January 26, 2025

To: Amity Bass, Field Supervisor (amity_bass@fws.gov)
Carly Lewis, Species Lead (carly_lewis@fws.gov)
Justin Shoemaker, Region 6 Lead (justin_shoemaker@fws.gov)

Federal eRulemaking Portal: https://www.regulations.gov FWS–R6–ES–2024–0142

U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shephard Way, Suite 1
Helena, MT 59601

Re: Comments on the DOI Fish and Wildlife Service Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Contiguous U.S. Distinct Population Segment of the Canada Lynx. Federal Register Vol. 89 No. 230, November 29, 2024. Proposed Rule.

Fish and Wildlife Service:

These comments are submitted on behalf of the Yellowstone to Uintas Connection, Alliance for the Wild Rockies, Conservation Congress, Council on Wildlife and Fish, Gallatin Wildlife Association, Native Ecosystems Council, Sage Steppe Wild, and Swan View Coalition. These organizations are non-profit entities that engage on public land issues affecting wildlife. More than the allotted 60 days is really needed for response, but we have summarized our findings and recommended management for Canda lynx Rocky Mountains and hope our work is read and studied carefully, as it represents a very large investment of time, and we think uniquely provides quantitative analysis using the models you have adopted.

Sincerely,

John Carter, Ecologist
Yellowstone to Uintas Connection
PO Box 464
Bondurant, Wyoming 82922
435-881-5404
Jcoyote23@gmail.com

And also, for the following:

Mike Garrity, Director
Alliance for the Wild Rockies
PO Box 505
Helena, Montana 59624
wildrockies@gmail.com

Denise Boggs, Director
Conservation Congress
1604 1st Ave S
Great Falls, MT 59401
denise@conservationcongress-ca.org

Steve Kelly, Director
Council on Wildlife and Fish
PO Box 4641
Bozeman, Montana 59722
troutcheeks@gmail.com

Clint Nagel, President
Gallatin Wildlife Association
P. O. Box 5317
Bozeman, MT 59717
www.gallatinwildlife.org

Sara Johnson, Director
Native Ecosystems Council
PO Box 125
Willow Creek, Montana 59760
sjjohnsonkoa@yahoo.com

Jonathan Ratner, Director
Sage Steppe Wild
31 Old Tie Hack Rd
Cora, Wyoming 82925
jonathan@wild-sage.org

Kieth Hammer, Director
Swan View Coalition
3165 Foothill Road
Kalispell, Montana
keith@swanview.org

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The U.S. Fish and Wildlife Service Federal Register Notice[1] (Notice) proposes to revise the critical habitat for the contiguous population segment of the Canada lynx due to a court order for not designating critical habitat in Colorado and five National Forests in Idaho and Montana, and because there is new information on Canada lynx habitat in the western U.S. **They are seeking information on: the amount and distribution of lynx habitat; any additional areas that should be included; special management considerations and managing for climate change; land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat; areas for exclusion; and improving the approach to designating critical habitat.**

Prior comments

1. **January 25, 2023 (link).** Species Status Assessment (SSA) for the Canada Lynx (Lynx Canadensis) Contiguous United States Distinct Population Segment. Version 1.0, October, 2017.

   These comments provide a brief review of the regulatory history and science involved in the ESA listing for Canada lynx and subsequent land management on National Forests. The review reveals that much of science is misinterpreted to favor human activities that degrade and fragment lynx habitat, while absence of evidence due to lack of studies is used to claim these activities either have little effect or in the case of timber manipulation, can even be beneficial. A review of the NRLMD and its application in linkage and peripheral areas as incorporated into Forest planning uses the Caribou NF as an example. The NRLMD provides limited guidance and protection to the Caribou NF as it is deemed "unoccupied"

[1] Department of the Interior, Fish and Wildlife Service. 2024. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Contiguous U.S. Distinct Population Segment of the Canada Lynx. Federal Register 89 No. 230 (pp 94656 – 94680) dated November 29, 2024.

by lynx. This is despite evidence that lynx persisted in the CNF over historical times. This "unoccupied" status results from failing to find current evidence of lynx long after habitats have been fragmented by mines, high road density, an explosion in motorized recreation accessing nearly every acre of land, timber projects, and including habitat alteration by livestock grazing. The CNF Forest Plan includes recognition of lynx linkage, but the provisions in that plan for linkage habitat lack adequate quantification and standards.

Noting that there is a lack of emphasis on landscape connections between core areas of the DPS, analysis and mapping is provided showing the existence of long recognized regional wildlife corridors. The principal corridor is the Yellowstone to Uintas Connection linking the Greater Yellowstone Area (GYA) to the Uinta Mountains and Colorado which passes through SE Idaho from lynx critical habitat in Wyoming. This is the most continuous high elevation, forested corridor making this connection. It also aligns with the CNF linkage to other areas. Protection and restoration of this and other corridors is essential to promote lynx connectivity and sustain meta-populations.

This review shows that regulatory mechanisms are inadequate to protect lynx habitat and connectivity. Monitoring snowshoe hare habitat and populations as well as lynx presence in these southern areas of the DPS is inconsistent. While some habitat mapping and modeling has been done, it is not being applied or expanded to identify and describe in sufficient detail the habitats and migration corridors needed for lynx to persist. Land management plans must be updated and amended to provide data-based criteria and quantitative standards to ensure habitat for lynx and snowshoe hare are connected and functional.

2. **January 29, 2024 (link)**. Draft Recovery Plan for the Contiguous United States Distinct Population Segment of Canada Lynx (Lynx Canadensis). November 2023.

In these comments we pointed out the misuse of the term Boreal Forest to characterize lynx habitat in the U.S. Boreal Forest occurs in Canada. Historical Canada lynx observations in the western U.S. occurred in Kuchler forest types that include Douglas fir, Englemann spruce, lodgepole pine, mixed conifer, whitebark pine, limber pine, and other associated types that are intermixed therein. We focused our analysis on the Greater Yellowstone Area which included nine National Forests and two National Parks with a total area of 16 million acres, of which 9.1 million acres are forested. Analysis Unit 5 (Unit 5) lies within these National Forests and Parks.

We illustrated the Olson (2021) Model within this area showing large areas of suitable habitat. Unit 5 Focal Areas were fragmented by prior clearcuts, and the Focal Areas were not connected. This raised uncertainty regarding the Model

ability to separate out or characterize fragmented habitat and would suggest that Focal Areas be expanded to account for the fragmentation, provide connectivity and address recovery of the fragmented areas. The Beauvais et al (2001) Model[2] showed most of this area to have high suitability for lynx habitat. See also Ehle (2002)[3]

We pointed out that the age of clearcuts and other forest projects need to be considered as habitat as their recovery takes place, citing Holbrook et al (2018)[4]. In addition, connectivity should be addressed, reflecting Kosterman (2014)[5]. We noted the 1988 Yellowstone Fires that affected nearly 800,000 acres now, nearly 40 years later should be considered as habitat as it would be a later stage of regeneration. We used the Caribou National Forest as an example of the analysis process for evaluating connectivity.[6]

Assessments and the resulting Recovery Plan have engaged in dismissing history of lynx occupancy in the southern portion of its range, have used an experimental model as opposed to actual habitat parameters such as vegetation types, and have not assessed current and potential habitat conditions. There is no quantitative habitat criteria used to describe current habitat and connectivity. Most human activities such as recreation, road density, trapping that affect lynx are dismissed due to "lack of evidence". Connections, or linkages between core populations, and peripheral areas were not addressed.

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[2] Beauvais, G., D. Keinath, and J. Ratner. 2001. Habitat mapping and field surveys for lynx (Lynx canadensis) on lands administered by the USDI - Bureau of Land Management in Wyoming. Report prepared for the USDI Bureau of Land Management-Wyoming State Office by the Wyoming Natural Diversity Database-University of Wyoming, Laramie, Wyoming. https://app.box.com/s/8mmrshcf2yv5dd1rwcldmg15z5gvvgtr

[3] Ehle, D.S. and Keinath, D.A. 2002. Habitat Mapping of Lynx Analysis Units on Bureau of Land Management Lands and Surrounding Areas in Wyoming. Wyoming Natural Diversity Database. https://app.box.com/s/oi16uss3gtljxrt53utjv4tgapodn0gx

[4] Holbrook, J.D., Squires, J.R., Bollenbacher, B., Graham, R., Olson, L.E., Hanvey, G., Jackson, S., Lawrence, R.L., 2018. Spatio-temporal responses of Canada lynx to silvicultural treatments within the Northern Rockies, U.S. For. Ecol. Manage. 422, 114–124. https://app.box.com/s/ycvcj6bihda4tvde5xgw0imwt282fklm

[5] Kosterman, Megan K., "Correlates of Canada Lynx Reproductive Success in Northwestern Montana" (2014). Theses, Dissertations, Professional Papers. Paper 4363. https://app.box.com/s/ku06s8g268s3p4dvwdbaglkjdr5neg1w See also: Kosterman MK, Squires JR, Holbrook JD et al (2018) Forest structure provides the income for reproductive success in a southern population of Canada lynx. Ecol Appl 28:1032–1043. https://doi.org/10.1002/eap.1707 https://app.box.com/s/1ecvhd4nznc1wdppvyu6naufzpiwzr80

[6] USDA Forest Service. 2003. Final Environmental Impact Statement for the Caribou National Forest Revised Forest Plan. Appendix IV. https://app.box.com/s/pqa6bwpxznxwh7mx7g4i370jbzerlnne

Specific positions contained in the DRP were challenged (p17 – 25). Please review these in the attached copy of our comments.

3. **February 15, 2024 (link).** Supplemental Comments on the Draft Recovery Plan (DRP) for the Contiguous United States Distinct Population Segment of Canada lynx (Lynx canadensis).

These comments pointed out the narrow focus of the SSA Appendix and Draft Recovery Plan and designated SSA 5 Focal Unit and SSA 5 Focal Area. These omit large areas of suitable modeled lynx habitat in Central and SE Idaho, Southwestern Montana, and Western Wyoming. It is our contention that the boundaries for the FU and FA are arbitrarily drawn and thereby eliminate consideration of habitat and linkages (current and potential) occurring in these wider areas.

Using the Olson (2021) Model[7], we analyzed the National Forests, National Parks, Critical Habitat, Focal Units, and Focal Areas within the GYA and ranked the Olson probability classes for each. A chart of National Forests visualized the rankings, showing that the Bridger-Teton NF contained the most high and moderate probability habitat, followed by the Caribou-Targhee, and Bitterroot NFs. Ranger Districts within the NFs were also ranked. With those in the Bridger-Teton NF and the Caribou-Targhee NF ranking the highest.

We concluded that the SSA Unit 5 must be expanded to also include the National Forests we have identified here that are in SW Montana, Central and SE Idaho, and Western Wyoming. (Figure 3). These and other land management units contain millions of acres of potential lynx habitat that will remain without adequate analysis and regulatory protection if this DRP goes ahead under its current, limited focus.

We have focused on connectivity and linkage for lynx. These linkages tend to follow the higher elevation areas and the least cost path between those. The Bates and Jones (2007) model we provided in our initial comments mapped corridors and cores in the connection between the GYA and the Uinta Mountains in Utah.[8] That effort needs to be expanded to identify connections within and from the Greater Yellowstone Ecosystem to both the northern and southern Rockies. This connection has already been mapped as the Regionally Significant

[7] Olson et al. 2021. Improved prediction of Canada lynx distribution through regional model transferability and data efficiency. Ecology and Evolution 11:1667 – 1690. https://app.box.com/s/32ww5q3ci96now3zy1fd2qgxzdf4lb21

[8] Bates, W. and Jones, A. 2007. Least-Cost Corridor Analysis for Evaluation of Lynx Habitat Connectivity in the Middle Rockies. Report to the Nature Conservancy by the Wild Utah Project, Salt Lake City. https://app.box.com/s/0g8b1ryqg1iz6r1fd61rdkc8fso97oh5

Wildlife Corridor which includes the higher elevation areas.[9] Now, a detailed look at current and potential forest cover needs to happen and FWS needs to produce this map along with effective, quantitative criteria for maintaining and restoring these connections and core areas.

We reiterated that no evidence has been provided that demonstrates the current Northern Rockies Lynx Management Direction has been effective. The statement from the SSA Appendix that, "SSA Units that have been modified based on recent verified occurrence data to represent the current distribution of lynx in the contiguous U.S.", indicates continued shrinkage of lynx occupancy without an actual analysis or summary of where the monitoring occurred and what was found. Were the National Forests (NF) and Parks we identify herein included in a monitoring effort? Our look at this indicates that monitoring is patchy, while recent observations are subject to ongoing habitat modification which then feeds back to less area used by lynx. We suggested next steps of analysis.

Comments on the Critical Habitat Proposal

1. Proposed Critical Habitat (CH)

The Notice cites the ESA definition of critical habitat as:

> (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary of the Interior (Secretary) that such areas are essential for the conservation of the species.

The Notice made several points regarding designation of CH for Units 3, 5, and 6.

> Unit 3 was occupied at the time of listing and is currently occupied and directly connected to the habitat and population in Canada. Unit 5 has small pockets of habitat on the Bridger-Teton NF and recent modeling (Olson et al 2021) shows this area does not contain the physical and biological features necessary to support lynx residency and is not directly connected to lynx habitats elsewhere. In Unit 6 it is uncertain whether this unit historically supported a resident population or if present, it was ephemeral. It is not connected to lynx habitats

[9] Wasatch Cache Revised Forest Plan and Final Environmental Impact Statement Regionally Significant Wildlife Corridor. 2003. Accessed on January 18, 2025. https://www.fs.usda.gov/detail/uwcnf/landmanagement/projects/?cid=stelprdb5076923

elsewhere. It now supports a resident population as the result of the State of Colorado reintroductions.

We obtained historical lynx observation records from the Beaverhead-Deerlodge NF[10], Montana Natural Heritage Program[11], and the Wyoming Game and Fish Department[12]. We mapped these records to illustrate the areas historically used, some of which occur up to the current time. (Figure 1). We requested but have not received the Idaho observation records. The map shows historic lynx concentration areas in Units 3 and 5. Unit 5 has widespread observation records which argue for a broader critical habitat designation of Unit 5 in total. The Notice claim of lack of habitat doesn't match with the historical presence of lynx. While the lack of lynx in Unit 5 today might be used to argue there is no habitat, the Notice and FWS ignore that Colorado likely was not occupied at time of listing, while Unit 5 was having many lynx observations during and following listing. Even as recently as February 2022, a Canada lynx was observed in the Bridger-Teton National Forest in the Gros Ventre Range.[13] The point is that lynx are present in the GYA Unit 5 and Unit 5 should be given the same consideration as Unit 6 which was not occupied. The lynx population in Unit 5 could be supplemented by reintroductions as was done in Colorado and critical habitat remain as designated in 2014 or increased to capture more suitable and high value habitat and connections.

We looked at how the Analysis Units, Focal Areas, and Critical Habitats captured the overall observations for the Wyoming and Montana Natural Heritage Program databases since these include observations pre- and post-listing of lynx. (Table 1). We also looked at the Flathead NF to see how the MNHP observations with low location uncertainty (100 meters or less) compared to the Olson et al (2021) habitat probability. The Olson Model output we received consists of a tiff image of pixels (250 meters square) for low (1), moderate (2), and high (3) probability. When we compared the lynx observations in the Flathead NF to the Olson Model, we found that category 2 and 3 captured 86% of the MNHP observations. (Figure 2).

[10] Records obtained from the Beaverhead-Deerlodge NF in the form of a layer file: Historic Lynx Records (citing McKelvey et al, 1999). https://app.box.com/s/6bg8w6k5ru1axlv3zcm5ba2tt3gjz9hg

[11] Montana Natural Heritage Program, Montana Animal Observations. Accessed: April 24, 2024. https://nris.mt.gov/reqapp/userMain.asp

[12] Wyoming Game and Fish Department. Lynx_canadensis_observations_statewide. Received on January 10, 2025.

[13] Koshmiri, M. 2024. Rare Wildcat Documented in the Yellowstone region for first time in a decade. Wyofile June 7, 2024. https://wyofile.com/rare-wildcat-documented-in-the-yellowstone-region-for-first-time-in-a-decade/

Figure 1. Lynx Observations in the Rocky Mountains

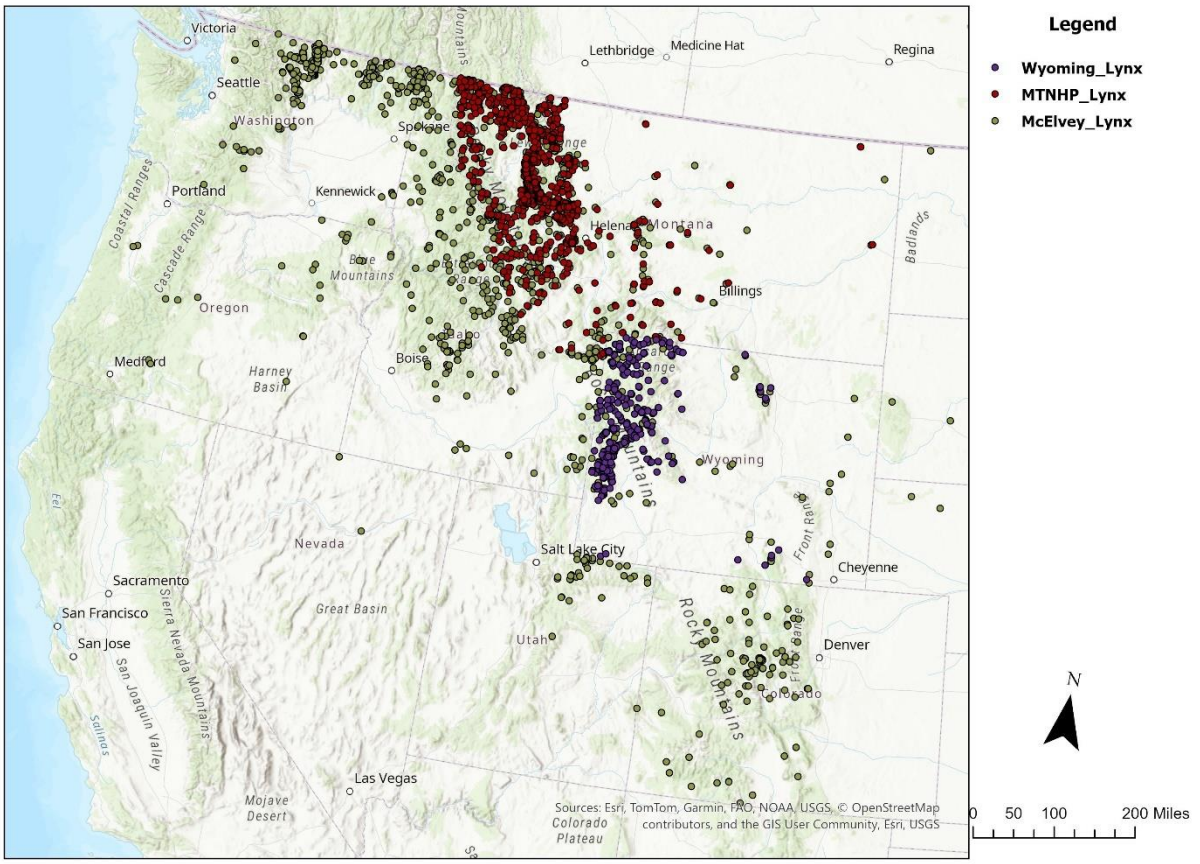
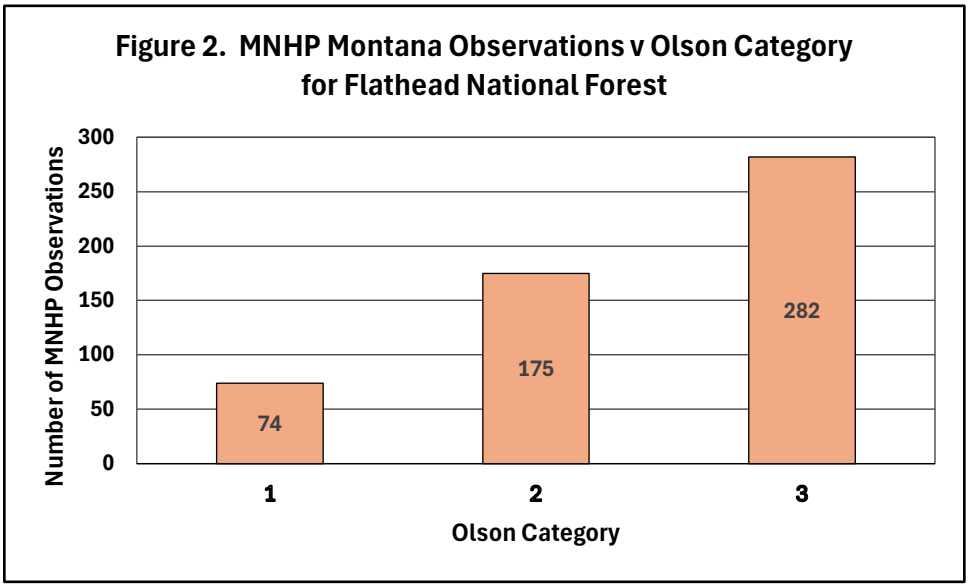


Table 1. Analysis Units 3 and 5 Lynx Observation Comparisons

Rocky Mountain Management Areas	MNHP Observations Captured/Percent of Overall	Wyoming Observations Captured/Percent of Overall
Overall Observations	2414/100%	314/100%
Unit 3	2244/93%	
Unit 3 FA	1817/75%	
Unit 3 CH 2014	1973/82%	
Unit 3 CH 2024	1821/75%	
Unit 5		198/63%
Unit 5 FA		73/23%
Unit 5 CH 2014		175/56%
Unit 5 CH 2024		73/23%



Here we see for Unit 3 that the 2024 proposed CH captured 75% of the MNHP observations which was less than the 2014 CH (82%) and much less than Unit 3 overall (93%). In Unit 5, the 2024 CH captured 23% of the Wyoming observations which was less than the 2014 CH (56%) and Unit 5 overall (63%).

Critical Habitat should be expanded in Unit 3 to include all of Unit 3 which captures 93% of observations. Critical Habitat in Unit 5 should be expanded to also capture the habitat level of Unit 3, or the 86% capture we found in the Flathead NF. In addition, connections to Units 3 and Unit 6 from Unit 5 will be necessary to retain genetic flow. Later in these comments we will address the expansion of protections into SE Idaho, NE Utah, and NW Colorado in the Yellowstone to Uintas Connection.

Squires et al (2010)[14] studied lynx in the Swan River drainage near Seeley Lake, Montana. The area was bordered by the Mission Mountain and Bob Marshall Wilderness areas. See Figure 3 for a map illustrating how studies or areas accessible to people can result in more observations compared to areas such as wilderness where human presence is low in winter. Does this mean, therefore, that the wilderness is not a suitable habitat? This speaks to the need for ongoing standardized surveys. This is a necessary element of any recovery effort.

We also looked at MNHP observations in Glacier National Park (GNP). (Figure 4). This shows scattered lynx observations that are lower in density than areas outside the park. Does this

[14] Squires, J.R., Decesare, N.J., Kolbe,J.A., and Ruggiero, L.F. 2010. Seasonal Resource Selection of Canada Lynx in Managed Forests of the Northern Rocky Mountains. Journal of Wildlife Management, 74(8):1648-1660. 2010. Published By: The Wildlife Society DOI: 10.2193/2009-184 URL: http://www.bioone.org/doi/full/10.2193/2009-184

mean the park has little suitable lynx habitat? Note the observations are along valleys where people may have access in winter, but not the wider area. A park-wide occupancy survey using motion activated cameras found a mean of 52 individual lynx and density of 1.28/100 km^2. Later, when we look at the Olson et al (2021) Model and its mean habitat probabilities across management areas, we see that Glacier NP is not rated high, yet it has a significant population. This argues for an expanded interpretation of Olson et al (2021) to include areas with mean habitat probabilities at least at or higher than Glacier NP.

Figure 3. Lynx Observations Adjacent to Bob Marshall Wilderness

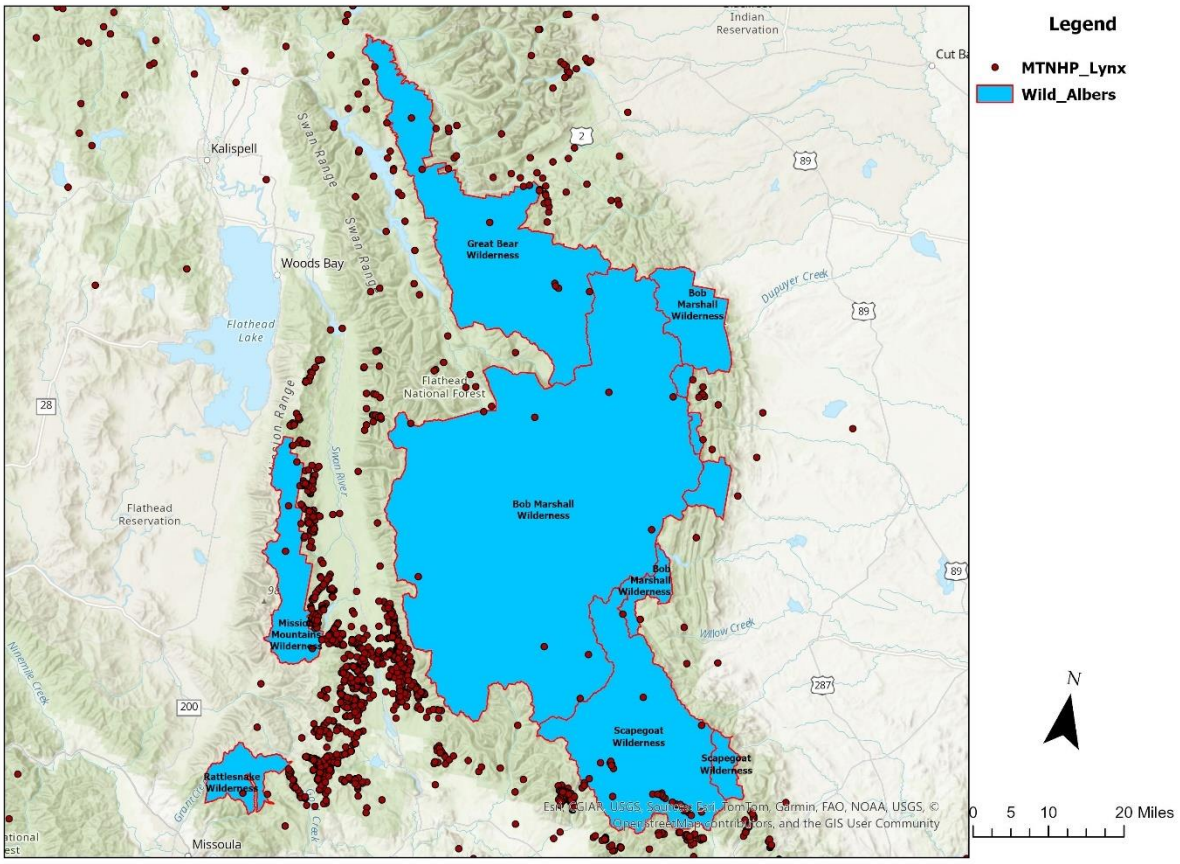
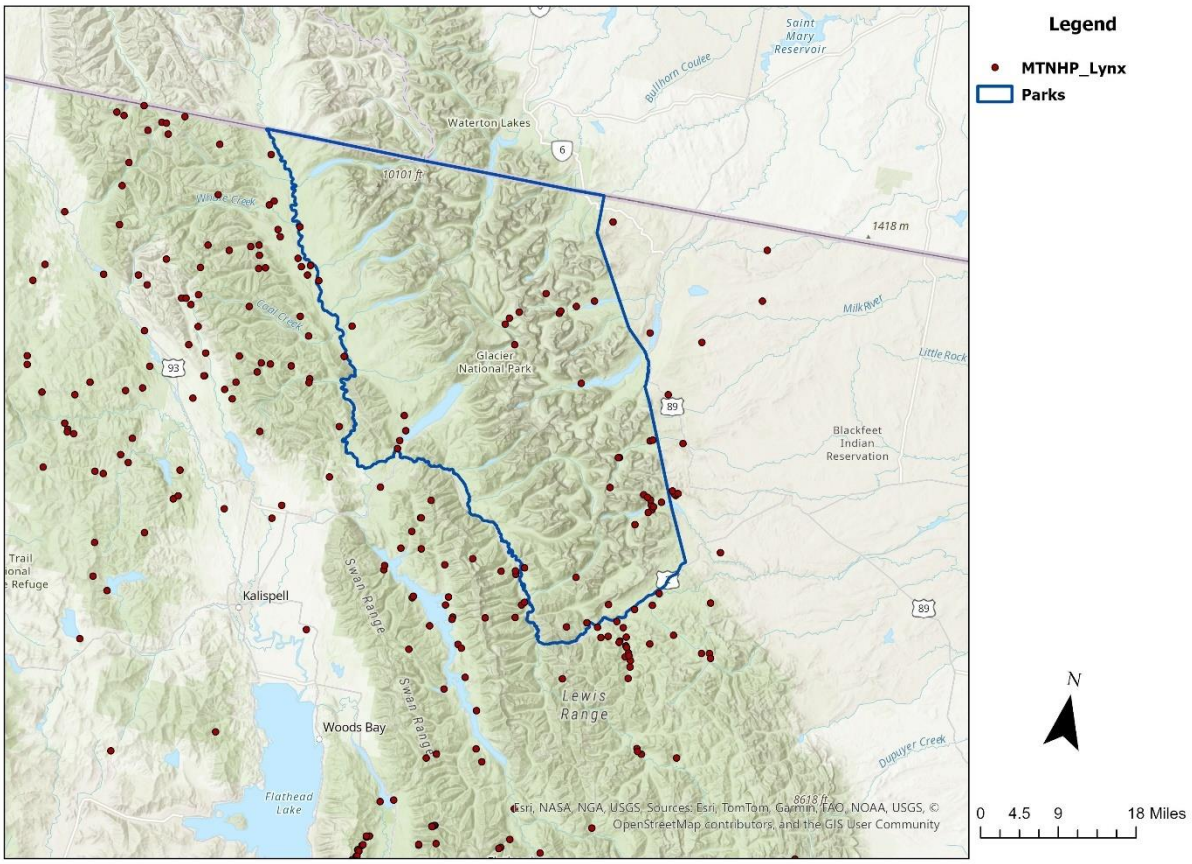


Figure 4. MNHP Lynx Observations Glacier National Park and Surrounding Area



In another example, the FEIS for the Dairy Syncline Mine in the Canada lynx linkage in SE Idaho shows 6 lynx observation locations (FEIS Figure 3.7.2), but we have no coordinates and dates for these.[15] The FEIS notes that IDFG Fish and Wildlife Information System records contain one observation of a female lynx with two cubs in August 2005, two miles southeast of the Blackfoot River Narrows and approximately 0.5 mile from the wildlife Study Area. (FEIS p3-169). These observations occurred in either or both the Soda Springs and Montpelier Ranger Districts of the CNF. " The Montpelier and Soda Springs Ranger Districts, including the Study Area, have been identified as potential linkage habitat between the 'core' Canada lynx habitat in Bridger-Teton National Forest and "'peripheral' habitat in the Ashley National Forest in Utah (USFS 2003b[16]; USFS 2007[17])". Also see Figure 1 from the FEIS for the Northern Rockies Lynx Management Direction.

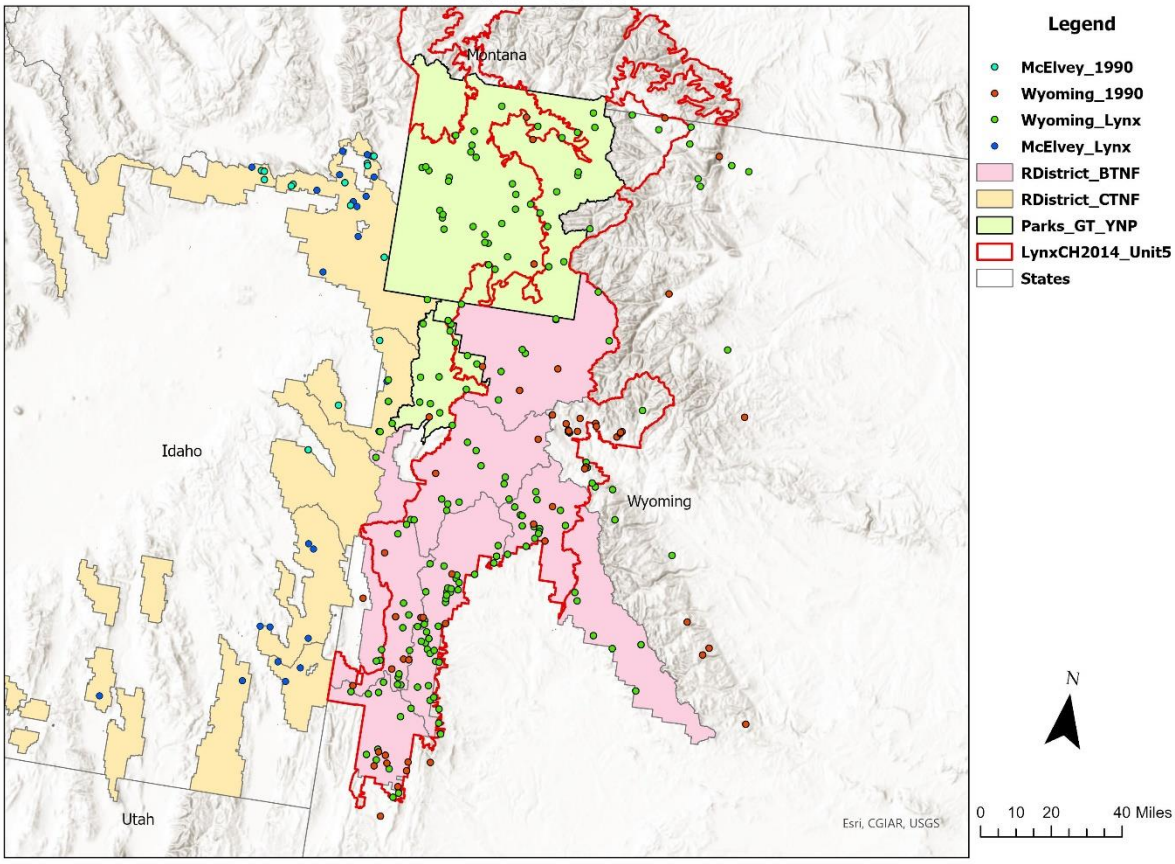
[15] U.S. DOI. 2019. Final Environmental Impact Statement Proposed Dairy Syncline Mine and Reclamation Plan. https://app.box.com/s/jmod5pcq1txhv4wmply3oxuazlm16tau

[16] USFS. 2003b. Final Environmental Impact Statement for the Caribou National Forest Revised Forest Plan. Idaho Falls, Idaho. https://app.box.com/s/pqa6bwpxznxwh7mx7g4i370jbzerlnne

[17] USFS. 2007. Final Environmental Impact Statement, Northern Rockies Lynx Management Direction. National Forests in Montana, and parts of Idaho, Wyoming, and Utah. March

We generated a map of observations before 1990 and after 1990 for the Contiguous area included in the Grand Teton and Yellowstone National Parks, Bridger-Teton NF, and Caribou-Targhee NF. (Figure 5, Table 2). This map illustrates the connection between these areas. The observations notated with _1990 are observations including 1990 forward. Some of the Wyoming observations overlay the McElvey observations, so we only include the Wyoming observations within Wyoming. Obtaining the current database for lynx observations in Idaho would fill in missing points such as the ones mentioned above in the Dairy Syncline discussion.

Figure 5. Wyoming and McKelvey Observations Pre- and Post-1990



Referring to the Federal Register Notice citation of the ESA definition of critical habitat:

> (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a

2007. https://app.box.com/s/smz8ucyfq4d07i27of3ot2tli89va9gx

determination by the Secretary of the Interior (Secretary) that such areas are essential for the conservation of the species

Table 2. Summary of Pre- and Post-1990 Observations by Area

Area	Observations Pre-1990 (Date Range)	Observations from 1990 (Date Range)	Total Observations
Grand Teton and YNP	57	5 Most recent 2008	62
Caribou-Targhee NF	32	14 Most recent 1998*	46
Bridger-Teton NF	99	25 Most recent 2010	124

*note the female and 2 kittens in 2005 from the Dairy Syncline reference should be included.

In our prior comments on the 2017 SSA, we referenced the FWS "Clarification of Findings" in a Remand Notice. (Comments January 25, 2023, p5). That document stated that "no evidence" was found that forest roads pose a threat. It also stated that mining and grazing were not "specifically addressed because we have no information to indicate they pose threats to lynx." Then, over snow recreation was explained away due to "no evidence". Timber harvest was described as beneficial, benign, or detrimental depending on harvest, spatial and temporal conditions. The Olson et al (2021) paper noted that human activities can displace lynx. We have argued that recreation has exploded in these Rocky Mountain Forests and that the claim that forest roads have little impact was based on little used roads in Washington.

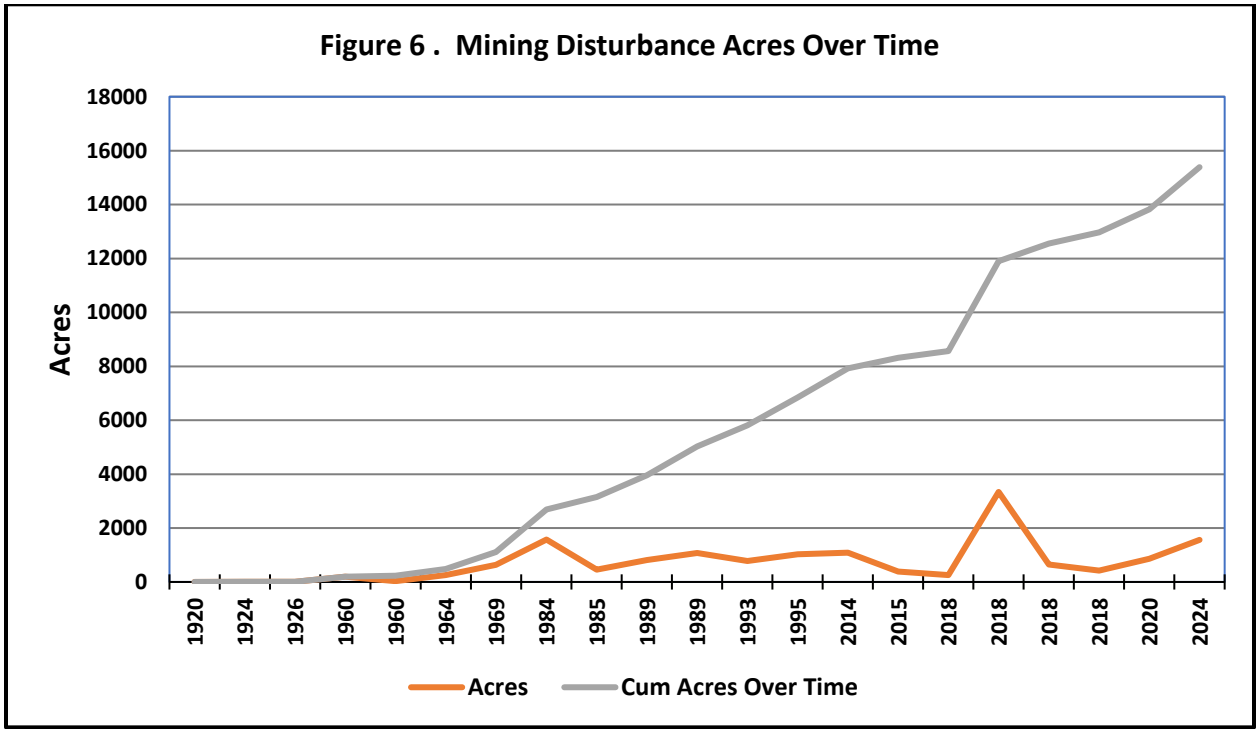
In our comments on the 2017 SSA, we noted that the 2013 Lynx Conservation Assessment and Strategy[18] refute these broad assertions. An illegal shooting example from Colorado is provided, showing over 14% of reintroduced lynx were shot in the first 10 years. (LCAS p84). Forest/backcountry roads and trails with low vehicular or snowmobile traffic "had little effect on lynx seasonal resource-selection patterns" and lynx traveled on roads "unplowed during winter". "Squires et al (2008) reported that lynx denned farther from all roads compared to random expectation. … occupy dens in early May when many forest roads are still impassable… snowmobiles no longer use the roads because of intermittent and unpredictable availability of sufficient snow." Finally, "fewer roads were located in denning habitat and higher road density occurred along forest edges and in managed stands, which lynx avoided…." (LCAS p84). But these factors are all dismissed as affecting lynx in the Remand Notice and we find no regulatory standards regarding these activities relating to lynx and lynx habitat in the Caribou National Forest or other Forests we have reviewed.

Even the mining industry acknowledges that mines have detrimental impacts. For example, in the Dairy Syncline FEIS, it is stated, "The year-round noise and human activity associated with

[18] Interagency Lynx Biology Team. 2013. Canada lynx conservation assessment and strategy. 3rd edition. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication R1-13-19, Missoula, MT. 128 pp. https://app.box.com/s/p80ykdfc41slqnm55j8f2qo5m7npb4aj

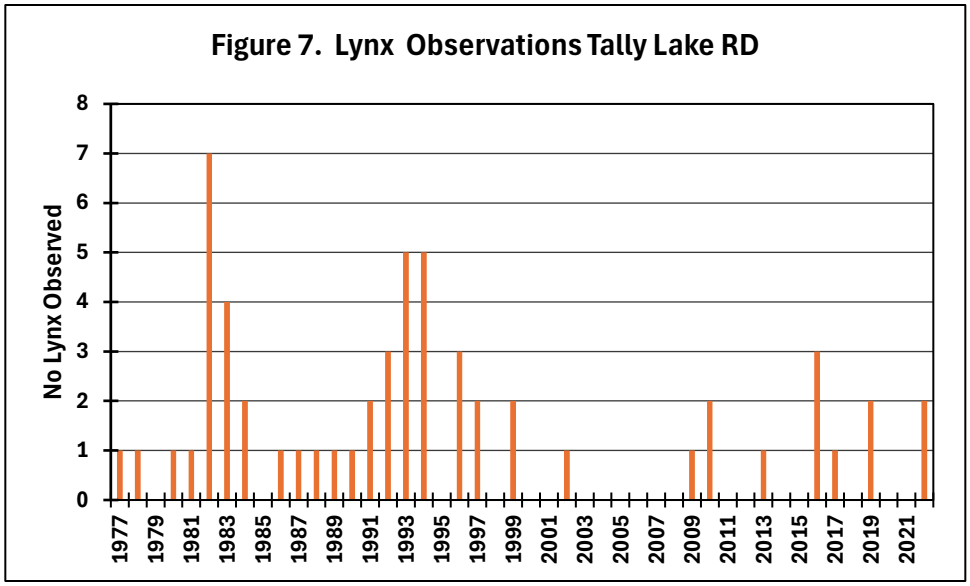
the construction and active mining phases of the Proposed Action would likely influence Canada lynx to travel around the periphery of the disturbed area". (Dairy Syncline FEIS p4-106). Note that these mines have about 400 blasts per week, excavation, and hauling going on 24/7 throughout the year.

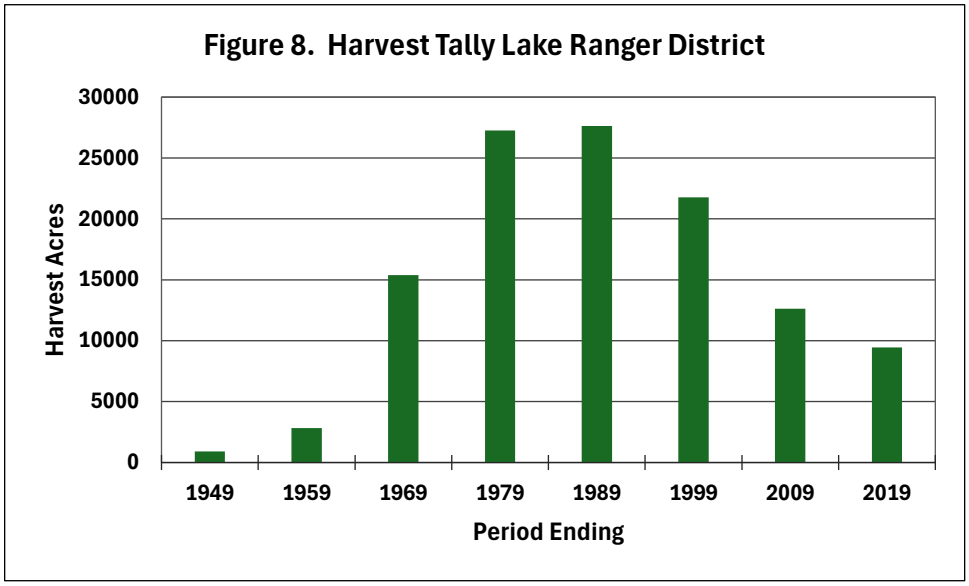
We have argued that the increased habitat destruction by mining in SE Idaho since the 1960's has disrupted lynx habitat and occupancy. Figure 6 is a chart of mining disturbance over time in the Montpelier and Soda Springs Ranger Districts in the Caribou NF, identified as lynx linkage connecting to the areas to the south. When the haul roads and other infrastructure are added, the area of disturbance is even larger.



We recently looked at the Tally Lake Ranger District in the Flathead NF to summarize lynx observations in relation to historical timber harvest. We used the McKelvey and MNHP observation data along with forest stand actions such as logging, thinning and other silviculture activities. Forest Service national databases were downloaded for this analysis. This data may not include all actions, and we have submitted a FOIA to the Flathead and Bridger-Teton NFs for their current data.[19] The trends in observations and forest timber activities are shown for the Tally Lake Ranger District in Figures 7 and 8.

[19] https://data.fs.usda.gov/geodata/edw/datasets.php Accessed November 18, 2024.





We did a macro look at roads in the National Forests in SSA Units 3 and 5. (Table 3). This was based on the Forest Service MVUM open roads and trails.[20] We looked at overall density and for a rough estimate, took out the areas of IRAs and Wilderness to calculate an approximate density in unprotected areas. These do not include many classes of roads and trails such as user-created, non-system, temporary, county, highway and others. There is a wide variation and there is a need for a more detailed analysis to determine why lynx occupies some areas with higher road density and don't occupy some with low road density. Are the areas with lynx present made so by the extent of protected areas? Are connections more highly

[20] https://data.fs.usda.gov/geodata/edw/datasets.php Accessed November 18, 2024.

fragmented by roads than the overall Forest? We would suggest this is the case in the Phosphate Mining Area in SE Idaho and in the Caribou NF where snowmobile access is open in 97% of the Forest and groomed trails proliferate. A further element in the analysis would be the level of use of these roads and determination of which constitute barriers to lynx due to intensive use in summer and winter.

Table 3. Summary of Road Miles/Square Mile - Protected v Unprotected

Forest Name	Miles/SqMi Entire Forest	Miles/sqmi unprotected
Beaverhead-Deerlodge National Forest	0.83	1.92
Bitterroot National Forest	1.11	3.62
Boise National Forest	1.20	2.22
Bridger-Teton National Forest	0.41	1.89
Caribou-Targhee National Forest	0.58	1.31
Custer Gallatin National Forest	0.43	0.96
Flathead National Forest	0.86	2.08
Helena-Lewis and Clark National Forest	0.66	1.80
Idaho Panhandle National Forests	1.81	2.51
Kootenai National Forest	1.92	2.66
Lolo National Forest	1.59	2.44
Nez Perce-Clearwater National Forest	1.20	3.40
Payette National Forest	0.79	2.66
Salmon-Challis National Forest	0.58	3.32
Sawtooth National Forest	0.53	1.97
Shoshone National Forest	0.28	1.64

What is missing in the analyses we have seen for lynx critical habitat, recovery planning, and at the project level are the spatial and temporal effects of roads, timber, mining, and recreation. Project analyses for Forest projects we are familiar with in the Northern Rockies (NR) and GYA have lacked this analysis. While clear-cuts and sparse forests may receive some lynx use, their suitability for lynx is significantly reduced for a significant amount of time. It has been shown not only that those clear-cuts and sparse forests are strongly avoided by lynx, but that restoration of lynx habitat use in these logging areas to 50% of previous use takes 20 years in forest thinnings, and 34-40 years for selection cuts and clear-cuts. Also, all logging treatments are avoided by lynx for at least 10 years.[21] Predictors for lynx reproductive success within

[21] Holbrook, J.D., Squires, J.R., Bollenbacher, B., Graham, R., Olson, L.E., Hanvey, G., Jackson, S., Lawrence, R.L., 2018. Spatio-temporal responses of Canada lynx to silvicultural treatments within the

occupied female home ranges were the connectivity of mature forest, intermediate (10 - 15%) amounts of young regenerating forest, young regenerating forest patches with low perimeter - area ratios, and the adjacency of mature forest to young regenerating types. Female lynx home ranges with greater than 50% mature forest and 10 - 15% young regenerating forest appear to be the optimum. [22]

Another factor that is dismissed is trapping and the effects on lynx. For example, Wyoming has trapping for coyotes, bobcats, wolves and other fur bearers. A recent report from Wyoming Game and Fish Department for bobcat trapping summarized the trapping effort in Wyoming. Annual trapping licenses ranged up to 2,699 and annual trap nights ranged from 251,852 – 653,682 over a ten-year period.[23] Trapping in Montana is widespread as it is in Idaho. Britell et al (1989) noted that hunting and trapping were the principal causes of mortality for lynx and that lynx are vulnerable to trapping.[24] They also noted that improved access encourages use of hound hunting and hound hunting is strongly influenced by road access. "Overexploitation, particularly during the critical low (population) period, minimizes the potential recovery, reduces the expansion of dispersing lynx into vacated habitats and jeopardizes sub-populations in the more accessible areas. This emphasizes the need to secure lynx distribution and numbers of low prey abundance." In the GYA and Southern Rockies Units where habitat suitability is lower than in the Canadian and Unit 3 areas that are connected, it is even more critical to reduce stressors on lynx habitat and prey.

Referring to the Notice regarding designation of CH, in making decisions on occupancy, critical habitat, and recovery, the Olson et al (2021) Model needs to be supplemented by an analysis of these spatial and temporal factors across all National Forests in Units 3, 5, and 6 along with an expansion of the Model to cover the habitats and connections between these. In addition, the occupancy in Unit 6 was based on a barely begun reintroduction program with lynx dispersing north to the Uinta Mountains and GYA. These areas with suitable habitat such as in the Caribou-Targhee NF and the higher elevation corridor connecting the Unit 6 to Unit 5 should be given the same consideration. If lynx were supplemented in Unit 5, the Uinta Mountains and elsewhere, they might have also been considered for critical habitat.

Later in these comments we refer to the Squires et al (2024) analysis and model which took disturbance factors into account. We suggest that the Northern Rockies and Greater Yellowstone Area and the connections between these and the Southern Rockies (Model Gap)

Northern Rockies, U.S. For. Ecol. Manage. 422, 114–124.
https://app.box.com/s/hmpchp3j22gew0a1r54fjzsovqw0hvfg

[22] Kosterman, M.K. 2014. Correlates of Canada Lynx Reproductive Success in Northwestern Montana. Graduate Student Theses, Dissertations, & Professional Papers. 4363.
https://scholarworks.umt.edu/etd/4363 Accessed on January 22, 2023.

[23] Wyoming Game and Fish Department. 2023. Bobcat License Data Summary Tables I and II.
https://app.box.com/s/5jjp64tw16qy2inwclzd4gxb11rrw7ws

[24] Britell, J.D., Poelker, R.J., Sweeney, S.J. and Koehler, G.M. 1989. Native Cats of Washington. 49p.
https://app.box.com/s/8ijb4b47bgp2xnhrhjuloi9joh4bex9j

be provided with the same modeling protocol to identify connections and priority habitat protections on the National Forests and other public lands.

2. Snow Depths as a Limitation

The Notice indicates that snow conditions (consistency, depth and duration) are needed to allow lynx to outcompete competitors. Squires et al (2010)[25] found that snow depth was deeper at 86 cm (SD=34) than generally available at 80 cm (SD=32), not significantly different, within home ranges but found no evidence that snow penetrability affected lynx travel routes. Gatlin (2020)[26] in updating lynx Analysis Units for the Beaverhead-Deerlodge NF, determined from these data and watershed evaluations that lynx selected habitats with a minimum snow depth of 50 cm (20 inches).

We analyzed snow depths at snow monitoring stations over a 21-year period ending in March 2024 within and adjacent to the Beaverhead-Deerlodge NF in conjunction with a project there. (Table 4, Figure 9). There were 29 monitoring stations covering all elevations and areas within and adjacent to the Forest. This analysis illustrates that in most years at all elevations sufficient snow depth is available to accommodate lynx. Even at the lowest elevations, there is sufficient snow in nearly half to 90% of the years.

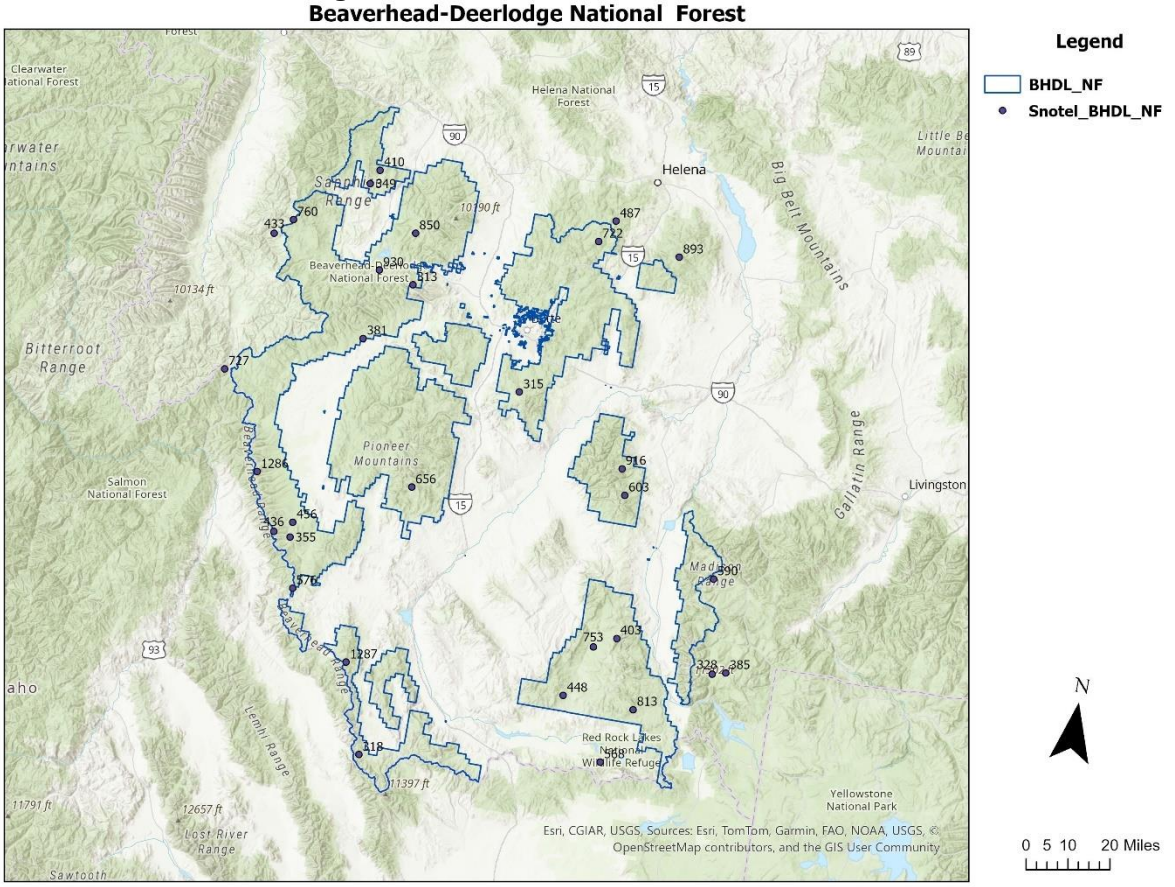
Table 4. Years At or Above Minimum Snow Depth of 20 Inches in Wisdom Ranger District, Beaverhead-Deerlodge NF

Station	Elevation, ft	Count of Years/percent of 21-year record
Combination 410	5600	9/43%
Daly Creek 433	5780	21/100%
Calvert Creek 381	6430	18/85%
Frohner Meadow 487	6480	21/100%
Tizer Basin 893	6880	21/100%
11 Stations	7000 - 8000	21/100%
13 Stations	8000 – 9000	21/100%

[25] Squires, J. R., Decesare, N. J., Kolbe, J. A., & Ruggiero, L. F. (2010). Seasonal resource selection of Canada lynx in managed forests of the northern rocky mountains. Journal of Wildlife Management, 74, 1648–1660. https://doi.org/10.2193/2009-184. https://app.box.com/s/fy8nll964ai9wzju67jcgygb84ce9l88

[26] Gatlin, J., and O.Neil, J. 2020. Habitat Mapping Documentation for Canada Lynx (*Lynx Canadensis*) on the Beaverhead-Deerlodge National Forest – 2020 Update. In: Gatlin (2021) Biological Assessment for Canada Lynx -Effects of the 2009 Revised Forest Plan and the Northern Rockies Lynx Management Direction. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd901415.pdf

Figure 9. SNOTEL Stations
Beaverhead-Deerlodge National Forest



Then we located lower and higher elevation snow monitoring stations in Wyoming, SE Idaho, and NE Utah. (Figure 10). These are located in the Yellowstone to Uintas Connection. The Wyoming SNOTEL (East Rim 460) is in the lynx migration path in the GYA connecting the Wyoming and Wind River Ranges mapped by Squires and Oakleaf (2005)[27]. The Bondurant station is an ACIS station. Table 5 shows the number of days these stations exceed the 20-inch depth minimum as well as the East Rim Divide station relative to the 36-inch mean depth from Squires et al (2010). Both locations have significant numbers of days exceeding these snow depth limits.

[27] Squires, J.R. and Oakleaf, R. 2005. Movements of a male Canada Lynx crossing the Greater Yellowstone Area, Including Highways. Northwest Science 79(2&3):196 – 201. https://app.box.com/s/67s5soh1bi5stphx7mojstclqouxadz1

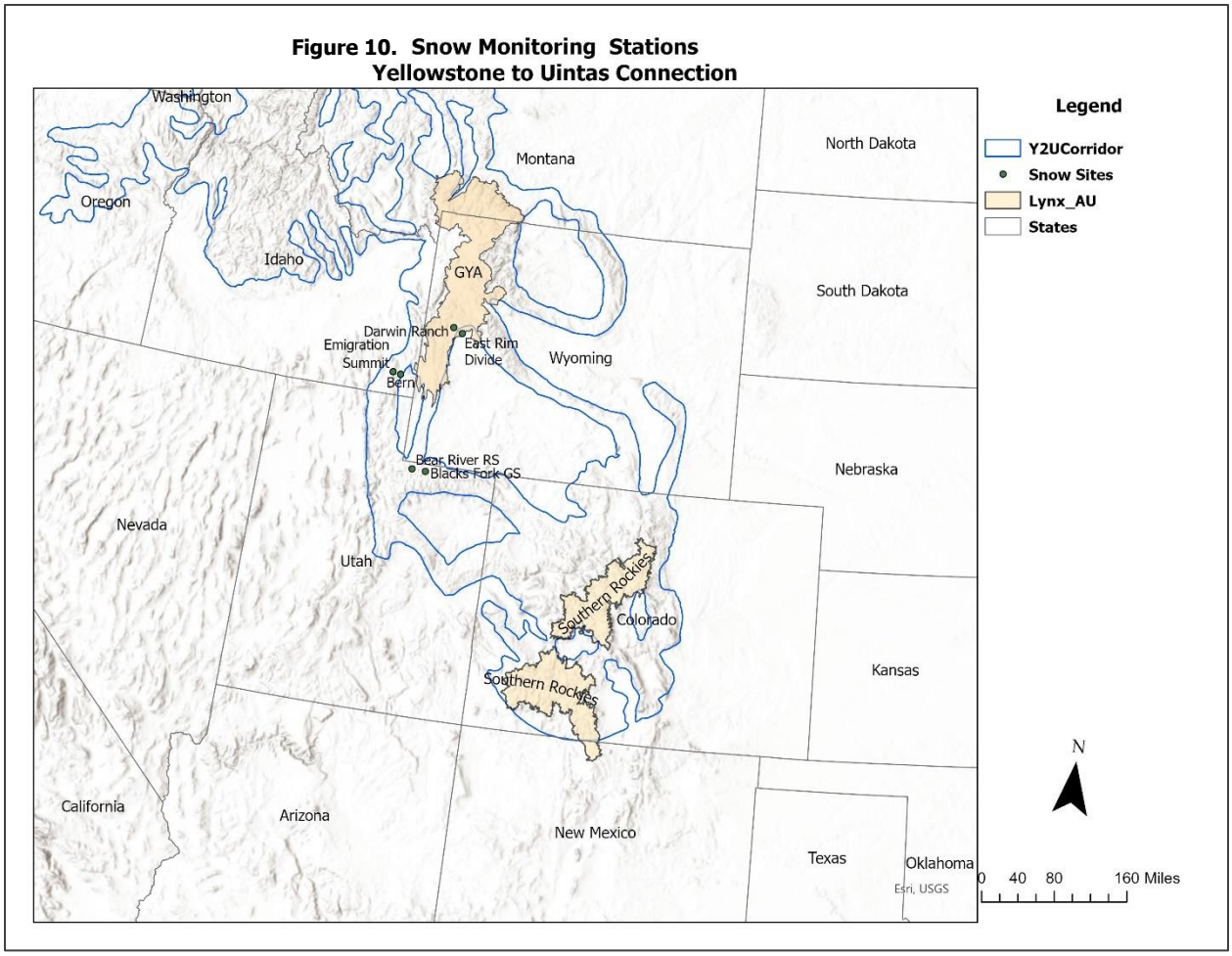


Table 5. Snow Depth Statistics for SNOTEL and ACIS Network Stations Wyoming 2011 - 2021

Station Name	Min/Mean/Max Days Above	Date Range for Onset of Depth Limit	Date Range for End of Depth Limit
Bondurant Darwin Ranch	0/68/128 > 20 in.	12/21 - 2/8	3/15 - 5/1
East Rim Divide	95/123/152 > 20 in.	11/26 - 1/4	4/9 - 5/4
East Rim Divide	1/49/94 > 36 in.	1/7 - 3/22	3/3 - 4/21

In SE Idaho we used the higher elevation Emigration Summit SNOTEL (471) and the lower elevation Bern ACIS station. Note that these are in the Bear River Range and its foothills. This area is rated as high probability habitat in the Olson et al (2021) Model. We also used SNOTEL stations for the Uinta Mountains where lynx was historically observed and had lynx

occurrence from the Colorado reintroductions. These are summarized in Table 6 and charted below in Figures 11 - 16. These are provided as indicative of the adequacy of snow in these important areas in the GYA and the Regionally Significant Wildlife Corridor (Yellowstone to Uintas Connection) connecting the GYA to the Uinta Mountains and Southern Rockies. That corridor follows the Bear River Range in SE Idaho through the higher elevation areas in Utah to the Uinta Mountains. Table 5 shows that at the higher elevations snow depths are adequate in all years, while the lower elevations have snow exceeding the 20-inch minimum in over half the years. Having cross-country skied and snowshoed in these areas, we can attest to the great snow, and it is also important to recognize that the Y2U connection in Utah contains historic ski areas that rely on deep snow. Snow in Unit 3, 5 and 6 is not limiting for Canada lynx.

Table 6. Snow Depth Monitoring Stations Wyoming, SE Idaho, and NE Utah

Station Name	Elevation	Years of Record Used	Years Above 20″ minimum	Percent of Years exceeding 20″ Minimum
Emigration Summit	7390	22	22	100%
Bern	5964	22	15	68%
East Rim Divide	8010	11	11	100%
Darwin Ranch	6620	13	11	85%
Bear River RS	8510	15	15	100%
Blacks Fork GS	9360	15	15	100%

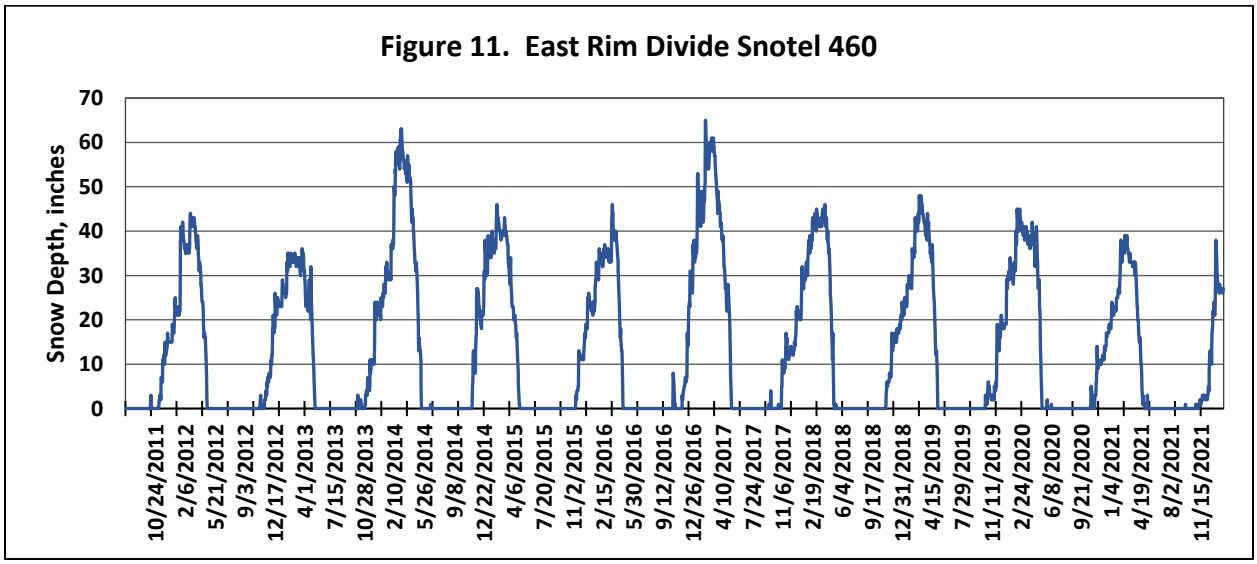


Figure 12. Bondurant Darwin Ranch

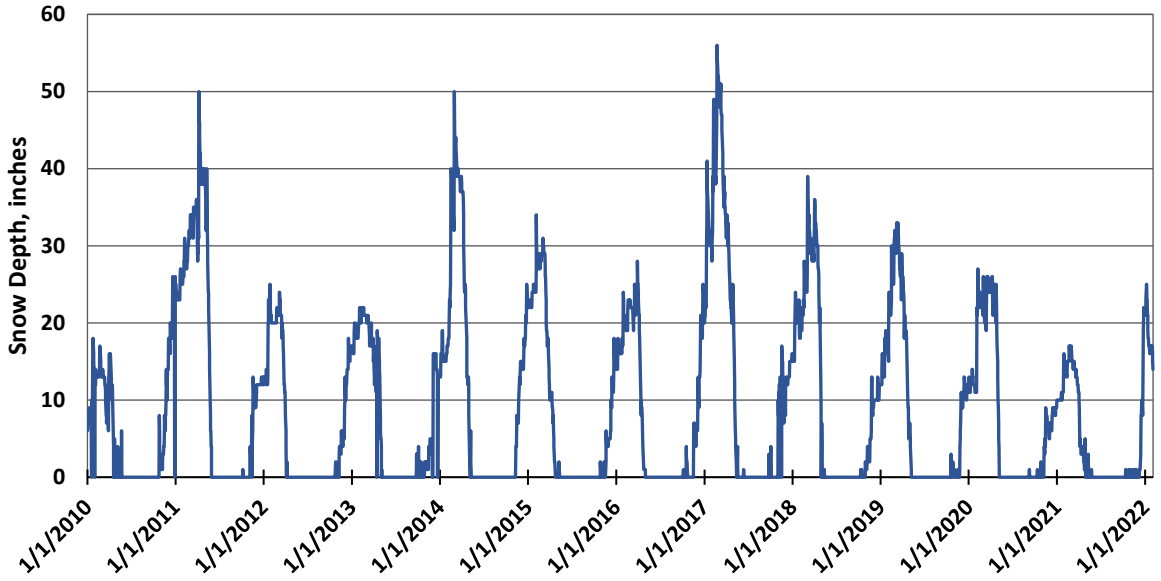


Figure 13. Emigration Summit Snow Depth

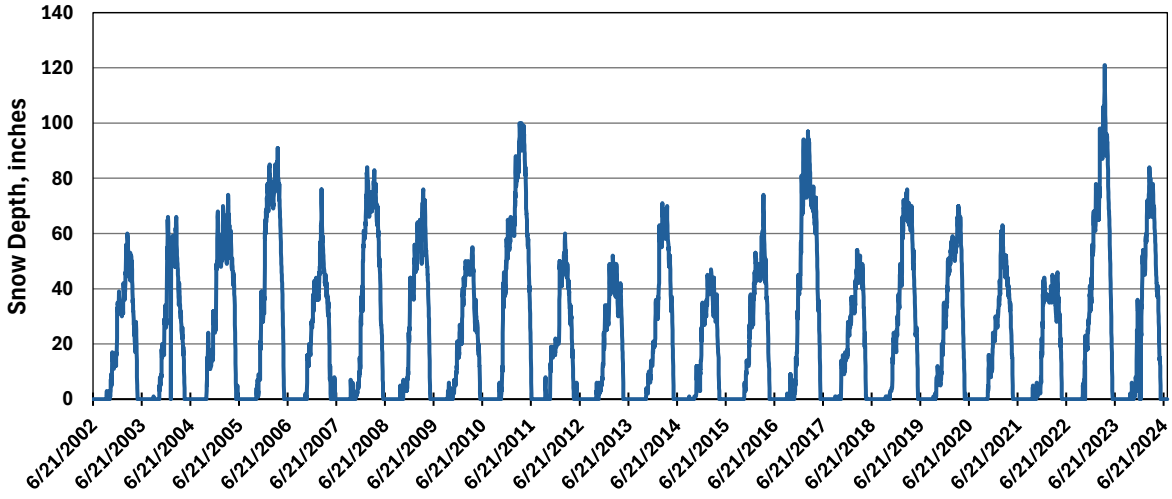


Figure 14. Bern Station Snow Depth

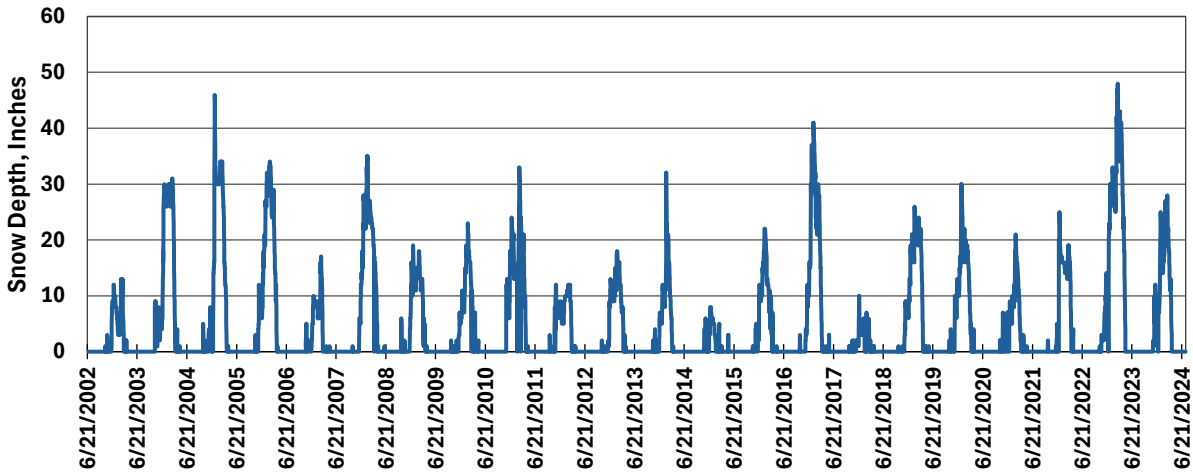
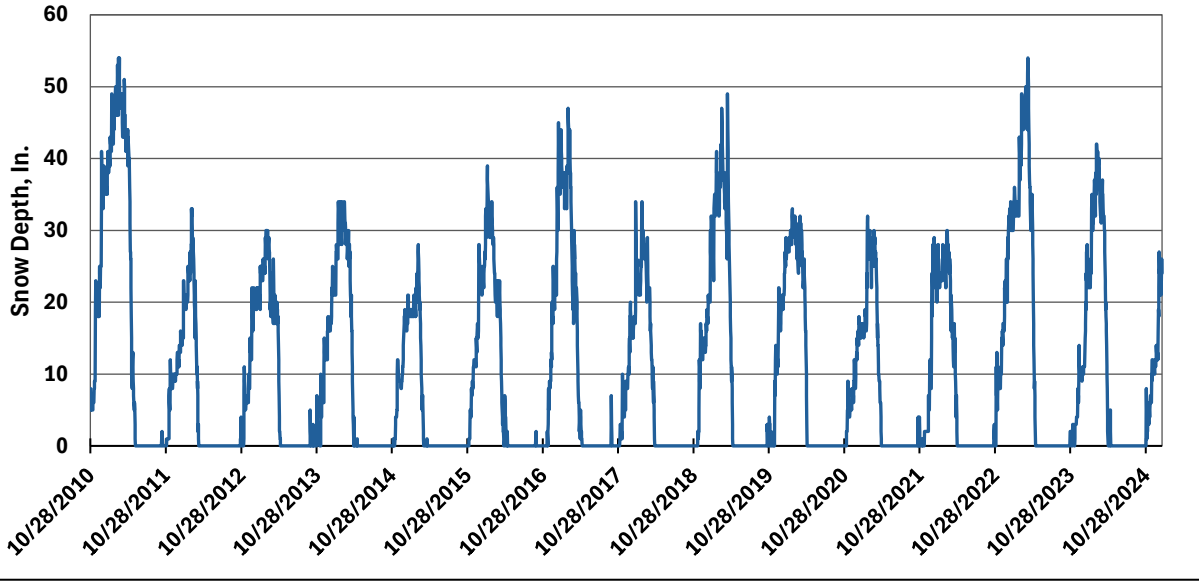
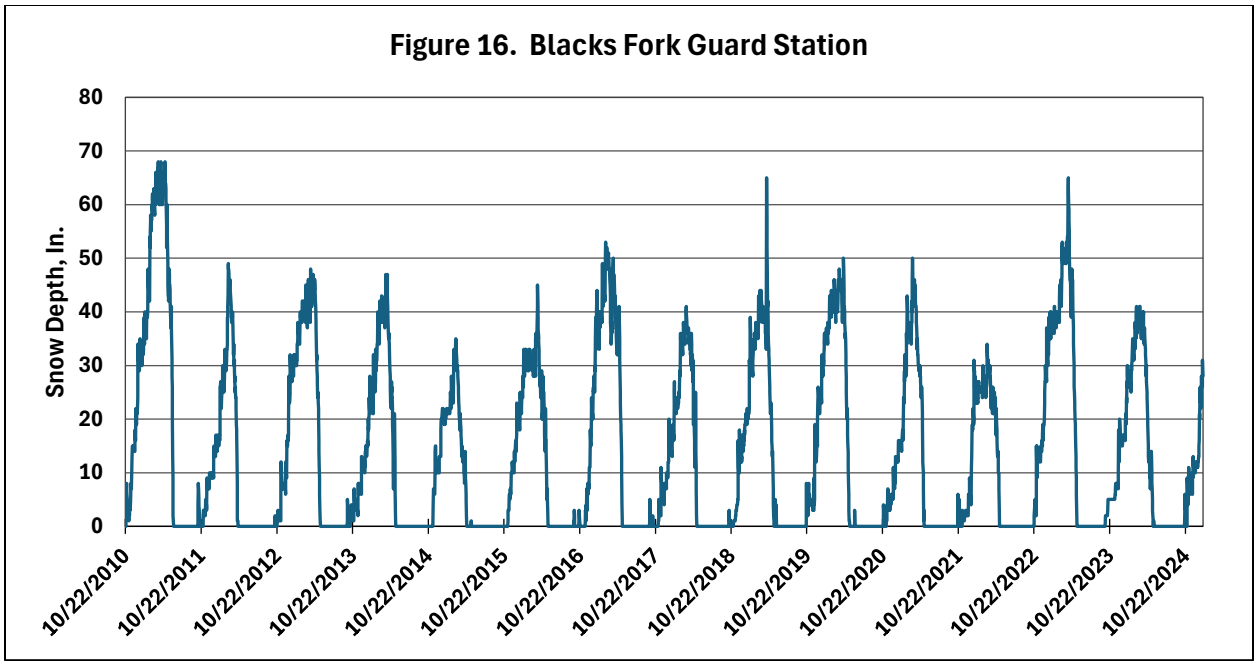


Figure 15. Bear River Ranger Station





3. Snowshoe Hare Populations

The Federal Register Notice also limits Unit 5 due to low snowshoe hare abundance, but in our prior comments on the Species Status Assessment, we pointed out that monitoring is spotty and that the Science Report indicates there are sufficient snowshoe hare present. When we request snowshoe hare studies from the Forest Service, they are few and far between. The Lynx BA[28] noted that land use plans have failed to provide monitoring of lynx, snowshoe hares, and their habitats.

The Science Report (SR) Chapter 13 reviewed the ecology of lynx in these southern areas and compared them to the taiga in Canada.[29] In both regions, lynx occurred where snowshoe hares were abundant. In the southern region, lynx was known to make exploratory movements prior to dispersal. The Colorado tracking data clearly illustrates these exploratory movements. Habitats in the southern region are patchier, and lynx make more use of alternate prey. For instance, lynx scats collected in north-central Washington contained 79% snowshoe hare and 24% red squirrel. (SR p376 - 377). Snow tracking studies in the southern Canadian Rocky

[28]USDA Forest Service and DOI Bureau of Land Management.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. https://app.box.com/s/pc4oeefty80a9gd4sa0757tne6020hp4

[29] Ruggiero, Leonard F.; Aubry, Keith B.; Buskirk, Steven W.; Koehler, Gary M.; Krebs, Charles J.;McKelvey, Kevin S.; Squires, John R. 2000.. Ecology and conservation of lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Available at: http://www.fs.fed.us/rm/pubs/rmrs_gtr030.html

Mountains found prey consisted of 52% snowshoe hare, 30% red squirrels, and the rest were flying squirrels, martens, voles, and grouse plus unknowns. Snowshoe hare densities were estimated to range from 0.01 - 0.47 hares/ha. (SR p377). *"In southern boreal forests, limited data suggest that because snowshoe hares typically occur at low densities (Chapter 7), alternative prey may always be important components of lynx diets, especially in the western mountains."* (SR p378). This refutes the total reliance on snowshoe hares that is being used to discount occupancy and habitat in these southern regions.

We previously referenced the association between lynx locations and habitat. The predominant association was with Rocky Mountain Conifer in these western interior states. Lynx uses a variety of habitats and elevations between summer and winter. Generally, they use higher elevations in more southerly locations and between summer and winter. Most conifer types are included in areas used by lynx and can include Douglas-fir, western larch, lodgepole pine, subalpine fir, whitebark pine, and Engelmann spruce. Occasionally, they will occur in non-forested areas such as shrub-steppe. (SR p379). Snow tracking in Washington found that lynx traveled around meadows and used thinned stands that contained several hundred trees per ha. (SR p381).

Home ranges in these southern areas are larger than in the north. The average for males is 151 km^2 and females, 72 km^2. In west-central Wyoming they were smaller at 90 and 66 km^2. (SR p383 – 384). These compare favorably with the Glacier National Park results cited earlier. In Washington, home ranges were bounded by rivers, ridges, and major highways. (SR p385). Exploratory movements in Montana ranged from 17 to 38 km. (SR p386). Dispersal can take place over larger distances of several hundred km. (SR p386 -387). In the north-central Washington study, 8 kittens were documented in a population of 23 lynx during the three-year study. Estimates of total lynx density for the 1,161 km^2 area was 2.4 lynx/100 km^2. (SR p387). Comparisons are made to northern populations during the lows in hare cycles, indicating similar demographics occur in the southern populations compared to these lows. (SR p389).

Because lynx are dependent on snowshoe hares for a majority of prey, we have looked for information on hare density in these southern states. Chapter 11 of the Science Report summarizes densities in Montana as well as the Wyoming Range. (SR p346). Hare densities from these studies ranged from 0.6/ha to 1.4/ha. Two studies cited from Utah gave densities ranging from lows in aspen with dense understory of 0.22/ha to 2.7/ha in spruce-fir habitat. Intermediate numbers occurred in Douglas-fir (0.57/ha and subalpine fir of 0.99/ha). Hare densities in Colorado ranged from 0.26/ha in aspen, to 0.46 in Engelmann spruce.

These southern hare densities compare to population lows in areas of Canada with persistent lynx populations. For example, from the Science Report (SR p362), *"Hare densities in the southwest Yukon declined from 8.0 to 10.7/ha to 0.2 to 0.5/ha during one cycle (Ward and Krebs 1985), and another population fell from 7.5/ha to 1.3/ha during the next cycle (Slough and Mowat 1996). Similarly, a population in the Northwest Territories fell from 7 to 9/ha to 0.4 to 1.0/ha during the early 1990s (Poole 1994), and a northern Alberta population declined drastically from about 17/ha to 0.34/ha*

during the early 1970s (Brand et al. 1976)." Hare densities at population lows in these studies were sufficient to support lynx populations, although at numbers. Based on the Science Report, hare densities alone are sufficient to support resident populations in these southern regions . When alternate prey is considered, they should be able to persist in the absence of fragmentation by human activities.

Berg and Gese (2010) used fecal pellets and live-trapping to estimate snowshoe hare density in the Bridger-Teton NF.[30] Snowshoe hare densities ranged between 0.07 – 4.82 hares/ha with a mean of 1.6 hares/ha. Data we received from the Ashley National Forest included numerous surveys.[31] While we have not analyzed the complete data set due to time constraints, a summary of seven locations was included with the data provided. The overall estimate from those sites averaged (0.26 – 0.5 hares/ha), with the highest reported site ranging from (0.92 – 1.74 hares/ha). These data show hare densities at or above the levels reported in the Science Report for Colorado and confirm those for Utah. When all prey is considered, it is clear that sufficient prey exists in these southern Forests to support lynx populations, but likely at lower lynx densities.

4. Fragmented Critical Habitat

The currently proposed critical habitat is fragmented between and within Rocky Mountain Analysis Units. (Figure 17). The Biological Assessment[32] for Canada lynx documents the importance of peripheral areas as:

> ***Peripheral populations may contain valuable genetic, physiological or behavioral adaptations that are unique to their ecological success. Because suitable habitats in areas where populations act as metapopulations are spatially separated, the persistence of a metapopulation is dependent on the efficiency and success of dispersing animals in reaching isolated patches of suitable habitat. When patches are fragmented and connections between patches do not exist, recolonization becomes problematic and the metapopulation may be unable to persist, even though patches of suitable habitat remain (Meffe and Carroll 1997). Additional fragmentation and isolation of suitable habitat occurring as a result of land management activities can not only affect small isolated habitat patches supporting smaller populations but also large contiguous patches supporting higher population levels.***

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[30] Berg, N.D., and Gese, E.M. 2010. Relationship between fecal pellet counts and snowshoe hare density in Western Wyoming. Journal of Wildlife Management 74(8):1745 – 1751. https://app.box.com/s/wej11h7xartsy5qe1vje80aw2wfam2y9

[31] Ashley National Forest. 2024. Response to April 4,2024 FOIA from Yellowstone to Uintas Connection.

[32] USDA Forest Service 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. 149p. https://app.box.com/s/pc4oeefty80a9gd4sa0757tne6020hp4

Ruggierio et al (1999) also discusses the effects of fragmentation on competition with lynx by other carnivores and the loss of connectivity.[33] Ruediger et al (2000)[34] citing McElvey at al (2000)[35] notes that "**a system of reserves embedded in a fragmented and non-natural landscape would not be sufficient to sustain lynx populations. Rather, a strategy that encompasses the entire landscape may be necessary**". Squires et al (2024)[36] notes, "future expansion of human-caused disturbance from urbanization and resort development in the relatively low-elevation valleys that intersect patches of lynx habitat in the Southern Rockies may threaten population connectivity and persistence, but that disturbance threshold is unknown." This points out the need for specific standards to prevent the destruction of lynx habitat, particularly in these sensitive Units 5 and 6.

Kosterman et al (2018) "The forest characteristics that defined high success included (1) abundant and connected mature forest and (2) intermediate amounts of small-diameter regenerating forest."[37] Holbrook et al (2019)[38] "the probability of a female producing kittens was most associated with the connectivity of mature, multistoried forests". Habitat fragmentation, *"accentuates the viability risk inherent in a small population and increases its vulnerability to local extirpation."* (LCAS p76). Examples of fragmentation include, *"removal of*

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[33] Ruggerio, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S., Squires, J.R. (Eds.), Ecology and Conservation of Lynx in the United States. University of Colorado Press, Boulder, CO. (pp84-86). https://app.box.com/s/6bg8w6k5ru1axlv3zcm5ba2tt3gjz9hg

[34] Ruediger et al. 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. Forest Service Publication #R1-00-53, Missoula, MT. (p2-19). https://app.box.com/s/xr7z1581gtmap9h46zbdzjp8sjzrvocy

[35] McKelvey, K. S,, K. B. Aubry, J. K. Agee, S. W. Buskirk, L. F. Ruggiero, and G. M. Koehler. 2000d. Lynx Conservation in an Ecosystem Management Context. Pages 419-441 In Ruggiero, L.E, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires. (Tech. Eds.). Ecology and Conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480 pp. https://app.box.com/s/6bg8w6k5ru1axlv3zcm5ba2tt3gjz9hg

[36] Squires, J.R., Olson, L.R., Ivan, J.S., McDonald, P.M., and Holbrook, J.D. 2024. Anthropogenically protected but naturally disturbed: a specialist carnivore at its southern range periphery. Biodiversity and Conservation: https://doi.org/10.1007/s10531-024-02978-8 https://app.box.com/s/qirh6aet9aqkfiwzix9uol1z2mzzuxgp

[37] Kosterman, M.K., Squires, J.R., Holbrook,J.D., Pletscher, D.H., and Hebblewhite, M. 2018. Forest structure provides the income for reproductive success in a southern population of Canada lynx. Ecological Applications 28(4):pp 1032-1043. https://app.box.com/s/1ecvhd4nznc1wdppvyu6naufzpiwzr80

[38] Holbrook, J. D., Squires, J.R., Bollenbacher, B., Graham, R., Olson, L.E., Hanvey, G, Jackson, S., Lawrence, R.L., and Savage, S. L. 2019. Management of forests and forest carnivores: Relating landscape mosaics to habitat quality of Canada lynx at their range periphery. Forest Ecology and Management, 437: 411–425. DOI: https://doi.org/10.1016/j.foreco.2019.01.011 https://app.box.com/s/c2jelk9v0gnyex1r5s2w2myhiws9p3hl

forest cover, development of highways and associated infrastructure, and intensive minerals or energy development…" (LCAS p77). [39]

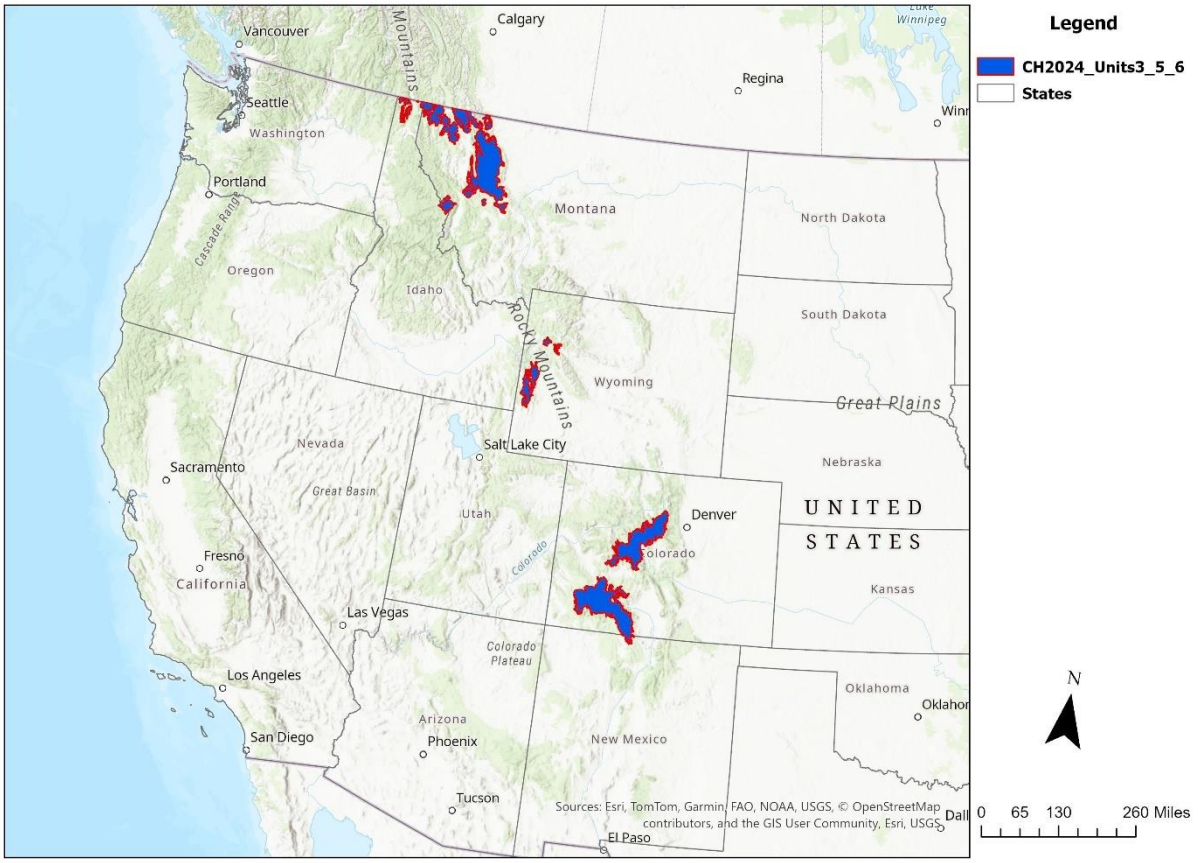
Anderson et al (2023) in their GNP study noted in their camera survey that "odds of lynx detection decreased by 0.8 times (95% CI = 0.7–1.0 times) for a 1 standard deviation increase in average human detections per day".[40] "Another explanation for a muted response of lynx to recreation could be that recreation in GNP is mostly concentrated on trails and may occur in a predictable enough fashion that lynx were able to cope to some degree. Other carnivores respond more strongly to off-trail versus on-trail recreation (Heinemeyer et al. 2019, Gunther and Haroldson 2020)." Human presence and activities are a factor in fragmentation of habitat.

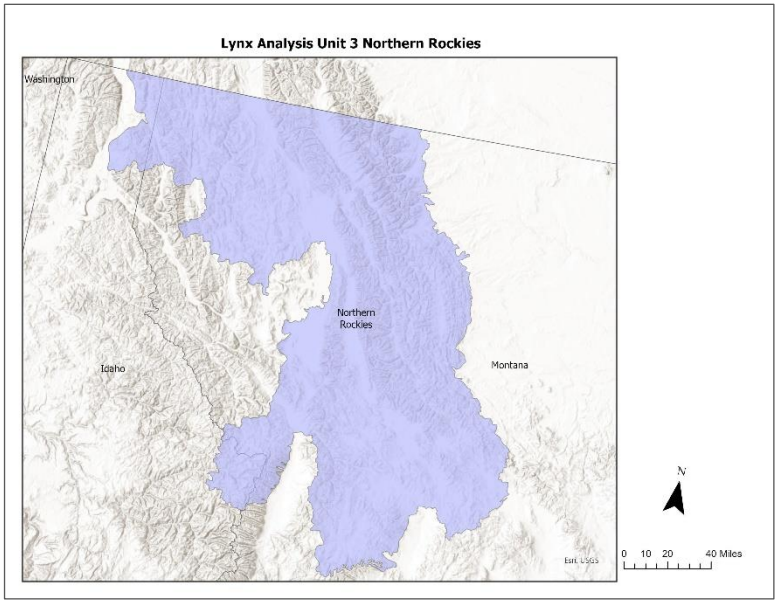
Using the publicly available GIS data from FWS, we compared the Analysis Units, Focal Areas and Critical Habitat to determine changes in area. (Figures 18 – 20, Table 6).

[39] Interagency Lynx Biology Team. 2013. Canada Lynx Conservation Assessment and Strategy. 3rd edition. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication R1-13-19, Missoula, MT. 128 pp. https://app.box.com/s/p80ykdfc41slqnm55j8f2qo5m7npb4aj

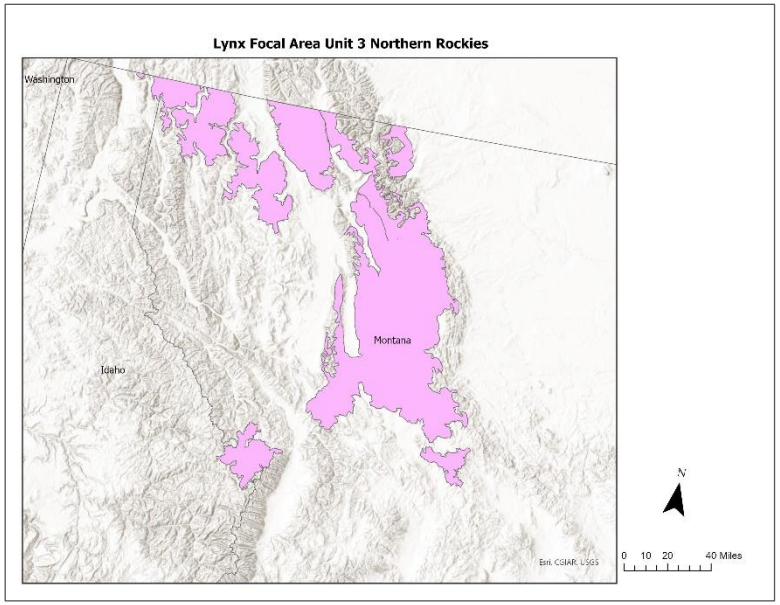
[40] Anderson, A. K., J. S. Waller, and D. H. Thornton. 2023. Canada lynx occupancy and density in Glacier National Park. Journal of Wildlife Management 87:e22383. https://doi.org/10.1002/jwmg.22383 https://app.box.com/s/fiu2oxhqe0gs4nswps9tcd12l5p6rlz9

Figure 17. 2024 Proposed Critical Habitat

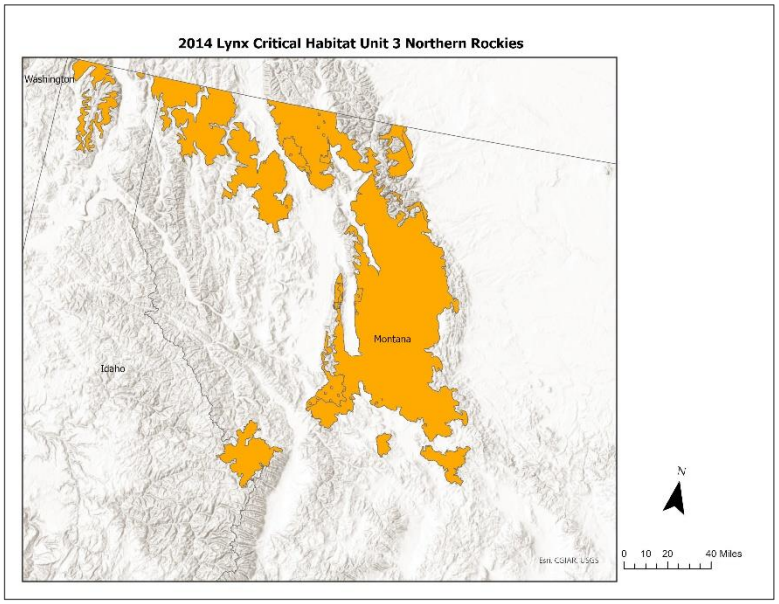




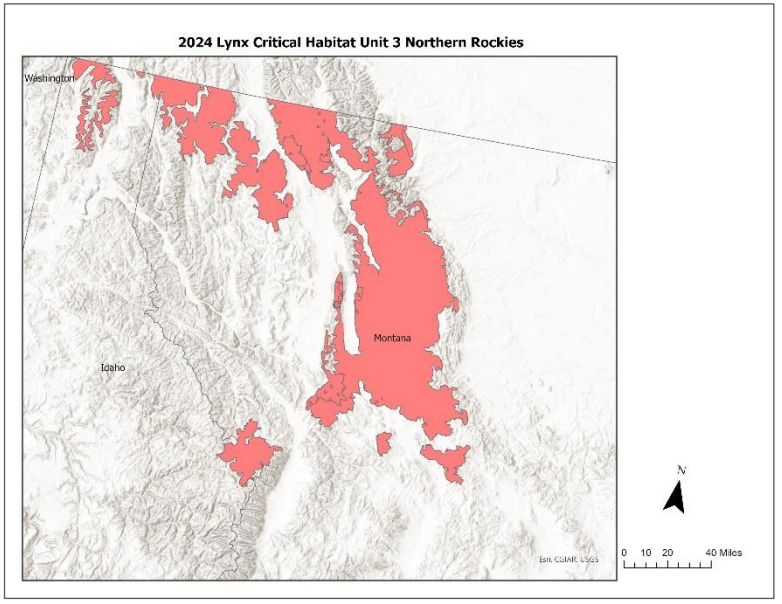
13,263,764 Acres Intact



4,867,820 Acres Fragmented

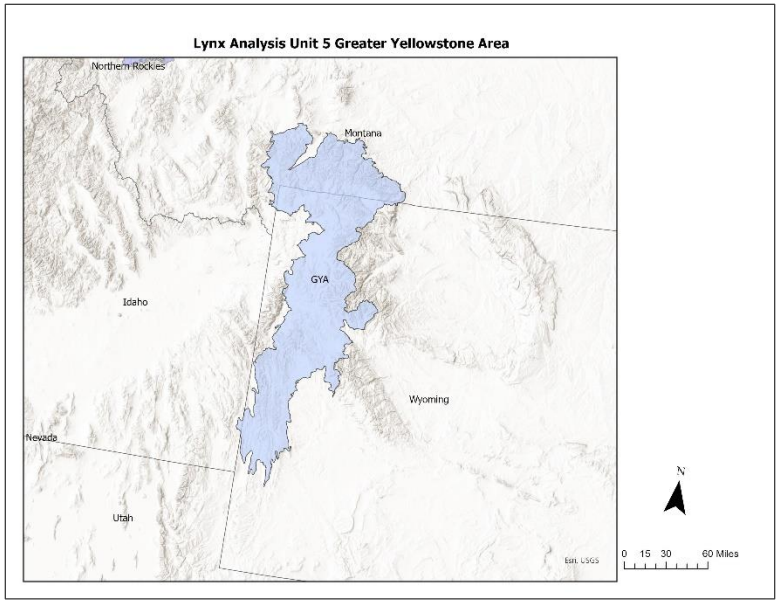


6,260,861 Acres Fragmented

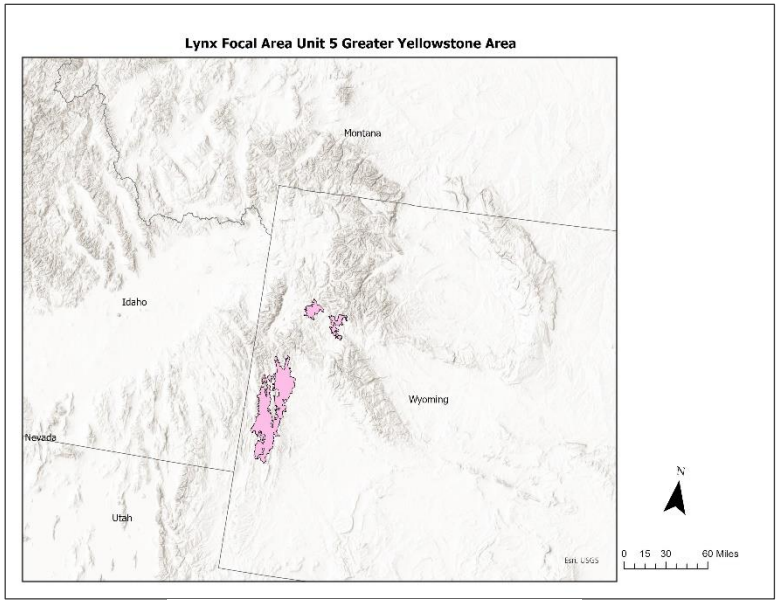


5,093,479Acres Fragmented

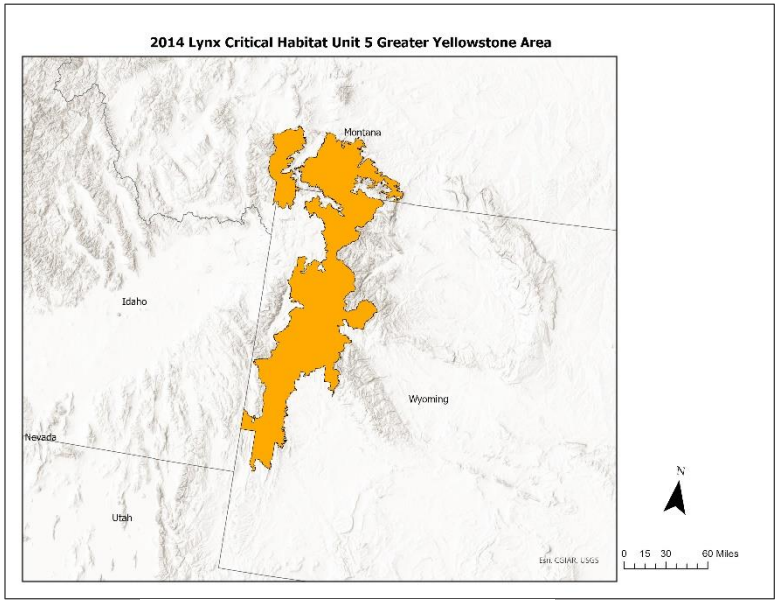
Figure 18. Evolution of 2024 Critical Habitat Analysis Unit 3 Northern Rockies



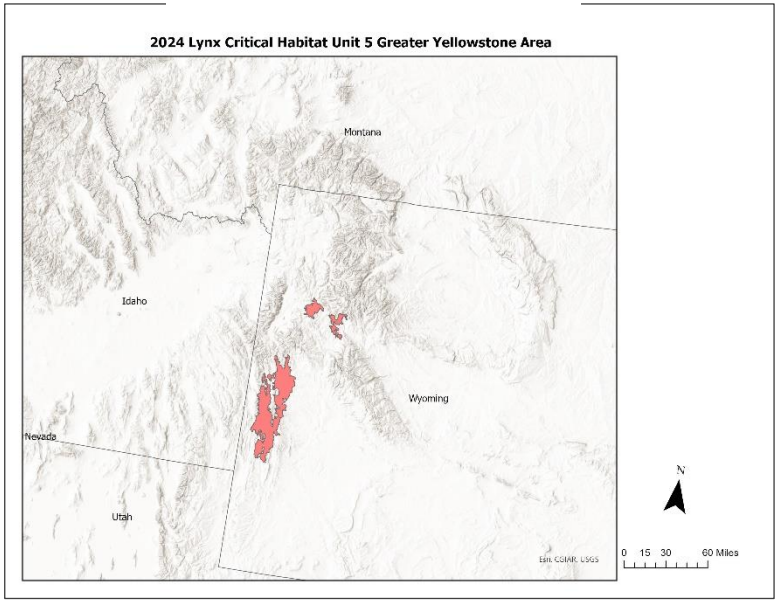
7,541,043 Acres Intact



717,141 Acres Fragmented

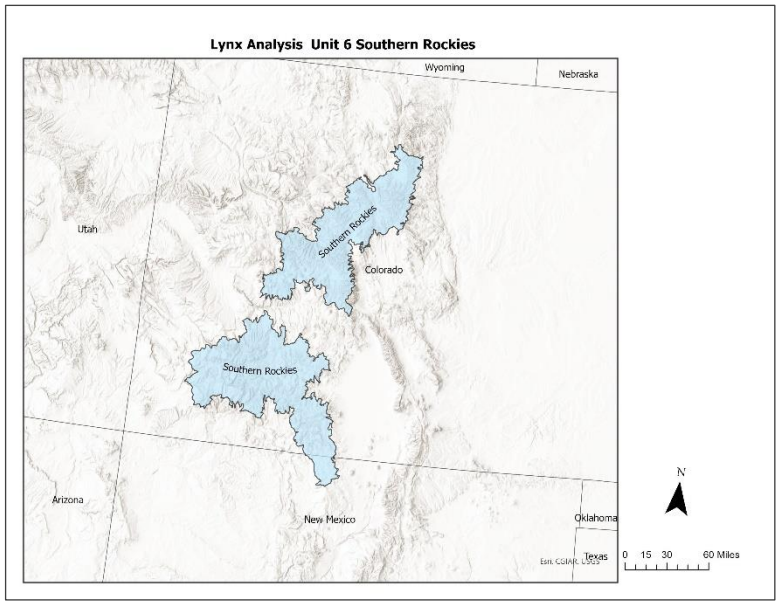


5,853,154 Acres Fragmented

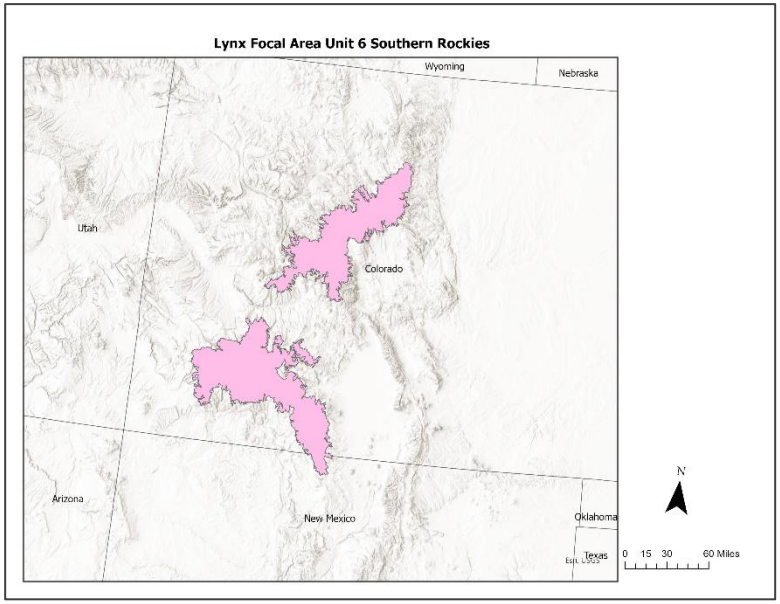


717,140 Acres Fragmented

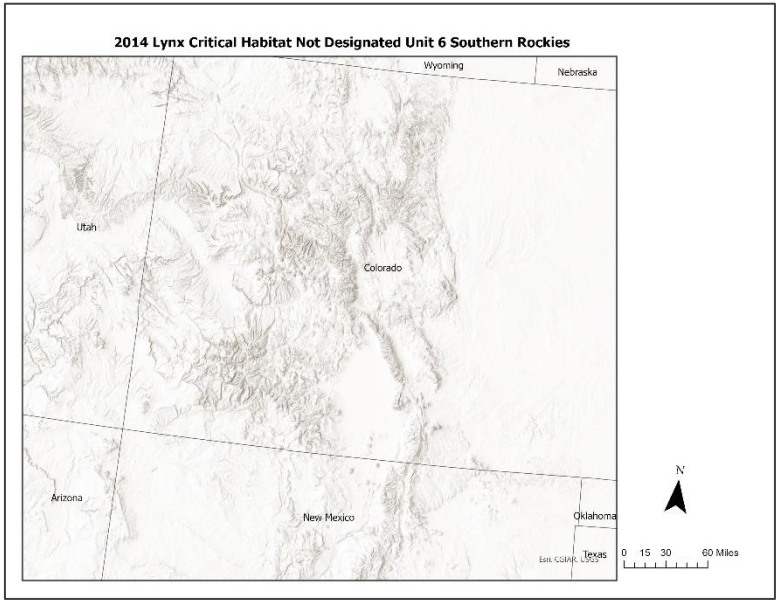
Figure 19. Evolution of 2024 Critical Habitat Analysis Unit 5 GYA



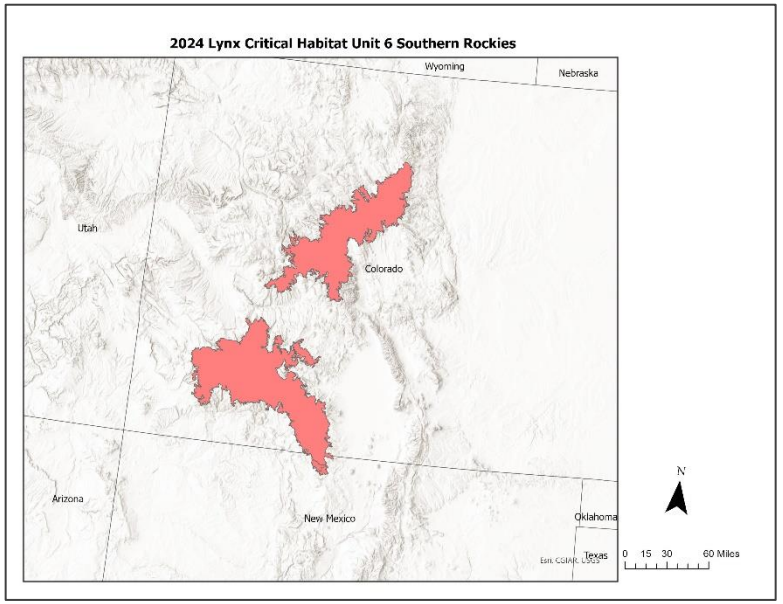
6,821,605 Acres Fragmented



4,867,820 Acres



0 Acres



4,914,547 Acres Fragmented

Figure 20. Evolution of 2024 Critical Habitat Analysis Unit 6 Southern Rockies

Table 6. Changes in Lynx Critical Habitat from 2014 to 2024 Proposed

Rocky Mountain Management Areas	Acres	CH Change %
2014 CH	12,114,016	
2024 CH proposed	10,725,166	11% loss
Total RM AU 2023 SSA	27,626,412	
AU3	13,263,764	
AU5	7,541,043	
AU6	6,821,605	
FA3	4,867,620	
FA5	717,141	
FA6	4,795,468	
2014 CH AU3	6,260,861	
2014 CH AU5	5,853,154	
2024 CH AU3	5,093,479	19% loss
2024 CH AU5	717,140	88% loss
2024 CH AU6	4,914,547	na

Overall, CH declined 11% from the 2014 CH status. The CH for Unit 3 declined 11% and for Unit 5 declined 88%. Colorado had no CH in 2014 and gained nearly 5 million acres, while Units 3 lost 1.4 million acres and Unit 5 lost 5.1 million acres. This appears contradictory in that Colorado (Unit 6) which was not occupied at the time of listing, is now proposed for nearly 5 million acres of CH. Meanwhile, Unit 5, which was occupied, is now facing an 88% reduction. The proposed CH for AU3, 5, and 6 are fragmented into smaller units with no identified protecting links. No linkages are provided within the Analysis Units nor between the Analysis Units.

Basing critical habitat on areas occupied at the time of listing has the effect of discounting historical observations prior to listing and depends on the effort expended to document observations. It also depends on how an area is defined. For example, a National Forest may have lynx observations at a particular point in time, while a smaller management unit such as a Ranger District might have none, so the Forest is occupied, while the Ranger District is not. A Ranger District may have observations while others do not, but using the Forest as a measure, the Forest would be occupied. We have pointed out that the rationale to now add critical habitat in Unit 6 should be used to expand critical habitat in Unit 5 to include the moderate and high probability habitat from Olson et al (2021), and in addition include the connecting corridor between Unit 5 and 6 which passes through the Caribou-Targhee NF, the Uinta-Wasatch-Cache NF, the Ashley NF and the BLM lands we identify later in these comments.

Using the McElvey historical observations[41], we tabulated these by management areas. (Table 7) Unit 3 (Montana and Idaho), being directly connected to the Canadian populations had the most observations (1200) with Unit 5 (219) and Unit 6 (57). Here, Unit 5 had four times the observations of Unit 6, yet Unit 6 added CH while Unit 5 lost most of its CH.

At a minimum, to correct the fragmentation in proposed management within Units 3, 5, and 6, the Analysis Units themselves should become critical habitat. A further level of fragmentation occurs between the Analysis Units and their critical habitats. Neither are the Olson et al (2021) Model[42] or the Squires et al 2024[43] Model areas connected. (Figure 21). This is an obvious omission since lynx were historically observed in the area including the Uinta Mountains in Utah and Wyoming in the area we call the Model Gap. Figure 21 illustrates the Olson and Squires model areas, 2024 proposed critical habitat and historic observations from McElvey. A large gap occurs while the modeling analyses have omitted the consideration of the higher elevation corridor between the GYA and Uinta Mountains which we address next.

Table 7. McElvey Lynx Observations by Management Area

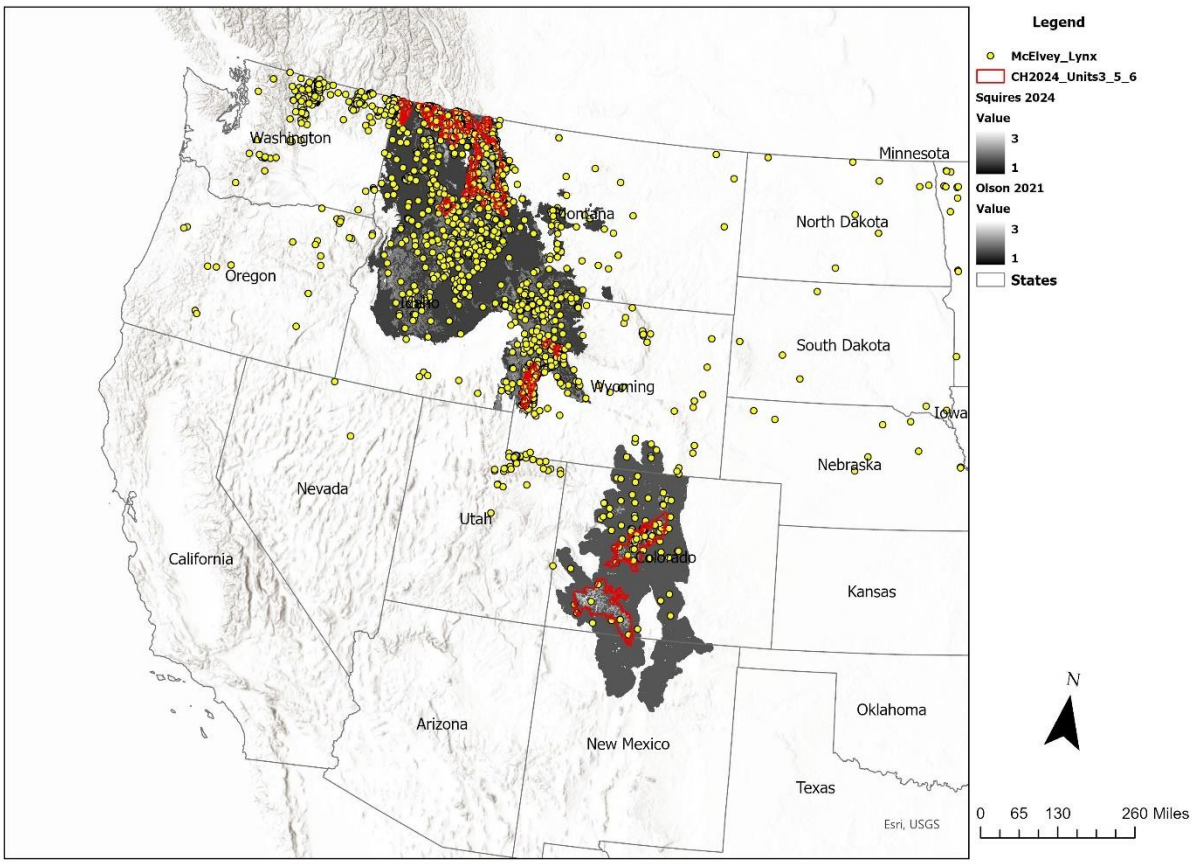
Rocky Mountain (RM) Management Areas	McElvey Observations	Percent of RM Historical	CH Percent of AU
Rocky Mtn States	2286	100	
2014 CH	1106	44.6	
2024 CH proposed	804	35.1	
AU3	1200	52.4	
AU5	219	9.6	
AU6	65	2.8	
2014 CH AU3	827	36.1	68.9
2014 CH AU5	189	8.3	86.3
2024 CH AU3	729	31.9	60.8
2024 CH AU5	75	3.3	34.2
2024 CH AU6	57	2.5	87.7

[41] Records obtained from the Beaverhead-Deerlodge NF in the form of a layer file: Historic Lynx Records (citing McKelvey et al, 1999). https://app.box.com/s/6bg8w6k5ru1axlv3zcm5ba2tt3gjz9hg

[42] Olson et al. 2021. Improved prediction of Canada lynx distribution through regional model transferability and data efficiency. Ecology and Evolution 11:1667 – 1690. https://app.box.com/s/32ww5q3ci96now3zy1fd2qgxzdf4lb21

[43] Squires, J.R., Olson, L.E., Ivan, J.S., McDonald, P.M., and Holbrook, J.D. 2024. Anthropogenically protected but naturally disturbed: a specialist carnivore at its southern range periphery. Biodiversity and Conservation. 27p. https://doi.org/10.1007/s10531-024-02978-8 https://app.box.com/s/qirh6aet9aqkfiwzix9uol1z2mzzuxgp

Figure 21. Gap Between Models and 2024 Critical Habitat



Lynx were documented in the Uinta Mountains and Greater Yellowstone Area from the Colorado reintroductions.[44] Ivan (2018)[45] characterized the lynx movements into Utah:

> Lynx that went to Utah were there long enough to transmit 1–136 ($\bar{x}$= 42) locations per individual across approximately 1–287 ($\bar{x}$= 100) days (Table 1; tally is approximate because we do not know where animals were in between weekly locations). **Most of these individuals entered and exited Utah via the Uinta Mountains in the northeast, Abajo Mountains in the southeast, or the East Tavaput Plateau in the east-central part of the state (Figures 1–29).** Those that spent a considerable amount of time in Utah tended to find and traverse the high country running north-south through the central portion of the state. Of the 17 individuals that spent time in Utah, 3 were known to have died there (Table 1).

[44] Ivan, J. 2017. Summary of movements of Colorado lynx in Wyoming. Colorado Parks and Wildlife. 36p. https://app.box.com/s/da8t9fbd3l587gpd1kmqnsikzugeir07

[45] Ivan, J. Summary of movements of Colorado lynx in Utah. Colorado Parks and Wildlife. 34p. https://app.box.com/s/7cwyp8cw68bxzsib0o8hyd9pb5lo6k61

> Six others were known to have died elsewhere (Colorado, Nebraska, New Mexico,) and the fates of the other 8 were unknown because their collars failed before they died (Table 1).
>
> CPW has no direct data indicative of reproductive activity for reintroduced lynx that traveled to Utah. **However, a male (BC05M03) and female (QU05F05) did occupy the same area of the Uinta Mountains for >200 days, including during breeding season, of 2006.** It is not known whether or not these individuals bred, denned, and/or produced kittens.

Clearly, these two lynx were able to survive in the Uinta Mountains.

We looked further at fragmentation in Analysis Unit 5, particularly in the Bridger-Teton NF and Caribou-Targhee NF. This illustrates that high probability habitat in Olson et al (2021) is fragmented by roads, clearcuts and mines. It further illustrates that Inventoried Roadless Areas are subject to disturbance and are fragmented. The Idaho Roadless Rule allows the IRAs to be divided up into prescriptions allowing timber harvest, mining, livestock grazing and in the case of SE Idaho, IRAs are traded away for tailings ponds and mine expansions. For example, the tailings pond for the Dairy Syncline Mine referenced earlier.

Figure 22 shows the SE Idaho linkage in the Soda Springs and Montpelier Ranger Districts. Phosphate mine leases effectively block the linkage as they operate 24/7 year-round, have heavy haul road and railroad traffic, and engage in blasting up to 400 times per week.[46] The roads shown do not include all roads, non-system Forest Service roads, illegal or user-created roads and trails. Nor is snowmobile activity represented. Ninety-seven percent[47] of the Caribou National Forest is open to snowmobiles, groomed trails fragment the Bear River Range and there is active trapping and dog pursuit of lions and other animals.

Figure 23 widens the view into Wyoming and the 2024 Proposed Critical Habitat. In the Wyoming portion, the linkages and proposed critical habitat are fragmented by timber harvest (clearcuts) and roads. Inventoried Roadless Areas are also fragmented by roads. Not all timber and thinning, prescribed fire, hazardous fuel reduction activities, or non-system roads are shown.

What is clear is that so-called protected areas such as IRAs cannot function for lynx unless they are given specific protection from roads, mines, and recreational vehicles as well as trapping and dog pursuit of predators. This should be part of the management going forward in designated critical habitat and connecting corridors.

---

[46] Draft Environmental Impact Statement Dairy Syncline for the proposed Dairy Syncline Mine and Reclamation Plan p2-9. https://app.box.com/s/8jtek3c3jttt4e0xppcytr9jwash9mao

[47] USDA. 2003. Revised Forest Plan and FEIS Caribou National Forest. https://app.box.com/s/seeaqtwqfyzlqcu64th3byuga9e0c5vb

Figure 22. SE Idaho Linkage Areas, IRAs Fragmented by Mines and Roads

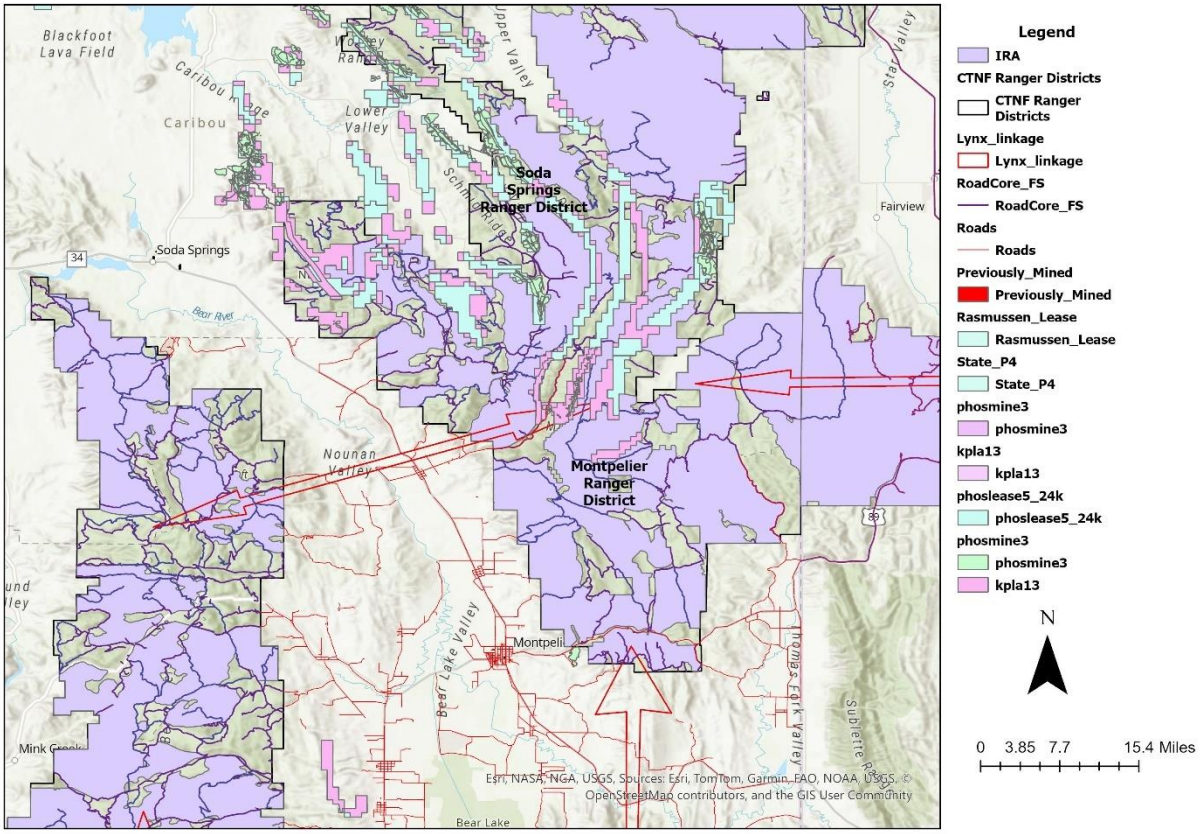
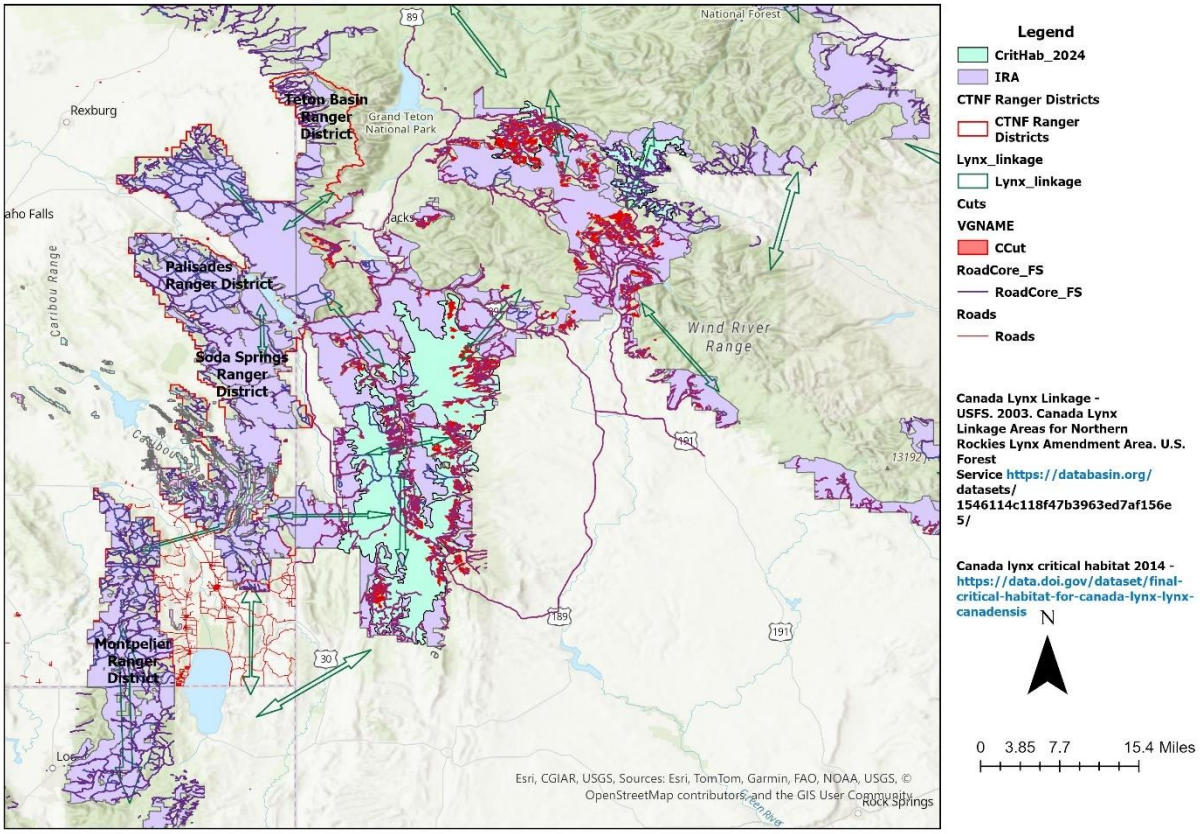


Figure 23. Greater Yellowstone Analysis Unit 5 Clearcuts, Roads, Mines, Linkage, and 2024 Proposed Critical Habitat



5. Applying Olson 2021 and Squires 2024

Squires et al (2024) constructed a model and analysis for the Southern Rockies lynx population in Colorado, southern Wyoming and northern New Mexico.[48] The modeling was similar to that in Olson et al (2021), which we find useful in prioritizing management areas for protection of lynx habitat and connectivity. An additional value of the Squires et al (2024) analysis is they incorporated natural disturbance such as fire and insect outbreaks, forest management such as timber harvest, protected areas such as National Parks and roadless areas, and human disturbance such as recreation use.

This is an analysis we have hoped to see in the numerous National Forest projects (mining, timber harvest, fire-related practices, ohv routes) but those projects avoid this level of analysis, resulting in litigation. What is now important is that the Fish and Wildlife Service map and

[48] Squires, John R.; Olson, Lucretia E.; Ivan, Jacob S.; McDonald, Peter M.; Holbrook, Joseph D. 2024. Anthropogenically protected but naturally disturbed: A specialist carnivore at its southern range periphery. Biodiversity and Conservation. https://doi.org/10.1007/s10531-024-02978-8. https://app.box.com/s/qirh6aet9aqkfiwzix9uol1z2mzzuxgp

protect lynx habitat and connectivity through expansion of critical habitat across the landscape. In this section, and due to time constraints, we focus on SSA Unit 5 and 3, the GYA and Northern Rockies using the Olson et al (2021) model. What is needed now is the blank portion of the map (Model Gap) between SSA Unit 6 (Southern Rockies) and Unit 5 (Greater Yellowstone Area) to be mapped, protected, and connected to the Greater Yellowstone Area and Northern Rockies.

In the following, we have also mapped the Regionally Significant Wildlife Corridor that was part of the Wasatch-Cache National Forest Plan[49] and the National Forests present within the models and the Corridor. We have used National Forests to analyze the models as they constitute the major portion of the modeled areas and they encompass most of the higher elevations in the regions of interest. Other land management areas must be included in critical habitat. These lands would include BLM, Tribal, State, Wildlife Refuges, National Parks and Monuments.

When we mapped National Forests, Ranger Districts, National Parks, Wilderness Areas, and Inventoried Roadless Areas we found there are 16 National Forests, 81 Ranger Districts, 3 National Parks, 25 Wilderness Areas, 482 individual polygons representing the fragmented IRAs. There are three National Forests in the Yellowstone to Uintas Connection in NE Utah, and 9 National Forests in the Squires et al (2024) model area. (Figures 24 – 27).

We used ArcGIS Pro Zonal Statistics to visually categorize the National Forests, Ranger Districts, National Parks, Wilderness Areas, and Inventoried Roadless Areas within the Olson et al (2021) modeled area. The maps provide ranges of the Olson et al (2021) habitat probability, with the red and orange representing those land management units with higher probabilities. Using these categories, visual patterns emerge across the landscape.

[49] Wasatch Cache Revised Forest Plan and Final Environmental Impact Statement Regionally Significant Wildlife Corridor. 2003. Accessed on January 18, 2025. https://www.fs.usda.gov/detail/uwcnf/landmanagement/projects/?cid=stelprdb5076923

Figure 24. National Forests Olson Probability Northern Rockies and Greater Yellowstone Area

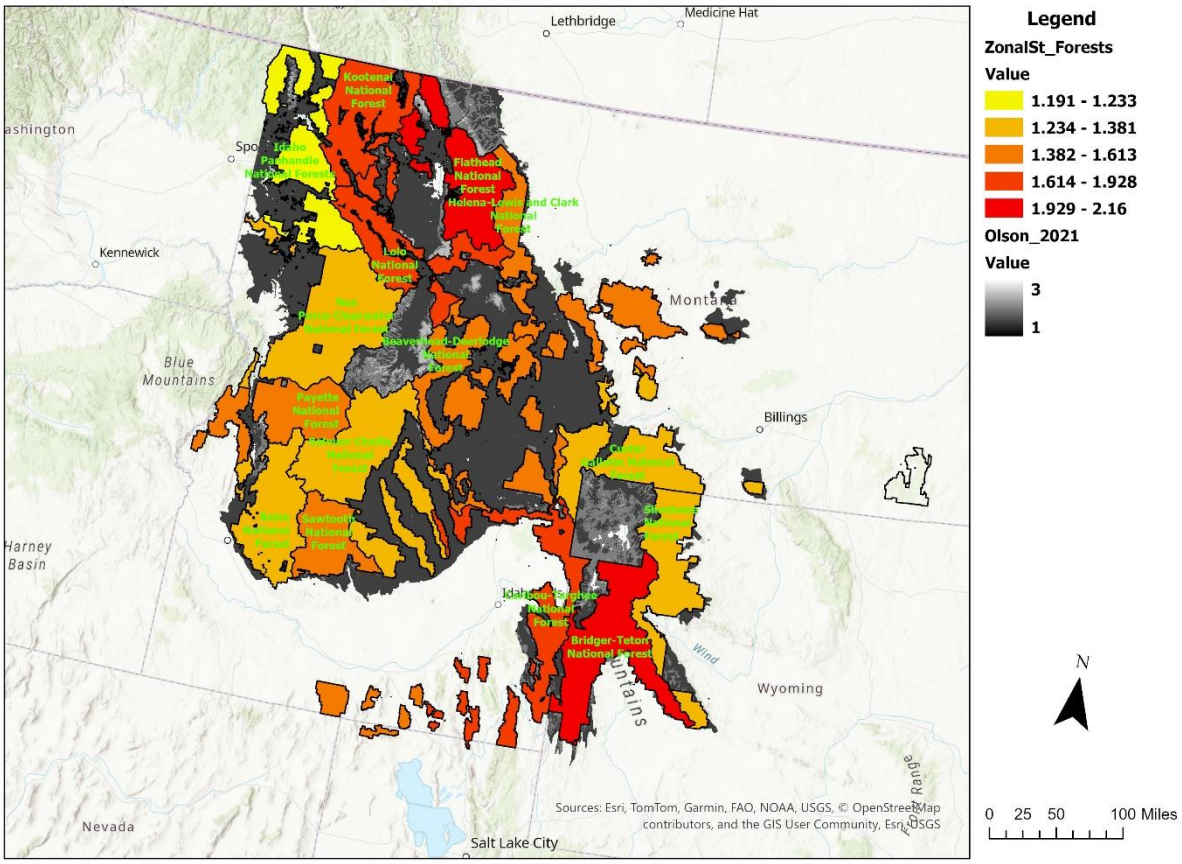
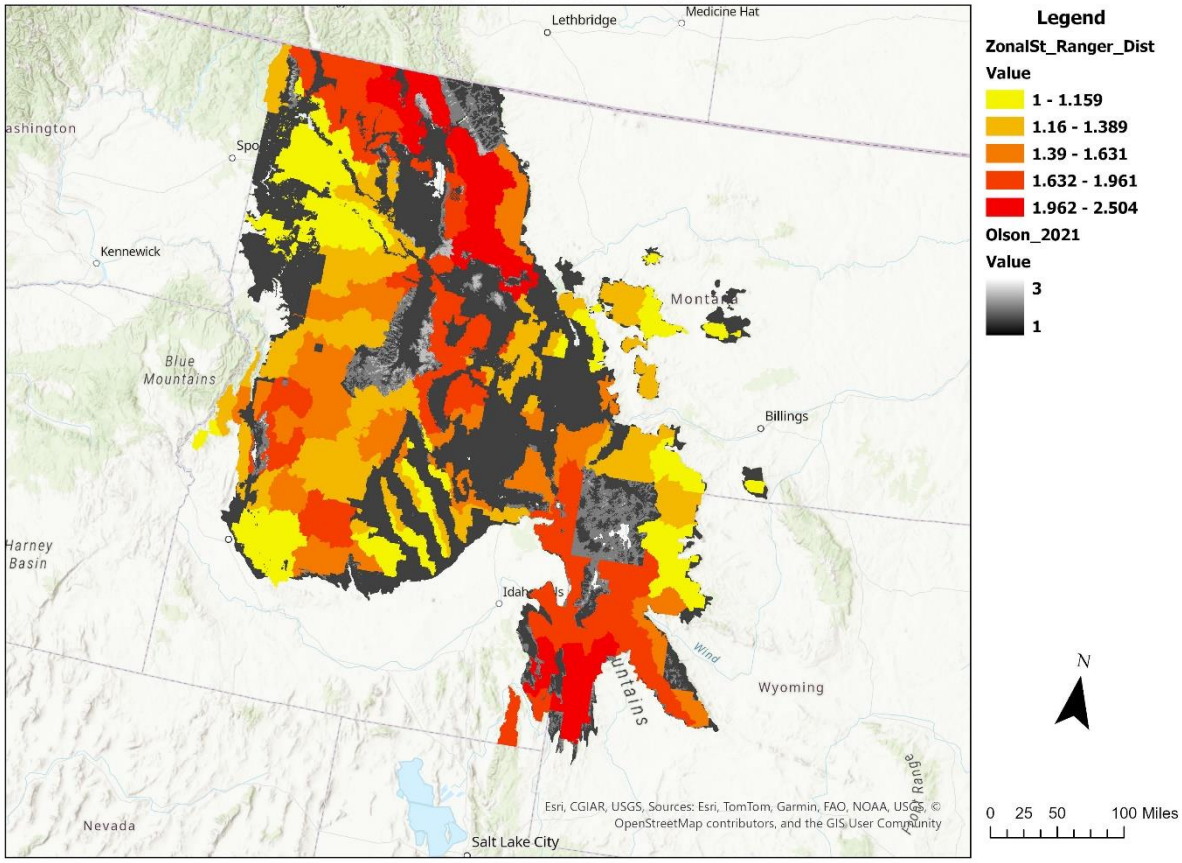
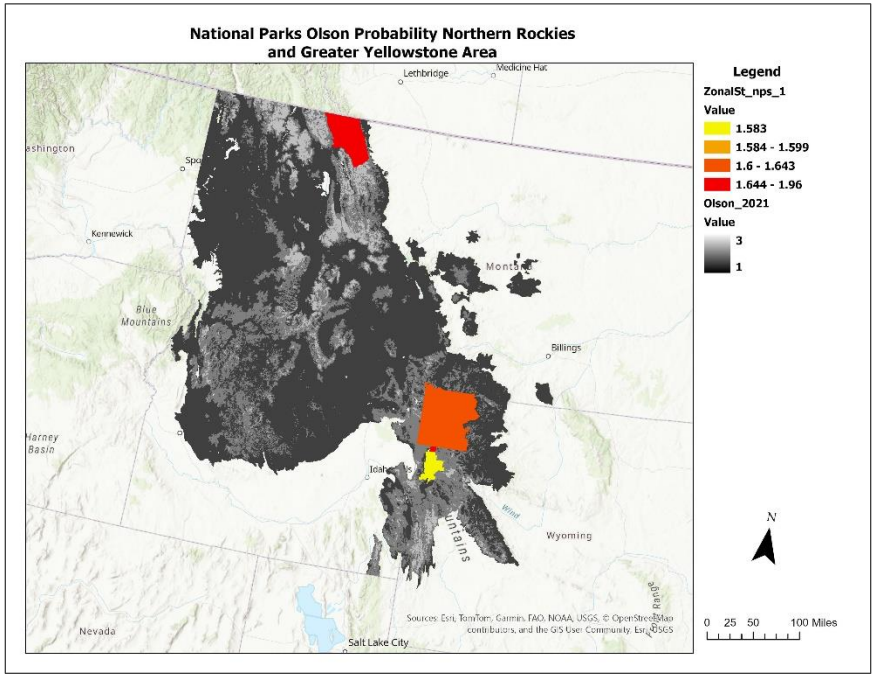
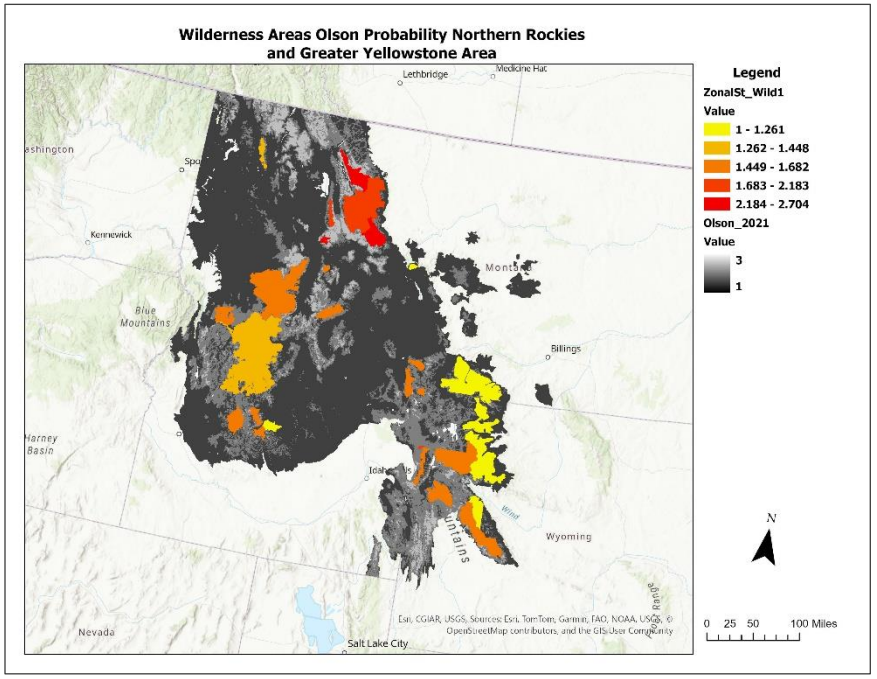


Figure 25. Ranger Districts Olson Probability Northern Rockies and Greater Yellowstone Area







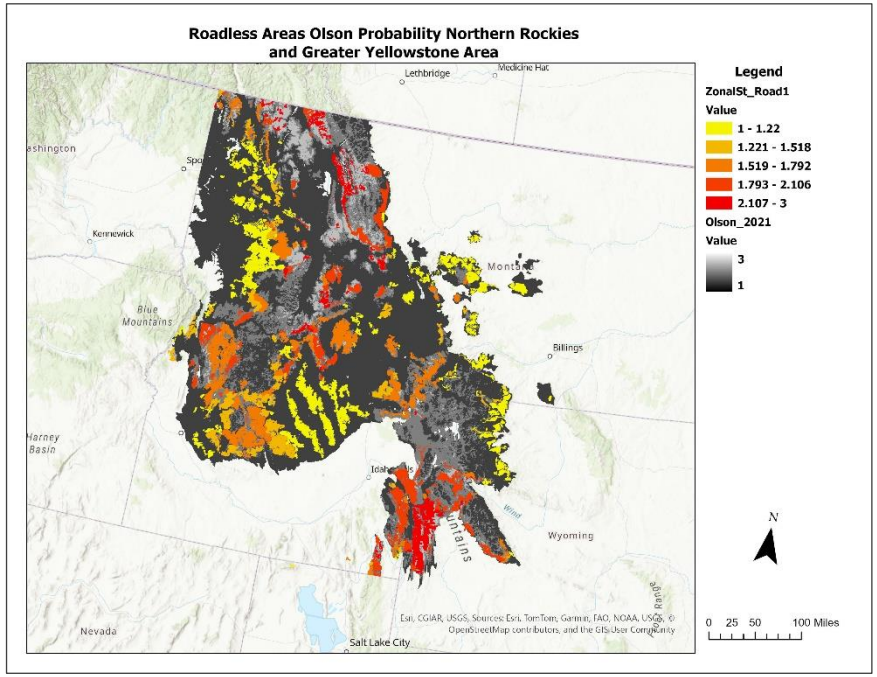
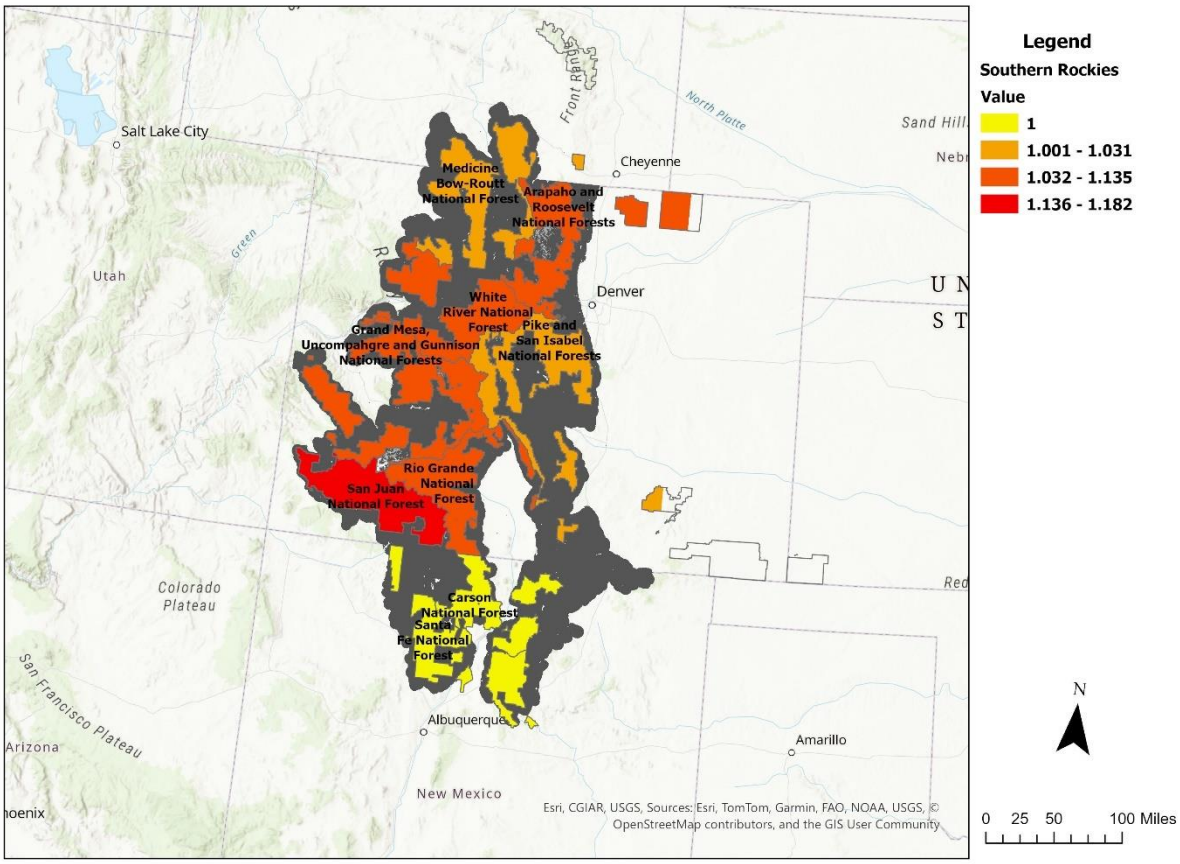


Figure 26. National Parks, Wilderness Areas, and IRAs within the Northern Rockies and Greater Yellowstone Area and Olson 2021

Figure 27. National Forests Squires Probability for the Southern Rockies

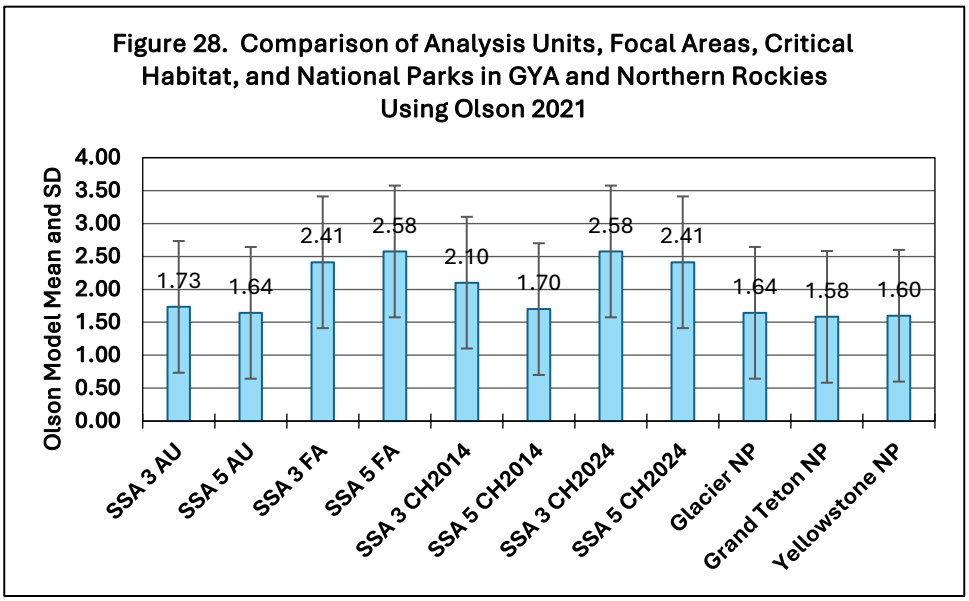


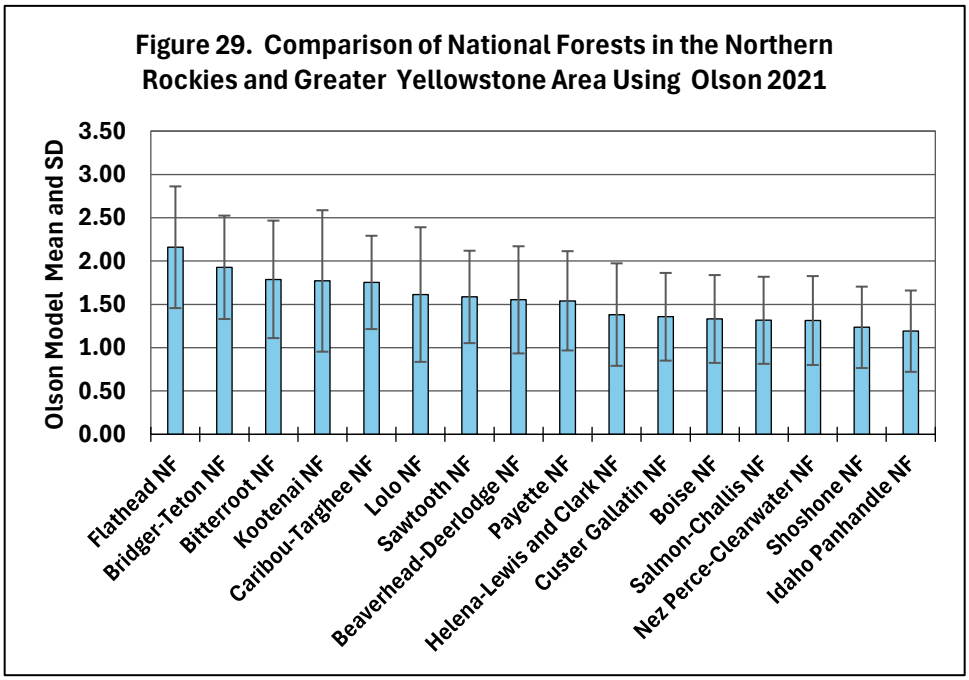
Anderson et al (2023) estimated a population of 52 lynx for Glacier National Park. When we analyzed Olson et al (2021) model data using ArcGIS Pro Zonal Statistics, we determine the mean habitat probability for Glacier NP was (1.64 ± 0.59). In Figure 28, the Analysis Units, Focal Areas, 2014 Critical Habitat and 2024 Proposed Critical Habitat were plotted. The Focal Areas and Critical Habitats had the highest habitat probabilities, but as we discussed before, they are fragmented and disconnected.

We can see that the standard deviations in Figure 28 indicate through their overlap, that the National Parks, the Unit 3 and 5 Analysis Units, and 2014 Critical Habitats have almost identical habitat probabilities to Glacier NP. Note that Unit 3 2014 Critical Habitat more closely compares to the Focal Area habitat probability. This analysis suggests that a broader critical habitat, that lowers the threshold to that of the Glacier NP level allows protection of habitats that should support lynx. We pursue that further in identifying management areas for focus and protection.

National Forests in the Northern Rockies and Greater Yellowstone Area are shown in Figure 29. They are ranked in order from highest to lowest Olson Model probabilities. The standard

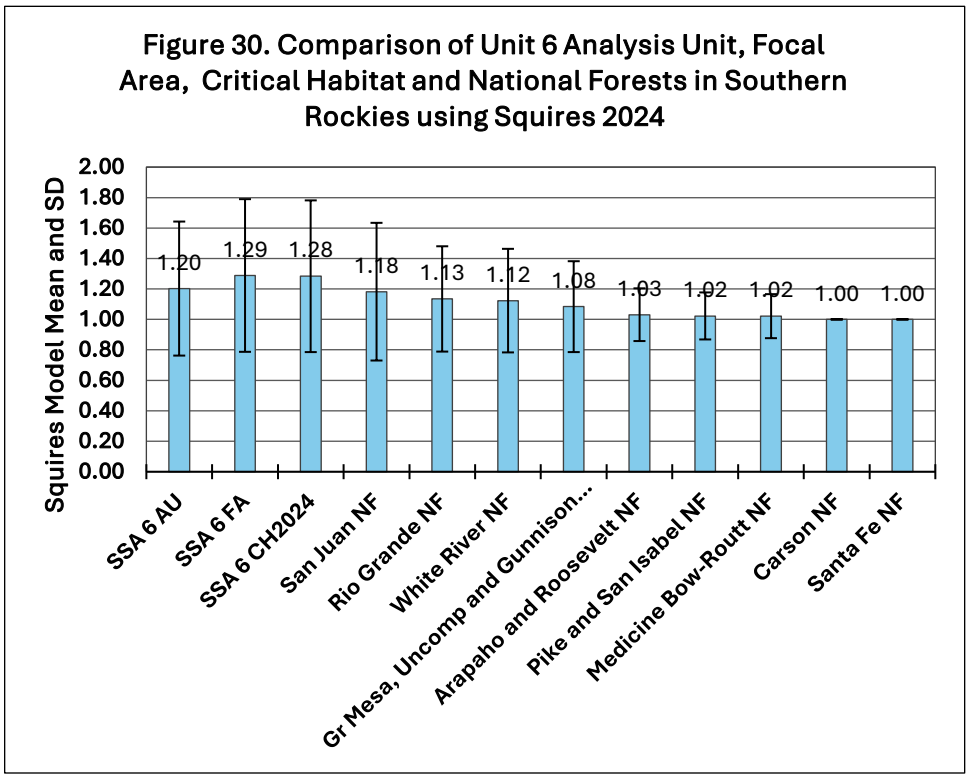
deviations show much overlap between these Forests and do not disqualify any of them as important or critical habitat. Several National Forests in Unit 5 have higher mean habitat probabilities than those in Unit 3, for example, the Bridger-Teton and Caribou-Targhee. Yet, the Notice downplays these Unit 5 NFs.





We generated a similar chart for the Southern Rockies Unit 6, which also has its proposed Critical Habitat fragmented. (Figure 30). In this case, we looked at the nine National Forests overlain by the Squires et al (2024) model. We note that the raster values in Squires range up to 3 as they did for the Olson (2021) model. Yet, the mean values in Olson (2021) range above 1.6

for all management areas. In the Southern Rockies, none approached this value, with the highest being the Unit 6 Focal Area at 1.29. Both models operate over a range from 1 to 3, representing the pixel values withing the model images. This indicates that Unit 5 should be more suitable than Unit 6 for supporting Canada lynx as the mean within the range of values is higher.



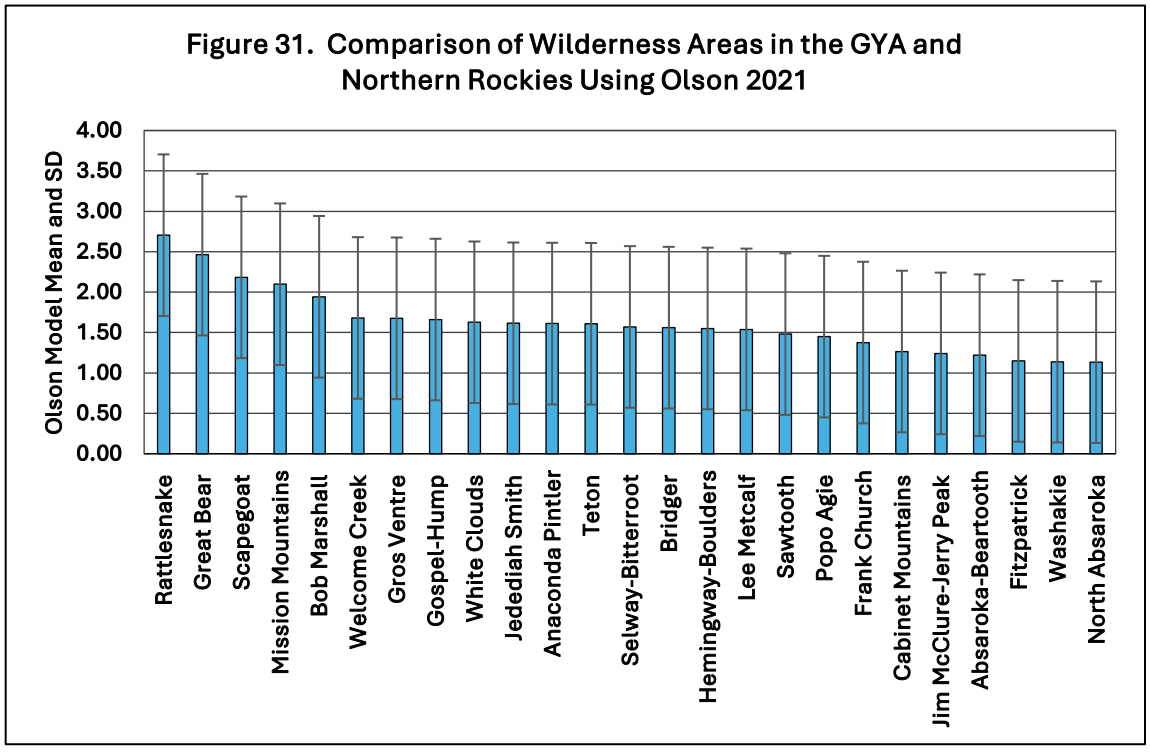
Whether the models are comparable is a question for the authors of those models. However, as habitat becomes less productive for lynx as one moves south away from the Canadian Boreal Forest, it makes sense that the Northern Rockies might have the highest values, followed by the Greater Yellowstone Area, then the Southern Rockies. This then becomes an important issue in that Colorado, with its much lower habitat probability is deemed suitable habitat and an introduced population is now considered as occupied habitat and given a much larger critical habitat than the Greater Yellowstone Area even though it has higher habitat probability.

> The Federal Register Notice made several points regarding designation of critical habitat for Units 3, 5, and 6. Unit 3 was occupied at the time of listing and is currently occupied and directly connected to the habitat and population in Canada. Unit 5 has small pockets of habitat on the Bridger-Teton NF and recent modeling (Olson et al 2021) shows this area does not contain the physical and biological features necessary to support lynx residency and is not directly connected to lynx habitats elsewhere. In Unit 6 it is uncertain whether this unit historically supported a resident population or if present, it was ephemeral. It is

not connected to lynx habitats elsewhere. It now supports a resident population as the result of the State of Colorado reintroductions.

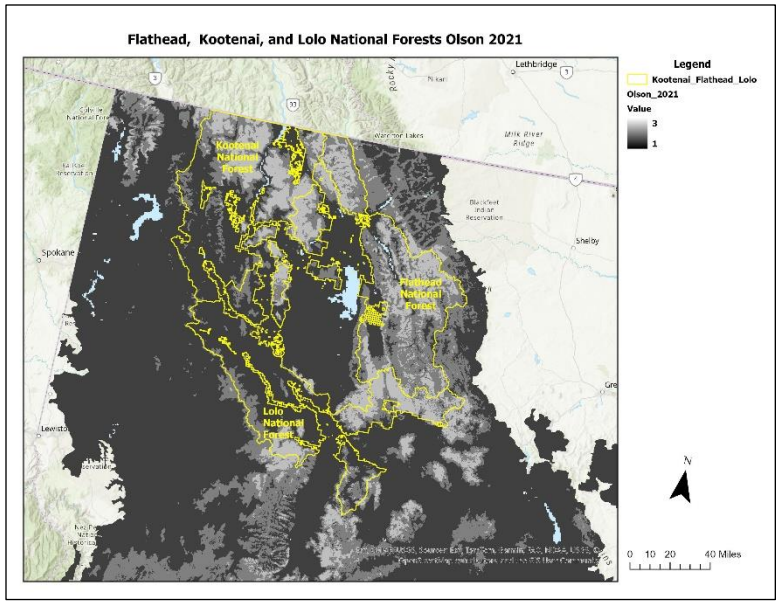
So, here we have what appears to be bias. Unit 5 (GYA) is claimed to not contain the physical and biological features needed and is not directly connected to habitats elsewhere. Yet, our analysis demonstrates that it has higher habitat probability than Unit 6 (Southern Rockies). The claim that it is not connected to habitats elsewhere is equally applicable to Unit 6 (Southern Rockies). They are not directly connected as well. The fault lies not in the landscape, but the failure to provide the needed connections. It is also a failure of the agencies that they have failed to explain why lynx are largely absent from the landscape in Unit 5 when it has high habitat probability across large areas.

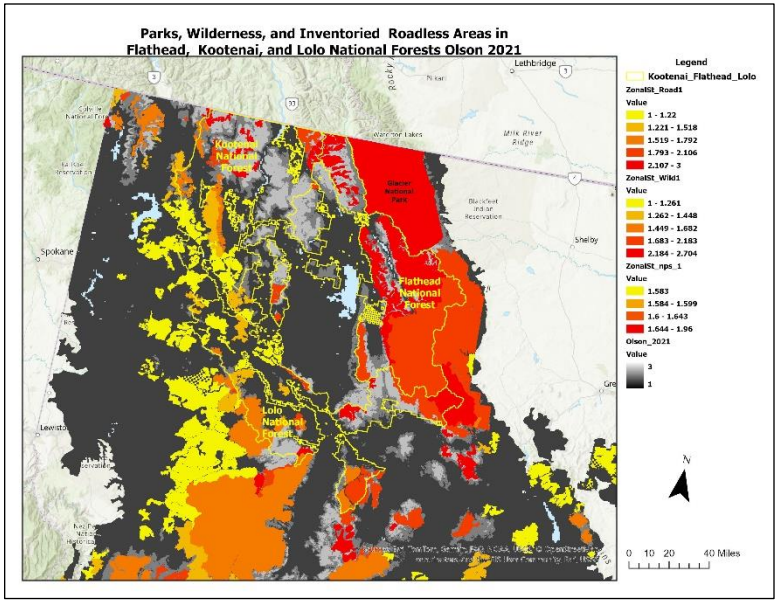
In a similar manner we used Zonal Statistics on the Wilderness Areas in the GYA and Northern Rockies. These are ranked in Figure 31. Ranking such as this will help in prioritizing land management units for designation as critical habitat or other protections. When it comes to Wilderness Areas, they have the highest level of protection against human disturbance, so can function as primary habitat or connections depending on their location and habitat probabilities. We also calculated the habitat probability for Inventoried Roadless Area, but there are too many polygons to represent in a chart. This data can be accessed in our spreadsheet which contains all the calculations and charts.[50]



[50] https://app.box.com/s/p50ujoi6b9rixcg17e872ne6uqwd24k6

We mapped the Wilderness, IRA, and Parks. (Figure 26). This provides a visual of the areas with higher habitat probability that could be used to identify connections. However, not all higher probability habitat is included in these designations. For example, in the Northern Rockies, three NFs (Flathead, Kootenai, and Lolo) with high habitat probability do not have these designations in sufficient areas to capture the highest probability habitat. (Figure 32). The Kootenai NF has a large area of higher probability habitat that is not in wilderness or roadless categories. For this reason, we recommend using the National Forests and Ranger Districts to help identify core and connecting habitat for management purposes.





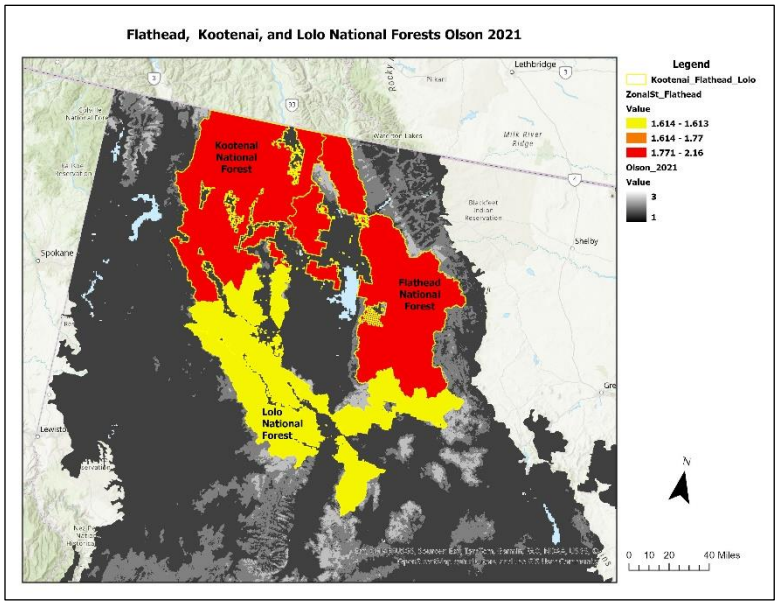


Figure 32. Flathead, Kootenai, and Lolo National Forests with Olson probability, and Protected Areas

6. Prioritizing Landscapes and Promoting Connectivity

Colorado Parks and Wildlife summarized lynx movements from the reintroductions in Colorado to Wyoming.[51] Locations from 16 male and 15 female lynx that were released in Colorado between 1999 - 2006 were in Wyoming between 1999 – 2010. It is interesting to note that the reintroduced lynx came from Canadian populations to the north. Inspection of the maps in the report gives the impression that these lynx were attempting to find their way directly back north. As the report describes, *"Most of these individuals entered and exited Wyoming via the Medicine Bow Mountains or the Park Range and traveled no farther into the state than the northern extent of these ranges… . At least 8 lynx made it to the Greater Yellowstone Area and beyond. A few entered/exited via the Uinta Mountains in Utah… ."* The report notes that there were likely other individuals that made the trip, but there has been no documentation since that time. (p3). Inspection of the figures in the report shows that some lynx apparently did cross the wide lower elevation valleys between the Medicine Bow Mountains and GYA, but there was no consistent path being followed and there were few conifer or high elevation areas present.

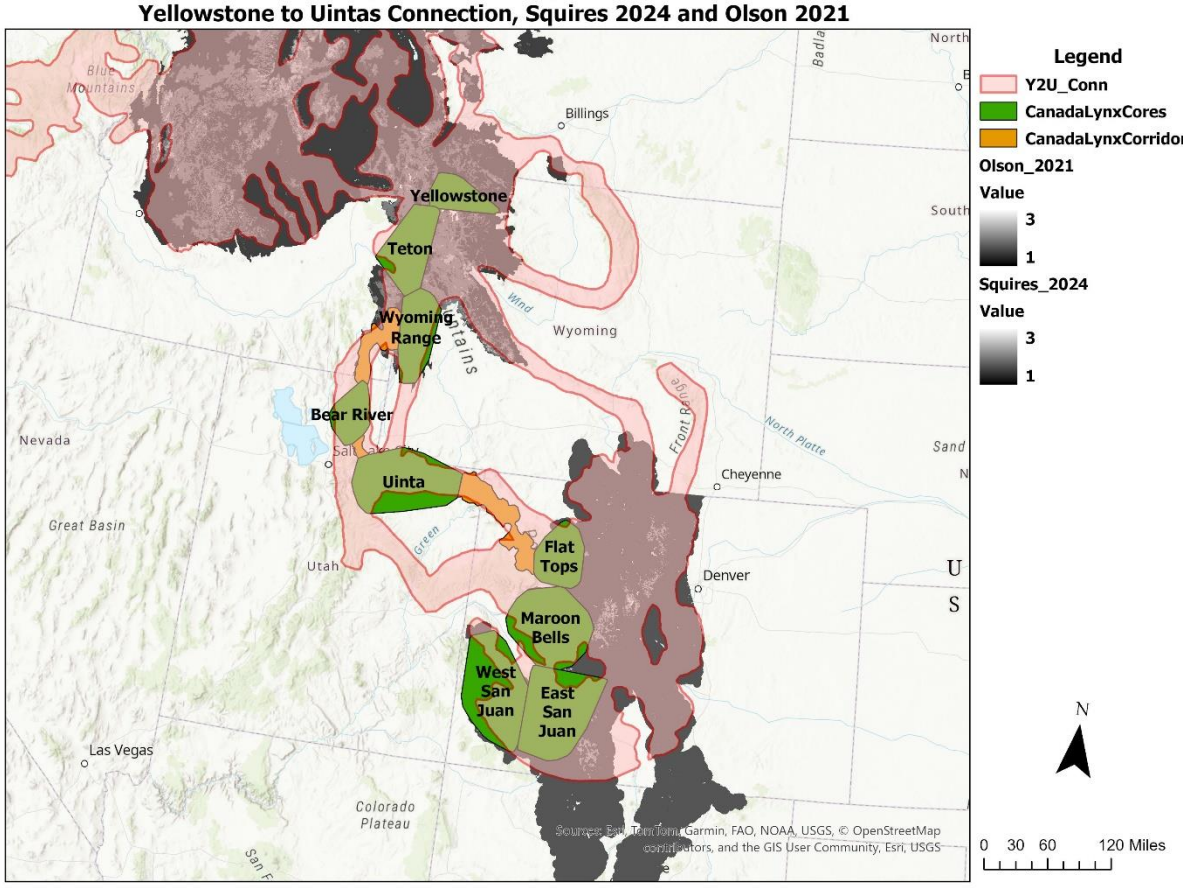
In our January 25, 2023 comments on the 2017 Canada Lynx Species Status Assessment, we reviewed the lynx least-cost path corridors and cores mapped by Bates and Jones (2007).[52] (Figure 33). These connect the Greater Yellowstone Area, passing through the Wyoming Range into SE Idaho and NE Utah through the Wasatch Range (Bear River and Monte Christo Ranges) to the Uinta Mountains and Southern Rockies. Their path followed the Yellowstone to Uintas Connection leg through the Uinta Mountains to Colorado. A slightly longer leg of the Y2U Connection passes to the south and through the East Tavaputs Plateau and Book Cliffs with elevations of 9,000 to 10,000 feet. Lynx from the Colorado reintroductions used these paths as described. The higher elevation areas are visible in Figure 34.

Bates and Jones (2007) least-cost path analysis of lynx connectivity between the San Juan Mountains in Colorado and the Greater Yellowstone Area reviewed the negative effects of habitat loss and fragmentation on wildlife populations and the resulting isolation of those populations. The role of landscape linkages in providing connections and gene flow was addressed. Using GIS, current spatial data for habitats, human factors affecting lynx movement, and potential travel corridors between core patches of lynx habitat in the southern and northern Rockies were identified. Habitat suitability analysis identified the best core areas for lynx based on vegetation type and road density. Habitat types suitable for lynx were identified and scored. These core and corridor areas of the least cost path overlaid with the Yellowstone to Uintas Connection leg of the Regional Corridor show they aligned with each other. Detailed maps of vegetation classes, road densities, core areas, housing density, slope, habitat permeability, and least cost corridors are provided in Bates and Jones (2007). Their

[51] Ivan, J. 2017. Summary of movements of Colorado lynx in Wyoming. Colorado Parks and Wildlife.
[52] Bates, W. and Jones, A. 2007. Least-Cost Corridor Analysis for Evaluation of Lynx Habitat Connectivity in the Middle Rockies. Report to the Nature Conservancy by the Wild Utah Project, Salt Lake City. https://app.box.com/s/0g8b1ryqg1iz6r1fd61rdkc8fso97oh5

analysis provides an assessment of the probability of successful dispersal for lynx as it assessed the entire landscape, while *"an animal traveling on the ground may not have prior knowledge of the territory it is crossing or obstacles it may come upon."* (p21). The model is suitable for making conservation and management decisions.

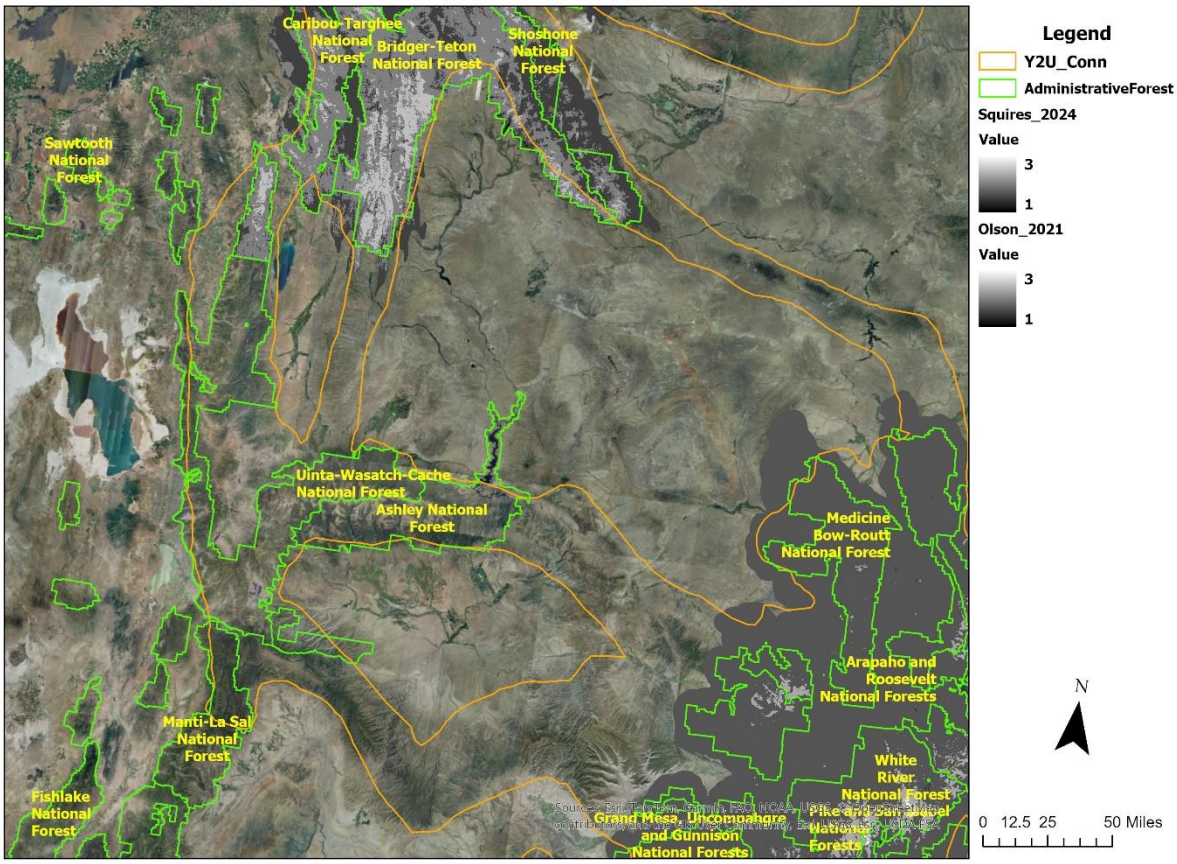
Figure 33. Bates and Jones (2007) Canada Lynx Cores and Corridors Yellowstone to Uintas Connection, Squires 2024 and Olson 2021



Colorado Parks and Wildlife engaged in a similar effort to map predicted use areas in Colorado.[53] They used location data from reintroduced lynx fitted with transmitters, filtered those data to remove locations for the first six months to account for habituation, considered elevations above 8,000 feet, and included factors for housing and road density, slope, distance to forest patches and vegetation types. Summer and winter data were used to generate models for both seasons. We note that Squires et al (2024) includes one of the authors of the CPW analysis and report. What is needed is a review of these two analyses and extending the Squires and Olson Models to cover this Model Gap and the Yellowstone to Uintas Connection.

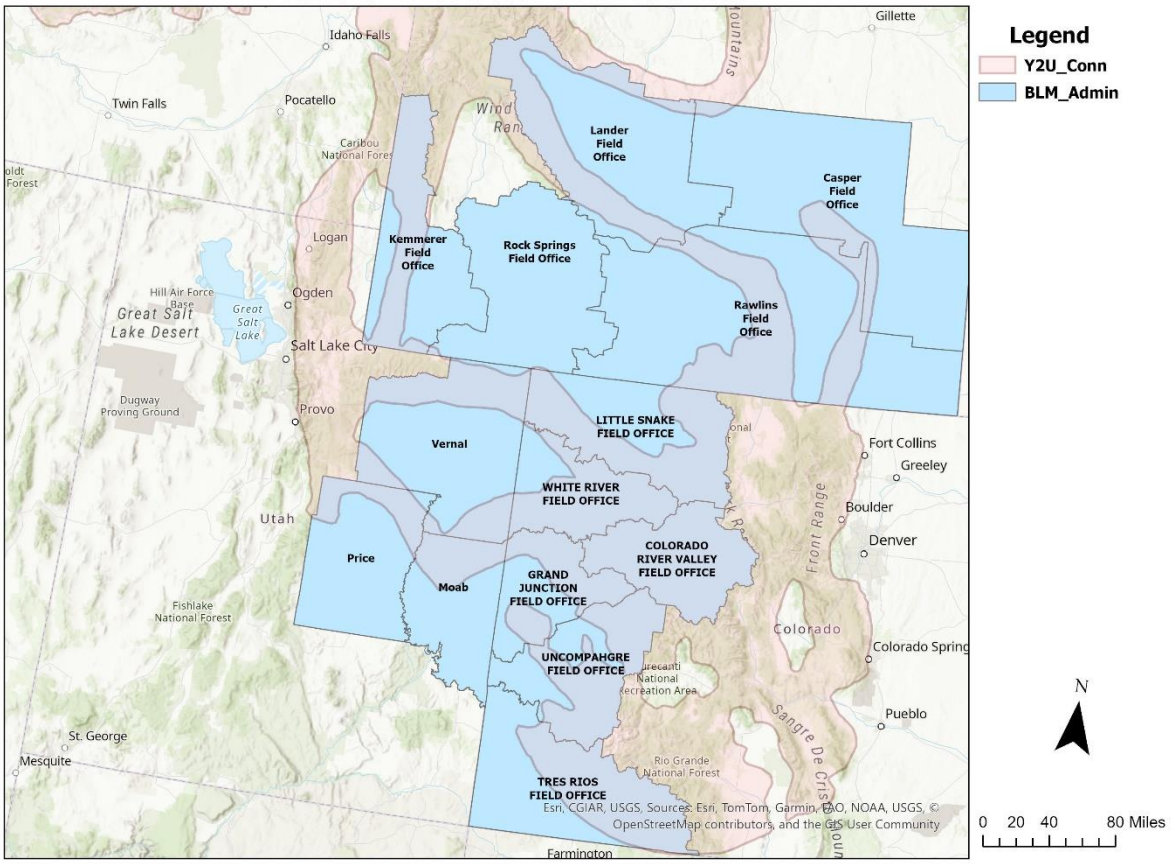
[53] Ivan, J., Rice, M., Shenk, T., Theobald, D., and Odell, E. Undated. Predictive Map of Canada Lynx Habitat Use in Colorado. Colorado Parks and Wildlife. Accessed on January 20, 2023. https://cpw.state.co.us/Documents/Research/Mammals/Publications/CPWPredictiveLynxMapReport.pdf

Figure 34. The Model Gap in the Yellowstone to Uintas Connection NE Utah and NW Colorado



We then took a closer look at land management in this Model Gap and the Yellowstone to Uintas Connection. Figures 35 and 36 show BLM Field Offices and National Forests within this gap are responsible for management of most of these public lands. This provides an opportunity to work with these two land managers to identify a continuous core and corridor system connecting the Southern Rockies and Greater Yellowstone Area and through land use plan amendments remove genetic barriers for lynx and provide standards to make these cores and corridors functional for lynx.

Figure 35. The Model Gap in the Yellowstone to Uintas Connection NE Utah and NW Colorado - BLM Field Offices



We looked closely at the linkages identified by the Forest Service[54] and the National Parks and National Forests within the Northern Rockies and Greater Yellowstone Area. (Figure 36 and 37). A more detailed analysis by the FWS team can identify specific areas for connecting these areas. Figure 37 shows the major vectors of movement within areas of high habitat probability or suitability. National Parks (Yellowstone and Grand Teton) and National Forests south to north (Unita-Wasatch-Cache, Caribou-Targhee, Bridger-Teton, Shoshone, Custer-Gallatin, Beaverhead-Deerlodge, Helena-Lewis and Clark, Lolo, Kootenai, and Flathead) combine to form a direct path (green arrows) from south of the GYA through the NR to Canada. A secondary leg (blue arrows) passes to the west and then north through National Forests (Sawtooth, Boise, Salmon-Challis, Payette, Nez Perce-Clearwater, Lolo, and Kootenai NFs).

[54] USDA Forest Service. 2007. FEIS Northern Rockies Lynx Management Direction. https://app.box.com/s/smz8ucyfq4d07i27of3ot2tli89va9gx and Figure 1 map: https://app.box.com/s/eaeejkj1gdznfx2ja7d3xh14bex3i83t

Figure 36. Major Pathways for Canada Lynx in the GYA and Northern Rockies

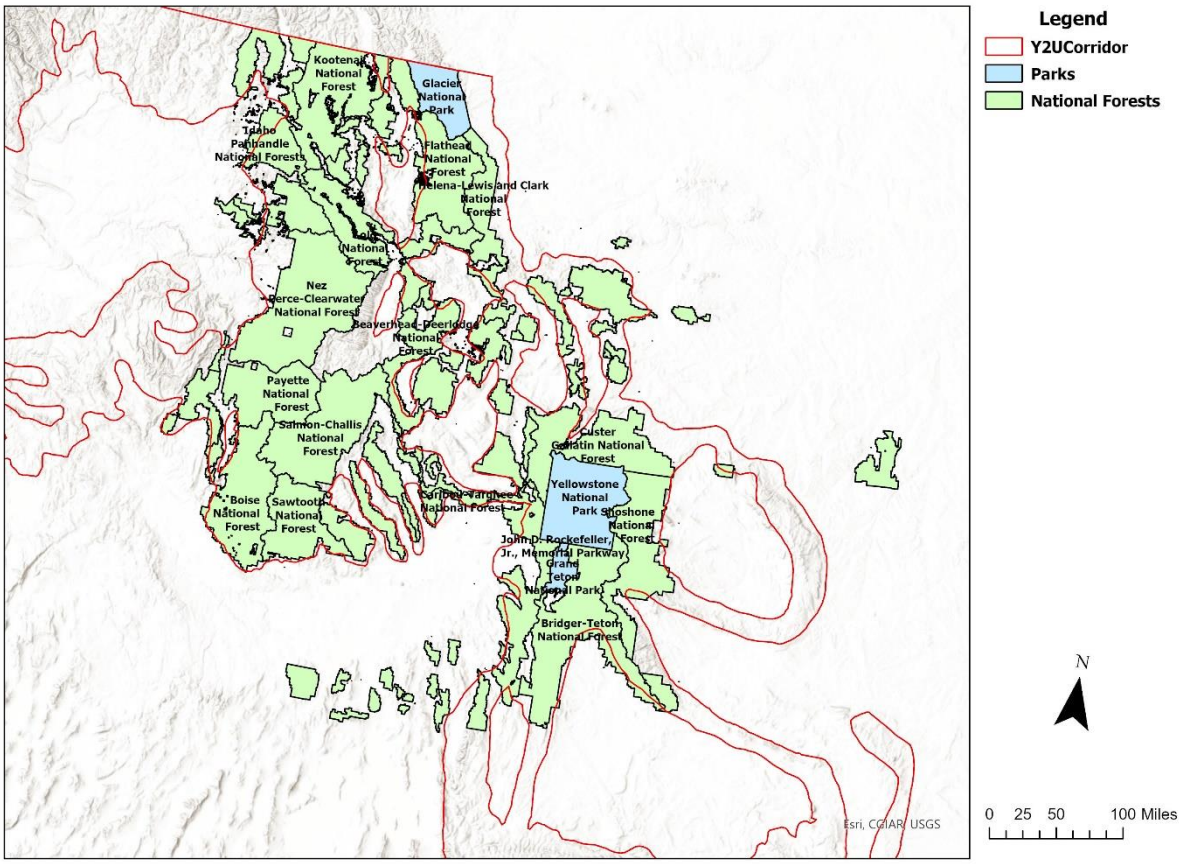
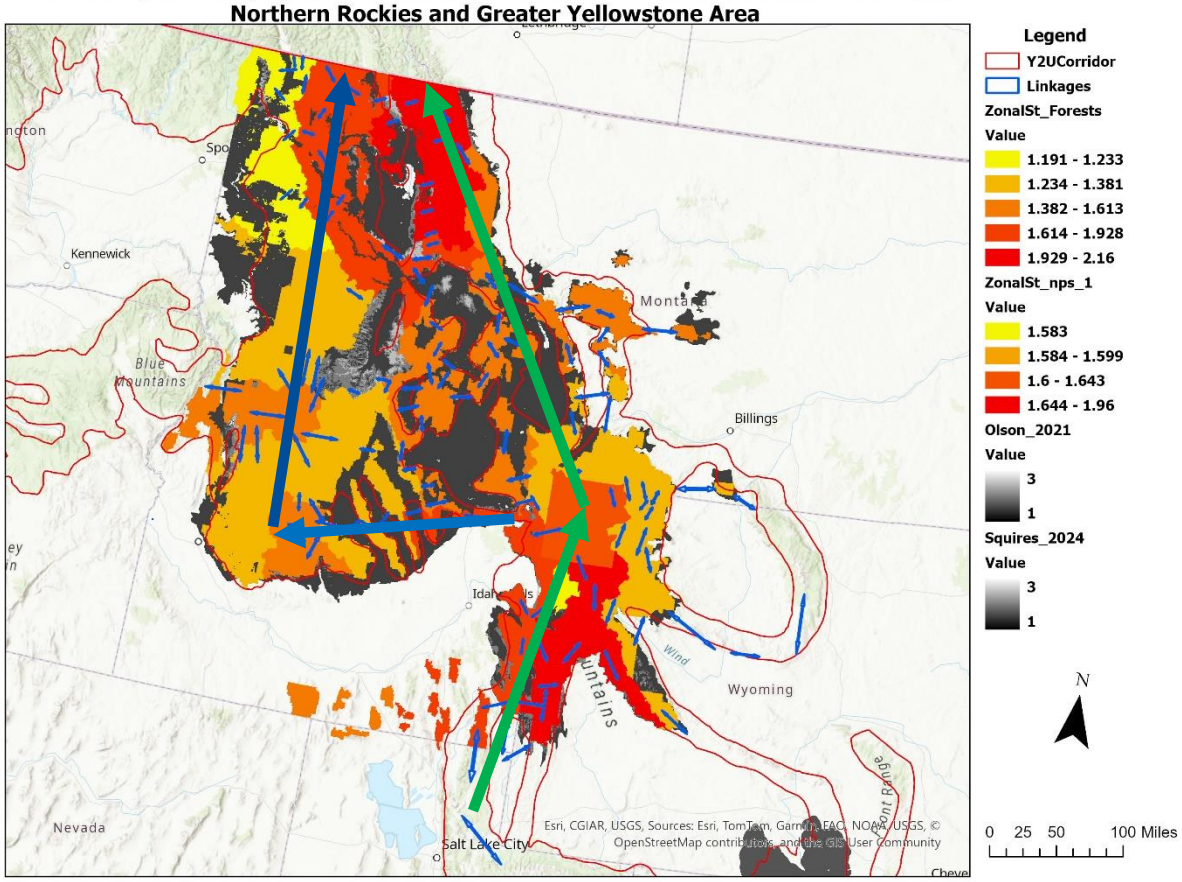


Figure 37.
Canada Lynx Linkages, Zonal Statistics at National Forest and National Park Level
Northern Rockies and Greater Yellowstone Area



1. Conclusions

The Federal Register Notice asked for input on:

> the amount and distribution of lynx habitat; any additional areas that should be included; special management considerations and managing for climate change; land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat; areas for exclusion; and improving the approach to designating critical habitat.

In these comments, we have provided analysis and rationale for expanded critical habitat for Canada lynx based on historic occupancy records and modeling by Olson et al (2021) and Squires et al (2024) and shown through mapping the management areas that should be given the highest priorities for Canada lynx protections. This also includes defining and protecting

migration corridors, particularly the Yellowstone to Uintas Connection between the Greater Yellowstone Area and Southern Rockies, and the Greater Yellowstone Area to the Northern Rockies. These currently isolated populations in these units may be doomed to extinction if protected corridors that can support lynx home ranges and migrations are not identified and protected. We found no areas for exclusion, instead major expansion is needed.

We have provided our previous detailed comments on the 2017 Species Status Assessment, Draft Recovery Plan, and Supplemental Draft Recovery Plan. These lay out the science and chronology of agency analyses with our interpretations as to those factors affecting lynx occupancy, historical lynx occupancy, factors that are dismissed as affecting lynx due to "lack of evidence" and our own analyses of lynx habitat.

We have noted that factors of human disturbance and development such as mines, road, recreation, trapping were all dismissed even though science at the time implicated these as well as timber manipulations. In those reviews, we also pointed out that the lack of regulatory mechanisms that were the reason for the original listing remain lacking. No evidence has been provided that the Northern Rockies Lynx Management Direction and amended Forest Plans have made a difference as inspection of the standards and guidelines reveals they have no teeth and, like logging in Lynx Analysis Units, have apparently made no difference. We regularly see LAUs exposed to high amounts of historical and currently proposed disturbance in new projects offered by the Forest Service. In these comments, we now see that human disturbance is admitted to displace lynx from preferred areas. What is missing is accounting for these and providing for lynx core and corridor habitat.

- Using historical lynx observations, we have shown that Unit 3 had the highest mean habitat probability or suitability, followed by Unit 5, with Unit 6 being lowest.
- Using the Olson et al (2021) and Squires et al (2024) models, we also quantitively showed that habitat suitability or probability was highest in Unit 3, next highest in Unit 5 and lowest in Unit 6 as reflected in the zonal statistics from these models.

In spite of this, Critical Habitat was reduced by 11% in Unit 3 and reduced by 88% in Unit 5, while Unit 6 had no Critical Habitat at the 2014 time of designation due to no occupancy, and now has millions of acres due to reintroductions made at the time of listing. The Federal Register Notice made the following claims to justify these changes.

> Unit 3 was occupied at the time of listing and is currently occupied and directly connected to the habitat and population in Canada. Unit 5 has small pockets of habitat on the Bridger-Teton NF and recent modeling (Olson et al 2021) shows this area does not contain the physical and biological features necessary to support lynx residency and is not directly connected to lynx habitats elsewhere. In Unit 6 it is uncertain whether this unit historically supported a resident population or if present, it was ephemeral. It is not connected to lynx habitats

elsewhere. It now supports a resident population as the result of the State of Colorado reintroductions

In these comments we have shown that snow levels and snowshoe hare populations are sufficient to support lynx in both Units 5 and 6. The Olson et al (2021) Model clearly shows a large area of habitat in Unit 5, but has excluded all but the most narrowly drawn areas as proposed critical habitat, which in themselves are disconnected from each other. The claim in the Notice that physical and biological features are lacking in Unit 5 are clearly wrong.

We demonstrated that many areas left out of critical habitat have habitat probabilities matching and exceeding that of Glacier National Park, where a recent effort has estimated a lynx population of 52 individuals and a population of 1.28/100 km^2. We demonstrated that to capture a majority of historic observations required including the high and moderate probability habitats as modeled by Olson et al (2021). To only include the highest probability further fragments critical habitat. Using the Flathead NF as an example, we found these two categories captured 86% of observations included in the Montana Natural Heritage Program database and this threshold should be the minimum used in defining critical habitat.

We illustrated recent and historical observations using the McElvey and Wyoming observations. Observations from 1990 to present were made throughout the Bridger-Teton NF, Yellowstone NP, Grand-Teton NP, and Caribou-Targhee NF. The absence of observations in the Caribou NF other than a female and two kittens in 2005 appears to be due to heavy human disturbance in the linkages through the Soda Springs and Montpelier Ranger Districts where phosphate mining goes on 24/7, and roads fragment the landscape along with universal snowmobile access. We also used the Tally Lake Ranger District as an example from the Flathead NF. Timber projects increased to a maximum in the period up to the listing of lynx, while lynx observations declined thereafter. High numbers of recorded observations resulting from intensive tracking efforts may bias such an analysis, but there appears to be causation rather than correlation in this case.

We summarized road densities in the Northern Rockies and Greater Yellowstone Area National Forests while adjusting for protected areas. These ranged widely and we did not take the analysis further. They provide food for thought and further analysis of whether it's the road density or the human uses during the different seasons that matter. We posit it is the level of human activity, and limiting this in is of high priority in restoring and maintaining lynx populations.

This late assignment of critical habitat to Unit 6 based on reintroductions at the time of listing has ignored that lynx from those reintroductions were moving within the corridor and remaining for more than half a year in the Uinta Mountains. In the Caribou NF, a female and two kittens were observed in 2005 indicating continued use of, or attempts to occupy, this leg of the corridor. This corridor and the CNF need to be added to critical habitat to provide regulatory constraint on disturbance and for restoration of the corridor. Reintroduction of

additional lynx in the Uinta Mountains seems a very practical approach in the face of the Colorado program.

In Section 4 of these comments, we focused on fragmentation of critical habitat and lack of connectivity. The science cited indicates that the metapopulations in Units 5 and 6 will blink out if not connected and their habitats are protected to be functional. We cited the Glacier NP study by Anderson et al (2023) in which they discussed lynx and other carnivores' avoidance of humans. We presented maps of each Analysis Unit showing the evolution of critical habitat and the depth of fragmentation we are presented with. The losses in critical habitat in Units 3 and 5 were major, while Colorado gained millions of acres. Yet, there were no designated corridors to maintain connections between these. We recommend that the Analysis Units themselves become critical habitat with added connections which should also be critical habitat.

We mapped example areas including the Bridger-Teton NF and its proposed critical habitat showing these were compromised by past logging and roads. Extending into the Caribou-Targhee NF, the linkage habitat is fragmented by phosphate mines which form a very likely barrier in the Soda Springs and Montpelier Ranger Districts. Inventoried Roadless Areas are compromised by roads, mining and timber harvest and therefore have their habitat security and connectivity compromised as well.

What is clear is that so-called protected areas such as IRAs cannot function for lynx unless they are given specific protection from roads, mines, and recreational vehicles as well as trapping and dog pursuit of predators. This should be part of the management going forward in designated critical habitat and connecting corridors.

In our last section, we provided an analysis and illustration of applying the Olson et al (2021) and Squires et al (2024) models to identify core and corridor habitat for lynx. We mapped the Bates and Jones (2007) model that took into account human infrastructure and genetics to identify a least-cost path for lynx through the Yellowstone to Uintas Connection that connects the Colorado lynx habitat in Unit 6 to the Uinta Mountains in NE Utah and the Wasatch Mountains north to the Bear River Range and SE Idaho, then connecting to the Greater Yellowstone Area in Unit 5.

We recommended that the Olson et al (2021) model be updated to incorporate a similar analysis as Squires et al (2024) that took into account disturbance. This and the Model Gap we identify between Unit 6 and Unit 5, which includes both Forest Service and BLM managed lands be modeled to complete the picture.

Using ArcGIS Zonal Statistics, we mapped the Forests and other land management areas showing the extent of IRA, National Parks, National Forests and their mean Olson Model probabilities for the Northern Rockies and Greater Yellowstone Area. We also mapped this same picture for the National Forests in Unit 6 using the Squires Model. These paint a clear picture of the relative importance of these land management units for lynx habitat and

connections. Charts of these rankings were provided with their standard deviations so they can be visually compared.

The differences between Model means across all three Analysis Units were compared. The Northern Rockies were highest with the Greater Yellowstone Area next and Southern Rockies well below the others. This comports with the idea that habitat quality declines as one moves south from the Boreal Forest in Canada. Using the Glacier National Park study showing its lynx estimated population with its Olson Model mean of 1.64 ± 0.59, we noted the National Forests and other management areas that are not significantly different from this should be managed as lynx habitat.

The idea that areas such as IRAs are protected is challenged with examples. One is that the Northern Rockies NFs do have high habitat probabilities, but there is a lack of protected areas, particularly in the Kootenai NF. What is clear is that so-called protected areas such as IRAs cannot function for lynx unless they are given specific protection from roads, mines, and recreational vehicles as well as trapping and dog pursuit of predators. This should be part of the management going forward in designated critical habitat and connecting corridors.

Finally, we presented a conceptual map using these higher rated Forests with a major link through the major vectors of movement within areas of high and moderate habitat probability or suitability. National Parks (Yellowstone and Grand Teton) and National Forests south to north (Unita-Wasatch-Cache, Caribou-Targhee, Bridger-Teton, Shoshone, Custer-Gallatin, Beaverhead-Deerlodge, Helena-Lewis and Clark, Lolo, Kootenai, and Flathead) combine to form a direct path (green arrows) from south of the GYA through the NR to Canada. A secondary leg (blue arrows) passes to the west and then north through National Forests including (Sawtooth, Boise, Salmon-Challis, Payette, Nez Perce-Clearwater, Lolo, and Kootenai).

All suitable habitats and connections for Canada lynx require land management that sustains currently functioning habitat. The current status of minimal analysis of impacts of roads, recreation, mines, trapping, and timber manipulations must be changed with science-based standards for each land management unit. The current concept of Lynx Analysis Units needs updating to account for science that was omitted when they were established. For example, we pointed out that work such as the 1989 Britell recommendations that included denning, travel, and stalking habitats as 60% of each square mile of lynx habitat were not used in the NRLMD which lacked defined characteristics for many elements of lynx habitat and connectivity. Other works such as Holbrook, Squires, Kosterman and others gave well defined habitat characteristics that should be incorporated into revised standards.

Current regulatory guidance is not taking these more quantitative measures into account in setting standards and for managing. All conifer forests need to be mapped with their current and potential stand characteristics and an analysis following that outlined in the FEIS for the

2003 Caribou National Forest Revised Forest Plan section on corridors in Volume IV. In that section (pages D-4 to D-8), a basic process for assessing connectivity is suggested. This includes:

- Assess historic patterns in vegetation and relative connectivity.
- Assess current patterns in vegetation and relative connectivity, including the impacts of human disturbance or physical barriers.
- Compare historic and current patterns of relative connectivity to determine if animal movement opportunities have been significantly interrupted.
- Consider ecologically based measures to restore historic animal movement

The 2013 LCAS provided the following conservation measures. These should be codified in quantitative terms that identifies and, through standards provides secure habitat and corridors for Canada lynx.

1. Vegetation management (includes several measures including landscape evaluation to identify opportunities for adaptation to climate change).
2. Wildland fire management
3. Habitat fragmentation (promote or retain large contiguous blocks of lynx habitat, identify linkage areas to maintain connectivity, minimize large scale development, and others
4. Recreation management (direct recreational activities away from identified linkage areas
5. Minerals and energy (locate facilities and roads outside of lynx habitat and linkage areas where possible)
6. Backcountry roads and trails (avoid coad reconstruction and upgrades that substantially increase speeds) .
7. Livestock grazing (manage in riparian areas to maintain snowshoe hares)

For areas already disturbed, the stage of regeneration or restoration must be determined to evaluate when (and if) those areas may return to lynx habitat or connectivity so those areas can be included in a defined recovery effort. Mature and Old Growth Forests must be protected. Designating Critical Habitat with these recommended constraints provides Canada lynx the needed protections.

Note: While we have used the Olson and Squires Models for our analysis, we have questions remaining about some of the parameters used and the omission of a major corridor. There are other models but none across the broader landscape such as Olson and Squires. Others include the Montana National Heritage Program, Beaverhead-Deerlodge NF, and the ones we cited herein. There is more we could include such as our analysis of historic lynx observations in relation to slope, aspect and elevation showing a wide range of use across these parameters; analysis of the various National Forests and their models; analysis of the Montana Natural

Heritage Program models, and others but given time constraints, we were unable to further refine our analysis. However, these comments should provide sufficient input to increase critical habitat, set protective standards, and begin to focus management on entire Forests, Ranger Districts, other agencies such as BLM, tribes, states, and so on.