate approximately 77 percent of the spruce-fir is in mature to late successional states" and 23 percent is in other stages.[176] Although a larger percentage is in the late and mature structural stages, there is some variety in the structural stages. In addition, the later stages are preferred by lynx and snowshow hare populations in the Southern Rocky Mountains because the later stages provide adequate cover for lynx and forage for hares.[177, 178] In addition, it is important to manage forests in the Southern Rocky Mountains to maintain mature stands with cone-

168 See Shenk, T.M. 2007.
169 *Ibid*
170 73 Fed Reg at 10867
171 *Ibid*
172 See Shenk, T.M. 2008.
173 73 Fed Reg at 10867
174 U.S.D.A. 1992. San Juan National Forest Amended Land and Resource Management Plan. USDA Forest Service. Durango, CO. April 1992.
175 U.S.D.A. 2003. Medicine Bow National Forest Revised Land and Resource Management Plan. USDA Forest Service, Rocky Mountain Region. December 2003.
176 See U.S.D.A. 2008b. (p. 154).
177 See Shenk, T.M. 2006.
178 See Zahratka and Shenk. 2008.

bearing trees for red squirrels, an important additional food source for lynx in the Southern Rocky Mountains.[179, 180, 181]

Additionally, the boreal forest PCE must contain "presence of snowshoe hares and their preferred habitat conditions, including dense understories of young trees or shrubs tall enough to protrude above the snow."[182] Though it is estimated that 0.5 hares/ha is needed to sustain a lynx population,[183] "a minimum snowshoe hare density necessary to maintain a persistent, reproducing lynx population within the contiguous United States has not been determined."[184] Modeling done by Steury and Murray[185] estimate that hare densities are needed between 1.1 and 1.8 hares/ha in order for the reintroduced species to persist in the southern Rockies. Snowshoe hares are common in the coniferous forests of the southern Rockies.[186] A study of snowshoe hare habitat in the White River National Forest found that the snowshoe hare population inhabiting the Vail Pass area is sufficient to support resident lynx.[187] In the habitat type used most by lynx in the Southern Rocky Mountains (Engelmann spruce and subalpine fir), Zahratka and Shenk[188] found snowshoe hare densities to be between 0.08 and 1.32 hares/ha, the upper range of which falls within predicted requirements mentioned above. However, as Steury and Murray[189] go on to say, lynx in the southern extent of their range may persist by relying on a greater variety of prey than animals in the north. Indeed, in some years, the diet of lynx in the Southern Rockies has consisted of up to almost 40 percent red squirrel, although the average lynx diet in Colorado consists of 17 percent red squirrel.[190] Red squirrels are found throughout subalpine and montane forests in Colorado, and squirrel densities in forests similar to those found in Colorado are between 50 and 250 animals/km^2.[191] Red squirrels may, therefore, provide an essential dietary component in years when snowshoe hare population numbers are low.[192, 193, 194]

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179 See Shenk, T.M. 2007.

180 Squires, J.R. and L.F. Ruggiero. 2007. Winter Prey Selection of Canada Lynx in Northwestern Montana. Journal of Wildlife Management 71(2):310-315.

181 Roth, J.D., J.D. Marshall, D.L. Murray, D.M. Nickerson and T.D. Steury. 2007. Geographical Gradients in Diet Affect Population Dynamics of Canada Lynx. Ecology 88(11):2736-2743.

182 73 Fed Reg at 10867

183 Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 2000a. The Scientific Basis for Lynx Conservation: Qualified Insights. *Chapter 16 (p. 446-447) in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

184 73 Fed Reg at 10866

185 Steury, T.D. and D.L. Murray. 2004. Modeling the reintroduction of lynx to the southern portion of its range. Biological Conservation 117:127-141.

186 Colorado Division of Wildlife. 2008. Hares – Jackrabbits & Snowshoe Hare. Last updated: June 12, 2008. Found online at: [http://wildlife.state.co.us/WildlifeSpecies/Profiles/Mammals/Hares.htm]

187 Doerr, J.G. 2005. Snowshoe Hare Habitat Relationships on the White River National Forest in Colorado. Unpublished Report. FS Files. Eagle, Colorado. *cited in* Roberts, E. supra 2008.

188 See Zahratka and Shenk. 2008.

189 See Steury and Murray. 2004 (p.138).

190 See Shenk, T.M. 2007.

191 Obbard, M.E. 1987. Red Sqirrel. Pp. 265-281, *in* Wild furbearer management and conservation in North America (M. Novak, J.A. Baker, M.E. Obbard, and B. Malloch, eds.) Ontario Trappers Association, Toronto, 1150 pp. *as cited in* Mammals of Colorado (J.P. Fitzgerald, C.A. Meaney, and D.M. Armstrong, eds.) Denver Museum of Natural History and University Press of Colorado (p. 198).

192 See Shenk, T.M. 2007.

193 See Squires and Ruggiero. 2007.

194 See Roth et al. 2007.

In addition, the hare population needs dense understories of young trees or shrubs tall enough to protrude above the snow. In their study on snowshoe hare populations in the Southern Rocky Mountains, Zahratka and Shenk[195] found that the mean understory cover was 57 percent for the spruce-fir forests in their study areas in the Gunnison National Forest. They also found that snowshoe hares used the spruce-fir forests more than lodgepole pine stands.[196] The lynx in the Southern Rocky Mountains prefer spruce-fir forests with 15-20 percent understory cover protruding from just above to at least 1.5 m above the snow line. In areas with willow as the main understory species, the mean percent understory is closer to 30 percent.[197]

The FWS also stated that boreal forest PCEs should contain "winter snow conditions that are generally deep and fluffy for extended periods of time."[198] In the critical habitat proposal, the FWS cited Hoving et al.,[199] saying that "snowfall was the strongest predictor of lynx occurrence at the regional scale."[200] The FWS went on to report that the northeastern area in the United States averaged greater than 105 inches if snowfall annually, Minnesota averaged 55 inches, one station in the Cascades averaged 115 inches, and one station in Montana averaged 124 inches while another averaged 90 inches. The FWS retrieved these numbers from a variety of data sources, and the averages from each location cover different year spans. Based on the numbers reported for various areas by the FWS, it can be assumed that "winter snow conditions that are generally deep and fluffy for extended periods of time" is considered by the FWS to be areas that accumulate an average of at least 55 inches of snow annually.[201]

In Colorado, the Silverton Weather Station averaged 156 inches of snow annually from about 1915 to 2007, the Telluride Weather Station averaged 167 inches of snow annually from about 1910 to 2007, the Leadville Weather Station averaged 118 inches of snowfall annually from 1948 to 1982, the Georgetown Weather Station averaged 93 inches of snowfall annually from about 1948 to 2007, and the Independence Pass 5 SW Weather Station had an average of 336 inches of snowfall annually from 1948 to 1980.[202] These stations are from various parts of the Southern Rockies in Colorado in areas used by the lynx as mapped by CDOW.[203] Comparing these numbers to those used by FWS to describe areas with adequate snow where critical habitat was designated, it is quite evident that there are several areas in the Southern Rockies that have "winter snow conditions that are generally deep and fluffy for extended periods of time."[204]

The next criteria for the boreal forest PCE is "sites for denning having abundant, coarse, woody debris, such as downed trees and root wads."[205] According to the critical habitat proposal, denning sites are found in forest stands typically in the mature or younger structural stage and consist of a "large amount of cover and downed, large woody debris" which are common in both "managed (logged) and unmanaged (e.g., insect damaged, wind-throw) stands."[206] In Maine, den sites were found near the roots of downed trees with

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195 See Zahratka and Shenk. 2008.
196 *Ibid*
197 See Shenk, T.M. 2007.
198 73 Fed Reg at 10867
199 Hoving, C.L., D.J. Harrison, W.B. Krohn, R.A. Joseph, and M. O'Brien. 2005. Broad-scale predictors of Canada lynx occurrence in eastern North America. Journal of Wildlife Management 69(2):739-751.
200 73 Fed Reg at 10866
201 *Ibid* at 10867
202 Western Regional Climate Center. 2008. Available online at: [http://www.wrcc.dri.edu/summary/Climsmco.html]
203 See Shenk, T.M. 2007.
204 73 Fed Reg at 10867
205 *Ibid*
206 *Ibid*

horizontal cover at 16 feet in a variety of stand types. In the North Cascades, Washington, lynx preferred sites in mature Engelmann spruce, subalpine fir, and lodgepole pine stands with a lot of "downed, woody debris" and usually with north-northeast aspects. In Montana, lynx prefer to den in areas with "abundant woody debris…and a dense understory cover." There was no information available for sites in Minnesota.[207]

In the Southern Rocky Mountains, lynx prefer sites with abundant understory and woody debris. Occurrence of den sites is usually associated with mixed stages of Engelmann spruce and a higher density of subalpine fir than found at any other type of lynx sites (i.e. kill, long bed, and travel sites). Most subalpine fir trees found at den sites are smaller. Den sites are usually found on "steep…, north-facing, high elevation…slopes," and are located in female winter use areas.[208] Given that there is no data available for den sites in Minnesota, FWS must not be using evidence of den sites as a criteria for designating critical habitat. Regardless, female lynx in the Southern Rockies seem to have no trouble finding habitat for den sites given that 37 dens have been documented in the area between 2003 and 2006,[209] not to mention several den sites that were most likely never found by researchers. In addition, CDOW has collected ample data on den sites in the Southern Rockies. Finally, according to the U.S. Forest Service, denning habitat is not a limiting factor to lynx in the Southern Rockies.[210]

The final criteria for the boreal forest PCE is a "matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range. The important aspect of matrix habitat for lynx is that these habitats retain the ability to allow unimpeded movement of lynx through them as lynx travel between patches of boreal forest."[211] The FWS doesn't go into detail for any other areas on this criterion, so it is hard to know what they were looking at in the areas where critical habitat was designated. However, a matrix habitat does exist in the Southern Rocky Mountains.[212]

Finally, PCEs also include: "[h]abitats that…are representative of the historic, geographical, and ecological distributions of a species."[213] Therefore, critical habitat should be designated in the Southern Rockies because not only does the region contain the physical and biological features that are essential for the conservation of the Canada lynx, as evidenced in the paragraphs above, but the region's population also represents the historic, geographical and ecological distribution of the species.

H. Inclusion of the Southern Rocky Mountain Population in the critical habitat designation is necessary in order to adequately address the concepts of representation, redundancy and resiliency, and in order to ensure the persistence and recovery of the Canada lynx in the contiguous United States.

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[207] *Ibid*

[208] See Shenk, T.M. 2008.

[209] *Ibid*

[210] See Hickenbottom et al. 1999.

[211] 73 Fed Reg at 10867

[212] Agee, J.K. Disturbance Ecology of North American Boral Forests and Associated Northern Mixed/Subalpine Forests. *Chapter 3 (p. 46) in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

[213] 73 Fed Reg at 10864

The proposed critical habitat rule seems to suggest that the Southern Rockies is not essential to the conservation of the species because of uncertainty that the reintroduction will result in a self-sustaining lynx population, and because lynx habitat in the Southern Rockies is disjunct from other lynx habitats in the U.S. and Canada, and is thus unlikely to receive immigrants from such populations, particularly immigration from populations in Canada. It is implied that the habitat in the Southern Rockies may not be of sufficient quality and quantity to sustain a lynx population, and that the lynx population in the Southern Rockies is unlikely to persist without immigration from other populations (particularly direct immigration from larger populations in Canada). It is also implied that the Southern Rockies is unlikely to contribute materially to the persistence of the DPS and the species as a whole.

We have previously established that there is no evidence to suggest that the Southern Rockies population is not self-sustaining. In addition, we have previously shown that there is little information on the level of dispersal between other core populations and the Southern Rockies. Given evidence of long-term historic presence of lynx in Colorado, and the demonstrated ability of lynx to move between the Southern Rockies and other core areas, it is not unreasonable to assume that there is some level of immigration into the Southern Rockies from other core populations (and some level of emigration from the Southern Rockies into other core populations). In addition, as discussed above, the Southern Rockies has habitat that meets all of the criteria for the PCEs laid out by the FWS. This habitat has been demonstrated to support long-term historical presence of lynx; as well as survival, reproduction and recruitment of reintroduced lynx. We recognize that there is uncertainty in predicting the likely future size and long-term viability of the reintroduced population. Similarly, we recognize that there is uncertainty in evaluating the importance of immigration from other core populations to the long-term viability of the reintroduced lynx population in the Southern Rockies, and in determining the level of dispersal between the Southern Rockies and other core populations. Given this uncertainty, there are several possible outcomes for the reintroduced population:

1. Habitat in the Southern Rockies is sufficient to support a self-sustaining population over time that is comparable in size to those in other core areas being proposed for designation without substantial immigration;
2. Habitat in the Southern Rockies is sufficient to support a population over time that is comparable in size to those in other core areas proposed for designation, but only with substantial immigration from other core populations;
3. Habitat in the Southern Rockies is sufficient to support a self-sustaining population that is smaller than those in the core areas being proposed for designation without substantial immigration;
4. Habitat in the Southern Rockies is sufficient to support a population that is smaller than those in the core areas being proposed for designation, but only with substantial immigration from other core areas; or
5. Habitat in the Southern Rockies is sufficient to support lynx survival and reproduction in during periods of high prey abundance, but not sufficient to support a self-sustaining population over time, and thus will persist only with substantial immigration from other populations.

The FWS has not given adequate consideration to this full range of potential outcomes for the reintroduced lynx population in Colorado, but instead has assumed that the fourth and fifth outcomes outlined above are the most likely, even though it is not currently possible to predict the most likely outcome based on available evidence.

The Southern Rockies may be essential to the conservation of the lynx under each of the above scenarios. Inclusion of the Southern Rockies in the critical habitat designation is necessary in order to adequately

address the concepts of representation, resiliency and redundancy necessary for the conservation of the contiguous United States Distinct Population Segment (DPS) and the species as a whole, under each of the above scenarios. The FWS's conclusion that the proposed critical habitat designation adequately provides the representation, resiliency and redundancy necessary for the conservation of a species, without inclusion of the Southern Rockies, is arbitrary and capricious.

The proposed rule does not clearly spell out the concepts of resiliency, redundancy, and representation, and FWS's interpretation of these concepts in the proposed rule fails to consider important elements of each concept that bear directly on the question of whether the Southern Rockies contributes substantially to the representation, resiliency or redundancy of the contiguous DPS, and thus whether the Southern Rockies should be included in the critical habitat designation. The interpretation of these concepts and the elements that should be considered in addressing each concept is also inconsistent with FWS's own interpretation used in making other recent decisions. [214]

In the proposed critical habitat rule for lynx, FWS states the following:

> "We are not currently proposing any areas outside the geographical area presently occupied by the species because we have determined that occupied areas are sufficient for the conservation of the species because these areas adequately address the concepts of representation, resiliency, and redundancy necessary for conservation of a species (Shaffer and Stein 2000). Resiliency of a species allows the species to recover from periodic disturbance. Areas are resilient if they are relatively large and contain particularly high-quality habitat or if their location or characteristics make them less susceptible to certain threats than other portions of the range. Resiliency of a species allows the species to recover from periodic disturbance. A species will likely be more resilient if large populations exist in high-quality habitat that is distributed throughout the range of the species in such a way as to capture the environmental variability found within the range of the species. The proposed revised critical habitat addresses the concept of resiliency because the total area of the five units covers a large geographic area (42,753 mi\2\ (110,727 km2)), and because it contains the highest quality habitat in the United States. Redundancy of populations may be needed to provide a margin of safety for the species to withstand catastrophic events. The idea is to conserve enough areas of the range such that random perturbations in the system act on only a few populations. The proposed revised critical habitat addresses the concept of redundancy because it includes five units distributed across a broad geographic area. Catastrophic events that could affect all five units are extremely improbable. Adequate representation insures that the species' adaptive capabilities (often as indicated by genetic diversity) are conserved. Genetic representation is not an issue for lynx, because lynx across the range are similar and all share the same haplotypes (Rueness et al. 2003, p. 71). Thus, we have determined that the five units contained in this proposed revised critical habitat address the concept of representation."[215]

It is important to note that the Southern Rockies provisional core area is within the area occupied by the species, and has not been included in the critical habitat designation. In addition, currently unoccupied portions of the range may contribute substantially to the representation, redundancy and resilience of the contiguous United States DPS. Finally, though we focus on the Southern Rockies area below, many of the same issues may apply to other portions of the lynx's historical geographic range in the contiguous United states that are not being proposed for critical habitat designation.

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[214] 73 Fed Reg at 39790-39838

[215] 73 Fed Reg at 10871

The FWS has failed to adequately assess whether the Southern Rockies provisional core area contributes substantially to the representation, redundancy and resiliency of the contiguous United States DPS. The FWS failed to consider key elements of these three concepts, and to adequately evaluate the Southern Rockies provisional core area (and other parts of the species range not included in the critical habitat designation) with respect to these elements. The FWS regularly uses these criteria in making decisions about listing species and designating critical habitat. In a recent decision by the Service to amend the listing for the Preble's Meadow Jumping Mouse, FWS provides a clearer and more detailed discussion of these three concepts, and elucidates elements that should be considered under each concept in determining whether a particular population contributes substantially to the representation, redundancy and resiliency of a listable entity.[216] We review this discussion below, in order to illustrate the FWS's failure to consider key elements of these concepts in the decision at issue here, and to evaluate the contribution of the Southern Rockies to the representation, redundancy and resiliency of the DPS, with respect to these elements. We then use the framework set forth by FWS in the decision to amend the listing for the Preble's meadow jumping mouse, to demonstrate that the Southern Rockies provisional core area contributes substantially to the representation, redundancy and resiliency of the DPS; and to provide information that the FWS failed to adequately consider in evaluating whether the proposed critical habitat designation adequately addresses the concepts of representation, redundancy and resiliency.

The FWS's July 2008 decision with regard to amendment of the listing for the Prebles' meadow jumping mouse, states that "representation"... "[is] intended to be [an] indicator[] of the conservation value of portions of the range."[217], and describes the concept of representation as follows:

"Adequate representation ensures that the subspecies' adaptive capabilities are conserved. Specifically, we should evaluate a portion to see how it contributes to the genetic diversity of the species. The loss of genetically based diversity may substantially reduce the ability of the species to respond and adapt to future environmental changes. A peripheral population may contribute meaningfully to representation if there is evidence that it provides genetic diversity due to its location on the margin of the species' habitat requirements."[218]

In determining if a portion of the range of the Prebles' meadow jumping mouse contributes substantially to the representation of the species, the FWS considered the following questions:

1. "To what extent does this portion of the range contribute to the genetic diversity of the species?"
2. "To what extent does this portion of the range contribute to the morphological/physiological diversity of the species?"
3. "To what extent does this portion of the range contribute to the behavioral diversity of the species?"
4. "To what extent does this portion of the range contribute to the diversity of ecological settings in which the species is found?" [219]

In determining whether the proposed critical habitat designation for the Canada lynx adequately addresses the concept of representation, the FWS's rationale is that:

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[216] 73 Fed Reg at 39790-39838
[217] 73 Fed Reg 39832
[218] *Ibid*
[219] *Ibid*

> "Adequate representation insures that the species' adaptive capabilities (often as indicated by genetic diversity) are conserved. Genetic representation is not an issue for lynx, because lynx across the range are similar and all share the same haplotypes (Rueness et al. 2003, p. 71)." [220]

In considering whether the Southern Rockies provisional core area contributes substantially to the representation of the contiguous United States DPS, the FWS did not provide adequate consideration of the extent to which the Southern Rockies provisional core area might contribute to the genetic diversity of the species; and did not provide any consideration of the extent to which the Southern Rockies provisional core area might contribute to the morphological, physiological, or behavioral diversity of the species, or to the diversity of ecological settings in which the species is found.

Evaluating the relative contribution of the Southern Rockies area to the genetic diversity of the species is complicated due to the functional extirpation of the native lynx population, and the reintroduction of Canada lynx from a wide variety of locations within the species' geographic range. The FWS must consider both the current contribution of the reintroduced lynx population to the genetic diversity of the DPS as a whole, and the potential for a lynx population in the Southern Rockies to contribute to levels of genetic diversity in the future, given its distance from other populations, and its existence in an ecological setting that is different from those in other portions of the range.

The reintroduced population in the Southern Rockies provisional core area may contribute substantially to the current genetic diversity of the species. Though it may be the case that Canada lynx across the species' range have relatively similar haplotypes, and thus low genetic diversity, we doubt that lynx across the species' range are genetically identical. The aim of FWS should be to conserve the genetic diversity that remains within the DPS, even if the level of diversity present within the species is currently low. In fact, if it is the case that the genetic diversity of the lynx is currently relatively low, this may make it even more important to conserve the genetic diversity that remains. The Southern Rockies population may currently have a relatively high level of genetic diversity, due to the reintroduction of lynx to Colorado from several areas across Canada (including Yukon, British Columbia, Quebec and Manitoba) and Alaska.[221] As discussed previously, it is also possible that a small number of native lynx were still present at the time of the reintroduction. These lynx may have bred with reintroduced lynx, potentially adding further to the genetic diversity of this population. The FWS has stated that:

> "The southern extensions of the North American lynx population that extend into the contiguous United States occur in marginal and naturally fragmented habitats and are likely dependent on migration from the core portion of the metapopulation in the Canadian taiga for genetic and demographic enrichment (McCord and Cardoza 1982, p. 729; McKelvey 1999, p. 232)"[222]

The FWS has little or no control over management of lynx populations in Canada, and anthropogenic impacts in Canada may eventually result in reduction or cessation of immigration of lynx from Canada into the contiguous United States DPS. If this were to occur, the reintroduced population in the Southern Rockies could serve as a reservoir of genetic diversity originally found in Canadian populations, thus contributing substantially to the genetic diversity of the United States DPS. Preserving a large number of populations across the geographic range, particularly populations with high within-population genetic

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[220] 73 Fed Reg 10871
[221] See Shenk, T.M. 2007.
[222] 73 Fed Reg at 10871

diversity, such as the Southern Rockies population, may be critical to maintaining the remaining genetic diversity within the DPS, and ensuring the adaptive capabilities of the DPS.

The Southern Rockies provisional core area may contribute substantially to the genetic diversity of the DPS in the future. The Southern Rockies provisional core area is relatively distant from other populations within the DPS (discussed in greater detail below). In addition, lynx in the Southern Rockies experience atypical ecological conditions (specific differences in ecological conditions are discussed in greater detail below). Finally, though it is currently unknown whether the quality of habitat in the Southern Rockies provisional core area, and thus the capacity to support a large populations, is reduced relative to other populations within the DPS, the FWS seems to believe that the habitat in the Southern Rockies is marginal and capable of supporting only a small population. Populations that share this combination of traits (isolation, small size, existence in environmental conditions that are atypical and/or marginal compared to those experienced by populations elsewhere in the range) frequently become genetically divergent over time, due to the combined effects of isolation, genetic drift and divergent natural selection. [223] Genetically distinct populations may benefit the long-term conservation of a species, through contributing to the among-population component of the species' genetic diversity, and thus the species' ability to adapt to future environmental change.[224] It is unknown whether the native lynx population had become genetically divergent from populations in the remainder of the DPS prior to its functional extirpation from the Southern Rockies. In addition, the functional extirpation of the native population of Canada lynx from the Southern Rockies, and the subsequent reintroduction of Canada lynx from various parts of Canada, has likely resulted in the loss of any genetic distinctness formerly contained within the native population. However, if it is the case that the Southern Rockies provisional core area is isolated, contains atypical and/or marginal habitat, and is only capable of supporting a small population, then it may be a potentially important site of future genetic divergence. Genetic divergence may be constrained by low within population genetic diversity thus, the currently high level of within-population genetic diversity may contribute to the potential for the population to become genetically divergent in the future. In addition, low to intermediate rates of immigration may facilitate evolution by natural selection, through increasing population size, preventing extinction, and providing novel variation for selection to act upon. [225] [226] [227] In recovering the DPS, the FWS should aim to maintain evolutionary processes that recover adaptive potential within the DPS that may have been lost due to range contraction and population extirpation in the past. We do not mean to imply that the reintroduced population is likely to regain genetic traits that may have been present in the Southern Rockies population prior to extirpation, but simply argue that preservation of variation in ecological conditions and distances between populations across the range of the DPS may result in generation of potentially adaptive genetic variation in the future.

The characteristics of the Southern Rockies may also result in morphological, physiological and behavioral divergence that is not clearly under genetic control, but that may nonetheless contribute substantially to the adaptive capabilities of the DPS. Geographic variation in environmental conditions may lead to variation

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[223] Lesica, P., and F. W. Allendorf. 1995. When are peripheral populations valuable for conservation? Conservation Biology **9**:753-760.

[224] *Ibid*

[225] Alleaume-Benharira, M., I. R. Pen, and O. Ronce. 2006. Geographical patterns of adaptation within a species range, interactions between drift and gene flow. Journal of Evolutionary Biology **19**:203-215.

[226] Gomulkiewicz, R., R. D. Holt, and M. Barfield. 1999. The effects of density dependence and immigration on local adaptation and niche evolution in a black-hole sink environment. Theoretical Population Biology **55**:283-296.

[227] Petren, K., P. R. Grant, B. R. Grant, and L. F. Keller. 2005. Comparative landscape genetics and the adaptive radiation of Darwin's finches: the role of peripheral isolation. Molecular Ecology **14**:2493-2957.

among populations, both in genetically determined inherited traits, and non-inherited traits that are not under direct genetic control.[228] Ruggiero et al. (2000) note that phenotypic differences among populations generally increase with distance between populations, and describe several cases where environmental differences between populations play a large role in generating among-population variation in the phenotype including morphological and behavioral traits.[229]According to Ruggiero et al. (2000), "Non-genetic changes to the phenotype that occur in the absence of genetic change, can be adaptive, can influence fitness, and may be preserved by indirect genetic mechanisms and learned behavior."[230] The reintroduced population in the Southern Rockies provisional core area is currently distant from other populations, and experiences a variety of ecological conditions that are different from those experienced by other populations within the DPS (discussed in greater detail below). Thus, the reintroduced population in the Southern Rockies may currently have unique, non-inherited morphological, physiological and behavioral traits resulting from environmental influences. For example, as we discussed previously, the diets of lynx in the Southern Rockies may differ from those in the northern portions of the DPS. Lynx in the Southern Rockies may compensate for relatively low snowshoe hare densities by increasing consumption of alternate prey, such as red squirrels. This may lead to learned behaviors that maximize successful capture of alternative prey, that are not present in populations elsewhere in the DPS where snowshoe hare densities are higher. Lynx in the Southern Rockies also occur at higher elevations than lynx elsewhere in the range, and may be acclimated to higher elevations. It will be difficult to gather data required to conclusively determine whether the reintroduced population has unique, non-inherited morphological, physiological or behavioral traits, but given that among-population variation in such traits is correlated with distance between populations and environmental differences between habitats occupied by different populations, the Southern Rockies may contribute substantially to the maintenance and generation of variation in non-inherited, morphological, physiological and behavioral traits in the future.

The FWS has not adequately evaluated how the Southern Rockies might contribute to maintenance and generation of genetic, morphological/physiological and behavioral diversity of the DPS. The Southern Rockies constitutes a unique ecological setting that contributes substantially to the diversity of ecological settings in which the lynx in the contiguous United States DPS is found. The unique ecological setting of the Southern Rockies should be conserved in order to preserve the ability of the Canada lynx to respond and adapt to environmental change. The Southern Rockies is separated from the nearest large areas of boreal forest in Wyoming by at least 100 km ,[231] and is near the southern boundary to the geographic range of the Canada lynx. Spatial distance between habitats is often correlated with environmental difference between habitats (e.g. due to clinal variation in environmental variables).[232] In addition, populations located near the boundaries to a species' geographic range, often exist in ecological settings that are atypical relative to populations located more centrally within the geographic range.[233] The environmental setting of the Southern Rockies differs significantly from the remainder of the DPS in several ways. First, the Southern Rockies region encompasses higher elevation terrain than the rest of the area occupied by the DPS.

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[228] Ruggiero, L.F., Schwartz, M.K., K.B. Aubry, C.J. Krebs, A. Stanley, and S.W. Buskirk. 2000. Species Conservation and Natural Variation Among Populations. *Chapter 5 in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the United States. U.S. Dept. of Agriculture, Forest Service Rocky Mountain Research Station, Missoula, Montana; published by University Press of Colorado, Boulder, Colorado, 480 pp.

[229] *Ibid*

[230] *Ibid*

[231] See McKelvey et al. 2000b.

[232] Lesica, P., and F. W. Allendorf. 1995. When are peripheral populations valuable for conservation? Conservation Biology **9**:753-760.

[233] *Ibid*

Occurrences in the southern Rockies are, in general, at higher elevations (1,250 to over 3,750 meters (4,100-12,300 feet)) than other areas in the contiguous United States. This is especially true compared to areas outside of the western United States.[234] The existence of higher elevation terrain may be important in the lynx's ability to respond to ongoing and future climate warming (discussed in greater detail in the section on resiliency). It is also possible that the type and spatial arrangement of habitat used by the lynx in the Southern Rockies differs from habitat occupied by the remainder of the DPS. The highest densities of snowshoe hares in the Southern Rockies may be in mature and late successional structural stages in Colorado, in contrast with other portions of the range, and lynx may prefer these structural stages in the Southern Rocky Mountains. In addition, it is possible that snowshoe hare densities and population cycles in the Southern Rockies differ from those in the more northern portions of the DPS. Finally, the abundance of snowshoe hares relative to the abundance of alternate prey such as red squirrels in the Southern Rockies may differ from abundance of these species relative to one another in the more northern populations of the DPS. Environmental variation throughout the range of the DPS is not well characterized, and these are just a few examples of differences that may exist between the Southern Rockies DPS and other populations. Inclusion of the Southern Rockies Provisional Core Area in the critical habitat designation is necessary in order to preserve the range of variability in ecological settings across the DPS and the geographic distribution of the Canada lynx. The Southern Rockies region constitutes a unique ecological setting that should be conserved in order to preserve the ability of the Canada lynx to respond and adapt to environmental change. The FWS has not adequately evaluated the extent to which the Southern Rockies provisional core area contributes to the diversity of ecological settings in which the species is found.

The FWS's July 2008 decision with regard to amendment of the listing for the Prebles' meadow jumping mouse, states that, "redundancy", "[is] intended to be [an] indicator[] of the conservation value of portions of the range.", [235]and describes the concept of redundancy as follows:

"Redundancy of populations may be needed to provide a margin of safety for the species to withstand catastrophic events. This concept does not mean that any portion that provides redundancy is per se a significant portion of the range of a species. The idea is to conserve enough areas of the range such that random perturbations in the system act on only a few populations. Therefore, we must examine each area based on whether that area provides an increment of redundancy that is important to the conservation of the species."[236]

In determining if a portion of the range of the Prebles' meadow jumping mouse contributes substantially to the redundancy of the species, the FWS considered the following questions:

1. To what extent does this portion of the range contribute to the total [gross area] range of the species?
2. To what extent does this portion of the range contribute to the total population of the species?
3. To what extent does this portion of the range contribute to the total suitable habitat?
4. To what extent does this portion of the range contribute to the geographical distribution of the species?[237]

In determining whether the proposed critical habitat designation for the Canada lynx adequately addresses the concept of redundancy, the FWS's rationale is that:

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[234] See McKelvey et al. 2000b. (p. 245).
[235] 73 Fed Reg at 39832
[236] *Ibid*
[237] 73 Fed Reg at 39801-39802

> "The proposed revised critical habitat addresses the concept of redundancy because it includes five units distributed across a broad geographic area. Catastrophic events that could affect all five units are extremely improbable."[238]

In considering whether the Southern Rockies provisional core area contributes substantially to the redundancy of the contiguous United States DPS, the FWS did not describe or consider to what extent this portion of the range contributes to the total [gross area] range of the species, the total population of the species, the total suitable habitat, or the geographical distribution of the Canada lynx in the contiguous United States.

The Southern Rockies is located more than 100km south of the largest patches of boreal forest in Wyoming, at the Southern boundary of the geographic range of the Canada lynx, the Southern Rockies contributes substantially to the geographical distribution of the species. Loss of the lynx population in Southern Rockies would constitute a substantial reduction in the geographic distribution of the contiguous United States DPS. Loss of the lynx population in Southern Rockies would also likely constitute a substantial reduction in the total area occupied by the species, the total population of the DPS, and the total habitat suitable for occupancy by lynx in the DPS.

The Southern Rockies may also contribute substantially to the ability of the DPS to withstand catastrophic events. The Southern Rockies is located at a greater spatial distance from the nearest population than the remaining populations in the DPS, and exists in an environmental setting that may differ substantially from the environmental settings experienced by other populations (discussed in greater detail above). Given these characteristics, the probability that the Southern Rockies would experience the same catastrophe simultaneously or in rapid sequence with the other core populations within the DPS, is much lower than the probability that two or more of the core populations being proposed for critical habitat designation might experience the same catastrophe simultaneously or in rapid sequence. For example, if dispersal between the Southern Rockies and other populations is limited compared with dispersal between northern populations in closer proximity to one another, and a disease arose in one of the northern populations, the probability that it would spread to nearby northern populations is much higher than the probability that it would spread to the Southern Rockies population. The FWS has failed to adequately consider the extent to which the Southern Rockies population contributes to the ability of the DPS to withstand catastrophic events.

The FWS's July 2008 decision with regard to amendment of the listing for the Prebles' meadow jumping mouse, describes the concept of resiliency as follows:

> "Resiliency of a species allows the species to recover from periodic disturbances. A species will likely be more resilient if large populations exist in high-quality habitat that is distributed throughout the range of the species in such a way as to capture the environmental variability found within the range of the species. It is likely that the larger size of a population will help contribute to the viability of the species overall. Thus, a portion of the range of a species may make a meaningful contribution to the resiliency of the species if the area is relatively large and contains particularly high-quality habitat or if its location or characteristics make it less susceptible to certain threats than other portions of the range. When evaluating whether or how a portion of the range contributes to resiliency of the species, it may help to evaluate the historical value of the portion and how frequently the portion is used by the species. In addition, the portion may contribute to resiliency for other reasons; for instance, it may contain an important concentration of certain types of habitat that are necessary for

[238] 73 Fed Reg at 10871

> the species to carry out its life-history functions, such as breeding, feeding, migration, dispersal, or wintering."[239]

In determining if a portion of the range of the Prebles' meadow jumping mouse contributes substantially to the resiliency of the species, the FWS considered the following questions:

1. To what extent does this portion of the range contribute to the total of large blocks of high-quality habitat?
2. To what extent do the population size and characteristics within this portion of the range contribute to the ability of the species to recover from periodic disturbances?
3. To what extent does this portion of the range act as a refugium of the species?
4. To what extent does this portion contain an important concentration of habitats necessary for certain life history functions?[240]

In determining whether the proposed critical habitat designation for the Canada lynx adequately addresses the concept of resiliency, the FWS's rationale is that:

> "The proposed revised critical habitat addresses the concept of resiliency because the total area of the five units covers a large geographic area (42,753 mi\2\ (110,727 km2)), and because it contains the highest quality habitat in the United States."[241]

Given what is known about Canada lynx habitat and lynx populations in the contiguous United States, the FWS's assumption that the resiliency of the DPS will be adequately assured by conserving only locations that currently contain the highest quality in the United States, is arbitrary and capricious.

The Canada lynx in contiguous United States DPS likely exists as a metapopulation, where the population is composed of a number of discrete subpopulations within habitat patches connected by dispersal. Through time subpopulations may go extinct and be recolonized, but the larger metapopulation persists.[242] The populations in the metapopulation that constitutes the DPS, may exist as a shifting mosaic of source and sink areas.[243] In source environments, births outnumber deaths, and surplus individuals are produced. These individuals must disperse to have a chance of surviving.[244] Sink environments do not produce enough animals to sustain themselves, and populations in sink areas will go extinct in the absence of immigration. This generally leads to a recommendation to focus on conserving the largest populations in the highest quality habitat, as FWS has done here.[245] In source-sink models, it is generally assumed that a given area is assumed to be either a source or a sink environment permanently.[246] However, in the case of the lynx, McKelvey et al.[247] note that source-sink concepts are complicated by strong temporal components. They find that lynx habitats in the north that are sources in one phase of the lynx-hare cycle, may be strong sinks a few years later. In addition, prey dynamics change with vegetative succession, such that areas that are sinks today may be sources in a few decades or vice-versa.[248] Theoretical and empirical evidence from a

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[239] 73 Fed Reg at 39832
[240] 73 Fed Reg at 39801-39802
[241] 73 Fed Reg at 10871
[242] See McKelvey et al. 2000a.
[243] *Ibid*
[244] *Ibid*
[245] *Ibid*
[246] *Ibid*
[247] *Ibid*
[248] *Ibid*

variety of species demonstrates that it is not uncommon for habitat quality to vary over time within patches in a population network, such that areas that are sources at one point in time become sinks at another point in time, and vice-versa.[249] [250] Thus, it is important to recognize temporal dynamics in habitat quality, in determining the number, spatial arrangement and type of habitat patches that must be designated as critical habitat in order to ensure the persistence and recovery of the United States DPS. The FWS appears to have assumed that the spatial position of the highest quality lynx habitat on the landscape, will be constant over time. In order to ensure the persistence of the metapopulation that makes up the DPS, it may be necessary to conserve a larger number of subpopulations, capture a wider range of environmental variability, and designate critical habitat in areas that are currently unoccupied, or that support relatively small, isolated populations.

The FWS has not adequately assured the resilience and thus long-term persistence of the metapopulation that makes up the contiguous United States DPS, in the absence of immigration from Canada. The FWS has little or no control over management of lynx habitat in Canada. Anthropogenic impacts in Canada could limit or cut off immigration into the DPS from lynx populations in Canada. Regardless of whether the FWS can assure the continuance of immigration from Canada, it must assess the probability of persistence of the DPS independent of Canadian populations, in determining the number and spatial arrangement of populations necessary to ensure the resilience of the metapopulation. McKelvey et al. (2000) note that existing evidence suggests that the subpopulations with the DPS are small, and that further loss or reduction of size of any of these populations could sharply increase the risk of their individual and collective extinction. [251] The FWS must consider including a greater number of populations, across a wider range of environmental variability, as critical habitat.

Given that the location of source and sink habitats, within the metapopulation that makes up the DPS, are spatially and temporally variable, and that all of the populations within the metapopulation are relatively small, the Southern Rockies could make a substantial contribution to the persistence of the metapopulation under two conditions: 1) if there is occasional successful exchange of migrants between the Southern Rockies population and other populations, and 2) if population dynamics are likely to fluctuate asynchronously with population dynamics in core areas in the remainder of the DPS. As discussed previously, the Southern Rockies may occasionally exchange migrants with other core populations. Theory and empirical evidence suggest that spatial distance between populations often reduces synchrony in population dynamics.[252] In addition, spatial variance in habitat quality may interact with stochasticity caused by varying weather conditions, such that a set of dissimilar habitat fragments is unlikely to experience the most unfavorable conditions simultaneously.[253] Theory and empirical evidence suggest that under the two conditions outlined above, the Southern Rockies population may contribute substantially to population persistence, even if the population is a sink population that cannot sustain itself in the absence of immigration.[254] [255] [256] [257] [258]

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[249] Thomas, C. D., E. J. Bodsworth, R. J. Wilson, A. D. Simmons, Z. G. Davies, M. Musche, and L. Conradt. 2001. Ecological and evolutionary processes at expanding range margins. Nature **411**:577-581.

[250] Boughton, D. A. 1999. Empirical evidence for complex source-sink dynamics with alternative states in a butterfly metapopulation. Ecology **80**:2727-2739.

[251] See McKelvey et al. 2000a.

[252] Hanski, I. 1998. Metapopulation dynamics. Nature **396**:41-49.

[253] *Ibid*

[254] Boughton, D. A. 1999. Empirical evidence for complex source-sink dynamics with alternative states in a butterfly metapopulation. Ecology **80**:2727-2739.

The Southern Rockies region may serve as a refugium for the contiguous United States DPS of the Canada lynx in the face of predicted climate warming. As discussed previously, the Southern Rockies region encompasses a greater amount of high elevation terrain than the remainder of the areas occupied by the DPS. Occurrences of Canada lynx in the southern Rockies are, in general, at higher elevations (1,250 to over 3,750 meters (4,100-12,300 feet)) than other areas in the contiguous United States. This is especially true compared to areas outside of the western United States.[259] This high elevation habitat in the Southern Rockies may be very important to the ability of the Canada lynx to respond to climate change in the years to come. Research suggests that the snowline will rise 150m with every degree rise in Celsius,[260] and for elevations at or below 1500m, snow accumulation will especially be effected.[261] Therefore, since many lynx occurrences in the Southern Rockies are well above the 1500m mark, this habitat may retain snow conditions appropriate for Canada lynx, while snow conditions may deteriorate in many of the other core areas proposed for designation.

Similarly, research predicts that the forests that are prime lynx habitat will move upslope[262] making the higher elevations in the southern Rockies critical to the recovery of the lynx. In addition, some models predict that over the next 100 years subalpine fir will mostly recede from its range in the northern U.S. Rockies while several predict the species core range will remain strong in the Southern Rocky Mountains.[263]

Thus, preliminary evidence indicates that, because of its ecological setting in relatively high elevation habitats in the Southern Rocky Mountains, the reintroduced population in the Southern Rockies may be disproportionately important to ability of the DPS to persist as the climate warms.

There is still a great deal of uncertainty in predicting the implications of climate change on forest distribution,[264, 265] making it all the more critical to preserve as much habitat that fits the lynx critical habitat

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[255] Gonzalez, A., and R. D. Holt. 2002. The inflationary effects of environmental fluctuations in source-sink systems. Proceedings of the National Academy of Sciences U.S.A. **99**:14872-14877.
[256] Crone, E. E., D. Doak, and J. Pokki. 2001. Ecological influences on the dynamics of a field vole metapopulation. Ecology **82**:831-843.
[257] Foppen, R. P. B., J. P. Chardon, and W. Liefveld. 2000. Understanding the role of sink patches in source-sink metapopulations: reed warbler in an agricultural landscape. Conservation Biology **14**:1881-1892.
[258] Frouz, J., and P. Kindlmann. 2001. The role of sink to source re-colonisation in the population dynamics of insects living in unstable habitats: an example of terrestrial chironomids. Oikos **93**:50-58.
[259] See McKelvey et al. 2000b. (p. 245).
[260] Beniston, M. 2003. Climatic Change in Mountain Regions: A Review of Possible Impacts. Climatic Change 59: 5-31.
[261] Martin, E. and Y. Durand. 1998. Precipitation and snow cover variability in the French Alps. *Chapter 5 in* Beniston, M. and J.L. Innes. The Impacts of Climate Variability on Forests. Lecture Notes in Earth Sciences, vol. 74.
[262] Gonzales, P., R.P. Neilson, K.S. McKelvey, J.M. Lenihan, and R.J. Drapek. Potential Impacts of Climate Change on Habitat and Conservation Priority Areas for *Lynx Canadensis* (Canada Lynx). Report to: Watershed, Fish, Wildlife, Air, and Rare Plants Staff; National Forest System; Forest Service; U.S. Department of Agriculture; Washington, DC. and: NatureServe, Arlington, VA
[263] Natural Resources Canada. 2007. Climate Change Models for *Abies lasiocarpa*. Online at: [http://planthardiness.gc.ca/ph_gcm.pl?speciesid=1000014]
[264] Danby, R.K. and D.S. Hik. 2007. Variability, contingency and rapid change in recent subarctic alpine tree line dynamics. Journal of Ecology 95: 352-363.
[265] McKenney, D.W., J.H. Pedlar, K. Lawrence, K. Campbell, M.F. Hutchinson. 2007. Change on the Distribution of North American Trees. BioScience 57(11): 939-948.

description as possible. This will maximize the chances that, regardless of the effects of climate change, the lynx will still have habitat somewhere in the southern portion of its range in another 100 years.

Oftentimes, climate change research predicts that habitat types will extend beyond the northern extent and recede from the southern extent of the current range, thus assuming that the southern portions of a species range should not be a high conservation priority. However, the accuracy of current models used to predict the effects of climate change are questionable.[266, 267, 268] For instance, current climate change models have been shown to make inaccurate predictions for current-day scenarios when run on historical data or those models used most often come up with different results using the same data.[269] These models can be good for a first assessment of overall impacts from climate change,[270] but to be completely useful for a specific species, these models should also incorporate information on that species biological interactions with their environment (i.e. interactions with other organisms, ability to disperse, etc.).[271, 272] In short, caution should be used when utilizing current models to predict the impacts of climate change on specific species.

Little research has actually been devoted to low-latitude range margins, and studies suggest that these southern populations, or rear edge populations, should be given a greater consideration.[273] Hampe and Petit[274]discuss some studies which indicate that certain low-latitude populations may be more stable than high-latitude range populations, due to biotic factors and varied topography which affords species a greater degree of refuge from changing climatic factors. Current climate change models rely heavily on global climate data which "ignore that regional-scale climate changes can be buffered locally by topographic heterogeneity."[275] Therefore, the lynx in the Southern Rockies may be better equipped to survive future climate change impacts.

The FWS has failed to adequately consider the extent to which the Southern Rockies provisional core area may contribute to the persistence of the DPS, in light of projected climate warming.

I. The FWS has not weighed the benefits of excluding the Southern Rockies against the benefits of including the region in its critical habitat proposal.

The court in Natural Resources Defense Council v. United States Department of the Interior found the FWS' failure to designate critical habitat for the California gnatcatcher as arbitrary and capricious, saying that "Section [1533] (b) (2) states that the Secretary may only exclude portions of habitat from critical habitat 'if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat.'"[276] The Southern Rockies were not considered in the economic analysis of critical habitat

266 Zimmer, C. 2007. Predicting Oblivion: Are Existing Models Up to the Task? Science 17(317): 892-893.
267 Hampe, A. and R.J. Petit. 2005. Conserving biodiversity under climate change: the rear edge matters. Ecology Letters 8: 461-467.
268 Pearson, R.G. and T.P. Dawson. 2003. Predicting the impacts of climate change on the distribution of species: are bioclimate envelope models useful? Global Ecology & Biogeography 12: 361-371.
269 See Zimmer, C. 2007.
270 See Pearson and Dawson. 2003.
271 See Hampe and Petit. 2005.
272 See Zimmer, C. 2007.
273 See Hampe and Petit. 2005.
274 See Hampe and Petit. 2005.
275 See Hampe and Petit. 2005.
276 Natural Resources Defense Council v. United States Department of the Interior, 113 F.3d 1121, No. 95-56075 (Ct. of App. 9th Cir. 1997).

designation,[277] nor was there any discussion of the benefits of excluding the Southern Rockies in the proposed critical habitat designation. Therefore, the FWS has not fulfilled the requirement to show that the benefits of excluding the Southern Rocky Mountains outweigh the benefits of designating habitat in the region. The USFWS is acting in an arbitrary and capricious manner. We want to see the FWS issue a new rule, one in which the benefits of excluding the habitat in the Southern Rockies region has been weighed against the benefits of inclusion, and habitat is, therefore, designated.

J. The FWS must revise the proposed critical habitat designation to include the Southern Rockies provisional core area in the designation.

Given scientific uncertainty about the eventual outcome of the reintroduction effort, the relative contribution of various populations to the persistence of the DPS, and the potential impacts of climate change across the range of the Canada lynx, the FWS should err on the side of caution and include the Southern Rockies provisional core area in the critical habitat designation. Waiting until these answers are resolved poses an unacceptable risk to the Southern Rockies population and the DPS as a whole. Designation of the Southern Rockies as critical habitat is essential to the persistence and recovery of the contiguous United States DPS of the Canada lynx.

7. Comments in response to the Draft Environmental Assessment for Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx.

We appreciate the opportunity to comment on the draft environmental assessment for the lynx Critical Habitat proposal ("Draft EA"). The "Purpose and Need" section of this document indicates that preparation of an Environmental Impact Statement ("EIS") is necessary if the Proposed Action requires "added refinement," but not if it is "adopted with minimal changes" (p. 4). As indicated in these comments, we believe significant changes to the Proposed Action are needed, and thus we believe that preparation of an EIS is necessary.

We would like to comment on the following bulleted excerpts from the Draft EA.

- "Section 3(5)(C)… states that critical habitat "shall not include the entire geographical area which can be occupied by the threatened or endangered species" except when the Secretary of DOI determines that the areas are essential for the conservation of the species...

  Within the geographic area occupied by the species, the Service will designate only areas currently known to support the physical and biological features essential to the conservation of the species. If information available at the time of designation does not show an area provides features essential for the conservation of the species or that the area may require special management considerations or protection, then the area should not be included in the critical habitat designation." (pp. 8-9)

The FWS has failed to provide sufficient data to indicate the Southern Rockies and other portions of the lynx's current habitat omitted from this rule are not necessary to support a recovered lynx population.

[277] Industrial Economics, Inc. 2008. Draft Economic Analysis of Critical Habitat Designation for the Canada Lynx. Report prepared for the USDI Fish and Wildlife Service. October 2008. Available online at: [http://www.fws.gov/mountain-prairie/species/mammals/lynx/criticalhabitat.htm]

- "Destruction or adverse modification of critical habitat is determined using the Service's December 9, 2004 interim guidance on "Application of the 'Destruction or Adverse Modification' Standard Under Section 7(a)(2) of the Endangered Species Act" and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing of a species. Specifically, in Gifford Pinchot Task Force v. United States Fish and Wildlife Service, the Ninth Circuit invalidated the Service's regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the statutory provisions of the Endangered Species Act (Act), the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species." (p.9)

We appreciate this background information regarding the Service's implementation of the Critical Habitat regulation, and we concur that the last sentence is an appropriate description of it and the FWS's role in its implementation.

- "Designating critical habitat in every area considered within the geographic range of lynx was not carried forward as an alternative because the ESA specifies that, except in circumstances determined by the Secretary, critical habitat shall not include the entire geographic area that can be occupied by the species." (p.13)

We disagree with this interpretation of the Critical Habitat regulations. Failure to include habitat that is occupied by a Threatened or Endangered species or population in a Critical Habitat designation should be the exception, not the rule, since it is unlikely that imperiled wildlife typically occupy "extra" non-important habitat. We believe that the burden of proof is upon FWS to justify excluding any areas of currently occupied lynx habitat from the Critical Habitat designation, rather than the reverse.

[Oil and Gas section]

- "All leases say that before any disturbance may occur, surveys or studies may be needed to determine the extent of impacts on resources and whether mitigation would be required. Leases also say that if threatened or endangered species are observed during operations, the lessee shall stop doing anything that would result in the destruction of the species." (p.36)

These oil and gas leasing stipulations do not provide sufficient assurance that lynx and their habitat will be protected from energy exploration and development, and thus do not ensure FWS' obligations under the Endangered Species Act will be met.

- "According to Wyoming's Oil and Gas Conservation Commission, there are eight natural gas wells are in operation and eight other natural gas wells and one oil well that have been "shut-in". Of the eight active natural gas wells, seven are owned by Exxon Mobil Corporation in the southern portion of Bridger National Forest in Sublette County. The other well is owned by Fidelity Exploration and Production Company and lies just east of Yellowstone National Park in the North Absaroka Wilderness. The "shut-in" wells are owned by various companies including, True Oil LLC., Black Diamond Energy of Delaware Inc., Cimarex Energy Co., Exxon Mobil Corp., and Humble Oil and Refining (Industrial Economics, Inc. 2008)." (pp.37-38)

We believe this description significantly under-represents the extent of current and proposed energy exploration and development that may affect lynx and lynx habitat in Wyoming. We urge FWS to

supplement this description with additional information from its own field staff in Wyoming, and officials from the U.S. Forest Service, U.S. Bureau of Land Management, and the Wyoming governor's office.

- "Actions that would be expected to both jeopardize the continued existence of the lynx and destroy or adversely modify its critical habitat would include those that significantly and detrimentally alter its habitat over an area large enough that the likelihood of its survival and recovery is significantly reduced. Note that the scale of actions would be a crucial factor in determining whether they would directly or indirectly alter critical habitat to the extent that the value of the critical habitat for the survival and recovery of lynx would be appreciably diminished. Thus, the likelihood of an adverse modification or jeopardy determination would depend on the baseline condition of the species and the critical habitat." (p.41)

A correct interpretation of the Critical Habitat regulations indicates that the standard for "adverse modification" can be well short of jeopardizing the survival or recovery of the entire listed entity. We suggest FWS replace this language in the Draft EA with its earlier description mentioned above, "…the Service determines destruction or adverse modification on the basis of whether… the affected critical habitat would remain functional to serve its intended conservation role for the species" (p.9).

- "Since 2000, Federal agencies have been required to consider the effects of their actions on lynx and consult with the Service as appropriate. While a similar process is required for critical habitat, analysis of effects to critical habitat is not expected to cause large increases in the number or complexity of consultations. This is because no unoccupied habitat has been proposed for designation as critical habitat." (p.41)

As we indicated in this comment letter, we disagree with the Service's decision to limit its lynx Critical Habitat designation to occupied habitat only. The Proposed Action should be expanded to include all areas of occupied and unoccupied lynx habitat necessary to support a recovered lynx population, and the EIS that accompanies it should revise this language from the Draft EA accordingly.

Conclusion

Thank you for your consideration of our comments, and we look forward to working with FWS and other federal and state agencies to protect and restore lynx and their habitat in the lower-48 states.

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Appendix 2. Excerpt from our April 28, 2008 letter complete with references.

FWS Point 6. Whether lands the Southern Rocky Mountains contain the physical and biological features that are essential for the conservation of the species and the basis for why that might be so.

FWS must designate critical habitat in Colorado. Identified as a "provisional core" area in the Recovery Outline, this area is clearly inhabited by a breeding population of lynx and contains suitable lynx habitat. Verified historical records of lynx in Colorado date back to the late 1800's.[278] Native lynx were widely believed to be functionally extirpated in the Southern Rockies by the mid-1970s, though reliable reports of native lynx tracks exist into the 1990's. In an effort to restore a viable population of Canada lynx to Colorado, the Colorado Division of Wildlife (CDOW) initiated a reintroduction effort in 1997, with the first lynx released in Colorado in February of 1999. From 1999 to 2007, 218 lynx were released in Colorado.[279] CDOW has intensively monitored the reintroduced lynx and their offspring since the first release in 1999. The results of this monitoring effort to date have demonstrated that the reintroduction effort has resulted in high initial post-release survival, followed by long-term survival, site fidelity, reproduction, and recruitment of Colorado-born lynx into the breeding population.[280] CDOW is engaged in ongoing monitoring to determine whether Colorado can support sufficient recruitment to offset annual mortality for a viable lynx over time.[281]

Here, FWS fails to even attempt to apply its unlawful interpretation of what constitutes "occupied" habitat when defending its decision to avoid designating critical habitat in Colorado. Rather, FWS gives two primary justifications for its decision to avoid designating critical habitat in the Southern Rocky Mountains (in Colorado, Utah and Wyoming). First, the FWS states that, "the Southern Rocky Mountains are disjunct from other lynx habitats in the United States and Canada". (Federal Register, Vol. 73, No. 40, pg. 10860). Second, FWS states that, "Although Colorado's reintroduction effort is an important step toward the recovery of lynx, we are not proposing revised critical habitat in the Southern Rockies because of the current uncertainty that a self-sustaining lynx population will become established." Neither of the above constitutes acceptable rationale for the Service's failure to designate critical habitat in the Southern Rockies, which currently support a breeding population of Canada lynx.

Whether a population is self-sustaining is not a legitimate rationale for not designating critical habitat under the ESA. Nowhere in the ESA does it state that critical habitat will be designated only in the areas where populations are found to be viable over the long-term. Species that are listed under the Endangered Species Act are, by definition, at risk of extinction, and thus not currently self-sustaining or viable over the long-term. The intent of listing a species under the Endangered Species Act, and subsequent designation of critical habitat, is to address threats to the viability of populations of threatened and endangered species, so that population declines are reversed, and populations are restored to levels that are viable over the long-term, thus recovering the species. Limiting designation of critical habitat only to those areas that contain populations that are currently self-sustaining, would undermine the purpose of the Endangered Species Act, and make it impossible to recover endangered species. Further, determining a population's long-term

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[278] Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 1999. Ecology and Conservation of Lynx in the United States. U.S.D.A. Forest Service, Rocky Mountain Research Station, General Technical Report, RMRS –GTR-30WWW.

[279] Shenk, T.M. 2007. Post-Release Monitoring of Lynx to Colorado, July 2006-June 2007. Colorado Division of Wildlife Research Report, CO-3430-0670-1.

[280] See Shenk, T.M. 2007.

[281] See Shenk, T.M. 2007.

viability requires long-term monitoring of a number of demographic parameters, and is particularly difficult in the case of rare species. If FWS required that the long-term probability of persistence of a population be determined prior to critical habitat designation, then FWS would be unable to designate critical habitat for the large majority of listed species. In fact, the Recovery Outline states that, "[a]t the present time, there are inadequate methods available to develop lynx population estimates for each of the six core areas. Without methods to assess population size or trends, it is not yet possible to develop demographic criteria for delisting the species." This statement suggests that FWS does not know whether the populations in any of the core areas are viable over the long term. Yet, these six core areas are being proposed for revised critical habitat designation while the Southern Rockies is being excluded from designation as critical habitat because of uncertainty regarding whether the Southern Rockies population will be viable over the long-term. This is clearly arbitrary and capricious. In addition, though there is no conclusive evidence that the reintroduced lynx population in the Southern Rockies will be self-sustaining, there is also no conclusive evidence that they will not.

Further, in the case of listed species, the question of whether or not populations will be self-sustaining is inextricably linked to how such populations are managed, and particularly to how existing threats to the species are addressed. Designation of critical habitat could contribute significantly to the likelihood that the Southern Rockies population will be viable over the long-term. Failure to designate critical habitat may compromise the viability of this population. In the past, critical habitat has often been designated in habitats where populations of a particular species were not self-sustaining at the time of critical habitat designation. This is key to addressing the threats to a species, and making progress down the long road to recovery.

In addition, the USFWS has not sufficiently defined its criteria on which to decide when the Southern Rockies population will become self-sustaining. Although it is stated in the critical habitat proposal that it is uncertain whether this population will become self-sustaining, they do not lay out any measures in the proposal for determining if and when it has done so. Site specific criteria would be in the recovery plan, another of the Secretary's duties as described in the ESA. 16 U.S.C.A. § 1533 (f) (1) states: "The Secretary shall develop and implement plans…for the conservation and survival of endangered species and threatened species listed…unless he finds that such a plan will not promote the conservation of the species." In 16 U.S.C.A. § 1533 (f) (1) (B), it says the Secretary shall "incorporate in each plan—(i) a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species," and "(ii) objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list." As of yet, no such plan has been developed for the Canada lynx in the contiguous United States.

The USFWS has, however, come up with a recovery outline.[282] The purpose of this outline is to guide recovery efforts and "inform the critical habitat designation process for the contiguous United States population of the Canada lynx" until the draft recovery plan is developed. The recovery outline states the Southern Rockies region is a "provisional core" area but, again, gives no criteria for it to become a core area. The outline defines a core area as one with "both persistent verified records of lynx occurrence over time and recent evidence of reproduction." The reason the Southern Rockies are a provisional core is because, again, the population can not yet be determined whether it is a self-sustaining.

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[282] United States Fish and Wildlife Service. 2005. "Recovery Outline; Contiguous United States Distinct Population Segment of the Canada Lynx." Sept. 14, 2005. [http://mountainprairie.fws.gov/species/mammals/lynx/final%20lynx%20RecoveryOutline9-05.pdf]

The recovery outline does, however, go into detail about the next category listing which is called "secondary areas." These areas are classified as areas with historical records of lynx but no evidence of reproduction or no recent surveys recording presence of lynx or reproduction. The outline continues to say that "[i]f future surveys document presence and reproduction in a secondary area, the area could be considered for elevation to core." So, the provisional core of the Southern Rockies region is provisional because it is not yet proven to be self-sustaining even though there is evidence of presence and reproduction of Canada lynx. Yet, the criteria of presence and reproduction are the basis for which a secondary core area could be elevated to core. Therefore, the USFWS is being inconsistent and has not clearly defined the criteria for what it means for the Southern Rockies to be self-sustaining.

Interestingly, the recovery outline also states "[a]t the present time, there are inadequate methods available to develop lynx population estimates for each of the six core areas. Without methods to assess population size or trends, it is not yet possible to develop demographic criteria for delisting the species." So, no habitat in the Southern Rockies region is going to be designated because it is not known if the populations are viable; yet, as seen here, the USFWS does not have a clear idea about the populations in any of the core areas.

In D.C. "Jasper" Carlton v. Babbitt, Biodiversity Legal Foundation v. Babbitt,[283] the court found the USFWS decision not reclassify the Selkirk grizzly population as endangered arbitrary and capricious because they "failed to sufficiently explain how they exercised their discretion with regard to the statutory listing factors and drew conclusions that cannot be supported by the evidence in the record." Similarly, the USWFS in the current case is acting in an arbitrary and capricious manner because they have failed to adequately define the guidelines by which the Southern Rockies lynx population can be defined as self-sustaining.

Similarly, the ESA contains no provision for eliminating habitat that supports disjunct populations of a species as critical habitat. Disjunct populations may contribute to species persistence through a number of mechanisms, and FWS has often designated critical habitat in areas that support disjunct populations in the past. Further, lynx can
move long distances, and the FWS has not clearly established that the Southern Rockies population is actually isolated from populations further North.

In addition, Section [1533] (b)(2) states that the Secretary may only exclude portions of habitat from critical habitat 'if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat."[284] The USFWS does not state anywhere that they have compared the benefits of this exclusion against the risks and have found the benefits to outweigh the risks.

According to the FWS's own definition, the Southern Rockies contains habitat that meets the criteria for critical habitat designation.

FWS uses the following criteria to determine which areas may be appropriate for critical habitat designation: 1) the area was occupied by lynx at the time of listing; 2) there is strong evidence that lynx are currently

[283] D.C. "Jasper" Carlton v. Babbitt, Biodiversity Legal Foundation v. Babbitt, 900 F.Supp. 526, C.A. No. 93-1174 (PLF), C.A. No. 93-1788 (PLF) (D.C. Dis. Ct. 1995), [http://web.lexis.nexis.com].

[284] Natural Resources Defense Council v. United State Department of Interior, 113 F.3d 1121, No. 95-56075 (Ct. of Apop. 9th Cir. 1997)

widely distributed throughout area; 3) breeding and recruitment have been recorded in several locations; 4) boreal forest with primary constituent elements are present in that unit; 5) the area seems to support the highest density of lynx for that region; and 6) the habitat is in need of special management. The Southern Rockies unit fits all six of those criteria.

The reintroduction effort started in Colorado in 1999 [285] so there were definitely documented animals present at the time of listing. Because the reintroduction effort began before the actual listing, this effort does not officially fall under the ESA. Even so, it is unclear how many animals were in the area before the reintroduction effort began. The last legal taking was recorded in the winter of 1973 to 1974. However, evidence of native lynx had been recorded as late as 1998.[286] Thus, there is a strong indication that lynx did inhabit the southern Rockies in Colorado at the time of listing.

There is also strong evidence that lynx are widely distributed throughout the southern Rockies region. The most recent report on the status of the lynx reintroduction effort suggests that lynx are well distributed throughout large parts of Colorado, and have also dispersed into Utah, Wyoming, New Mexico, Nebraska and Montana. [287] The Southern Rockies geographical area is mainly in Colorado, extending into northern New Mexico and southern Wyoming.[288] Thus, there is evidence that the lynx populations are distributed throughout this region.

Within the Southern Rockies unit, breeding and recruitment have been documented at multiple locations, and over several years.[289] It is also likely that there are undocumented births by females that are no longer being tracked or were born in Colorado and have never been collared.[290]

In the recovery outline put out by the USFWS, they state that boreal forest habitat able to support Canada lynx populations extends down into the southern Rockies.[291] Although this habitat is patchier in the southern extent, the boreal forests in the southern Rockies are indeed comprised of the primary constituent elements essential to lynx recovery. These elements are: "(1) Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing: (a) Presence of snowshoe hares and their preferred habitat conditions…; and (b) Winter snow conditions that are generally deep and fluffy for extended periods of time; and (c) Sites for denning that have abundant coarse woody debris…"[292] The Canada Lynx Conservation Assessment and Strategy[293] verifies the presence of all these elements within the Southern

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[285] Colorado Department of Natural Resources. 2002. "Colorado Lynx Reintroduction and Augmentation Program>" Date accessed: February 1, 2006. [http://wildlife.state.co.us/NR/rdonlyres/D8976105-8D2C-4788-A82A-08CD0961E74A/0/reintro_augmentation.pdf]

[286] Fuediger, Bill, Jim Claar, Steve Gniadek, Bryon Holt, Lyle Lewis, Steve Mighton, Bob Naney, Gary Patton, Tony Rinaldi, Joel Trick, Anne Vandehey, Fred Wahl, Nancy Warren, Dick Wenger, and Al Williamson. 2000. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Missoula, MT

[287] See Shenk, T.M. 2007

[288] Bureau of Land Management. "Southern Rocky Mountains." Date Accessed May 5, 2006. [http://www.blm.gov/wildlife/pl_62sum.htm].

[289] See Shenk, T.M. 2007

[290] See Colorado Department of Natural Resources (2006).

[291] United States Fish and Wildlife Service (2005).
See Ruediger et al. (2000).

[292] See 70 FR 68294.

[293] See Ruediger et al. (2000).

Rocky Mountains of Colorado. Therefore, the Southern Rocky Mountains do have boreal forest habitats consisting of the primary elements necessary for lynx conservation.

Finally, the Southern Rockies region, especially the core reintroduction area, is in need of special management. The Canada Lynx Conservation Assessment and Strategy details several risk factors particular to lynx in the Southern Rocky Mountains. These include fire exclusion, grazing, recreational uses, and predator control only to name a few.[294] In the 2003 report "Lynx Conservation in the Southern Rocky Mountains: Agency Neglect Threatens Lynx Recovery," Center for Native Ecosystems (CNE) and other Southern Rocky regional non-profit groups outline several promises made by the U.S. Forest Service and the Bureau of Land Management to conserve lynx populations on federal lands. Many of these promises were made through the signing of the "Lynx Conservation Agreement" in 2000 by both of these agencies. With these promises in mind, the USFWS stated in its 2000 Biological Opinion that the management strategies of these agencies would not jeopardize lynx survival.[295] However, at the time of CNE's report, neither agency had fulfilled several of its promises. As eighty-two percent of land in the Southern Rocky Mountains is federal land,[296] this habitat is definitely in need of the added critical habitat protection.

There are a number of additional reasons why lynx habitat in the Southern Rockies meets the criteria for critical habitat designation. First, the Southern Rockies contains no less than eight percent of the remiaing lynx habitat in the contiguous United States. Second, given that the Southern Rockies population is distant from other populations in the contiguous U.S., and occupies somewhat different habitat, its population fluctuations (due to environmental stochasticity or catastrophes) may be asynchronous with those of more connected lynx populations, and thus may help reduce the risk of extinction due to environmental stochasticity or catastrophe. Third, habitat in the Southern Rockies constitutes an important component of the historic geographic and ecological distribution of the species. Fourth, lynx can disperse over long distances, and may persist as a metapopulation, and the Southern Rockies population may contribute to metapopulation persistence through a number of mechanisms. Finally, Emerging theoretical work and empirical evidence suggests that populations at the margin of species' geographic ranges may make a larger contribution than previously thought, to species persistence, among and within-population genetic diversity, and local ecosystem structure and function.

Designating critical habitat in the Southern Rockies would positively contribute toward ensuring the long-term viability of the Southern Rockies lynx population, and therefore would contribute toward the long-term survival and recovery of the species. Colorado contains no less than eight percent of remaining lynx habitat in the contiguous United States. Critical habitat designation would be an effective regulatory mechanism to address several of the most critical factors affecting lynx survival in the Southern Rockies as well as several of the greatest sources of habitat fragmentation, degradation, and loss.

It is clear that the remaining suitable lynx habitat in Colorado must be protected because it has been, and will continue to be, impaired by a variety of human activities.[297] Colorado Division of Wildlife data

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294 See Ruediger et al. (2000).

295 Center for Native Ecosystems. November 4, 2003. "Lynx Conservation in the Southern Rocky Mountains: Agency Neglect Threatens Lynx Recovery." Date Accessed May 5, 2006. [http://www.nativeecosystems.org/lynx/Lynx_Conservation_Report.pdf].

296 See Defenders of Wildlife v. Norton (2002).

297 *See, e.g., id.* at 40,093 (acknowledging that in the "Southern Rocky Mountains 77 percent" of lynx habitat is in "developmental allocations," and that "[a]ctivities that may be detrimental to lynx or lynx habitat, such as some timber harvest regimes and fire suppression, can occur in developmental allocations"); *id.* at 40,097 (acknowledging that "[i]n

indicates that human-caused mortality accounts for 30.6% of all lynx mortality in the Southern Rockies[298]. This includes significant mortality from motor vehicle collisions. As the regional population continues to grow and its concomitant infiltration into the mountain habitat of the lynx continues, pressures on lynx habitat and the opportunities for human disturbance of lynx and their habitat will only grow. As development, including infrastructure to support oil and gas drilling and development associated with ski area expansion, continues to encroach on lynx habitat in the Southern Rockies, the opportunities for collisions with vehicles and other human-related mortality will only grow. As development continues to encroach, the secondary negative effects such as increased access to lynx habitat for competitors like coyotes will only grow.

Critical habitat designation offers the opportunity to appropriately scale, refine, and redirect such future development to maintain the viability of the most crucial segments of habitat and minimize its contribution to individual mortality as well as habitat fragmentation, degradation, and loss. Currently, a significant amount of new development activity is approved in lynx habitat, even after consultation under Section 7 of the ESA, which is incompatible with maintaining habitat usability and viability. This indicates that the current mechanisms available to effect preservation of crucial habitat for lynx in the Southern Rockies are inadequate. Given the nature and magnitude of the primary threats to lynx habitat in the Southern Rockies, such as logging, conversion through residential and industrial development, and fragmentation and degradation from roads, we must take a landscape-level approach to identifying and protecting the most important patches of core lynx habitat in the Southern Rockies while also having the ability to significantly mitigate or deny truly inappropriate activities in those crucial patches. Critical habitat allows us to do both by providing the appropriate standard of consideration for habitat viability in the appropriate locations.

Colorado contains no less than eight percent of remaining lynx habitat in the contiguous United States, and it is clear that the remaining suitable lynx habitat in Colorado must be protected as it has been, and will continue to be, impaired by a variety of human activities.[299] For example, the increased interest in skiing poses an increasing threat to lynx in Colorado. Kelley, J. 2006. Number of visits piling up at Colorado's ski resorts. *Rocky Mountain News*. March 14, 2006. Snow sports are noted throughout the LCAS as one of the primary causes of lynx habitat degradation. The compaction of snow that results from winter activities, such as skiing and snowmobiling, effectively removes the lynx's morphological advantages in deep snow and provides access to potential competitors into areas they would normally be unable to infiltrate.

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local areas, lynx may be negatively influenced by high traffic volume on roads that bisect suitable lynx habitat and associated suburban developments that contribute to the loss of habitat connectivity" and that this risk is "higher" in Colorado than elsewhere).

[298] See Shenk, T.M. 2007

[299] *See, e.g.,* 68 Fed. Reg. 40076 (July 3, 2003) (Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx) at 40,093 (acknowledging that in the "Southern Rocky Mountains 77 percent" of lynx habitat is in "developmental allocations," and that "[a]ctivities that may be detrimental to lynx or lynx habitat, such as some timber harvest regimes and fire suppression, can occur in developmental allocations"); *id.* at 40,097 (acknowledging that "[i]n local areas, lynx may be negatively influenced by high traffic volume on roads that bisect suitable lynx habitat and associated suburban developments that contribute to the loss of habitat connectivity" and that this risk is "higher" in Colorado than elsewhere).