United States Department of the Interior

Fish and Wildlife Service

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In Reply Refer To:
File: M19 USFS Region One_ Northern Region
06E11000-2017-F-0552 NRLMD - Lynx critical habitat

October 18, 2017

Leanne Marten, Regional Forester
U.S. Forest Service
Northern Region
26 Fort Missoula Road
Missoula, Montana 59804

Nora Rasure, Regional Forester
U.S. Forest Service
Intermountain Region
324 25th Street
Ogden, Utah 84401

Dear Mses. Marten and Rasure:

This is in response to the U.S. Forest Service's (Forest Service) request for U.S. Fish and Wildlife Service (Service) review of the biological assessment regarding the effects of the Northern Rockies Lynx Management Direction (NRLMD) on designated Canada lynx critical habitat. A determination of may affect, likely to adversely affect was made by the Forest Service. Additional information was received from the Forest Service through September 18, 2017.

The attached biological opinion addresses the effects of the NRLMD on designated Canada lynx critical habitat with respect to seven National Forests and is based on information provided for this action in the biological assessment (dated July 1, 2017), additional information received during the consultation process, and information in our files. The biological opinion was prepared in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. § 1531 et seq.). A project file of this consultation is on file at the Service's Montana Ecological Services Office.

We appreciate your efforts to ensure the conservation of threatened and endangered species as part of your responsibilities under the Act. If you have questions or comments related to this correspondence, please contact Katrina Dixon at 406-449-5225, extension 222.

Sincerely,

Jodi L. Bush
Office Supervisor

Enclosure
cc: AES, R-6, MS 60120 (Attn: Doug Laye)
Montana Department of Fish, Wildlife, and Parks, Helena, MT (Attn: Director)
File: 7759 Biological Opinions - 2017

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

BIOLOGICAL OPINION

on the

Effects of the Northern Rockies Lynx Management Direction on Designated Critical Habitat for Canada Lynx

Agency:	U.S. Department of Agriculture Forest Service Northern Region Missoula, Montana
Consultation Conducted by:	U.S. Fish and Wildlife Service Montana Ecological Services Office Helena, Montana
Date Issued:	October 18, 2017

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I. INTRODUCTION

In this biological opinion, the U.S. Fish and Wildlife Service (Service) analyzes the Northern Rockies Lynx Management Direction (NRLMD) and the potential effects implementation of the NRLMD may have on designated critical habitat for Canada lynx (*Lynx canadensis*).

This consultation represents the first tier of a tiered consultation framework, with each subsequent project that may affect lynx critical habitat as implemented under the NRLMD being the second tier of consultation. These second tier consultations would reference back to this biological opinion to ensure that the effects of specific projects under consultation are commensurate with the effects anticipated in this biological opinion. With each subsequent second tier consultation, the cumulative total of acres treated under the exemptions and/or exceptions to the vegetation standards would be tracked.

Section 7(b)(3)(A) of the Endangered Species Act of 1973, as amended (Act) requires that the Secretary of Interior issue biological opinions on federal agency actions that may affect listed species or critical habitat. Biological opinions determine if the action proposed by the action agency is likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Section 7(b)(3)(A) of the Act also requires the Secretary to suggest reasonable and prudent alternatives to any action that is found likely to result in jeopardy or adverse modification of critical habitat, if any has been designated. This biological opinion addresses only impacts to designated critical habitat for Canada lynx and does not address the overall environmental acceptability of the NRLMD.

Consultation History

Formal consultation related to the NRLMD and lynx critical habitat began with the November 2, 2016 letter from the Forest Service to the Service requesting consultation on the NRLMD and its impacts to lynx critical habitat as designated by the Service on September 12, 2014. We received a draft biological assessment March 17, 2017 and provided comments to the Forest Service on that biological assessment on April 28, 2017. We received a second draft biological assessment on June 21, 2017 and provided comments to the Forest Service on June 27, 2017. We then received a final biological assessment from the Forest Service dated on July 1, 2017. As part of the consultation process, the Service continued to receive information related to this consultation through September 18, 2017.

In 2007, the Forest Plans on 18 National Forests in the Northern, Intermountain, and Rocky Mountain Regions of the Forest Service were amended with the NRLMD. The NRLMD provides programmatic management direction related to lynx and lynx habitat and applies to occupied, mapped lynx habitat as defined in the NRLMD. On March 23, 2007, the Service issued a biological opinion and incidental take statement regarding the effects of the NRLMD on lynx (U.S. Fish and Wildlife Service 2007). The incidental take statement anticipated take in the form of harm (modification of habitat that reduces the snowshoe hare prey base for lynx) based on the treatment of up to six percent of occupied lynx habitat over ten years. This included treatment of up to 729,000 acres using the exemptions from the vegetation standards in the NRLMD to allow fuel treatment projects in the wildland urban interface (WUI), which is defined in the NRLMD as the area adjacent to an at-risk community that is identified in a community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is

the area 0.5 mile from the boundary of an at-risk community or within 1.5 miles of the boundary of an at-risk community under special conditions (U.S Forest Service 2007b). The incidental take statement also anticipated that no more than 64,320 acres of snowshoe hare foraging habitat would be treated using the exceptions to vegetation standards in the NRLMD for precommercial thinning projects for other resource benefit. The 10-year time-frame provided in the 2007 biological opinion and incidental take statement expired in March of this year (2017). Thus, the Forest Service requested a five-year extension to allow sufficient time for Forests to revise their Forest Plans and complete Section 7 consultation on those revised Forest Plans. On March 27, 2017, the Service provided the Forest Service with an amended incidental take statement, which extended the time-frame of the 2007 biological opinion to 2022 (U.S. Fish and Wildlife Service 2017). Thus, the 2007 no jeopardy biological opinion for lynx remains in effect under a similar tiered consultation framework as described above and the effects of the NRLMD on lynx are not considered in this document.

Critical habitat was first designated in 2006. No critical habitat was designated on Forest Service lands, thus no consultation occurred in 2007 on the effects of the NRLMD on lynx critical habitat. In 2009, the Service issued a final rule for a revised designation of lynx critical habitat. In this 2009 final rule, critical habitat was designated on Forest Service lands. As a result of a 2010 court order, the 2009 final rule was remanded to the Service for further consideration. The Service issued another final rule for a revised designation of critical habitat for lynx in September of 2014 (79 FR 54782). In this 2014 final rule, critical habitat was again designated on Forest Service lands.

A complaint was filed in November of 2014 regarding the 2014 final rule. As a result of a 2016 court order, the 2014 final rule was remanded to the Service for further action as described by the order. The remand stated that the Service failed to designate the state of Colorado as occupied lynx critical habitat and failed to comply with the 2010 court order regarding the Beaverhead-Deerlodge, Bitterroot, Nez Perce, Lolo, and Helena National Forests of Montana and Idaho. While the 2014 final rule was remanded to the Service, the court order stated that the 2014 "final rule shall remain in effect until the Service issues a new final rule on lynx critical habitat, at which time the September 2014 final rule will be superseded." The Service has not issued a new final rule on lynx critical habitat, thus the 2014 final rule remains in effect.

Of the National Forests (Forests) that amended their Forest Plans in 2007 with the NRLMD, critical habitat has been designated on all or portions of 10 Forests including: the Idaho Panhandle, Kootenai, Flathead, Lolo, Helena, Lewis and Clark, Custer, Gallatin, Shoshone, and Bridger-Teton National Forests (see Appendix 1). Three of these Forests have since revised their Forest Plans (U.S. Forest Service 2017). During the Forest Plan revision process the Kootenai, Idaho Panhandle, and Shoshone Forests incorporated the NRLMD into their revised Forest Plans. Section 7 consultations have occurred for each revised Forest Plan and the effects of the revised Forest Plans on lynx critical habitat were analyzed. Therefore, this biological opinion does not address these three forests as consultation on critical habitat for them has been completed. However, information for these three Forests was provided in the biological assessment and was considered in making our destruction or adverse modification determination in the conclusion section. Further, the Shoshone Forest has recently reinitiated consultation on their revised Forest Plan and is in the process of preparing a supplement to their 2015 Revised Plan biological

assessment to further analyze effects to lynx and lynx critical habitat. That action will have a separate section 7 consultation document completed for it.

The remaining seven Forests with designated critical habitat have not completed forest plan revision to date. The Flathead, Helena, Lewis and Clark, Custer, and Gallatin National Forests have initiated forest plan revision planning, while the Bridger-Teton and Lolo National Forests have yet to initiate forest plan revision planning.

Finally, since the adoption of the NRLMD in 2007, the Custer and Gallatin National Forests have combined into one Forest, the Custer Gallatin National Forest, and the Helena and Lewis and Clark National Forests have combined into the Helena-Lewis and Clark National Forest. Until Forest Plans are revised, these two Forests continue to be managed under four individual Forest Plans. Thus, for the remainder of the document, we will refer to these Forests individually rather than combined.

II. DESCRIPTION OF THE PROPOSED ACTION

The NRLMD provides programmatic management direction for Canada Lynx habitat through the use of objectives, standards, and guidelines intended to meet the primary goal of conserving Canada lynx. All of the programmatic objectives, standards, and guidelines are outlined by management activity type in the NRLMD Record of Decision (U.S Forest Service 2007a) and are included in Appendix D of the biological assessment (U.S. Forest Service 2017) and are incorporated here by reference. The NRLMD objectives, standards, and guidelines apply to all Forest Service actions within mapped lynx habitat.

As defined in the NRLMD Record of Decision Glossary (U.S Forest Service 2007a), an objective is a statement describing the desired conditions that promote achievement of a goal. A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action (a Forest Plan must be amended to deviate from a standard). A guideline is a management action that should be used to meet objectives (amending a Forest Plan is not required to deviate from a guideline). While a Forest Plan amendment is not required to deviate from a guideline, the 2007 NRLMD biological assessment (U.S. Forest Service 2007b) and the 2007 NRLMD biological opinion (U.S. Fish and Wildlife Service 2007) made the assumption that guidelines would be implemented in most cases. We continue to make that assumption here. The lack of implementation of a guideline does not automatically equate to an adverse effect and any effects of such would be analyzed in site-specific Section 7 consultations.

The NRLMD is intended to avoid or reduce the potential for projects proposed under Forest Plans to adversely affect lynx through a suite of objectives, standards, and guidelines that promote and conserve the habitat conditions needed to produce adequate snowshoe hare (lynx primary prey) densities to sustain lynx home ranges, and thus sustain lynx populations. Vegetation Standards VEG S1, S2, S5, and S6 include some exemptions for fuel treatment projects within the WUI. In addition, Standard VEG S5 includes exceptions for pre-commercial thinning to benefit other resources and Standard VEG S6 includes exceptions for treating vegetation surrounding administrative sites, for research studies, or for incidental impacts during

salvage harvest. Such exemptions and exceptions allow for the treatment of and temporary impacts to snowshoe hare habitat (lynx foraging habitat). Under the NRLMD, a maximum of approximately six percent of mapped lynx habitat could be treated on each Forest using the exemptions to the vegetation standards for fuel treatment projects in the WUI.

Because critical habitat is not always the same as mapped lynx habitat and mapped lynx habitat often consists of more acres than critical habitat (see Appendix 1), using the exemptions could allow for treatment of large portions of critical habitat on some Forests. In order to better promote the distribution of acres treated using the exemptions and to reduce the potential impacts to critical habitat, on September 18, 2017, the Forest Service provided additional information to the 2017 critical habitat biological assessment that included an "adjusted threshold" reducing the amount of critical habitat that could be treated on each Forest using the exemptions for fuel treatment projects in the WUI. The adjusted threshold does not change the total amount of mapped lynx habitat that could be treated across the Forests using the exemptions under the NRLMD, it just lowers the amount of mapped lynx habitat that could be treated within critical habitat. The adjusted threshold is based on the relative percentages of critical habitat on each Forest. The adjusted threshold was determined by multiplying the percentage of mapped lynx habitat on each Forest that occurs within critical habitat by the total number of acres that could be treated under the exemptions. For example, the Lolo Forest could treat 59,469 acres using the exemption as described in the NRLMD. Because only 27 percent of occupied habitat on the Lolo Forest is in critical habitat, the adjusted threshold would allow no more than 27 percent of the total exemption acres to be applied within critical habitat. Thus, under the adjusted threshold, a maximum of approximately 16,056 acres of critical habitat could be treated on the Lolo Forest using the exemption for fuel treatment projects in the WUI. The adjusted threshold acres for the action area are displayed further in the effects analysis section of this biological opinion.

For the purposes of this biological opinion on the effects of the NRLMD to designated lynx critical habitat, we have defined the action area to be those seven National Forests that have amended their Forest Plans with the 2007 NRLMD and have not completed forest plan revision to date. As previously described in the consultation history section above, three Forests with designated critical habitat have revised their Forest Plans (Kootenai, Idaho Panhandle, and Shoshone Forests) and have already completed section 7 consultation on the effects of their revised Forest Plans on lynx and designated critical habitat. The 2007 NRLMD amendment continues to be applicable to the remaining seven Forests with designated critical habitat that have not completed forest plan revision to date. The Flathead, Helena, Lewis and Clark, and Lolo Forests occur within Critical Habitat Unit 3 and the Custer, Gallatin, and Bridger-Teton Forests occur within Critical Habitat Unit 5.

As explained in the consultation history section above, because the 10-year time-frame provided in the 2007 biological opinion and incidental take statement for lynx had expired in March of this year (2017), the Forest Service requested a five-year extension. To be consistent with the recent amended incidental take statement related to the NRLMD and lynx (U.S. Fish and Wildlife Service 2017), the time-frame for this biological opinion is also through the year 2022. Additional details of the proposed action (the NRLMD), including monitoring and reporting requirements, can be found in the biological assessments prepared for the NRLMD for lynx (U.S. Forest Service 2007b) and lynx critical habitat (U.S. Forest Service 2017), the 2007

biological opinion prepared for the NRLMD for lynx (U.S. Fish and Wildlife Service 2007), and additional information received during the consultation process. These documents are incorporated by reference.

III. STATUS OF THE SPECIES /CRITICAL HABITAT DESCRIPTION

The Service published a revised designation of critical habitat for the contiguous United States distinct population segment of the Canada lynx on September 12, 2014, which became effective on October 14, 2014 (79 FR 54782). In total, approximately 38,955 square miles have been designated within five units in the states of Maine, Minnesota, Montana, Wyoming, Idaho, and Washington (see Table 1).

Table 1. Critical habitat units designated for lynx (79 FR 54782).

Critical Habitat Units	Area Designated (mi^2)	Land Ownership
Unit 1: Maine	10,123	Private, State, Federal
Unit 2: Minnesota	8,069	Federal, State, Private
Unit 3: Northern Rocky Mountains (MT and ID)	9,783	Federal, Private, State
Unit 4: North Cascades	1,834	Federal, Private
Unit 5: Greater Yellowstone Area (MT and WY)	9,146	Federal, State, Private
TOTAL	**38,955**	

The five units contain the physical or biological features essential to the conservation of the lynx as they are comprised of the primary constituent element and its components laid out in the appropriate quantity and spatial arrangement. The units are discussed below with information taken from the final rule revising designated critical habitat for lynx (79 FR 54782) followed by a discussion on the primary constituent element and its components.

Unit 1 is located in northern Maine in portions of Aroostook, Franklin, Penobscot, Piscataquis, and Somerset Counties. This area was occupied by the lynx at the time of listing and is currently occupied by the species. This area is the one area in the northeastern region of the lynx's range within the contiguous United States that currently supports breeding lynx populations and may serve as a source of lynx, or provide connectivity for more peripheral portions of the lynx's range, in the Northeast.

Unit 2 is located in northeastern Minnesota in portions of Cook, Koochiching, Lake, and St. Louis Counties. This area was occupied by the lynx at the time of listing and is currently occupied by the species. Lynx are currently known to be distributed throughout northeastern Minnesota. This area is essential to the conservation of lynx because it is the only area in the Great Lakes region for which there is evidence of recent lynx reproduction. It likely acts as a source or provides connectivity for more peripheral portions of the lynx's range in the region. National Forest land in Unit 2 is managed under Forest Plans that have incorporated management direction similar to the NRLMD, which reduces or eliminates adverse effects on lynx, by reducing adverse effects on habitat important to lynx.

Unit 3 is located in the Northern Rocky Mountains of northwestern Montana, in portions of Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Missoula, Pondera, Powell, and Teton Counties and in a small portion of northeastern Idaho in Boundary County. This area is approximately 9,783 square miles, was occupied by the lynx at the time of listing, and is currently occupied by the species. Lynx are known to be widely distributed throughout this unit and breeding has been documented in multiple locations. This area is essential to the conservation of lynx because it appears to support the highest density lynx populations in the Northern Rocky Mountain region of the lynx's range. It likely acts as a source for lynx and provides connectivity to other portions of the lynx's range in the Rocky Mountains, particularly the Yellowstone area. Table 2 illustrates the preponderance of federal lands designated as critical habitat, which are primarily National Forest system lands, within Unit 3. Vegetation management and timber harvest are dominant land uses, and so special management is required depending upon the silvicultural practices conducted. Vegetation management practices that provide for a dense understory are beneficial to lynx and snowshoe hares. National Forest lands in Unit 3 are managed under the NRLMD (U.S. Forest Service 2007a). The NRLMD includes a suite of management directives that enhance, maintain, and conserve dense understories within this habitat.

Table 2. Square miles of lynx critical habitat per ownership per state in Lynx Critical Habitat Unit 3: Montana and Idaho (79 FR 54782).

	Federal (mi^2)	State (mi^2)	Private(mi^2)
Montana	8,743	156	839
Idaho	45	.04	0

Unit 4 is located in the North Cascade Mountains of north-central Washington in portions of Chelan and Okanogan Counties and includes BLM lands in the Spokane District as well as Loomis State Forest lands. This area was occupied by the lynx at the time of listing and is currently occupied by the species. This unit supports the highest densities of lynx in Washington. This area is essential to the conservation of lynx because it is the only area in the Cascades region of the lynx's range that is known to support breeding lynx populations. National Forest lands in Unit 4 are managed under the 2006 Conservation Agreement (U.S. Forest Service and U.S. Fish and Wildlife Service 2006), which defers any projects that adversely affect lynx until Forest Plans are amended to consider the conservation needs of lynx and lynx habitat.

Unit 5 is located in the Greater Yellowstone Area of southwestern Montana, in portions of Carbon, Gallatin, Park, Stillwater, and Sweetgrass Counties, and in northwestern Wyoming in portions of Fremont, Lincoln, Park, Sublette, and Teton Counties. This area was occupied by the lynx at the time of listing and is currently occupied by the species. The Greater Yellowstone Area is inherently marginal lynx habitat with highly fragmented foraging habitat (snowshoe hare habitat). For this reason, lynx home ranges in this unit are likely to be larger and incorporate large areas of non-foraging matrix habitat. Table 3 illustrates the preponderance of federal lands designated as critical habitat, which are primarily National Forest system lands, within Unit 5. National Forest lands in Unit 5 are managed under either the NRLMD (U.S. Forest Service

2007a) or the Southern Rockies Lynx Management Direction (U.S. Forest Service 2008), which provides management direction similar to the NRLMD.

Table 3. Square miles of lynx critical habitat per ownership per state in Lynx Critical Habitat Unit 5: Montana and Wyoming (79 FR 54782).

	Federal (mi^2)	State (mi^2)	Private(mi^2)
Montana	2,235	12	140
Wyoming	6,688	10	60

Conservation Needs of the Species

The physical or biological features that are essential to the conservation of lynx were identified within the geographical area occupied by lynx at the time of listing. These physical or biological features are the primary constituent elements (PCE) laid out in adequate quantity and spatial arrangement to be essential to the conservation of the species. Based on this and the current knowledge of the life history, biology, and ecology of lynx, the PCE for lynx critical habitat is (79 FR 54811):

1. Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:
    a. Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface;
    b. Winter conditions that provide and maintain deep, fluffy snow for extended periods of time;
    c. Sites for denning that have abundant coarse woody debris, such as downed trees and root wads; and
    d. Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.

The final rule also described activities that may affect critical habitat and therefore should result in consultation. These activities include, but are not limited to: (79 FR 54827):

1. Actions that would reduce or remove understory vegetation within boreal forest stands on a scale proportionate to the large landscape used by lynx…These activities could significantly reduce the quality of snowshoe hare habitat such that the landscape's ability to produce adequate densities of snowshoe hares to support persistent lynx populations is at least temporarily diminished.

2. Actions that would cause permanent loss or conversion of the boreal forest on a scale proportionate to the large landscape used by lynx…Such activities could eliminate and fragment lynx and snowshoe hare habitat.

3. Actions that would increase traffic volume and speed on roads that divide lynx critical habitat…These activities could reduce connectivity within the boreal landscape for lynx, and could result in increased mortality of lynx within the critical habitat units.

Further, the rule notes that in matrix habitat, activities that change vegetation structure or condition would not be considered an adverse effect to lynx critical habitat unless those activities would create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within a potential home range, or if they adversely affect adjacent foraging or denning habitat.

Analysis of the Species/Critical Habitat Likely to be Affected

Critical habitat has been designated for Canada lynx within the action area, which lies within Critical Habitat Units 3 and 5. The biological assessment determined that the NRLMD would likely adversely affect areas of designated critical habitat within the action area. Therefore, formal consultation with the Service has been initiated and this biological opinion determines whether or not activities associated with the NRLMD are likely to result in destruction or adverse modification of designated lynx critical habitat.

IV. ENVIRONMENTAL BASELINE

Under the provisions of section 7(a)(2), when considering the "effects of the action," the Service is required to consider the environmental baseline. Regulations implementing the Act (50 C.F.R. § 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed federal projects in the action area that have undergone section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress.

In 2007, the Service prepared a biological opinion on the effects of the Northern Rockies Lynx Management Direction (NRLMD) on lynx and determined that the NRLMD was not likely to jeopardize lynx (U.S. Fish and Wildlife Service 2007). The NRLMD applies to occupied, mapped lynx habitat within lynx analysis units (LAUs). LAUs are typically large enough to represent the average home range size of a female lynx and contain adequate habitat and landscapes to support lynx year-round. The NRLMD provides direction primarily for lynx habitat management to avoid or reduce the potential for projects proposed under Forest Plans to adversely affect lynx. The direction accomplishes this through a suite of standards and guidelines that reduce or avoid adverse effects on lynx from land management activities primarily by reducing or avoiding adverse effects on lynx habitat and snowshoe hare habitat. Thus, the NRLMD promotes and conserves the habitat conditions needed to produce snowshoe hare (lynx primary prey) densities that are adequate to sustain lynx within their home ranges, and thus sustain lynx populations and promote recovery of Canada lynx. Some exemptions and

exceptions to avoiding adverse effects to lynx may occur within the WUI to protect human safety and property or for activities for other resource benefit.

The action area contains physical or biological elements essential for the conservation of the species, including the PCE. Stand initiation habitat, including early stand initiation habitat, potentially provides for PCE 1a; multi-story habitat potentially provides PCE 1a and/or 1c; habitat such as stem exclusion is one of the boreal forest successional stages comprising the PCE, also potentially providing denning habitat PCE 1c; areas of critical habitat not mapped as lynx habitat generally provide matrix habitat (PCE 1d); and the action area in general provides deep, fluffy snow conditions (PCE 1b). Table 4 displays the acres of critical habitat by Forest, including mapped lynx habitat and matrix habitat.

Snowshoe hare habitat (PCE 1a) in the action area is generally comprised of young forests in stand initiation and older, multi-story forests. Early stand initiation stands are very young regenerating stands characterized by dense growth of young trees, providing abundant forage and hiding cover for snowshoe hare during the summer. In the winter, these stands are covered by snow and unavailable to snowshoe hares. As they age, these stands transition into stand initiation phase, where trees have grown tall enough to protrude above the snow, and provide forage and dense hiding cover for snowshoe hares in the winter and summer. Multi-story forests with dense horizontal cover (a dense understory of young trees and shrubs) provide both lynx and snowshoe hares with abundant forage and hiding cover during summer and winter. Summer habitat is not believed to limit snowshoe hare or lynx populations. However, winter habitat is believed to be a factor limiting snowshoe hare and lynx populations (Squires et al 2010, ILBT 2013).

Stands of trees with a relatively closed overstory canopy and limited understory vegetation are characterized as stem exclusion habitat. These phases are forest successional stages that are part of the boreal forest landscape described in the critical habitat PCE. Little light reaches the forest floor so understory vegetation (including trees) are shaded and grow slowly; shrubs become dormant and new trees are precluded by a lack of sunlight and/or moisture. Thus, these structural stages do not currently provide snowshoe hare habitat due to the lack of horizontal cover described in PCE1a. In some stem exclusion stands, a limited amount of snowshoe hare forage may be available during the summer as a greater variety and quantity of deciduous forage and cover is available to hares due to the lack of snow cover and the growth of seasonal vegetation. This summer habitat is covered by snow during the winter and is unavailable to hares or lynx.

Winter conditions that provide and maintain deep, fluffy snow conditions for extended periods in boreal forest landscapes (PCE 1b) occur throughout the action area. These conditions likely restrict potential lynx competitors from effectively encroaching on or hunting snowshoe hares in winter lynx habitat. In addition to snow depth, other snow properties, including surface hardness or sinking depth, also influence lynx foraging success.

Lynx den sites (PCE 1c) are generally found in mature spruce-fir forests among downed logs or root wads in areas with abundant coarse woody debris and dense understories with high horizontal cover. Downed trees provide cover for den sites and kittens and are often associated with dense woody stem growth. The structural components of lynx den sites are common

features in both managed and unmanaged stands. Because lynx have large home ranges and low den site fidelity, most lynx populations are not limited by a lack of immediate den sites (Squires et al. 2008).

As mentioned, the NRLMD focuses on maintaining and improving snowshoe hare habitat within mapped lynx habitat. Areas that are not mapped as lynx habitat generally do not have inherent potential to produce snowshoe hares at densities that would support lynx residency and reproduction. The Service designated critical habitat on Forest Service lands that in some instances were not mapped as lynx habitat by the Forest Service. This situation occurs where critical habitat, specifically PCE1d, was designated in areas of 'matrix' habitat. The identification and description and use of the term "matrix habitat" did not arise until the designation of critical habitat. Matrix habitat is comprised of patches of habitat types that occur within or adjacent to boreal forest and do not have the capacity to produce high density snowshoe hare habitat. These habitat types typically consist of dry forest, hardwood forest, or non-forested habitat types. Matrix habitat cannot become lynx habitat through forest succession. Lynx use matrix habitat to travel within their home range, but do not depend upon it for prey species or denning sites.

Projects that occur within matrix habitat must still be analyzed for potential effects to matrix habitat. As for all critical habitat, including matrix habitat, the Forest Service may use the guidance in the Service's 2014 critical habitat designation (79 FR 54782) to assess and/or reduce or avoid negative effects on critical habitat**.** As stated in the final rule, activities that change vegetation structure or condition in matrix habitat are not considered an adverse effect to lynx critical habitat unless those activities create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat or if they adversely affect adjacent foraging and denning habitat.

Table 4. Critical Habitat Acres by Forest (*adapted from U.S. Forest Service 2017*).

Forest	Total Critical Habitat Acres	Total Mapped Lynx Habitat Acres within Critical Habitat	Total Matrix Habitat Acres within Critical Habitat
Bridger-Teton	2,697,795	1,746,390	951,405
Custer	337,798	119,618	218,180
Flathead	2,190,873	1,681,210	509,663
Gallatin	1,023,195	496,976	526,219
Helena	404,015	278,843	125,172
Lewis and Clark	696,300	437,528	258,772
Lolo	368,145	269,843	98,302
TOTAL	7,718,121	5,030,408	2,687,713

Several vegetation management actions have been completed since the NRLMD was implemented in 2007. Many of these actions have used the exemptions and/or exceptions to

VEG S5 and S6. Table 5 displays the approximate acreage of all critical habitat that has been impacted from vegetation management since 2007 and also displays the acres treated using the exemptions and/or exceptions to vegetation standards VEG S5 and S6.

Table 5. Critical Habitat Acres Treated by Forest Vegetation Management Actions since 2007 (*adapted from U.S. Forest Service 2017*).

Forest	Total Critical Habitat Acres Treated (including matrix)	Critical Habitat Acres Treated Using the WUI Exemption	Critical Habitat Acres Treated Using the Exceptions to VEG S5 and S6
Bridger-Teton	32,388	13,811	300
Custer	0	0	0
Flathead	28,921	4,660	266
Gallatin	3,305	990	545
Helena	5,618	872	0
Lewis and Clark	519	43	0
Lolo	2,195	0	0

Other types of management actions that have occurred in lynx critical habitat since 2007 include but are not limited to ski area development and expansion, road construction, oil and gas development, winter recreation management, and grazing management. Appendix K in the NRLMD biological assessment (U.S. Forest Service 2007b) and Appendix D in the NRLMD biological opinion (U.S. Fish and Wildlife Service 2007) provide lists of management actions that occur within lynx habitat. Such actions may also occur within lynx critical habitat. These appendices are incorporated by reference.

Since the NRLMD was amended to Forest Plans in 2007, few new management actions (other than vegetation management projects described previously) have been implemented. The Big Mountain Ski Resort on the Flathead National Forest is within critical habitat; some new ski area improvements have been implemented within permitted ski area boundaries since 2007, including modifications to ski runs and installation of a new chair lift. But, no expansion or improvements outside ski area permit boundaries are known. The NRLMD does not provide for net increases in groomed snow trail routes for skiing or snowmobiles (without a project specific Forest Plan amendment), and no such net increases are known within lynx critical habitat in the action area since 2007. No new oil and gas development projects are known to have occurred. New grazing management plans have been implemented but no changes in grazing management that would affect lynx critical habitat are known. Some new roads have been constructed within lynx critical habitat, but the majority of new road construction since 2007 has been associated with vegetation management projects where new roads are usually temporary roads built to accommodate access to logging units and closed thereafter. In addition, many acres of lynx critical habitat within the action area occur in areas or allocations that cannot be developed, such as wilderness.

Fire and other natural disturbance processes both, currently and historically played an important role in maintaining a mosaic of forest successional stages that provides habitat for both snowshoe hare and lynx (Ruediger et al. 2000, ILBT 2013), including the PCE for lynx critical habitat. In the action area, fire regimes are variable having both - frequent (35-100 years) stand-replacing or mixed severity fires and infrequent (200+ years) stand replacement fires. Within the past seventy years, land management agencies began effective fire suppression with the advent of aircraft support. This fire exclusion has the potential to alter vegetation mosaics and species composition that may reduce the quality and/or quantity of lynx habitat. In western forests, fire exclusion in areas with a history of infrequent fire return intervals has probably not had much impact. But areas where the fire regime was historically frequent or mixed has generally shifted to more intense fire regimes, resulting in forest compositions and structures that are more homogeneous, composed of more shade-tolerant species with more canopy layers, and are more susceptible to severe fires, insects, and diseases.

As noted in the critical habitat final rule, climate change is another threat to the PCE (79 FR 54810). By the end of this century in Units 3 and 5, climate change is expected to result in reduced snow duration and quality, and the upslope contraction of snow conditions favorable for lynx (79 FR 54825). Climate change is also extending fire prone seasons and can result in larger and higher intensity wildfires than occurred historically; such events are more likely in fire adapted western forests were active fire suppression over the past sixty years has interrupted historic fire regimes (Ruediger et al. 2000). In general, climate change can directly affect both snowshoe hare and lynx population dynamics, and has the potential to adversely affect the lynx critical habitat PCE over the long term.

V. EFFECTS OF THE ACTION

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, with the effects of other activities interrelated or interdependent with that action. Indirect effects are those caused by the proposed action and are later in time, but still are reasonably certain to occur (50 C.F.R. § 402.02). The effects of the action are added to the environmental baseline to determine the future baseline and to form the basis for the determination in this opinion. Should the federal action result in a jeopardy and/or adverse modification conclusion, the Service may propose reasonable and prudent alternatives that the federal agency can take to avoid violation of section 7(a)(2). The effects discussed below are the result of direct and indirect impacts of implementing the NRLMD.

Our effects analysis is based on what the NRLMD permits or prohibits, as well as a quantitative assessment of the effects to lynx critical habitat from actions that have the most potential to negatively affect lynx. The analysis includes an estimate of acres that may be treated in lynx critical habitat under future actions using the exemptions from and exceptions to VEG S5 and S6. This includes the adjusted threshold (described in detail above) for the acreages of critical habitat that could be treated on each Forest using the exemptions for fuel treatment projects in the WUI. While we analyze what the NRLMD and adjusted thresholds would allow, many actions that are allowed and projected may not actually occur. Many activities that are allowed by the Forest Plan direction are never fully carried out for a variety of reasons, such as funding

limitations and environmental or policy considerations. However, the following sections analyze the potential effects to the lynx critical habitat PCE and components from full implementation of activities that may occur under the direction in the NRLMD.

Vegetation Management

Vegetation management includes activities that change the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of the NRLMD, vegetation management does not include removing vegetation for permanent developments like mineral operations, ski runs, roads, and the like, and does not apply to fire suppression or wildland fire use.

The Forest Service has identified four objectives related to vegetation management that would improve the quality of lynx critical habitat by improving conditions for prey: (1) manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx (Objective VEG O1); (2) provide a mosaic of habitat conditions through time that support dense horizontal cover and high densities of snowshoe hare, and provide winter snowshoe hare habitat in both the stand initiation structural stage and in the mature, multi-story conifer vegetation (Objective VEG O2); (3) conduct fire use activities to restore ecological processes and maintain or improve lynx habitat (Objective VEG O3); and (4) focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover (Objective VEG O4).

Forest management activities can result in a conversion of vegetation types. For example, silvicultural prescriptions might be designed to change species composition to favor western larch, which has a high economic value, at the expense of lodgepole pine, which has low economic value but provides better lynx habitat. This kind of stand type conversion could negatively affect lynx critical habitat. The Objectives VEG O1, O2, O3, and O4 reduce the potential for adverse effects to lynx from such conversions of habitat. Attainment of the vegetation management objectives through projects designed using vegetation management standards and guidelines would support lynx survival and conservation. With the application of these measures, we do not anticipate that the proposed action would adversely affect lynx critical habitat via habitat conversions within the action area.

The primary factors driving lynx populations, behavior, and distribution is the abundance and distribution of snowshoe hares. Vegetation management or natural fire can set back vegetation succession to an early stand initiation structural stage, which may be used by snowshoe hares during the summer but is snow-covered and thus unavailable to hares during the winter. Eventually these stands regenerate into a stand initiation structural stage, providing high stem densities and horizontal structure extending above the snowpack during winter, and become high quality snowshoe hare habitat (Squires et al. 2010, Kosterman 2014, Holbrook et al. 2017). Older forested stands also provide high quality habitat when they provide multi-story mature or late successional forests that provide high horizontal cover for both lynx and snowshoe hare (Murray et al. 1994, Squires et al. 2010, Kosterman 2014, Holbrook et al. 2017). In Montana, these stands were used consistently by both lynx and snowshoe hare during the winter (Squires et al. 2010). These stands, along with stands in a stand initiation structural stage (including early

stand initiation), provide the landscape mosaic of habitat conditions needed for snowshoe hare production and lynx foraging (hunting) habitat (Kosterman 2014), and thus provide for PCE 1a.

Standards VEG S1, VEG S2, VEG S5, and VEG S6 would lead to attainment of the vegetation objectives described above by limiting the disturbance to snowshoe hare habitat and ensuring that enough habitat within each LAU would be available to provide lynx with sufficient snowshoe hare prey and lynx foraging habitat conditions (PCE 1a). Under Standard VEG S1, if more than 30 percent of lynx habitat in an LAU is in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects. Additionally, Standard VEG S2 requires that timber management projects shall not regenerate (i.e., change to stand initiation structural stage) more than 15 percent of lynx habitat within an LAU in a 10-year period. It is important to note that stand initiation structural stages are not considered adverse if they occur in less than 30 percent of an LAU. Indeed, these young stands typically contain high stem densities and horizontal cover, which provides summer habitat and eventually grows into essential winter foraging habitat for snowshoe hares. Vegetation Standards VEG S1 and VEG S2 promote a balance, a mosaic, of young and older stands within each LAU.

Thinning stand initiation structural stages can reduce horizontal cover that is critical to maintain the snowshoe hare prey base. High horizontal cover is important to hares and lynx. Reducing dense horizontal structure through silvicultural thinning would likely reduce an area's carrying capacity for snowshoe hares (Ruggiero et al. 2000; Griffin and Mills 2014, 2007; Homyack et al 2007; ILBT 2013). By deferring precommercial thinning that reduces snowshoe hare habitat until the stand no longer provides winter snowshoe hare habitat, Standard VEG S5 ensures that stand initiation snowshoe hare and lynx habitat (PCE 1a) is not degraded. This standard protects and maintains the high stem densities that provide high quality snowshoe hare forage during summer and/or winter seasons and maintains the inherent capacity of the habitat to produce snowshoe hares and provide for PCE 1a.

As previously mentioned, lynx preferentially forage in spruce-fir forests with high horizontal cover, abundant hares, deep snow, and large-diameter trees during the winter. The high horizontal cover found in multi-story conifer stands is a major factor affecting winter hare densities. During winter, snowshoe hares were consistently found in multi-story forest stands. These older, multi-story stands provide forage, hiding cover, and likely thermal cover for both snowshoe hares and lynx. Standard VEG S6 precludes vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests. This standard protects mature, multi-story habitat that provides a dense understory and high quality snowshoe hare habitat and also maintains the inherent capacity of the habitat to produce snowshoe hares and provide for PCE 1a.

Guideline VEG G1 directs that vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stage stands to enhance habitat conditions for lynx or their prey. In other words, emphasis should be on those stands that do not currently provide snowshoe hare habitat, which in turn may improve snowshoe hare habitat (PCE 1a) over the long-term. Adverse effects to lynx critical habitat are not anticipated as a result of treatments in a stem exclusion or similar stage. Such stands are

characterized as having a closed canopy with limited understory, lacking dense cover preferred by hares and are generally not progressing towards year-round snowshoe hare habitat. Treatment of stem exclusion stands would open up the stands and encourage an increase in horizontal cover (understory regeneration). Thus, treatments in these stands do not reduce existing snowshoe hare habitat (PCE 1a) and have the potential to improve the habitat for snowshoe hares by either creating openings to allow understory growth or stimulating the regeneration of dense stands of young trees used by hares.

Vegetation management typically does not influence the overall winter conditions that provide and maintain deep fluffy snow for extended periods of time (PCE 1b), as such conditions are a function of topography and climate. However, actions may result in some level of localized snow compaction, which could promote an increase in use by potential lynx competitors (ie. other terrestrial predators of hares like coyotes and bobcats). As explained further in the recreation management section below, we have no evidence that snow compaction facilitates increased competition to a level that negatively affects lynx (Kolbe et al 2007, ILBT 2013, 79 FR 54829). Further minimizing the potential for snow compaction related to vegetation management, Guideline VEG G4 directs that prescribed fire activities should not create permanent travel routes that facilitate snow compaction and that constructing permanent firebreaks on ridges or saddles should be avoided. Thus, while vegetation management may affect PCE 1b to some degree via localized snow compaction, we expect any effects would be insignificant.

Guideline VEG G5 is focused on habitat for alternate prey species, primarily red squirrel and directs that such habitat should be provided in each LAU. Red squirrel habitat typically contains snags and downed wood, generally associated with mature or older forests, which may be used by lynx for denning (PCE 1c) if the required components are provided and it is in close proximity to snowshoe hare habitat. Guideline VEG G11 directs that denning habitat (PCE 1c) should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future. Denning habitat elements are generally found distributed across the Forests. Vegetation management projects may result in localized effects to PCE 1c by removing existing coarse woody material and/or affecting its recruitment. This can affect the quality and quantity of available lynx denning habitat (PCE 1c). In most cases, denning habitat is not known to be limited within lynx habitat in the action area, and the vegetation management objectives, standards, and guidelines either directly or indirectly promote the development and retention of adequate amounts of denning habitat. In the cases where PCE 1c may be affected by vegetation management, Guidelines VEG G5 and VEG G11 would apply and would minimize the potential for effects by requiring that such habitat be provided and well distributed. Therefore, vegetation management is unlikely to result in adverse effects to PCE 1c.

While the vegetation management direction does not include standards and guidelines specific to matrix habitat (PCE 1d), we do not expect vegetation management activities that are implemented under the NRLMD to have adverse impacts on PCE 1d. As described in the 2014 lynx critical habitat final rule, activities in matrix habitat that change vegetation structure or conditions would not be considered an adverse effect to lynx critical habitat unless those

activities would create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within a potential home range, or if they would adversely affect adjacent foraging habitat or denning habitat (FR 79 54827). While vegetation management activities may effect vegetation within PCE 1d, we do not expect that such activities would affect the ability of a lynx to travel through such habitat because vegetation management is not likely to create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within a potential lynx home range. As such, the effects from vegetation management that occur within PCE 1d would be insignificant.

The vegetation management standards and guidelines work together to promote the vegetation management objectives. In addition to the vegetation management standards, standard ALL S1 also applies to vegetation management projects in that vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area. Having this standard apply to each LAU (which represents a lynx home range) would maintain connectivity among LAUs and throughout the larger landscape, thus minimizing the potential impacts to habitat connectivity and linkage areas from vegetation management. We do not expect habitat connectivity or linkage to be adversely affected from vegetation management projects.

Based on the best available information, the Service concludes that the NRLMD would conserve the most important components of lynx critical habitat: a mosaic of early and mature multi-story forests with high levels of horizontal cover and structure. These components ensure habitat that maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat (PCE 1a) and denning habitat (PCE 1c). These standards and guidelines are applicable to all vegetation management actions on at least 94 percent of mapped lynx habitat within the action area. As analyzed below, areas within the WUI (totaling approximately six percent of mapped lynx habitat) are exempt from the standards; however Guideline VEG G10 would apply and requires consideration of the standards in designing fuel treatment projects. Where these standards and guidelines are applied to vegetation management projects, we anticipate few projects, if any, would have adverse effects on lynx critical habitat. Collectively, application of the vegetation management standards and guidelines is expected to avoid most adverse effects to lynx critical habitat and the PCE would continue to serve its intended conservation role for lynx.

Exemptions from, and exceptions to, vegetation management standards for fuel treatment projects in the WUI and activities for other resource benefit

The NRLMD includes exemptions from Standards VEG S1, VEG S2, VEG S5, and VEG S6 to allow for fuel treatment projects within the WUI. In addition, exceptions listed in VEG S5 and VEG S6 would allow some activities for other resource benefit such as to protect structures, for research, and/or to promote the conservation of tree species such as whitebark pine and aspen. These exemptions and exceptions would allow actions that may have adverse effects on lynx critical habitat, specifically PCE 1a, by reducing the horizontal structure of natural forest succession phases, and/or affecting the mosaics of the forested landscape in localized areas. For the same reasons as explained above, we do not expect adverse effects to PCE 1b, 1c, 1d, or stem exclusion habitat from vegetation management using the exemptions and/or exceptions.

Under the NRLMD, beginning in 2007, a maximum of six percent of mapped lynx habitat could be treated through the exemptions and an additional 0.5 percent through the exceptions described above for both fuel treatment projects in the WUI and activities for other resource benefit (U.S. Fish and Wildlife Service 2007). Much of this mapped lynx habitat is also designated critical habitat. Of the designated lynx critical habitat that is mapped lynx habitat (i.e. excluding matrix), approximately 1,122,135 acres occur within the WUI. As a result of the six percent cap on the amount of snowshoe hare habitat that could be treated, approximately 360,450 acres of PCE 1a could actually be impacted by the exemptions from the vegetation standards for fuel treatment projects in the WUI. The amount of PCE 1a that could be treated under the exceptions to the vegetation standards related to activities for other resource benefit is approximately 6,913 acres.

Table 6. Acres of PCE 1a that may be treated through 2022 using the exemptions from, and/or exceptions, to the NRLMD vegetation standards (without the adjusted threshold; *adapted from U.S. Forest Service 2017)*.

Forest	Maximum Acres of PCE 1a Treated Using Exemptions for Fuel Treatment Projects in the WUI	Maximum Acres of PCE 1a Treated Using Exceptions for Activities for Other Resource Benefits	Total Acres of PCE 1a Treated Using Exemptions and/or Exceptions	Percent of Mapped Lynx Habitat Within Critical Habitat
Bridger-Teton	110,909	930	111,839	6.4 %
Custer	7,765	1,000	8,765	7.3 %
Flathead	94,019	914	94,933	5.6 %
Gallatin	41,262	1,270	42,532	8.6 %
Helena	19,047	579	19,626	7.0 %
Lewis and Clark	27,979	20	27,999	6.4 %
Lolo	59,469	2,200	61,669	22.9 %
TOTAL	**360,450**	**6,913**	**367,363**	**7.3%**

However, in order to better promote the distribution of acres treated using the exemptions and to reduce the potential impacts to critical habitat, the Forest Service provided an adjusted threshold for using the exemptions for fuel treatment projects in the WUI within critical habitat. With the adjusted threshold for using the exemptions in critical habitat, the amount that could be impacted is reduced to approximately 276,006 acres of PCE1a. The amount of PCE 1a that could be treated under the exceptions does not change with the adjusted threshold. For comparison purposes we have provided both a table that displays the amount of PCE 1a that could be treated under the exemptions and exceptions without the adjusted threshold (Table 6) and a table that displays the amount of PCE 1a that could be treated under the exemptions and exceptions using the adjusted threshold (Table 7).

Table 7. Acres of PCE 1a that may be treated through 2022 using the exemptions from and/or exceptions to the NRLMD vegetation standards using the adjusted threshold (*adapted from U.S. Forest Service 2017).*

Forest	Maximum Acres of PCE 1a Treated Using Exemptions with Adjusted Threshold for Fuel Treatment Projects in the WUI	Maximum Acres of PCE 1a Treated Using Exceptions for Activities for Other Resource Benefit	Total Maximum Acres of PCE 1a Treated Using Exemptions and/or Exceptions	Percent of Mapped Lynx Habitat Within Critical Habitat on the Forest where PCE 1a may be Treated
Bridger-Teton	94,273	930	95,203	5.5 %
Custer	7,144	1,000	8,144	6.8 %
Flathead	89,318	914	90,232	5.4 %
Gallatin	28,058	1,270	29,328	5.9 %
Helena	14,857	579	15,436	5.5 %
Lewis and Clark	26,300	20	26,320	6.0 %
Lolo	16,056	2,200	18,256	6.8 %
TOTAL	**276,006**	**6,913**	**282,919**	**5.6 %**

The biological assessment describes the amount of critical habitat that has previously been treated since 2007. Based on the amount of snowshoe hare habitat treated over the past 10 years, the biological assessment describes that it is highly unlikely that all of these acres that could be treated under the exemptions from and exceptions to the vegetation management standards would actually be treated. However, because future activities are unknown, the maximum amount of treatment that could occur under the adjusted threshold through 2022, and in turn may adversely affect PCE 1a, is analyzed here.

It is important to note that mapped lynx habitat consists of a mosaic of various forest structural stages and not all mapped lynx habitat is providing PCE 1a at the same time. However, at a programmatic scale such as this, it is not possible to accurately map PCE 1a at every point in time for the life of the programmatic. Forest structural stages change over time and what is providing PCE 1a today may not be at some point in the future and what is not providing PCE 1a today may provide such in the future. Thus, we are analyzing the maximum amount that could be treated to be sure we do not overlook any potential effect. While the percent provided in the last column of Table 7 displays the maximum percentage of mapped lynx habitat that may provide PCE 1a that could be treated, it is not expected that this maximum would be reached all at the same time and will likely never be reached. Future site-specific consultations on projects will provide both the amount of PCE 1a within the action area LAU(s) and the amount of PCE 1a affected by the action, thus, analyzing the specific amount of PCE 1a that will be affected. We

expect that such an analysis will likely reveal that much of the treatments will not occur within PCE 1a.

For perspective on the total amount of lynx critical habitat that may be treated with projects that may adversely affect lynx critical habitat, the average home range size of a lynx was reported as 53,375 acres for males and 21,745 acres for females (Squires et al. 2004). Acres treated are expected to be distributed throughout the Forests and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, adverse effects, while possible, are likely to affect only portions of any individual lynx home range. Further, many of the WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect of the exemptions. Under the NRLMD, vegetation management that adversely affects lynx critical habitat, specifically PCE 1a, would not be allowed in the majority of lynx critical habitat. Table 6 displays the amount of PCE 1a that may be treated through 2022 as a result of using the exemptions from and exceptions to the NRLMD vegetation standards.

The exemption from Standard VEG S1 for fuel treatment projects within the WUI would affect the forest mosaic by allowing more than 30 percent of lynx habitat within an LAU to be in a stand initiation structural stage not yet providing winter snowshoe hare habitat. The exemption for fuel treatment projects in the WUI in Standard VEG S2 would allow more than 15 percent of an LAU to be regenerated to a stand initiation structural stage within a decade. Where exemptions from Standards VEG S1 or VEG S2 are used within the WUI, adverse effects to lynx critical habitat may occur by temporarily reducing the quality and productivity of PCE 1a until treated stands begin to provide snowshoe hare habitat.

The exemption from Standard VEG S5 for fuel treatment projects in the WUI would reduce natural levels of horizontal structure in early successional phases by allowing precommercial thinning during the stand initiation structural stage, prior to when the stand no longer provides winter snowshoe hare habitat. It is well documented that such thinning in hare habitat results in a corresponding decrease in the abundance of snowshoe hares (see Ruggiero et al. 2000). Thinning dense stands of young trees may adversely affect lynx critical habitat by reducing the capacity of these stands to produce snowshoe hares and provide PCE 1a. Similarly, the exemption for fuel treatment projects in the WUI from Standard VEG S6 would likewise allow management actions that would reduce the horizontal cover and thus the quantity and quality of PCE 1a in older, multi-story stands, potentially resulting in adverse effects to lynx critical habitat. Research has documented the importance of these multi-story stands as foraging habitat for lynx and for hares (Squires et al. 2010), especially during the winter months. Thus, exemptions in either Standard VEG S5 or VEG S6 may reduce the capacity of an LAU to support lynx reproduction and/or occupancy. Overall, the amendment limits the exemptions from Standards VEG S5 and VEG S6 to areas within the WUI and with the adjusted thresholds for critical habitat the anticipated adverse effects would occur on no more than 276,006 acres of lynx critical habitat PCE 1a. The site-specific impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares and may not always result in adverse effects.

While exemptions are in place for fuel treatment projects in the WUI, Guideline VEG G10 directs that such projects should be designed considering Standards VEG S1, VEG S2, VEG S5,

and VEG S6 to promote conservation. Thus, while some adverse effects to lynx critical habitat (specifically PCE 1a) may occur by use of the exemptions, consideration of the standards in designing fuel treatment projects may result in minimizing such effects.

The NRLMD also allows exceptions to Standards VEG S5 and VEG S6 for activities that would protect structures from wild fire, for research, to conserve other vegetation communities such as whitebark pine and aspen, and/or for incidental removal during salvage harvest. Such treatment could reduce the quantity and/or quality of PCE 1a by reducing the horizontal cover, potentially affecting the ability of an LAU to support lynx reproduction and/or occupancy. The maximum amount of treatment allowed under the exceptions to the Standards VEG S5 and VEG S6 is 6,913 acres throughout the action area. However, the site-specific impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares and may not always result in adverse effects.

In summary, vegetation management under the NRLMD would promote forested landscape patterns that maintain or restore lynx habitat. This positive effect would occur on lynx critical habitat with the exception of lynx critical habitat associated with vegetation management exemptions and/or exceptions. Actions implemented under the exemptions from, and/or exceptions to, the vegetation standards of the NRLMD may affect lynx critical habitat. Adverse effects to lynx critical habitat as a result of these exemptions and exceptions may occur specifically due to the treatment of PCE 1a or snowshoe hare habitat. This includes treating up to 282,919 acres of PCE 1a (see Table 6 for acreage by Forest).

The conservation role of lynx critical habitat is to support viable core area lynx populations. The activities that treat PCE 1a may have adverse effects on lynx critical habitat by reducing snowshoe hare forage and numbers. Snowshoe hare forage would be diminished primarily through the removal of the dense horizontal structure of natural forest succession phases and/or altering the mosaics of the forested landscape in localized areas.

Although the exemptions from, and exceptions to, vegetation management standards may result in some adverse effects to lynx critical habitat, vegetation objectives, standards, and guidelines overall would contribute to creating and maintaining landscape patterns that sustain snowshoe hare and lynx populations. No permanent loss (such as paving or building construction) of habitat or conversion of the boreal forest would occur as a result of vegetation management under the NRLMD. The habitat would retain its inherent capacity to regenerate. Some vegetative treatments may degrade the function of the PCE by delaying the development of high density snowshoe hare habitat through succession; however, they do not remove the PCE from the site. Such actions may change the successional stage of a stand, but do not affect that stand's potential to produce snowshoe hare habitat in the future. Although vegetation management under the NRLMD may adversely affect areas of critical habitat, specifically PCE 1a, any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence and would continue to serve their intended conservation role for lynx.

Livestock Management

Livestock management includes grazing of livestock on Forest lands. Livestock may compete with snowshoe hares for forage resources (Ruediger et al. 2000). Browsing or grazing also could

impact plant communities that connect patches of lynx habitat within a home range. Snowshoe hare habitat such as riparian willow and aspen communities are most likely to be affected by grazing (ILBT 2013). Conversely, appropriate grazing management can rejuvenate and increase forage and browse in some habitats. At the time of the lynx listing, the Service found no evidence that grazing was a factor threatening lynx, therefore, grazing was not addressed in the final lynx listing rule (March 24, 2000; 65 FR 16052). Overall, grazing is not likely to reduce the snowshoe hare prey base or have substantial effects on lynx (ILBT 2013). As such, there is no existing research that provides evidence of lynx critical habitat being adversely affected by grazing, or of lynx movements within home ranges being impeded by grazing practices.

The Forest Service has identified one objective and four guidelines related to livestock management. Objective GRAZ O1 directs the Forests to manage livestock grazing to be compatible with improving or maintaining lynx habitat. The NRLMD would reduce the potential for grazing to affect lynx critical habitat through the guidelines for livestock management practices that provide for: regeneration of trees and shrubs (Guideline GRAZ G1), aspen stands (Guideline GRAZ G2), riparian areas and willow cars (Guideline GRAZ G3), and shrub-steppe habitats (Guideline GRAZ G4). These guidelines should adequately minimize the potential for effects of grazing to lynx critical habitat and may improve the habitat over baseline conditions.

The quality and quantity of snowshoe hare habitat (PCE 1a) would not be significantly diminished as a result of grazing livestock. Livestock management is not likely to affect snow conditions (PCE 1b). Effects to lynx denning habitat (PCE 1c) would likely be none to very negligible. Impacts to matrix habitat (PCE 1d) would not create a barrier or impede lynx movement within a potential home range. With the application of the guidelines, the effects of grazing across the action area would be minimal and livestock management under the NRLMD is expected to either have no effects to lynx critical habitat or have insignificant and/or discountable effects to lynx critical habitat depending on site-specific information. Thus, the PCE and its components (PCE 1a, 1b, 1c, and 1d), would not be significantly affected. Lynx critical habitat would continue to serve the intended conservation role for lynx.

Human Use Projects

Human use projects include actions such as recreation management, Forest roads, and mineral and energy development. Recreation management includes developed ski areas, winter dispersed recreation, and non-winter dispersed recreation. Below we analyze the effects to lynx critical habitat in general. It is important to note that not all developed areas on Forest lands would be considered critical habitat. From the final rule (79 FR 54823): "*Given the scale of the lynx critical habitat units, it was not feasible to completely avoid inclusion of …or human-made structures such as buildings, paved and gravel roadbeds, parking lots, and other structures that lack the PCE for the lynx. These areas, including any developed areas and the land on which such structures are located, that exist inside critical habitat boundaries are not intended to be designated as critical habitat. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this final rule have also been excluded by text in this rule*."

Recreation Management

Dispersed winter recreational uses and activities, such as snowmobiling, cross-country skiing, and snowshoeing also occur within lynx critical habitat. The range of lynx is restricted to forested areas with deep snow conditions (PCE 1b) during the winter. Lynx evolved in and are highly adapted to a boreal forest environment. Morphologically, lynx are well-adapted to hunting snowshoe hares in deep snow (Murray and Boutin 1991) in densely forested environments. Lynx have very large feet in relation to body mass, which prevents them from sinking deep into snow. This provides lynx with an inherent competitive advantage over many other mammalian carnivores in deep snow conditions. Their primary prey, snowshoe hare are also adapted to living in dense boreal forests in areas with abundant snow. Within the last century, coyotes have expanded their range from western and central prairie regions in North America to forests of the east and far north. Morphologically, coyotes are at a disadvantage hunting in high snow areas, as their feet are fairly small in relation to body mass and they therefore sink into soft snow (Murray and Boutin 1991).

To date, research has confirmed that lynx and coyote populations coexist, despite dietary overlap and competition for snowshoe hare and alternate prey species. In some regions and studies, coyotes were found to use supportive snow conditions more than expected, but none confirm a resulting adverse impact on lynx populations in the area. The best scientific information from within the action area, an area populated by both lynx and coyotes, concludes that coyotes did not require compacted snow routes to access winter snowshoe hare habitat (Kolbe et al 2007, ILBT 2013). In our final rule (March 24, 2000; 65 FR 16052), snow compaction created by human activities was not found to be a threat to the lynx DPS. We also have no evidence that packed snow trails facilitated competition to a level that negatively affects lynx or lynx populations.

The proposed action includes Objective HU O1 to maintain the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat. In addition, recreation activities should be managed to maintain lynx habitat and connectivity (Objective HU O2) and rather than developing new areas in lynx habitat, activities should be concentrated in existing developed areas (Objective HU O3). The NRLMD Guideline HU G11 states that designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat. Further, Guideline HU G12 limits winter access for non-recreation special uses and mineral and energy exploration and development to designated routes or designated over-the-snow routes.

Winter dispersed recreation such as snowmobiling is unlikely to affect PCE 1a, 1c, or 1d. Insignificant effects to PCE 1b may indirectly occur via snow compaction. However, while snow compaction may occur, the areas of compaction are localized. In addition, snow compaction does not impact the overall ability for winter conditions to provide and maintain deep fluffy snow for extended periods of time. Thus, adverse effects from winter dispersed recreation are not anticipated.

Developed recreation can result in the direct loss of lynx critical habitat, and depending on the structural stage, could affect PCE 1a, 1c, and/or 1d. Large developed sites, such as four-season

resorts, alter lynx habitat, result in direct loss of lynx habitat on the footprint of the development itself, and may fragment habitat depending upon size and location. Developments such as ski areas result in permanent loss of lynx habitat through the development of permanently groomed runs and resort infrastructure, such as lift termini, buildings and roads. Some loss of lynx habitat is unavoidable with development, but at Forest or larger scales, relatively small areas are affected. The most serious impact of ski or four-season resort development is the associated private land development at the base, with resulting increases in highway traffic, speeds, and surrounding development. Such development can impact connectivity between areas of lynx habitat, typically valley bottoms between mountain ridges.

The NRLMD includes objectives, standards, and guidelines that address the most serious consequence of development, requiring new or expanding permanent developments to maintain or where possible, promote habitat connectivity within LAUs and linkage areas (Objective All O1, Standard All S1, Guideline All G1, Objective LINK O1, and Standard LINK S1). Recreational activities should be managed to maintain lynx habitat and connectivity (Objective HU O1), with activities concentrated in existing developed areas, rather than developing new areas in lynx habitat (Objective HU O3). Objective HU O4 provides for lynx habitat needs and connectivity when developing new or expanding existing developed recreation sites or ski areas.

Several guidelines in the NRLMD reduce impacts within the development itself, including: adequately sized inter-trail islands that support winter snowshoe hare habitat (Guideline HU G1), providing foraging habitat for lynx that is consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes (Guideline HU G2), provide for lynx movement and maintain the effectiveness of lynx habitat (Guideline HU G3), and consider the location of access roads and lift termini to maintain and provide lynx security habitat if identified as a need (Guideline HU G10).

Some use of critical habitat at developed ski areas (winter recreation), or immediately adjacent areas, by lynx may be possible. If lynx use is precluded by habitat alteration or excessively high levels of human activities, Standard ALL S1 directs that new or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area. The NRLMD does not prohibit the development of recreation sites on Forest lands, therefore lynx critical habitat may be affected by new developed recreation through habitat alteration or loss. Such effects may sometimes be adverse via a reduction in existing snowshoe hare habitat (PCE 1a) or habitat that may become snowshoe hare habitat in the future. Although effects to winter snow conditions (PCE 1b) (via compaction) and denning habitat (PCE 1c) may occur from new developments, we do not anticipate the effects to be adverse because overall winter conditions are not influenced and denning habitat is not limited. We also do not anticipate adverse effects to matrix habitat (PCE 1d) because the scale of a ski area is not expected to create a barrier or impede lynx movement within an LAU.

The main effect of non-winter recreation is disturbance to lynx rather than effects to habitat. While studies that have considered the reactions of lynx to human presence are few, anecdotal information does suggest that lynx are rather tolerant of humans (ILBT 2013). Due to the low susceptibility of lynx to displacement by humans, this activity presents low risk of effects to how lynx use critical habitat. Effects to the PCE from non-winter dispersed recreation, including effects to 1a, 1b, 1c, and/or 1d, are not likely to adversely impact lynx critical habitat.

In summary, although areas of lynx critical habitat may be adversely affected by recreation management such as ski areas, the NRLMD as a whole has objectives, standards, and guidelines to reduce the potential impacts and lynx critical habitat would continue to serve the intended conservation role for lynx.

Mineral and Energy Development

Mining and energy development on Forest lands in the action area may directly impact lynx critical habitat. New development could result in small, localized effects to lynx critical habitat, including PCE 1a, 1c, and or 1d.

Objective HU O5 directs the Forests to manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat. The NRLMD also contains the following three guidelines that would minimize the potential impacts of mineral and energy development on lynx critical habitat by remote monitoring to reduce snow compaction (Guideline HU G4), reclamation plans that restore lynx habitat (Guideline HU G5), and limitations on winter access to designated routes or designated over-the snow routes (Guideline HU G12). With the application of these measures, the mineral and energy development would likely result in either no effects or only minor, insignificant effects to lynx critical habitat depending upon the scale of development. Lynx critical habitat would continue to serve its intended conservation role for lynx.

Forest Roads

Unlike paved highways, Forest roads rarely receive motorized use at levels that create barriers or impediments to lynx movements. Lynx have been documented using less-traveled roadbeds for travel and foraging (Koehler and Brittell 1990). Recreational, administrative, and commercial uses of forest roads are known to disturb many species of wildlife. In Montana, Squires et al. (2010) concluded that forest roads with use levels that are low had little effect on how lynx used seasonal resources. Lynx show no preference or avoidance of unpaved forest roads, and the existing road density does not appear to affect lynx habitat selection (McKelvey et al. 2000). The best information suggests that the types of roads managed by the Forest Service do not likely adversely affect lynx. Lynx mortality from vehicle strikes are unlikely, and to date have not been documented on Forest lands in the action area given the relatively slow speeds at which vehicles on these roads travel (due to topography and road conditions) and generally low traffic volumes. Any new permanent road construction may affect lynx critical habitat. The relatively small amount of snowshoe hare habitat (PCE 1a) affected within the route prism would be minor and likely insignificant. Temporary routes constructed in snowshoe hare habitat may also have minor impacts on the PCE. However, temporary routes are restored and/or decommissioned such that effects are temporary and not permanent and vegetation grows back. Also, the amount of vegetation and area impacted for the linear structures tends to be limited. Thus, impacts to the PCE and its components would likely be insignificant as a result of new road construction.

To reduce highway effects on lynx, Objective HU O6 directs the Forests to work cooperatively with other agencies to provide for lynx movement and habitat connectivity and to reduce the

potential of lynx mortality. While this objective relates to highways, which typically do not occur on Forest land, it encourages cooperation with other agencies in order to reduce the potential for effects. Several guidelines relate to potential impacts of Forest roads, including upgrading (Guideline HU G6), new permanent roads (Guideline HU G7), cutting brush (Guideline HU G8), and new roads built for project use (Guideline HU G9). These guidelines generally discourage improving road access for people and minimize impacts of road construction (permanent and/or temporary) and maintenance on lynx critical habitat.

As described in the critical habitat final rule (79 FR 54823) human-made structures including paved and gravel roadbeds, parking lots, and other structures that lack the PCE for the lynx, are not intended to be designated as critical habitat and have been excluded by text. While the roadbed itself may not be designated as lynx critical habitat, it can affect the way lynx use the adjacent habitat. However, based on the information above, we do not anticipate any effects to lynx critical habitat related to roads to be significant or adverse. Lynx critical habitat would continue to serve the intended conservation role for lynx.

Linkage Areas

The NRLMD promotes maintenance and improvements in connectivity to the extent that the Forest Service has authority to influence or control actions that affect connectivity. Connected forest habitats allow lynx to move long distances to find food, cover, and mates. Because the Forests in the action area have such large amounts of lynx critical habitat compared to other land owners, the NRLMD has the ability to impact connectivity.

In addition to objectives, standards, and guidelines related to site-specific actions, the following objective, standard, and guidelines apply to all Forest projects within linkage areas in occupied habitat, subject to valid existing rights. Such management direction is incorporated to improve connectivity. Objective Link O1 directs the Forests to work with landowners in areas of intermingled land ownership to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat. Coordination among different land management agencies is important to lynx critical habitat because lynx have large home ranges and may move long distances. Thus, without coordination, the effects of mixed ownership patterns on lynx critical habitat would likely lead to reductions in habitat connectivity. Standard LINK S1 requires the Forests to identify potential highway crossings when highway or forest highway construction or reconstruction is proposed in linkage areas. In addition, Guideline LINK G1 guides Forests to retain Forest land in public ownership and Guideline LINK G2 guides management of livestock grazing in shrub steppe habitats to contribute to maintaining or achieving a preponderance of mid- to late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

In addition, Standard ALL S1 addresses the impacts to lynx critical habitat from loss of connectivity within occupied habitat in the action area. Standard ALL S1 requires that new or expanded permanent developments and vegetation management projects in a LAU or linkage area maintain habitat connectivity. Thus, under this standard, Forest Service actions will not be permitted to degrade connectivity in lynx habitat or in linkage areas.

The objective, standards, and guidelines described above would reduce or minimize the potential for effects to lynx in most cases, and therefore the NRLMD would ultimately conserve adequate connectivity with occupied lynx critical habitat. The specific effects of projects that may impact connectivity would be analyzed during project-specific consultation. Squires et al. (2013) concluded that while changes to habitat structure can affect lynx movement, there is no evidence that genetic isolation is an issue. We do not anticipate Forest Service actions would result in adverse impacts to lynx connectivity. Such actions are not likely to create a barrier or impede lynx movements. Thus, under the NRLMD, linkage and connectivity within lynx critical habitat would continue to serve their intended conservation role for lynx.

Effects Summary

The Forest Service designed the NRLMD to address those risk factors to lynx that were relevant in terms of Forest Plan direction. Overall, the NRLMD reduces or avoids the potential for adverse effects to lynx critical habitat. The benefits of the NRLMD to lynx critical habitat come primarily from the vegetation management objectives and implementation of the standards and guidelines. This suite of objectives, standards, and guidelines clearly conserve snowshoe hare and lynx habitat (PCE 1a) in all occupied, mapped lynx habitat in the action area. However, the NRLMD is likely to result in adverse effects to lynx critical habitat, with the main influence from actions that impact snowshoe hare habitat or PCE 1a. The majority of adverse effects to lynx critical habitat from the NRLMD would be a result of the exemptions from (fuel treatment projects in the WUI), and exceptions to (activities for other resource benefit), the vegetation standards. Other than vegetation management, many activities authorized by Forests will have relatively minor or less substantial impacts on lynx critical habitat. A limited number of actions where third parties are involved, such as ski area expansions and development, may also have adverse effects on lynx critical habitat. The likelihood of these actions occurring is low, but if such activities were to occur, the effects specific to such activities would be analyzed in site-specific analysis.

We anticipate adverse effects to lynx critical habitat only from the actions proposed under the NRLMD that occur within lynx foraging habitat, PCE 1a (snowshoe hare habitat). A maximum of 276,006 acres and 6,913 acres that provide for lynx critical habitat PCE 1a could be treated via exemptions from, and exceptions to, the vegetation standards, respectively.

We do not anticipate adverse effects to critical habitat as a result of the treatments in stem exclusion stands that do not provide snowshoe hare habitat, winter snow conditions (PCE 1b), areas that provide PCE1c (denning habitat), or areas that provide PCE1d (matrix habitat). Although the exemptions from, and exceptions to, the NRLMD vegetation management standards may result in some adverse effects to lynx critical habitat, vegetation objectives, standards, and guidelines overall would contribute to creating and maintaining landscape patterns that sustain snowshoe hare and lynx populations. The habitat would retain its inherent capacity to regenerate. Vegetation management under the NRLMD may adversely affect areas of critical habitat, specifically PCE 1a. However, any affected LAUs are expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence and would continue to serve their intended conservation role for lynx.

VI. CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

As previously described, the action area has been defined as those seven National Forests that have critical habitat designated on their lands but have not revised their Forest Plans after the 2007 NRLMD amendment. In Montana, tribal lands were excluded from the lynx critical habitat designation. State lands managed in accordance with the Montana Department of Natural Resources and Conservation Forested State Trust Lands Habitat Conservation Plan were also excluded from the designation. Thus, while there may be some state and private land within the Forest boundaries that were not excluded from the designation, the majority of land designated as lynx critical habitat is in federal ownership with the Forest Service managing the preponderance of lynx critical habitat within the action area.

On state and private lands with lynx critical habitat, vegetation projects, fuel treatment projects, mineral extraction, oil and gas exploration, urban and rural development, recreation site construction and use, road construction, and utility corridors all have the potential to affect the PCE and its components. Some snowshoe hare habitat (PCE 1a) may be temporarily reduced in quantity and/or quality or may be permanently lost to development. The cumulative effects to PCE 1a may range from insignificant to adverse depending on site-specific conditions and actions. Some non-federal actions may slightly impact localized snow conditions (PCE 1b) via snow compaction. However, we do not expect such actions to significantly affect the overall winter conditions that provide and maintain deep fluffy snow for extended period of time. Some non-federal actions may reduce the availability of den sites (PCE 1c) through removal of coarse woody debris. Because denning habitat is not limiting throughout the action area, any cumulative effects to PCE 1c would be insignificant. Vegetation management and/or development of private lands to support increased human populations will likely continue and may reduce habitat connectivity in matrix habitat (PCE 1d). Since new developments would likely occur at lower elevations and because the amount of private land within the action area is very small, we do not expect such actions would create a barrier or impede lynx movement between patches of foraging habitat and between foraging and denning habitat within in a potential lynx home range. Thus, cumulative impacts to PCE 1d would likely be insignificant.

Not all lands would be developed or used in ways that have negative impacts on lynx critical habitat. Combined, private lands developed or used in ways that would have negative impacts on lynx critical habitat would constitute a fairly small proportion of lynx critical habitat within the action area. Non-federal lands are scattered throughout the action area and comprise a fairly small portion of the action area relative to the large LAU landscape required by an individual lynx to support its home range. Many non-federal lands are and would be adjacent to or interspersed with Forest Service land, and therefore some of the potential negative effects on the private parcels would be moderated by federal land management. Therefore, we anticipate that the lynx critical habitat within the action area would retain its current ability for the PCE to function and critical habitat would continue to serve its intended conservation role for the species.

VII. CONCLUSION

After reviewing the current status of designated lynx critical habitat, the environmental baseline for the action area, the effects of the action, the cumulative effects, and best available information, **it is the Service's biological opinion that the effects of the NRLMD are not likely to result in the destruction or adverse modification of designated Canada lynx critical habitat.** Implementing regulations for section 7 define "destruction or adverse modification" as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (81 FR 7216). The Lynx Critical Habitat Final Rule (79 FR 54826) explains that "*the key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species. Activities that may destroy or adversely modify critical habitat are those that alter the physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for the lynx DPS.*" The role of critical habitat is to support life-history needs of the species and provide for conservation of the species.

The best available information describes the importance of snowshoe hare habitat (PCE1a) to lynx (Squires et al. 2010, Kosterman 2014, Holbrook et al. 2017). The NRLMD will not preclude continued adequate amounts of snowshoe hare habitat needed to sustain lynx in the LAUs within the action area and thus, the critical habitat in each of the LAUs would remain functional. When added to the status of the critical habitat units, the effects of the project are such that the conservation role of the lynx Critical Habitat Units 3 and 5 will continue to serve its intended conservation role for lynx and the physical or biological features, including the PCE components essential to the conservation of lynx, will not be altered to a point that precludes or significantly delays development of these features. Thus, the Service concludes that while the NRLMD may result in some level of adverse effects to lynx critical habitat, the level of adverse effects are not reasonably expected to result in an alteration that appreciably diminishes the value of critical habitat for the conservation of lynx.

Our conclusion is based primarily on the information presented in the biological assessment on the effects of the NRLMD on lynx critical habitat (U.S. Forest Service 2017), additional information received during consultation, information in our files, and informal discussions between the Service, the Forest, and other personnel. Our rationale for the no destruction or adverse modification conclusion is based on, but not limited to the following factors summarized below, as detailed earlier in this biological opinion.

- The NRLMD addresses land management actions that have the most potential to adversely affect key lynx habitat components. While negative effects on lynx critical habitat may not be totally eliminated, the Service considers the retention of high quality snowshoe hare habitat (PCE 1a) within in lynx critical habitat as most essential to lynx conservation. The NRLMD vegetation standards directly address the major impacts identified from vegetation management (impacting stand initiation and multi-story stands that provide PCE 1a). Managing and moderating these impacts will minimize affects to snowshoe hare habitat and production, thus benefiting lynx critical habitat.

- As described in our biological opinion, we anticipate adverse effects to lynx critical habitat from those actions under the NRLMD that occur within snowshoe hare habitat and impact PCE1a. The majority of these adverse effects would be a result of actions using the exemptions from, and/or exceptions to, the vegetation management standards.

- Moreover, for those areas that provide lynx critical habitat but not snowshoe hare habitat, we do not anticipate the NRLMD to result in adverse effects to the remaining PCE and components, including PCE 1b (deep fluffy snow), PCE 1c (denning habitat), PCE 1d (matrix habitat), and stem exclusion habitat (part of the PCE boreal forest).

- Actions conducted under the NRLMD that may adversely affect PCE 1a using exemptions from, and exceptions to, the vegetation management standards will occur on no more than 276,006 and 6,913 acres, respectively. Refer to Table 6 for acreage by Forest.

- The percent of PCE 1a on any particular Forest in the action area that may be treated ranges from 5.4 percent to 6.8 percent of critical habitat on that Forest. A total of approximately 5.6 percent of PCE 1a on all 7 Forests in the action area combined may be treated using the exemptions from, and exceptions to, the NRLMD vegetation standards.

- Additional Forests with lynx critical habitat in Critical Habitat Units 3 and 5 (Idaho Panhandle, Kootenai, and Shoshone) have undergone section 7 on their revised forest plans and may also conduct actions that may adversely affect PCE 1a using exemptions from, and exceptions to, the vegetation management standards in their Forest Plans. Acres of impact to PCE 1a on these three Forests could potentially occur on no more than 96,051 acres using the exemptions and 30,120 acres using the exceptions.

- The combined adverse effects of vegetation management from these Forests on lynx critical habitat would occur on a very small portion of Critical Habitat Units 3 and 5. When considering all Forests with critical habitat in Unit 3 combined, 250,226 acres of critical habitat in Unit 3 may be adversely affected, which is approximately 4.0 percent of all critical habitat in Unit 3 (Unit 3 is 9,783 square miles or 6,261,095 acres). With all Forests with critical habitat in Unit 5 combined, 158,864 acres of critical habitat in Unit 5 may be adversely affected, which is approximately 2.7 percent of all critical habitat in Unit 5 (Unit 5 is 9,146 square miles or 5,853,417 acres). Thus, the impacts on Critical Habitat Units 3 and 5 are relatively small and would not appreciably diminish the value of critical habitat for the conservation of lynx.

- It is important to note that mapped lynx habitat consists of a mosaic of various forest structural stages and not all mapped lynx habitat is providing PCE 1a at the same time. However, at a programmatic scale such as this, it is not possible to accurately map PCE 1a at every point in time for the life of the programmatic. Forest structural stages change over time and what is providing PCE 1a today may not be at some point in the future and what is not providing PCE 1a today may provide such in the future. Thus, we are analyzing the maximum amount that could be treated to be sure we do not overlook

any potential effect. Future site-specific consultations on projects will provide both the amount of PCE 1a within the action area LAU(s) and the amount of PCE 1a affected by the action, thus, analyzing the specific amount of PCE 1a that will be affected. We expect that such an analysis will likely reveal that much of the treatments will not occur within PCE 1a.

- The adverse effects to lynx critical habitat due to the exemptions for fuel treatment projects in the WUI and exceptions for activities for other resource benefit are offset by the beneficial effects of the NRLMD. Monitoring and recording of actions are required as decisions are signed to ensure that the number of acres treated through exemptions and exceptions do not exceed the amounts described here.

- While the NRLMD would allow activities that may adversely affect lynx critical habitat, the nature of most vegetation management alteration is temporary and reversible (i.e. forests regrow or can be restored). Some vegetative treatments may degrade the function of the PCE by delaying the development of high density snowshoe hare habitat through succession; however, they do not remove the PCE from the site. Such actions may change the successional stage of a stand, but do not affect that stand's potential to produce snowshoe hare habitat in the future. The adverse effects on lynx critical habitat from vegetation management carried out under the NRLMD are temporary and no permanent loss of the inherent capacity of treated stands to provide lynx habitat is expected.

- Acres treated are expected to be distributed throughout the Forests and are not likely to be excessively concentrated within any one LAU or group of adjacent LAUs. Thus, adverse effects, while possible, are likely to affect only portions of any individual lynx home range.

- Other projects types that may adversely affect lynx critical habitat, such as recreation development are constrained by other standards such as mandating maintenance of connectivity and would likely only affect a relatively small proportion of lynx critical habitat within the action area. Such actions would undergo site-specific consultation to determine such effects.

- A large proportion of lynx critical habitat on Forest Service lands in the action area occurs in lands that cannot be developed (i.e. wilderness), where management focuses on the maintenance of natural ecological processes, or conservation of rare ecological settings or components.

- With management under the NRLMD, LAUs are expected to continue to provide conditions that would be conducive to supporting lynx. Although some actions under the NRLMD may adversely affect areas of critical habitat, the treatments are expected to have small to insignificant effects on Critical Habitat Units 3 and 5 as a whole. The critical habitat is expected to remain capable of producing adequate densities of snowshoe hares to support continual lynx presence because the NRLMD would maintain snowshoe hare habitat in adequate amounts to sustain snowshoe hare populations.

- Thus, while vegetation management projects that use the exemptions from, and/or exceptions to, the vegetation standards may adversely affect PCE 1a, the limited amount of PCE 1a that could be treated is not likely to result in an appreciable reduction in the conservation value of critical habitat for the lynx DPS. The NRLMD would allow for the critical habitat in the action area to provide a prey base and foraging habitat for a breeding population of lynx and connectivity for lynx movement within home ranges, and dispersal, serving its role in the conservation of lynx. The Service views 'conservation' as the process used to achieve recovery. The vegetation objectives, standards, and guidelines would contribute to sustaining and growing snowshoe hare and lynx populations within lynx critical habitat in the action area and the NRLMD would not appreciably diminish the value of lynx critical habitat for the conservation and recovery of lynx.

We conclude that the adverse effects of the NRLMD on PCE 1a are limited in severity and in scale to the extent that critical habitat would continue to produce adequate densities of snowshoe hares and adequate levels of cover to support persistent lynx populations across Critical Habitat Units 3 and 5. We conclude that the proposed action will not alter the physical or biological features of critical habitat to an extent that appreciably diminishes the value of critical habitat for the conservation of lynx. The alterations will not preclude or significantly delay development of such features. The critical habitat units would retain their current ability for the primary constituent element to be functionally established. Therefore, the proposed action is not likely to result in the destruction or adverse modification of designated Canada lynx critical habitat.

REINITIATION NOTICE

This concludes consultation on the effects of the NRLMD as outlined in your July 1, 2017 biological assessment. As provided in 50 C.F.R. § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (a) the amount or extent of taking specified in the incidental take statement is exceeded; (b) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) a new species is listed or critical habitat designated that may be affected by the identified action.

As explained in the consultation history section above, because the 10-year time-frame provided in the 2007 biological opinion and incidental take statement for lynx had expired in March of this year (2017), the Forest Service requested a five-year extension in order to allow enough time for all Forests in the NRLMD action area to complete Forest Plan revision. To be consistent with the recent amended incidental take statement related to the NRLMD and lynx (U.S. Fish and Wildlife Service 2017), the time-frame for this biological opinion is also through the year 2022. If any Forests have not completed Forest Plan revision by the end of 2022, then reinitiation of consultation on the NRLMD may be necessary.

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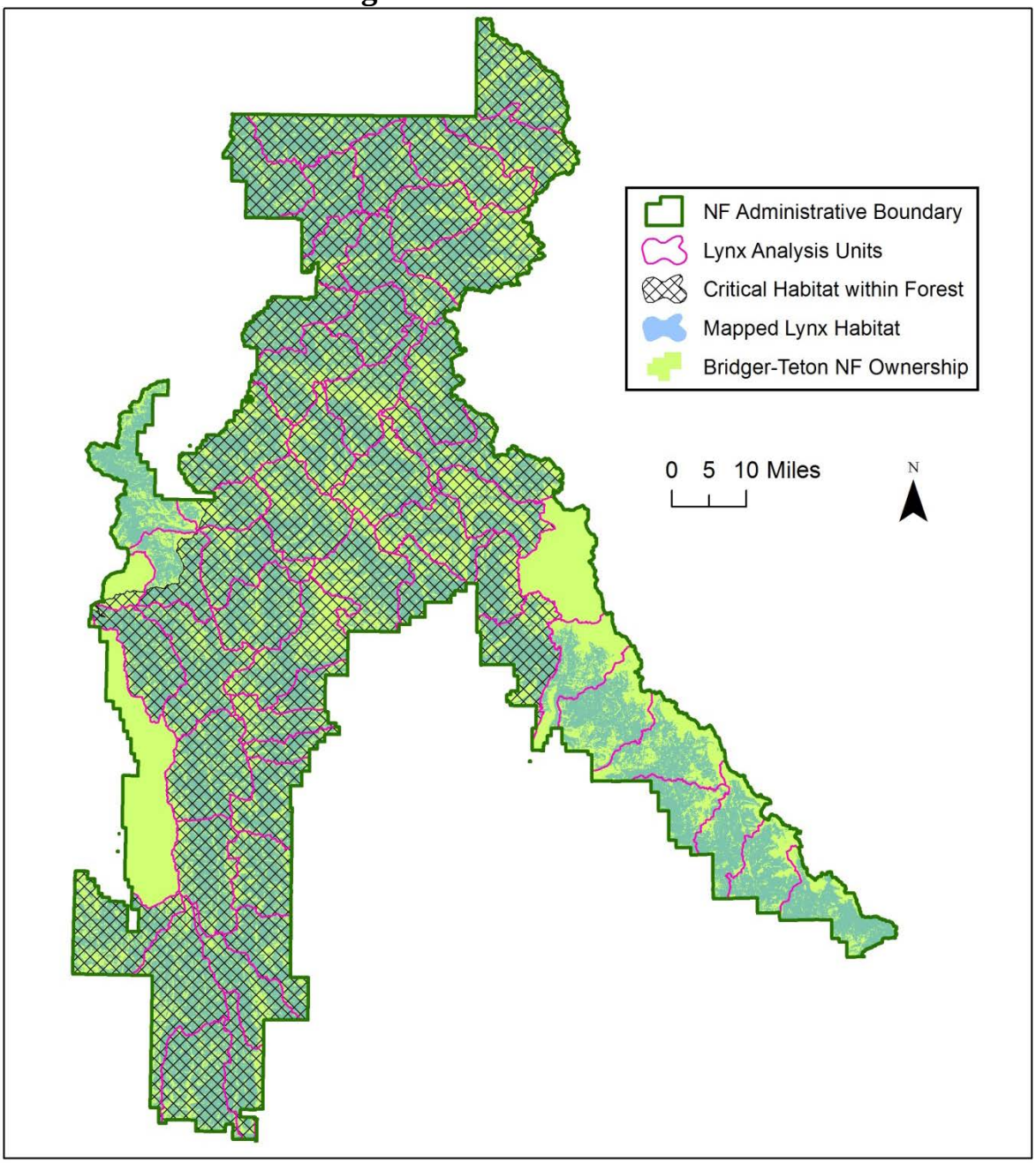
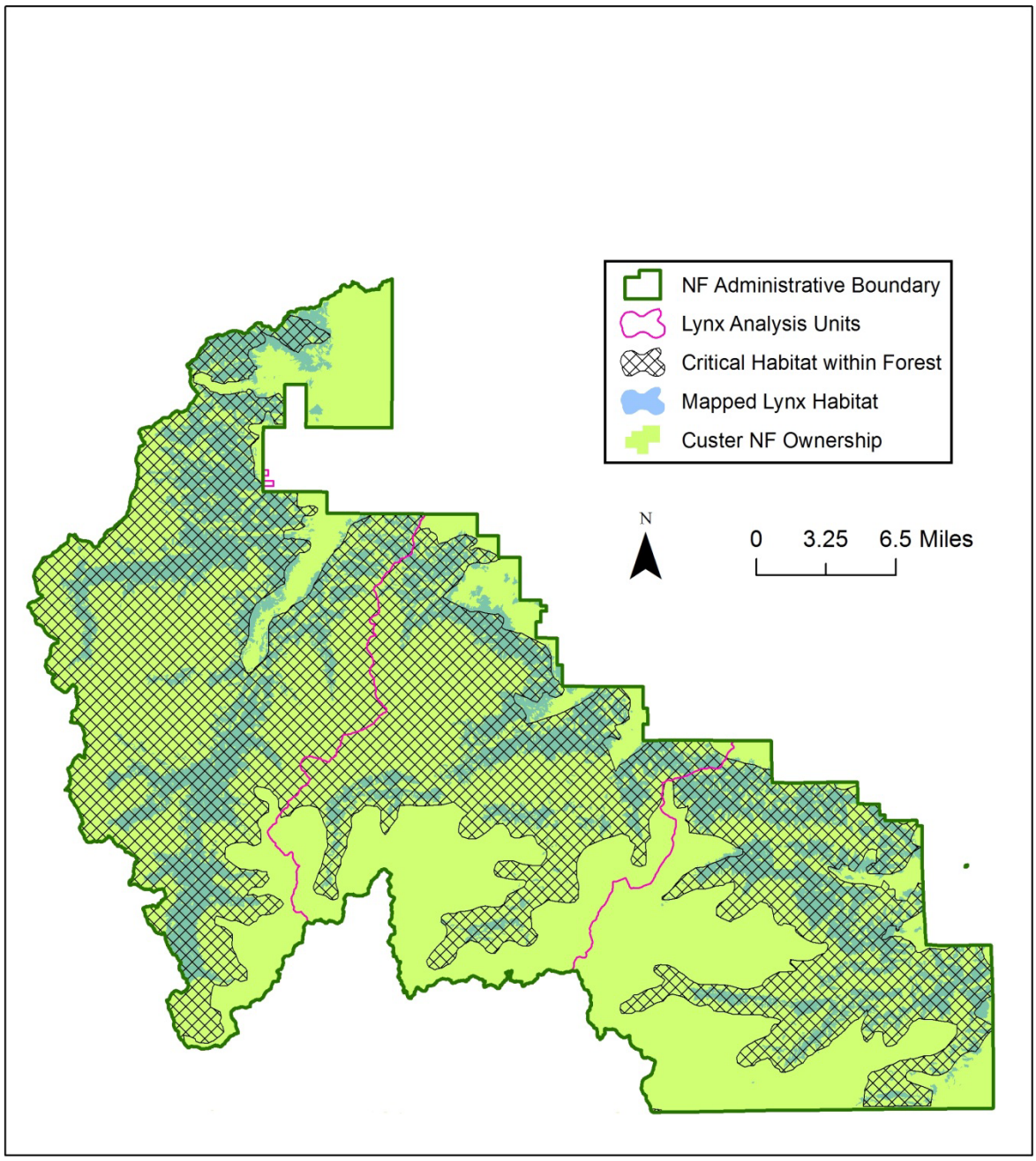
Appendix 1

Maps, by Forest, displaying occupied, mapped lynx habitat and designated critical habitat.

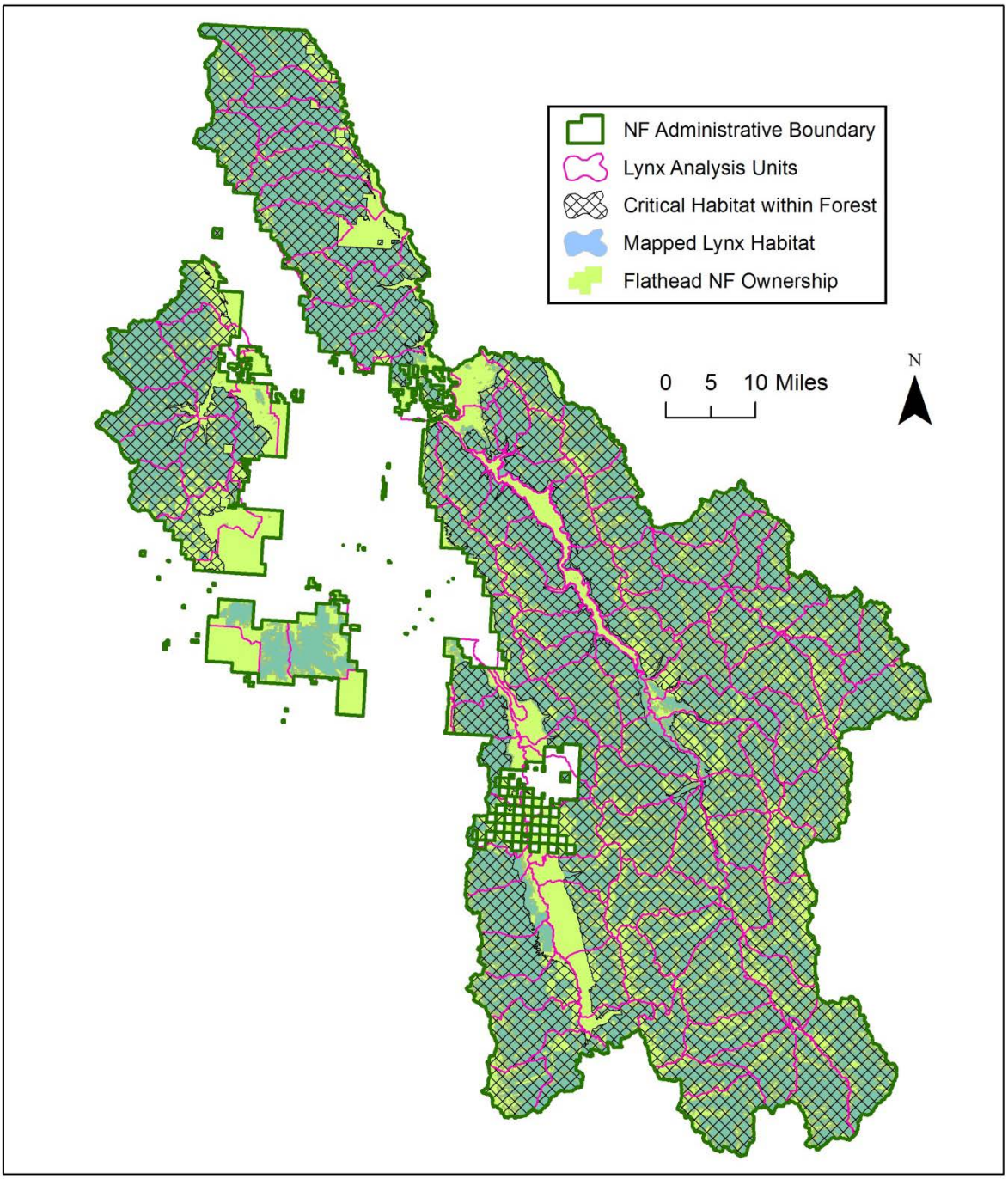
Bridger-Teton National Forest



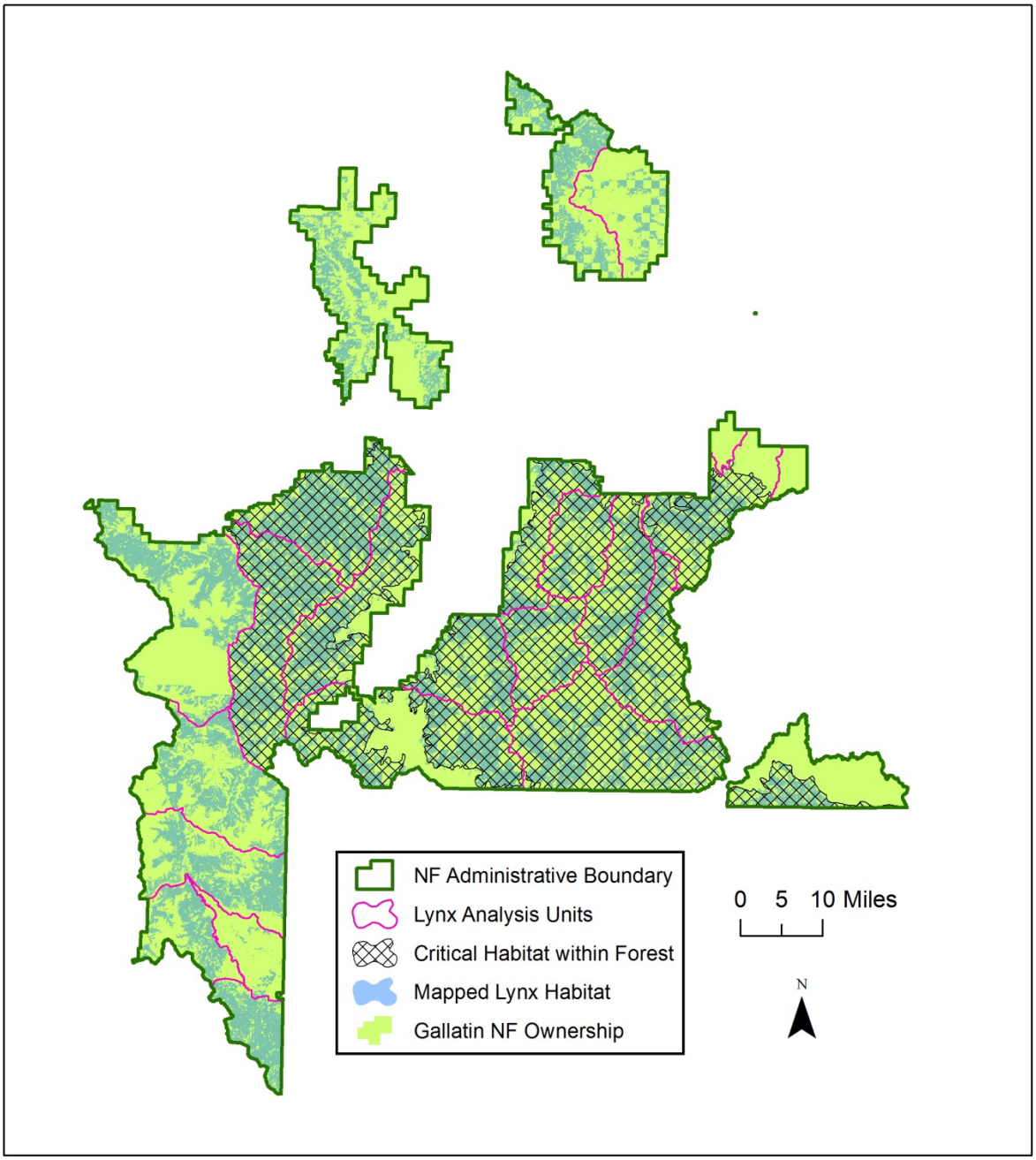
Custer National Forest



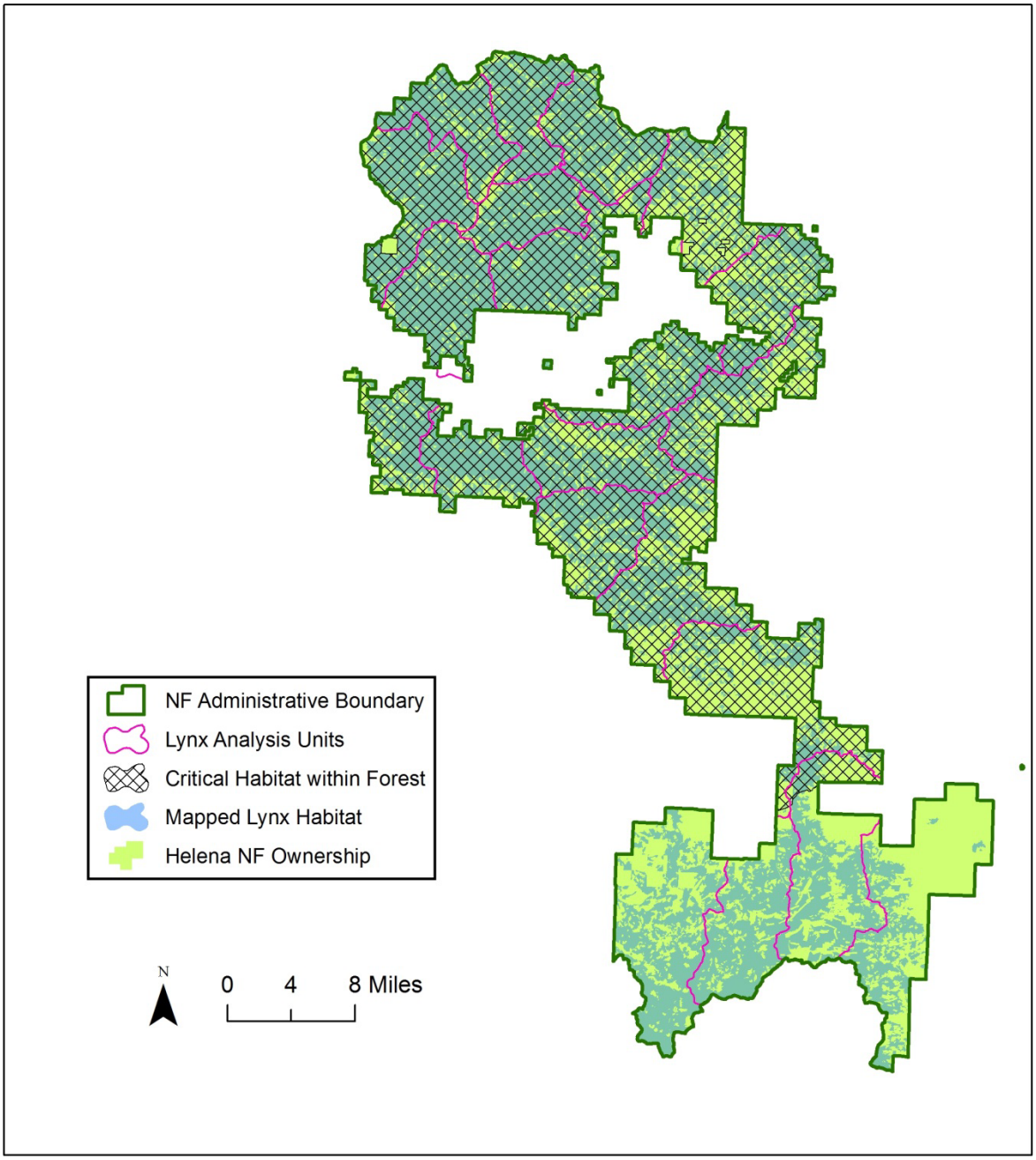
Flathead National Forest



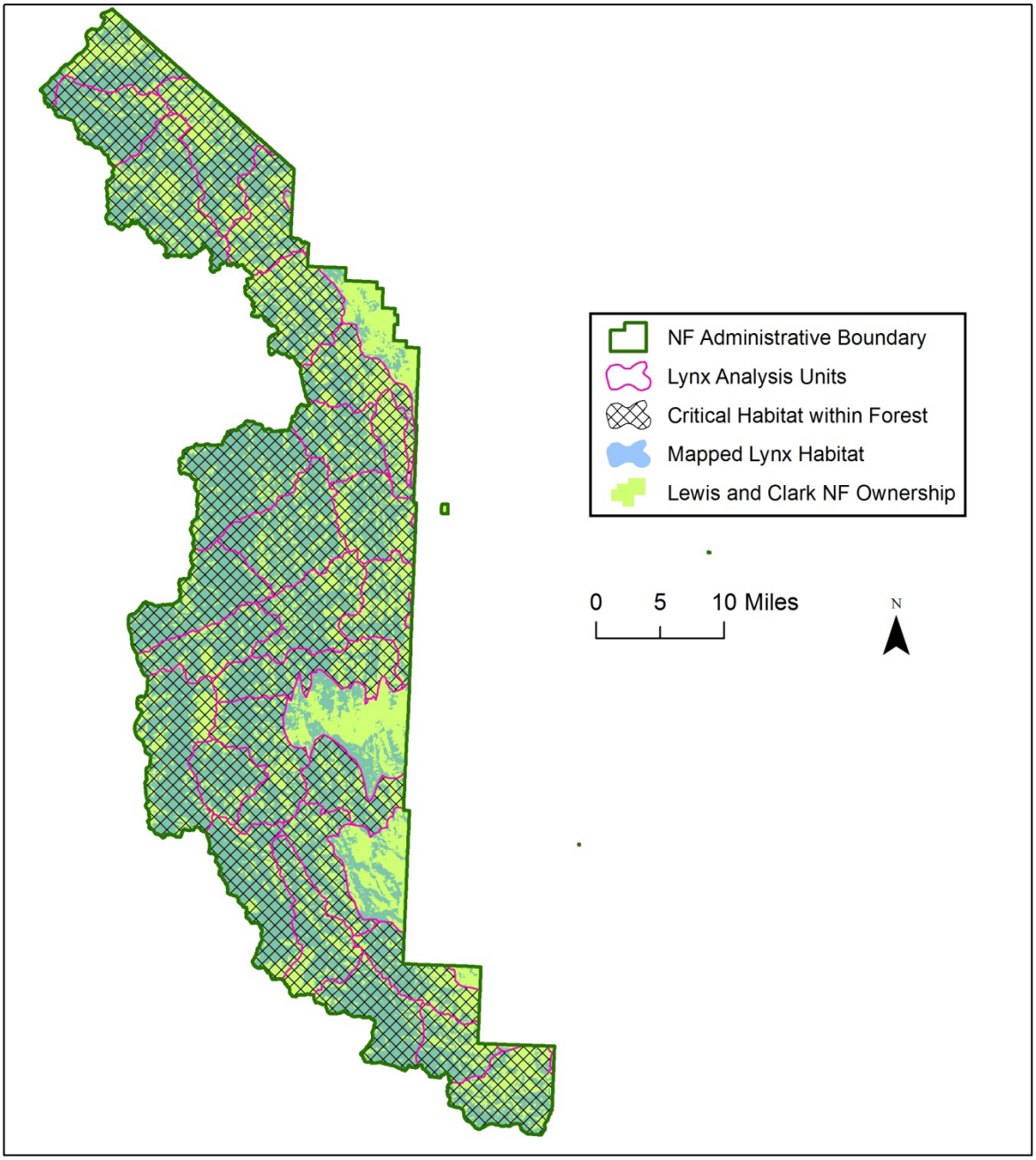
Gallatin National Forest



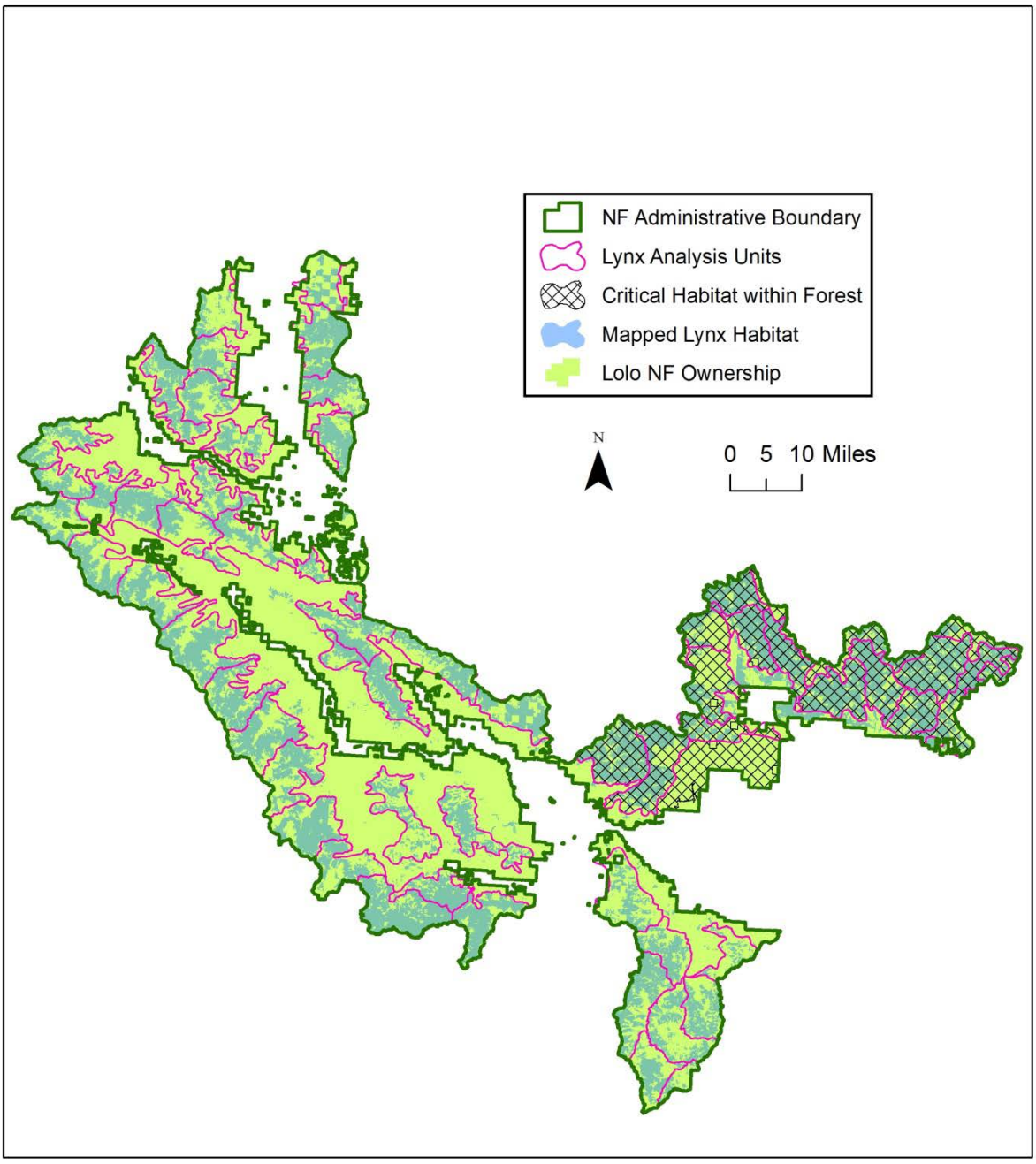
Helena National Forest



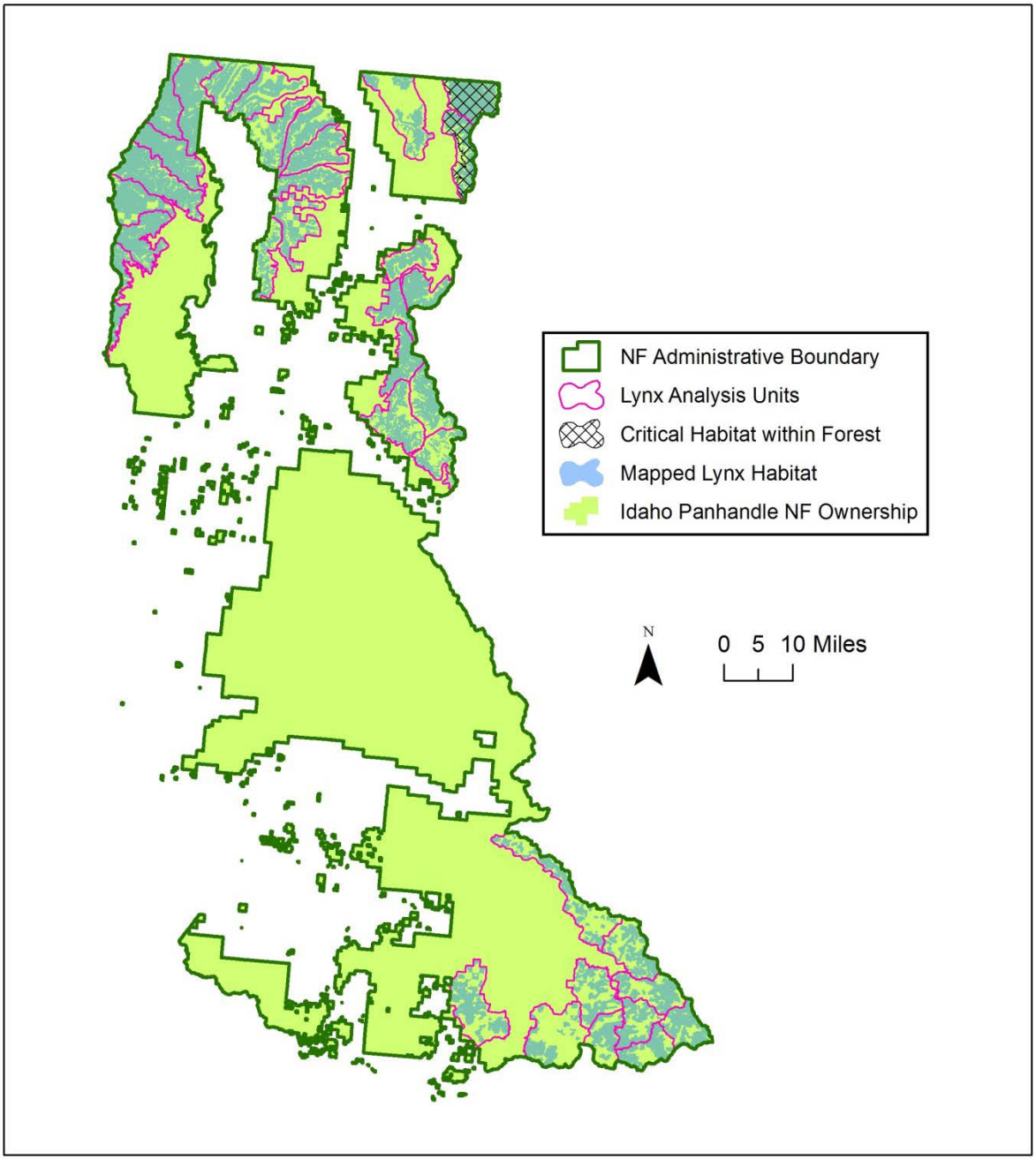
Lewis and Clark National Forest



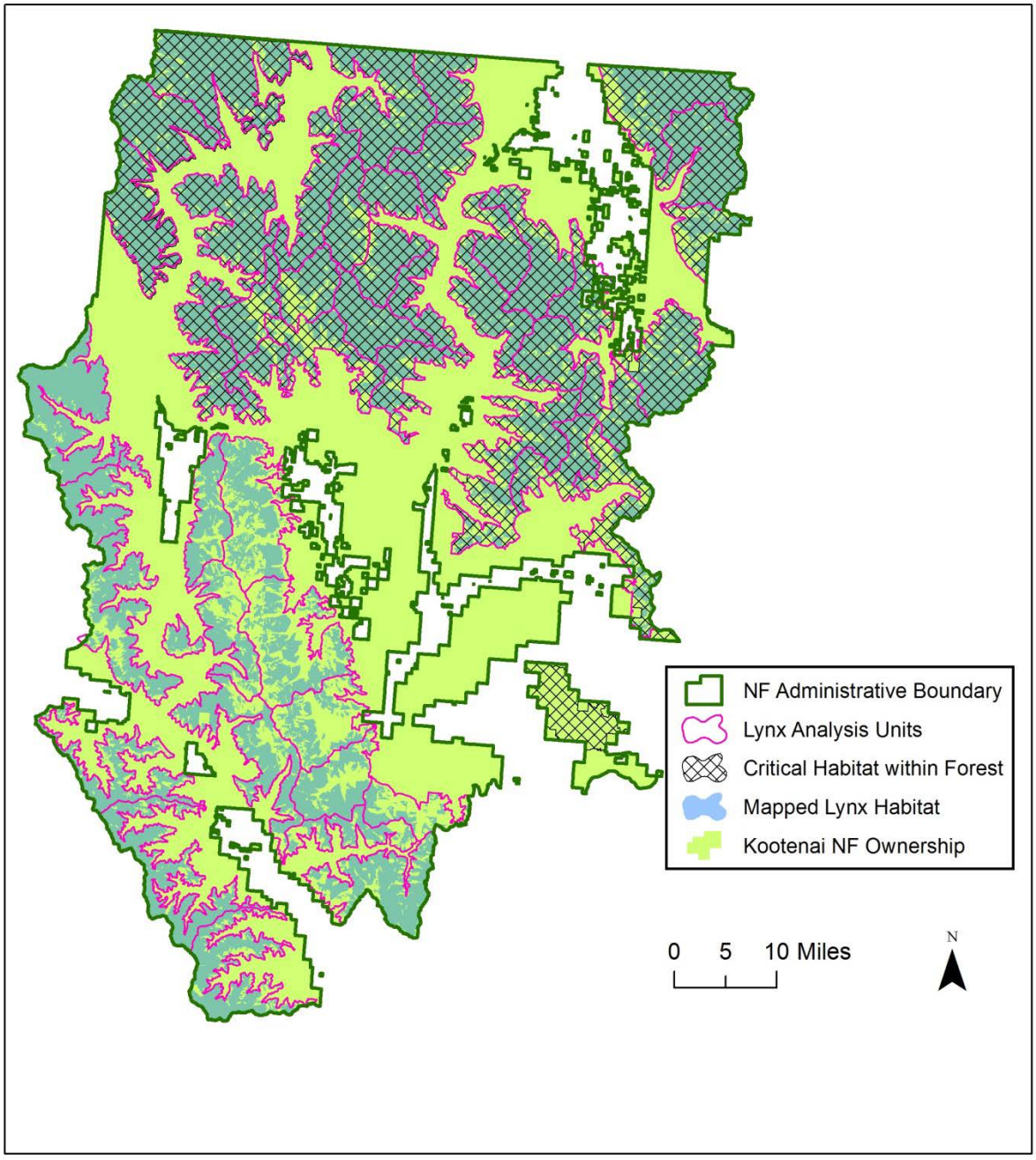
Lolo National Forest



Idaho Panhandle National Forest



Kootenai National Forest



Shoshone National Forest