



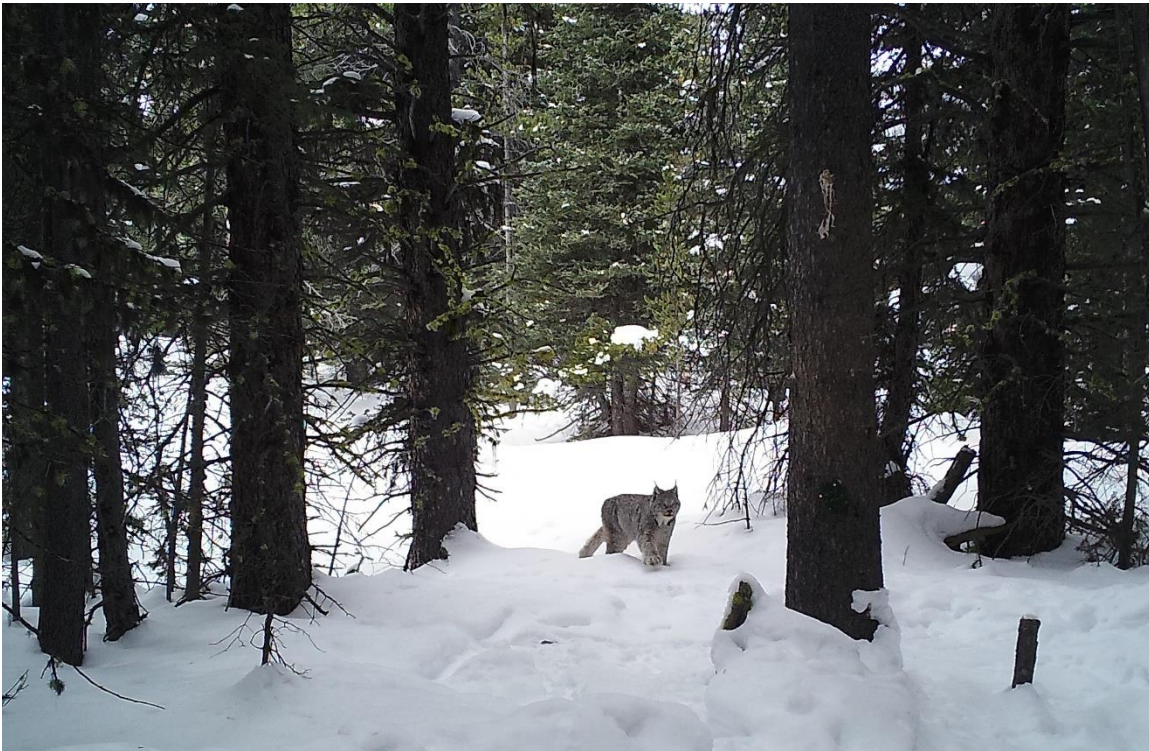
Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Northern Region

Beaverhead-Deerlodge National Forest

November 2025

Beaverhead-Deerlodge National Forest Canada Lynx Habitat Forest Plan Amendment Appendices



Contents

Appendix A - Habitat Model and LAU Delineation Processes	1
Definitions	1
Relationship between Habitat Type and Existing Vegetation	3
Best Available Scientific Information for Canada Lynx Habitat Mapping and LAU Delineation	3
Lynx Conservation Assessment and Strategy (LCAS).....	3
Research Informing Lynx Analysis Areas.....	4
Northern Rockies Lynx Management Direction (NRLMD)	11
Research on Snow as a Lynx Habitat Component	12
NRLMD Biological Opinion	13
Regional Forester’s Memo	13
Data Sources	14
Data Sources Summary	14
Alternative 1.....	18
Canada Lynx Habitat, Alternative 1	18
Lynx Analysis Units, Alternative 1	19
Alternative 2.....	19
Canada Lynx Habitat, Alternative 2	19
Lynx Analysis Units, Alternative 2	21
FACTS Activity Codes Descriptions	23
References.....	27
Appendix B – Maps.....	33
Appendix C – Detailed Lynx Analysis Unit Information.....	40

List of Tables

Table A1. Summary of relevant research investigating home range size and use areas for Canada lynx.....	7
Table A2. Data sources used for Alternative 1 and Alternative 2 Canada lynx habitat mapping and LAU delineation.	14
Table A3. Existing vegetation cover type and aspect combinations used to model lynx habitat in Alternative 1.	18
Table A4. Watersheds where habitat polygons were changed to reflect ground-verified snow elevations.....	20
Table A5: FACTS activity codes and descriptions of activities that remove 50 percent or greater canopy cover.....	23
Table C1. Alternative 1 Lynx Analysis Unit (LAU) identification, total area and mapped lynx habitat area within each LAU by ownership	40
Table C2. Alternative 2 Lynx Analysis Unit (LAU) identification, total area and mapped lynx habitat area within each LAU by ownership.	68

Figures

Figure A1. Example of refining secondary vegetation polygons within a 300 meter buffer from primary vegetation polygons.	21
Figure B1. Alternative 1 Canada lynx analysis units (LAUs) and mapped habitat.....	33
Figure B2. Alternative 2 Canada lynx analysis units (LAUs) and mapped habitat.....	34

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

Figure B3. Beaverhead-Deerlodge National Forest Lynx Analysis Units and Olson et al. Habitat Probability for Alternative 1..... 35

Figure B4. Beaverhead-Deerlodge National Forest Lynx Analysis Units and Olson et al. Habitat Probability for Alternative 2..... 36

Figure B5. Alternative 1 Beaverhead-Deerlodge National Forest Proposed Lynx Analysis Units and Western Lynx Biology Team Tiers. 37

Figure B6. Alternative 2 Beaverhead-Deerlodge National Forest Proposed Lynx Analysis Units and Western Lynx Biology Team Lynx Tiers. 38

Figure B7. Linkage areas around the Beaverhead-Deerlodge National Forest as identified in the Northern Rockies Lynx Management Direction. 39

Appendix A - Habitat Model and LAU Delineation Processes

This appendix describes the direction, data, and processes used to model Canada lynx habitat and delineate Lynx Analysis Units (LAUs) for the alternatives described in this environmental assessment. Definitions are provided for terms used in this appendix, environmental assessment, and supporting documentation. These are limited to terms describing vegetation and habitat for Canada lynx.

The Northern Rockies Lynx Management Direction (NRLMD) identifies where and how to manage for lynx using a two-step hierarchical process. The first step is to identify areas on the Forest that have the potential to develop vegetative communities that support snowshoe hares and lynx. This potential vegetation type, i.e. habitat type, reflects the inherent ability of the land to generate a particular vegetative community and is therefore a static property of the land. Thus, in the case of lynx management, the potential vegetation type informs where there is the *potential* for lynx to occupy the Forest if conditions are right.

The second step in the process is to identify the existing vegetative conditions for the locations that have the inherent ability to generate the habitat types that lynx prefer. This includes identifying the current species assemblage (i.e., seral stage) as well as the current structural stage of the vegetation assemblage that is present. The existing vegetation type thereby reflects the dynamic nature of the forest and is not a static property of the land. In the case of lynx management, the existing vegetation type informs where the conditions are currently right for lynx to occupy the Forest and where they are not.

By incorporating this two-step hierarchical process, the NRLMD aims to first prioritize where to manage for lynx, lynx habitat, and second what conditions to manage towards, preferred lynx seral and structural stages.

The intent of the habitat model and subsequent LAU delineation are designed solely to inform the first stage of this hierarchical process. The proposed forest plan amendment does not attempt to classify the existing vegetative condition of potential lynx habitat because such specific classifications are most appropriately considered during project-level analysis where lynx management standards are applied. The methods for identifying existing vegetative conditions are not described here and are not within the scope of the environmental analysis that this Appendix supports as they remain unchanged, do not differ between alternatives, and are described in site-specific project analyses. Other documents in the project record describe the methods for classification of existing structural stages (see 2021 biological assessment, Appendix C, pages 10-14).

Definitions

Existing Vegetation Type is vegetation that occurs on a site at time of observation, it includes forbs, grass, shrubs, and trees. Existing forested vegetation can be grouped into Region 1 dominance types (described below). Existing vegetation is synonymous with cover type and is described by the dominant plant species.

Region One Dominance Type is determined by the species with the greatest abundance of canopy cover, basal area, or trees per acre within a setting or map feature. The species that

determine the dominance type are always of the same lifeform, such as herb, tree, or shrub. Therefore it is necessary to identify the dominant lifeform and tree lifeform subclass before determining dominance type (Barber et al. 2011).

Habitat Type is a vegetation classification system that indicates a land area's capability to support a particular plant association (i.e. ecological site potential), that would develop under present environmental conditions if all successional sequences were completed without the interference of disturbance. Habitat types are an aggregation of plant communities with similar biophysical characteristics, function, and response to disturbance (Pfister et al. 1977). They are typically named using the dominant overstory species and an indicator plant from the undergrowth layer, (e.g. subalpine fir/grouse huckleberry or ABLA/VASC).

Potential Vegetation Type is a grouping of habitat types described in Milburn (Milburn et al. 2015). Similar habitat types are grouped into a potential vegetation type (PVT). For example, the PVT ABLA1 (ABLA = *Abies lasiocarpa*, subalpine fir) includes the following habitat types from Forest Habitat Types of Montana (Pfister et al. 1977): ABLA/OPHO (subalpine fir/devil's club), ABLA/GATR (subalpine fir/sweetscented bedstraw), ABLA/CACA (subalpine fir/bluejoint) and several others.

Primary Vegetation is a description of lynx habitat defined by the Lynx Conservation Assessment and Strategy (LCAS): primary vegetation types [existing vegetation] are lodgepole pine, subalpine fir, and Engelmann spruce (Ruediger et al. 2000). Primary vegetation is also defined by the NRLMD FEIS (USFS 2007) in Appendix B: mesic subalpine fir forests in the western U.S. are extensions of boreal forests. Subalpine fir habitat types dominated by cover types of spruce/fir, Douglas-fir, and seral lodgepole pine should be mapped as primary vegetation. Note that the previous sentence definition includes both habitat types (i.e. potential vegetation types) and existing vegetation cover types.

Secondary Vegetation is a description of lynx habitat. The LCAS defines secondary vegetation: "that, when interspersed within subalpine forests [primary vegetation habitat], may also contribute to lynx habitat, includes cool, moist Douglas-fir, grand fir, western larch and aspen forests." (Ruediger et al. 2000).

Secondary and Peripheral Lynx Habitat Area is defined by the Canada Lynx Recovery Outline (FWS 2005) and the revised LCAS (Interagency Lynx Biology Team 2013). Secondary and peripheral areas are not core habitat and may contribute to lynx persistence by providing habitat to support lynx during dispersal movements or other periods, with animals likely returning to core areas (FWS 2005). Both secondary and peripheral areas lack evidence of lynx reproduction. These areas have sporadic historical records of lynx, generally corresponding to cyclic population highs in Canada and might contribute to lynx persistence by supporting successful dispersal or exploratory movements. Habitat in these areas appears to be inherently patchier and less productive and likely only support lynx intermittently. This term is a classification of a landscape area, it is not a determination of whether a forested stand contains conditions that support lynx habitat.

Structural stage is a characterization of a forested stand, not by tree species, but rather describes the horizontal and vertical distribution of the components of a forest stand. Attributes described include height, diameter, crown layers and stems of trees, shrubs and the herbaceous understory, and snags and down woody debris. The number of layers of age classes (e.g. single-story or multi-story), the approximate age of existing forest (e.g. saplings or mature trees), and whether

the forested canopy is closed providing shade or if the trees are spread out allowing sunlight to reach the forest floor, are indications of the density of the vegetation (i.e. horizontal cover).

Relationship between Habitat Type and Existing Vegetation

Habitat types represent a site's potential of a specific floral climax stage if it moves through its successional pathways. A site will reach its climax stage if little to no disturbance occurs that would reset the successional process. The name of a habitat type may not reflect the existing vegetation because the habitat type is the climax species that would occupy a site. For example, many subalpine fir habitat types are dominated by lodgepole pine existing vegetation. Subalpine fir is more shade tolerant, so if no fire, timber harvest, or other disturbance affects the stand, it will develop into a subalpine fir stand because it can regenerate in the shade of the lodgepole pine while the lodgepole cannot reproduce as effectively in its own shade. Many of these stands persist as lodgepole pine stands nearly indefinitely because of periodic mountain pine beetle or other disturbance tree-killing agents, which opens the canopy enough to allow sufficient light on the forest floor to regenerate lodgepole pine.

Best Available Scientific Information for Canada Lynx Habitat Mapping and LAU Delineation

The environmental assessment includes a list of best available scientific information used for modeling Canada lynx habitat and LAU delineation. Best available scientific information is also discussed here, and additional research publications are listed that we consider best available scientific information informing this amendment.

Lynx Conservation Assessment and Strategy (LCAS)

In response to the decision to list the Canada lynx as threatened in 2000, the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000) was acknowledged as one of the sources of best available scientific information to assist in conservation of lynx (Interagency Lynx Biology Team 2013). When the first edition of the LCAS was written in 2000, most lynx research had been conducted in Alaska and Canada, but since then, the research has expanded and the revised LCAS (3rd edition, Interagency Lynx Biology Team 2013) provides an updated synthesis of the best available scientific information about lynx ecology and responses to management.

The 2000 LCAS was developed by interagency committees and multiple teams. An interagency Steering Committee (consisting of the Forest Service, State Directors of the Bureau of Land Management, Regional Directions of the Fish and Wildlife Service, Research Station members, and state representatives from Maine, Minnesota, and Montana) appointed an interagency Lynx Biology Team to prepare the conservation strategy and a separate Science Team to assemble the best available information. A Biological Assessment Team and a Planning Team were also established to assess how programmatic plans provide for lynx habitat requirements and determine if plans needed to be updated or changed. Once drafted, the LCAS received extensive internal and external review from independent scientific peer reviewers, solicited review by the Science Team, interagency internal review, and comments from state wildlife management agencies. The Biology team then addressed and incorporated comments with an interdisciplinary team consisting of other agency experts from silviculture, range, recreation, fire, and transportation (Ruediger et al. 2000).

The LCAS (Ruediger et al. 2000) explained that lynx occur in mesic coniferous forests that have cold, snowy winters, provide a prey base of snowshoe hare (Ruggiero et al. 1999), and that both snow conditions and vegetation type are important factors to consider in defining lynx habitat. Primary vegetation is considered necessary to support lynx reproduction and survival and that secondary vegetation includes other vegetation types that, when intermingled with or immediately adjacent to primary habitat, may also contribute to lynx habitat. In the Rocky Mountains, primary vegetation types are lodgepole pine, subalpine fir, and Engelmann spruce (Aubry et al. 1999 *in* Ruediger et al. 2000). The third edition of the LCAS noted that in the Northern Rocky Mountains geographic area (which includes the BDNF), lynx occur primarily in the spruce-fir forest potential vegetation types (Steele et al. 1981, Kuchler 1964, Pfister et al. 1977, Johnson and Simon 1987, Williams et al. 1995 *in* Interagency Lynx Biology Team 2013).

The LCAS described secondary vegetation as cool, moist Douglas-fir, grand fir, western larch and aspen forests. Dry forest types do not provide lynx habitat (e.g., ponderosa pine, dry Douglas fir) (Ruediger et al. 2000, Interagency Lynx Biology Team 2013). Ruediger et al. (2000) noted that east of the Continental Divide, subalpine fir forests are the primary vegetation and intermixed Engelmann spruce and moist Douglas-fir habitat types where lodgepole pine is a major seral species are secondary vegetation that may contribute to lynx habitat.

The LCAS (Ruediger et al. 2000, Interagency Lynx Biology Team 2013) included specific direction for identifying LAUs. LAUs are static analysis units that approximate a theoretical female home range used to analyze potential effects of projects on lynx and to monitor habitat changes over time. This direction is summarized below:

- LAUs should generally be 25-50 square miles in contiguous habitat and should likely be larger in less contiguous, poorer quality, or naturally fragmented habitat, encompass all seasonal habitats and will likely contain non-habitat areas (e.g., lakes, alpine tundra, rock scree slopes). Discontinuous habitat is unlikely to provide effective lynx habitat.
- LAU delineation should be coordinated with adjacent administrative units and state wildlife management agencies, where appropriate.
- LAUs with insignificant amounts of lynx habitat may be discarded, or lynx habitat within the unit incorporated into neighboring LAUs.
- At least 10 square miles of primary vegetation should be present in each LAU.
- Daily movement distances of females (3-6 miles) should be considered in relation to the distribution of habitat across the LAU where small patches of primary vegetation located beyond daily movement distances could be discarded or incorporated into a neighboring LAU.
- After LAUs are identified, their spatial arrangement should be evaluated. The number and arrangement of contiguous LAUs needed to maintain lynx habitat well distributed across the planning area should be determined.

Research Informing Lynx Analysis Areas

The 2000 LCAS made recommendations to develop a consistent and effective approach to conserve Canada Lynx on federal lands in the conterminous United States (Ruediger et al. 2000). Based on their collective expertise and “on studies at the southern part of lynx range in the western United States” (Ruediger et al. 2000, page 79) the authors of the LCAS provided an estimate of the minimum area of primary habitat (10 mi²) required to support lynx on federal lands in the conterminous western United States. Expert-based assessment of habitat suitability

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

can accurately identify areas of conservation and management priority and reliably predict species occurrence (Crawford et al. 2020, Hurtado et al. 2023, Di Febbraro et al. 2018, Pearman-Gillman et al. 2020), including for lynx (Hornseth et al. 2014) and for bobcats (*Lynx rufus*) (Reed et al. 2017). As such, they provide an important conservation tool when information is limited (Di Febbraro et al. 2018), as was the case at the time of the writing of the LCAS.

In addition to reviewing current science, the 2000 LCAS documented a variety of assumptions for creating LAU and primary habitat direction. These include:

Where no information exists, we made assumptions or inferences, based on the collective experience and professional judgement of team members and other scientists (Ruediger et al. 2000, Executive Summary, page 5).

A conservative approach is prudent to avoid irrevocably committing resources that may ultimately prove to be important to the survival and/or conservation of lynx (Ruediger et al. 2000, Executive Summary, page 5).

On many issues, however, no empirical information exists. In these cases, assumptions or inferences were made based on the collective experience and professional judgment of team members, in consultation with other lynx experts (Ruediger et al. 2000, Introduction, page 2).

...we assumed that maintaining high-quality foraging habitat within each LAU through time is very important. In addition, we inferred that limits must be placed on the extent of habitat alteration that can occur at one time within an LAU. Limits on alterations within LAUs are intended to aid in maintaining a distribution of suitable lynx habitat across the landscape. Although we acknowledge the positive and negative impacts of large scale, landscape events on lynx habitat, we recognize also that human alteration of habitat differs from natural events such as fire (Ruediger et al. 2000, Home Range, page 74).

The value of defining an appropriate analysis scale is described by McKelvey et al. (1999, page 420):

“...the scale at which forest management strategies are defined will be a critical consideration for lynx conservation. Because lynx occupy large home ranges and occur at low densities (about one lynx/50 km²)...the long-term viability of lynx populations cannot be achieved at the spatial scale of relatively small parcels of public land, or even higher units such as individual National Forests or National Parks. Consequently, we believe that lynx conservation in the contiguous United States can only succeed as part of an ecosystem management strategy that is designed to address the needs of a variety of potentially conflicting resource uses over long periods of time and broad spatial scales.”

Lynx analysis units are not intended to depict actual home ranges, but are intended to provide analysis units of the appropriate scale and with a minimum amount of habitat to analyze potential direct and indirect effects of projects or activities on individual lynx and monitor habitat changes (Ruediger et al. 2000). Application of Forest plan standards and guidelines at the LAU scale allows areas of quality lynx habitat to be maintained within each LAU, thereby maintaining a good distribution of lynx habitat at the scale of a lynx home range (Ruediger et al. 2000). To successfully apply the NRLMD each LAU should be a reasonable approximation of a lynx home range and have a reasonable amount of high-quality habitat (ten square miles) so that habitat modeling reflects a reasonable approximation of home range and the habitat within and project-level effects can be tracked meaningfully through time. If LAUs are too small, or the amount of habitat within them too little, application of the NRLMD may not maintain sufficient habitat

across the landscape. If LAUs are too large, the conservation impact of the Forest plan standards and guidelines may be diluted.

Research prior to and following the publication of the LCAS clearly demonstrated the substantial variation in home range size for lynx. Home range size varies among sexes, seasons, geographic locations, physiographic features (ridges, streams, etc.), habitat distribution, lynx and hare density, and cyclical hare phases (more heavily in the northern part of the lynx range) (Mowat et al. 1999, Koehler and Aubry 1994, Aubry et al. 1999, FWS 2017). Research methods (e.g., live trapping, radio telemetry, or snow tracking) to determine home ranges also produce varying results (Koehler and Aubry 1994, Interagency Lynx Biology Team 2013, Aubry et al. 1999). Overall, many factors contribute to the size of a lynx home range with substantial variation across the species range (see review of relevant literature in Table A1).

There is a strong correlation between habitat quality and home range size based on the relationship between lynx and hares. Canada lynx preference for forested stands with high horizontal cover is well established (Holbrook et al. 2019, USFS 2007, Squires et al. 2010, Holbrook et al. 2017b, Kosterman et al. 2018, Koehler et al. 2008, FWS 2017) as it is a strong determinant of the distribution and accessibility of snowshoe hares (Squires and Ruggiero 2007, Ivan and Shenk 2016). Decreases in hare density resulted in changing or increasing home ranges, increases in home range overlap between individuals, or increased lynx movements (Poole 1997, Koehler 1990, Poole 1994, Mowat et al. 1999, Ward and Krebs 1985, Apps 2000), although other research documented no change to lynx activity from lower hare densities (O'Donoghue et al. 1998, Brand et al. 1976). Southern snowshoe hare populations (southern Canada and the contiguous U.S.) exhibit lower densities and less pronounced, or absent, population cycles compared to their northern counterparts (Apps 2000, FWS 2017, Hodges et al. 2009, Hodges 1999), and generally have larger home ranges (Apps et al. 1999, Squires and Laurion 1999, Koehler and Aubry 1994). In places with better habitat quality (e.g., northern Canada), lynx home ranges tend to be smaller (Vashon et al. 2012, Aubry et al. 1999); similarly, there is more natural patchiness and fragmentation of lynx habitat in the southern range which may also contribute to a larger home range size (Buskirk et al. 1999, Koehler 1990, Squires et al. 2013, Mowat et al. 1999).

Lynx research shows that female home ranges are smaller in habitats with high snowshoe hare density, particularly in northern boreal forests. For instance, studies found female home ranges to be as small as 12 mi² in the Yukon (Aubry et al. 1999), 3.6 mi² in Alaska (Kesterson 1988), and core use areas of 1 to 12 mi² in Minnesota (Burdett et al. 2007). Vashon et al. (Vashon et al. 2008, Vashon et al. 2012) found home ranges as small as 10 mi² in northern Maine, concluding that this population's dynamics resembled those in northern Canada during peak hare abundance. These studies reporting small female home range sizes corroborate the LCAS recommendation for 10 mi² of primary habitat in each LAU because there appears to be a minimum amount of habitat a female needs to carry out life history requirements. Due to the inherent patchiness of lynx habitat at the southern range periphery, LAU sizes will be larger to incorporate 10 mi² of primary habitat which does not occur in contiguous patches. This is consistent with the BDNF Alternative 2 LAU model, which consists of LAUs that range in size from 26.6 mi² to 147.8 mi².

The LCAS provided a recommendation for LAU and primary habitat sizes to conserve lynx in the conterminous United States for lynx home ranges based on a reasonable inference of the literature while considering the wide variation reported. The revised 2013 LCAS maintained the recommendation for ten square miles of primary habitat within LAUs and did not suggest

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

changing LAU sizes even after reviewing more current lynx science “...it appears that at least 26 square kilometers (or 10 square miles) of primary vegetation (spruce/fir) must be present (Interagency Lynx Biology Team 2013, page 87). More recent lynx research continues to support these recommendations (Table A1). Thus, the LCAS direction for LAU size and primary habitat minimums continues to provide a reasonable estimate of a home range and habitat conditions ensuring the NRLMD standards and guidelines remain meaningful to govern the location and scale of vegetation treatments and other actions while conserving the vegetative conditions that support lynx across the landscape.

Table A1. Summary of relevant research investigating home range size and use areas for Canada lynx.

Source and Methods	Home Range Size and Use Areas	LCAS Interpretation for the Contiguous United States
(Koehler et al. 1979) Monitored two lynx via radio telemetry in Montana.	Male 36 km ² (14 mi ²); not enough data for the female.	This study reports a home range at the smaller end of a home range for an individual lynx in Montana. It was based only on one individual for less than an entire year limiting the usefulness for comparison.
(Carbyn and Patriquin 1983) Radio-collared three lynx in Manitoba to study movements.	Home ranges for two females averaged 156 km ² (60.2 mi ²) and 221 km ² (85.3 mi ²) for a male.	This study is based on three individual lynx in Manitoba, limiting its usefulness for comparison. This study illustrates some of the larger home range sizes reported for lynx.
(Brainerd 1985) Seven lynx were radio-collared in the Garnet and Cabinet Ranges in Montana between 1983-1984.	Annual home ranges for lynx averaged 122 km ² (47.1 mi ²) for males and 43.1 km ² (16.6 mi ²) for females.	This study in Montana reported moderately sized home ranges for lynx. This study was based on only two lynx in the Cabinet Mountains and seven in the Garnet Range. The Cabinet Mountains in northwest Montana have higher precipitation than most other areas of the state, resulting in some of the best lynx habitat in the state. The results of this study are not in conflict with the recommendation for LAU sizes of 25-50 mi ² .
(Bailey et al. 1986) Radio-collared nine lynx in Alaska and monitored movements and mortality.	Movements varied; in 1983 two females used areas 51 km ² (19.6 mi ²) and 89 km ² (34.4 mi ²). Males used between 64-783 km ² (24.7 – 302 mi ²) with a juvenile utilizing 8.3 km ² (3.2 mi ²). Areas used in summer were smaller than those in winter.	Research occurred in Alaska where habitats are very different than the conterminous western U.S. but included to demonstrate the wide variation in species range. We assume that the Alaska habitats are better for lynx and it follows that the reported home ranges for females are less than to the middle of what the LCAS recommends be used as an overall home range size for the conterminous western U.S.
(Kesterson 1988) Radio-collared 29 lynx in Alaska and monitored in relation to lynx and hare densities.	Home ranges varied seasonally; female had smaller summer home ranges (9.4 km ² ; 3.6 mi ²) that were larger in spring (51.6 km ² ; 19.9 mi ²). Seasonal home range of males were (93 km ² ; 36 mi ²).	Research occurred in Alaska where habitats are very different than the conterminous western U.S. but included to demonstrate the wide variation in species range. Assuming Alaska habitats are better for lynx, it follows that the female home range across seasons is much smaller than what the LCAS recommends for an overall home range. It also supports the LCAS recommendation for at least 10 mi ² of primary habitat because the Alaska habitats are likely high-quality and females used 3.6 mi ² to 19.9 mi ² .

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

Source and Methods	Home Range Size and Use Areas	LCAS Interpretation for the Contiguous United States
(Koehler 1990) Tracked seven lynx using radiotelemetry in north central Washington during 1985-1987.	Mean home range for females was 39±2 km ² (15±0.7 mi ²) and males 69±28 km ² (26.6±10.8 mi ²). Prey scarcity may have contributed to the large home range, low density, and low productivity (high kitten mortality).	The research was conducted in the Cascade Mountains of Washington, a region within the contiguous U.S. but outside the Northern Rockies planning area. The average home range sizes found do not conflict with the LCAS recommendation of 25-50 square miles for overall home range size.
(Koehler and Aubry 1994) Review of lynx research, including home range information and the variables that may have influenced size (low prey density, trapping pressure, seasonal differences).	Radiotelemetry studies estimated home ranges for lynx vary in size from 8-783 km ² (3-302 mi ²) in both Canada and the United States. In places with low hare density in Minnesota, lynx occupied areas of 145-243 km ² (56-94 mi ²) and 51-122 km ² (19.7-47.1 mi ²) for males and females, respectively. In western Montana, the mean range home size for two males and two females was 133 km ² (51 mi ²). Lynx will maintain home ranges for several years but the size may change.	This review disclosed the large size variation in home range sizes for Canada lynx. In Minnesota, female lynx occupied home ranges around 20-47 mi ² , which supports LCAS recommendation of home range sizes to be 25 to 50 mi ² . Although Minnesota is not in the Northern Rockies Lynx Planning Area that the LCAS was providing recommendations for, it is describing lynx in the contiguous United States. Similarly, in Montana, the mean home range for males and female was 51 mi ² . This supports the upper limit for LAU sizes as described in the LCAS and this research informed the LCAS.
(Aubry et al. 1999) Reviews lynx ecology in southern boreal forests (Southern Canadian Rocky Mountains, Washington, Montana, Wyoming, etc.) and compares findings to northern taiga lynx populations, including home range size (refer to table 13.2 in this reference for method and mean range comparison).	In general, lynx home ranges in southern boreal forests are larger compared to those in northern areas during high snowshoe hare densities. The average mean home range size in southern boreal forests is 72 km ² (28 mi ²) for females and 151 km ² (58 mi ²) for males.	This review of lynx ecology in southern boreal forests was certainly incorporated into the LCAS recommendations for home range size of 25 to 50 mi ² . This does not describe "primary use area" but instead provides an overall average for the total home range size of females and males based on the capability of the southern Rocky Mountains area to support lynx. This review reported home range sizes from the taiga of high snowshoe hare densities of 24 mi ² for males and 12 mi ² for females. This supports the LCAS recommendation of 10 mi ² of primary habitat.
(Squires and Laurion 1999) 13 lynx in Montana and 2 lynx in Wyoming were radio-collared and tracked (Wyoming 1996-1997; Montana 1998).	In Montana: average daily straight-line distance ranged from 2.8 km (1.7 mi) for males and 3.2 km (2 mi) for females. Annual home ranges averaged 238 km ² (92 mi ²) for males and 115 km ² (45 mi ²) for females. Lynx living at the southern extent of the range have larger home ranges.	This research supports the LCAS recommendations for female home range size of 25 to 50 mi ² because the study reported annual home range size of 45 mi ² for females. This research was conducted in Montana and Wyoming which are directly applicable to the LCAS recommendations for the Northern Rockies Lynx Planning area.

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

Source and Methods	Home Range Size and Use Areas	LCAS Interpretation for the Contiguous United States
(Apps 2000) Radio collared ten lynx in southeastern British Columbia and used telemetry and snow tracking to study lynx movements, home ranges, and habitat selection based on a variety of variables.	Mean home ranges for males averaged 381 km ² (147 mi ²) and 229 km ² (88 mi ²) for females. Hare densities, and diet, space-use, movements, reproduction, subadult survival, and dispersal of lynx were consistent with those of northern populations during hare lows (larger home ranges). Lynx populations in the southern Canadian Rocky Mountains are not subject to the same cyclic hare pulses as northern populations.	This study occurred in British Columbia, Canada where the habitat is very different from conterminous western U.S. making comparisons difficult. This study was included to demonstrate the wide variation in home range.
(Burdett et al. 2007) GPS-collared 11 lynx in Minnesota to study seasonal movements.	Home ranges ranged from 29-522 km ² (18-324 mi ²) for males and 5-95 km ² (3.1-59 mi ²) for females. Mean core areas (intensively used places within home ranges) ranged from 6-190 km ² (3.7-118 mi ²) for males and 1-19 km ² (0.6-11.8 mi ²) for females. Large home ranges for males may be a function of female distribution.	The study was conducted in Minnesota which is not in the Northern Rockies Lynx Planning Area that the LCAS was providing recommendations for, but it is describing lynx in the contiguous United States. This study reporting home range size in Minnesota supports the LCAS recommendations for overall home range size. Female home ranges were reported to be 3-59 mi ² which closely aligns with the recommendations for 25-50 mi ² overall and somewhat supports the primary use area of 10 mi ² because the study found that females use 0.6 to 11.8 mi ² as average core areas. The presence of high-quality, prey-rich habitats were attributed for the lower end ranges of home range and core area sizes and likely are not as applicable to habitats in the contiguous U.S. portion of the Northern Rockies.
(Vashon et al. 2008) and (Vashon et al. 2012) Used radio collars and telemetry on 43 lynx in Maine from 1999-2004 and estimated home range size.	Home ranges for females averaged 25.7 km ² (9.9 mi ²) and 53.6 km ² (20.7 mi ²) for males.	This study on Canada lynx in northern Maine found that the population exhibited characteristics similar to boreal forest populations during periods of high snowshoe hare abundance and reported home ranges are relatively small. These results support the LCAS recommendation for 26 km ² of primary habitat needed to sustain a female on a home range.
(Vashon et al. 2012) Species assessment for Canada lynx in Maine.	In an area where >40% of the forested habitat supported >1.0 hare/2.5 acres, lynx home ranges were small averaging 21 mi ² (54 km ²) for males and 10 mi ² (26 km ²) for females. Winter home ranges of males were only slightly smaller than summer ranges (17 mi ² vs. 23 mi ² ; 44 km ²	This density of snowshoe hares is similar to other studies that report areas of high habitat quality. Habitats supporting 1 to 1.5 hares per hectare are excellent quality. In this case, female lynx had a relatively small home range of 26 km ² which directly corresponds to the LCAS recommendation for this minimum primary habitat to be contained in a home range. Vashon et al. describes lynx in Maine where although it is not in the Northern Rockies Lynx Planning

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

Source and Methods	Home Range Size and Use Areas	LCAS Interpretation for the Contiguous United States
	vs. 60 km ²). Conversely, female winter ranges were nearly 3 times larger than their summer ranges (15 mi ² vs. 5 mi ² ; 39 km ² vs. 13 km ²). Although females were with kittens during both periods, the kittens were smaller and less mobile during the summer, which likely explains the smaller home-range size during this period (Vashon et al. 2008).	Area that the LCAS was providing recommendations for, it is describing lynx in the contiguous United States.
(Vanbianchi et al. 2018) Modeled functional connectivity for lynx in north central Washington by developing two models (core and matrix habitat). Used GPS data from 13 collared lynx for habitat modeling.	Travelling lynx use a broader range of habitats compared to lynx moving within core areas. Average home range size was 88 km ² (33 mi ²) with habitat concentration areas ranging from 10-1,459 km ² (3.8-563.3 mi ²) with three less than 19 km ² (7.3 mi ²).	Results of this study from north-central Washington for average home range size corroborates the LCAS recommendation for an overall home range size of 25-50 mi ² . North-central Washington is not Northern Rockies Lynx Planning area but is in contiguous United States.
(Holbrook et al. 2019) Monitored 32 female lynx in northwestern Montana from 1999-2013 to assess quality habitat for this species. Lynx were collared with either VHF (1999-2004) or GPS collars (2005-2013).	Median home range size was 23 km ² (8.9 mi ²) with a range of 18-66 km ² (6.9-25.5 mi ²). Core use areas ranged from 3-21 km ² (1.2-8.1 mi ²) with a median of 6 km ² (2.3 mi ²). Female lynx selected for home ranges containing specific proportions of mature and advanced regenerating forest classes.	This study calculated home range sizes using a different method than most other studies including the research that the LCAS was based on. However, the result of a median home range supports the LCAS recommendation for a core area of 26 km ² because this research was done in northwest Montana which contains the best habitat in the state.
(Anderson et al. 2023) Estimated lynx occupancy and density in Glacier National Park in Montana using camera traps.	Used 40 km ² (15.4 mi ²) grid cells for sampling units as a conservative estimate of home range size based on Squires and Laurion (1999). Lynx detections were mostly concentrated in areas with highest snowshoe hare densities.	This research also supports the LCAS recommendation of 10 mi ² as the minimum amount of primary habitat needed to support lynx. This study used a 15.4 mi ² grid as a conservative estimate for home range size based on previous lynx research to determine occupancy and density from camera traps.
(Kynoch et al. 2025) Used GPS telemetry and accelerometer data to study seasonal patterns of lynx activity in Alaska in 2019.	Lynx home ranges during the spring averaged 57 km ² (22 mi ²) with a range of 9-161 km ² (3.5-62.2 mi ²). Lynx concentrated activities in areas less than a quarter of their home ranges, averaging 13 km ² (5 mi ²) with a range of 1-36 km ² (0.4-13.9 mi ²). During the summer, home ranges	This research occurred in Alaska where the habitat is very different from conterminous western U.S. which makes comparisons difficult. This study was included to demonstrate the wide variation in lynx home ranges.

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

Source and Methods	Home Range Size and Use Areas	LCAS Interpretation for the Contiguous United States
	<p>averaged 78 km² (30.1 mi²) with a range of 18-138 km² (6.9-53.3 mi²) with core use areas averaging 21 km² (8.1 mi²) with a range of 4-37 km² (1.5-14.3 mi²). In fall, home ranges decreased to 21 km² (8.1 mi²) with a range of 18-26 km² (6.9-10 mi²). Fall core use areas averaged 6 km² (2.3 mi²) with a range of 4-7 km² (1.5-2.7 mi²). Winter home ranges averaged 27 km² (10.4 mi²) with a range of 15-51 km² (5.8-19.7 mi²). Lynx spent most of their time concentrating activities in 5 km² (1.9 mi²) with a range of 3-7 km² (1.2-2.7 mi²) in winter.</p>	

Northern Rockies Lynx Management Direction (NRLMD)

The Northern Rockies Lynx Management Direction (NRLMD) limits habitat alteration through standards measured at the scale of an LAU. The final environmental impact statement, Appendix B (USFS 2007) included criteria and procedures for mapping lynx habitat. The Lynx Biology Team, five members of the Science Team, and three U.S. Fish and Wildlife Service (FWS) consultation biologists developed the initial criteria and procedures for Lynx Habitat Mapping in the United States (USFS 2007, Appendix B) in 2007. The mapping direction developed by the Lynx Biology Team states:

1. *In the western U.S., lynx occurrences generally are found only above 4,000 ft. elevation (McKelvey et al. 2000). Areas below 4,000 ft. usually should be excluded. Note that elevation ranges are specified in the geographic area descriptions in the Lynx Conservation Assessment and Strategy.*
2. *Within the boundaries defined by the first two steps, map vegetation that could contribute to lynx habitat, as described for each geographic area in the Lynx Conservation Assessment and Strategy, using the finest-scale vegetation information that is available. The following clarifies primary and secondary vegetation for the western U.S.*
 - a. *Mesic subalpine fir forests in the western U.S. are extensions of boreal forests. Subalpine fir habitat types dominated by cover types of spruce/fir, Douglas-fir, and seral lodgepole pine should be mapped as primary vegetation. These types must be present to support foraging, denning and rearing of young.*
 - b. *Other cool, moist habitat types (e.g., some Douglas-fir, grand fir) may contribute to lynx habitat where intermingled with and immediately adjacent to primary vegetation. These types are described as secondary vegetation.*
 - c. *Lynx do not appear to be associated with dry forest habitat types (e.g., ponderosa pine, dry Douglas-fir, and dry or climax lodgepole pine) except to move among*

mesic stands (Ruggiero et al. 2000b). These dry types should not be included as vegetation contributing to lynx habitat.

3. *The next steps are to identify lynx habitat within a Lynx Analysis Unit (LAU), which involves consideration of several additional factors:*
 - a. *Determine whether the amount and spatial arrangement of vegetation is sufficient to warrant delineating a LAU (amount, patch size, inter-patch distance).*
 - b. *Evaluate land ownership pattern (to assess feasibility of achieving lynx conservation objectives on federally administered lands, to determine appropriate size and configuration of the LAU, etc.).*
 - c. *Review occurrence records of all types to assess validity of identifying the area as lynx habitat-location, pattern, consistency, year in relation to Canadian population cycles. Evaluate the records as described in Chapter 8 (McKelvey et al. 2000). Lack of records in an area does not necessarily indicate lack of habitat; conversely, detections do not necessarily indicate lynx habitat. Independently, occurrence records indicate only occurrence. Collectively, as a data set, occurrences can reveal habitats that likely are important to lynx.*

Snow depth information may be useful to exclude ungulate winter ranges and areas that do not contain adequate snow cover during the winter.

Note: Once identified as “lynx habitat,” there is no longer a distinction between primary and secondary vegetation. Conservation measures of the Lynx Conservation Assessment and Strategy (LCAS) apply to lynx habitat.

Research on Snow as a Lynx Habitat Component

Abundant research confirms that snow is an important component of lynx habitat (Koehler et al. 2008, Maletzke 2004, Koehler and Brittell 1990, Squires et al. 2013, Peers et al. 2020, Stenseth et al. 2004). Habitats with deep, fluffy snow give lynx a competitive advantage over animals that do not have large feet adapted for over-snow travel, such as bobcats, mountain lions, and coyotes (McCord and Cardoza 1982, Ruggiero et al. 2000, Ruediger et al. 2000). Lynx are a cold-adapted predator dependent on snowy winters providing deep, powdery, and persistent snow for a predation advantage over other terrestrial carnivores (Murray and Boutin 1991, Hoving et al. 2005, Carroll 2007, Gonzalez et al. 2007, Ruggiero et al. 2000, Interagency Lynx Biology Team 2013, Peers et al. 2020). Winter habitat is believed to be a factor limiting snowshoe hare and lynx populations (Squires et al. 2010, Interagency Lynx Biology Team 2013).

Squires et al. (2010) studied lynx habitat during winter in northwest Montana and provided empirical data for establishing snow depths that provide a competitive advantage over other meso-carnivores during winter, and development of corresponding lower elevational thresholds for mapping lynx habitat. This study quantifies snow depth and penetrability that give lynx this competitive advantage. King (2019) determined that an average snow depth of 0.84 meters was included in a best-fit occupancy model for lynx in Washington state.

(Holbrook et al. 2017a) determined that intermediate snow depths and the distribution of snowshoe hares were the strongest predictors of where lynx selected their home ranges. Scully et al. (2018) found that lynx distribution was strongly associated with snowshoe hare abundance and

topographic variables related to lower temperatures and increased moisture and that spatial overlap of lynx, bobcats and cougars increased during the snow-off season. Olson et al. (2021) found that the top four variables that had the most effect on lynx habitat capability included snow, precipitation, cold temperatures and normalized difference vegetation index (NDVI), a measure of long-term forest presence or productivity. In the 2017 Species Status Assessment (SSA), the FWS recognized that the lynx, as a boreal forest- and snow-adapted specialist predator, is broadly exposed and highly sensitive to climate change and has limited capacity to adapt to projected warming and related impacts (FWS 2017). In the 2023 addendum to the SSA, FWS noted that individual lynx require large boreal forest landscapes with snow conditions (consistency, depth, and duration) that allow lynx to outcompete other terrestrial hare predators (FWS 2023). In the 2024 Lynx Recovery Plan (FWS 2024), climate change is cited as one of the primary drivers of influencing lynx habitat in the continental United States; this is an important concern due to the species' reliance on habitats that include adequate snow.

The interagency Western Lynx Biology Team (WLBT)¹ team recognized that early (late 1990s era) lynx mapping inaccuracies occurred due to 1) an incomplete understanding of snow variables (annual snowfall amount, duration of the snow season, and snow conditions – e.g., “deep/fluffy”) associated with lynx occurrence or residency, and either did not apply an elevational gradient or threshold, or elevational thresholds were too low; 2) over-mapping of secondary vegetation (mesic Douglas fir, grand fir, western larch, and aspen habitat types) that was not immediately adjacent to or intermixed with primary vegetation (subalpine fir / Engelmann spruce habitat types); and/or 3) databases that were insufficient to accurately map habitat types.

NRLMD Biological Opinion

The FWS's 2007 biological opinion on the effects of the NRLMD amendment noted that although lynx habitat maps were developed using the best mapping resources available to the Forest Service at the time of preparation, the types of mapping resources and technology available on each Forest varied, and thus the accuracy and precision varied as well (FWS 2007). In some cases, lynx habitat may have been over-mapped and that they expected that lynx habitat maps and LAUs would be further refined and improved as more information became available (FWS 2007).

Regional Forester's Memo

A 2016 Northern Region Regional Forester's memo provided procedures for mapping updates to lynx habitat in the Northern Region when new information and/or databases are available (Marten 2016). This is in response to NRLMD standard LAU S1: “Changes in LAU boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.” This memo referred to provisions for updating lynx habitat maps in the NRLMD final environmental impact statement (USFS 2007) and Biological Opinion (FWS 2007), as well as in the 2013 Canada Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team

¹ The interagency Western Lynx Biology Team (WLBT) was appointed by the interagency Western Lynx Steering Team to review and interpret the latest science related to Canada lynx and lynx habitat. Composed of wildlife biologists with lynx expertise from federal land management agencies in the western US (primarily Forest Service, FWS and Bureau of Land Management), the WLBT was aided by a Science Advisor who coordinated and provided additional scientific information, as well as by invited interdisciplinary technical advisors. The WLBT advised the Steering Team on the relationship between science and management, with the goal of providing recommendations related to forest management for the conservation and recovery of lynx on Federal lands in the West.

2013). These provisions direct to be consistent with the lynx habitat criteria and procedures provided by the Lynx Biology Team and the NRLMD, to work with the Regional Office staff on updated mapping and to document the procedures used for the mapping updates.

Data Sources

Data Sources Summary

Table A2 summarizes the data sources used in the alternatives. Each source listed in the table is described in more detail below.

Table A2. Data sources used for Alternative 1 and Alternative 2 Canada lynx habitat mapping and LAU delineation.

Source	Alternative 1	Alternative 2
SILC	Yes	No
DEM	Yes	No
VMap polygon boundaries	No	Yes
VMap existing cover type	No	Yes, PVT correction
Subwatersheds (HUC6)	Yes	Yes
Potential Vegetation Type, Jones PVT	No	Yes
Potential vegetation type, FSVeg	No	Yes, where available
Vegetation management, FACTS	No	Yes, PVT correction
Fire severity, MTBS	No	Yes, PVT correction
Fire severity, BARC	No	Yes, PVT correction
Snow Depth and Density	No	Yes

Satellite Imagery Land Classification (SILC)

The University of Montana developed the Satellite Imagery Land Classification (SILC) system, which classified existing forest cover type and size class attributes from remotely sensed imagery at a 30-meter resolution. Landsat satellite imagery captured between 1994 and 2000 was refined with training data plots and three versions were produced between 1998 and 2002.

SILC provides a raster-based map of existing vegetation which differs from potential vegetation type because it represents conditions at the time of classification, describing ephemeral conditions. An existing vegetation map is only accurate until the next disturbance (wildfire, insect outbreak, timber harvest), or until enough time passes without disturbance for forest succession to progress. Although existing vegetation provides valuable information about the composition and structure, this classification provides little insight about site productivity and management implications. Alternative 1 used SILC to identify lynx habitat.

Digital Elevation Model (DEM)

Digital elevation models (DEMs) are a representation of the earth's topographic surface without trees, buildings, or other objects. They represent terrain and are primarily created from topographic maps but can be created from a variety of data sources. Digital Elevation Models depict slope gradient and aspect, among other features.

Region 1 Existing Vegetation Map Products (VMap)

Region 1 Existing Vegetation Map Products (VMap) is an existing vegetation map product for the Northern Region. It is a multi-level geospatial database used to produce four primary map products: lifeform, tree canopy cover class, tree diameter, and tree dominance type. Grassland and shrubland vegetation communities are included for forests east of the Continental Divide. Elevation, aspect, and slope are included in VMap data. VMap polygons allow for a finer spatial resolution than raster satellite derived imagery to more precisely model habitat.

VMap products are derived using remote sensing technology and are based on a combination of airborne imagery and a nationally available digital topographic and climatic data. This dataset is aggregated to 10-meter raster data at a range of resolutions to accurately depict vegetation patterns across landscapes (Ahl et al. 2018).

VMap polygons were drawn by software that delineated imagery into homogeneous groups of vegetation. Therefore, the outline of the VMap polygons work well as a static polygon to use as a mapping unit to assign habitat attributes.

Subwatersheds (HUCs)

Subwatersheds encompass creeks and streams that contribute waters to larger river systems and range in size from approximately 10,000 to 40,000 acres. These subwatershed features are commonly referred to as sixth hydrologic units code (HUC) and, more recently, twelve code hydrologic units. For the remainder of this document, these hydrologic features will be referred to as subwatersheds. Because subwatersheds are seamless, share adjacent boundaries, and encompass the approximate size of female lynx home range (25-50 square miles), the Forest used these features in the Lynx Analysis Unit delineation process for both alternatives described in this environmental assessment.

Potential Vegetation Type (PVT)

Potential vegetation type (R1 PVT Type) is based on habitat typing (see the habitat type definition above). Potential vegetation types are groups of habitat types assembled based on bio-physical attributes and climactic conditions that affect site potential. These assemblages of habitat types are depicted in Table 2 of Region 1 Existing and Potential Vegetation Groupings used for Broad-level Analysis and Monitoring (Milburn et al. 2015) and described in metadata for the Jones (Jones 2004) model. Potential vegetation is ideally suited for planning and assessment processes because it represents ecological site potential.

Two sources of potential vegetation type data were used for Alternative 2 habitat mapping: forest-wide modeled potential vegetation type (Jones PVT) and data from Field Sampled Vegetation (both described below).

Field Sampled Vegetation (FSVeg)

FSVeg is a relational Oracle database that houses field sampled vegetation information consisting of stand exams, stratified random sample data, Forest Inventory and Analysis (FIA) data, and some other less common data sets. Information on habitat type, where available, was the only attribute from FSVeg used in Alternative 2. FSVeg provides accurate habitat types because data are based on field survey. However, FSVeg data is limited to the Forest where vegetation inventories have been completed. Habitat type where available in FSVeg was assigned to a PVT group and used in Alternative 2 habitat modeling.

Jones Potential Vegetation Type (PVT)

Jones Potential Vegetation Type (Jones PVT) geospatial data modeling covers all lands managed by the Forest Service Northern Region and is contiguous at a 90-meter resolution. Potential vegetation mapping units delineate areas having similar biophysical environments, such as similar climate and soil characteristics, and is modeled from spatially referenced field data having a reference to habitat type (Pfister et al. 1977). Individual habitat types were aggregated into 46 types: 26 forest types, 10 shrubland types, 5 grassland types, 1 alpine type, and 4 non-vegetated types. Nearest neighbor interpolation was used to extrapolate plot-level data across the spatial domain by using precipitation, temperature, solar radiation, potential lifeform, elevation, aspect, slope and soils data to assign classifications. Jones PVT was designed to characterize broad scale patterns for regional and subregional assessments. Although the resolution is at a 90-meter cell, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres. This resolution is appropriate for characterizing lynx habitat at the scale of a LAU. Jones PVT was used to model lynx habitat for Alternative 2 where FSVeg lacked habitat type data.

Human and Natural Disturbance

Site potential is the most important indicator of lynx habitat; the potential of a site to provide lynx habitat remains constant but the existing vegetation and structural stage of that site varies with time since and type of disturbance. Human and natural disturbance events alter vegetation composition and structural stage. Disturbance data was used to review Jones PVT potential vegetation type classifications. For example, an area classified as grass by Jones PVT may have been a forest severely burned or clearcut prior to classification. The grass in this example would be reclassified to a forested habitat type based on disturbance data, or ground-based knowledge of the site. Examples of human and natural disturbance considered include timber harvest, wildfire, and insect mortality. The data sources described below were used to review and correct potential vegetation type misclassifications. Human and natural disturbance data were used in Alternative 2 process only.

Vegetation Management Disturbance

Forest Activity Tracking System (FACTS) database is a tabular and spatial record of past vegetation management activities on National Forest System land. Information is entered into the database annually by local Forest Service staff and requires the inclusion of polygons representing where vegetation was manipulated by year. Vegetation management actions that removed 50 percent canopy or more were considered when reviewing potentially misclassified vegetation data.

FACTS activity codes queried to indicate vegetation management actions that remove equal to or more than 50 percent canopy cover include activities like a patch clearcut or a stand clearcut with leave tress, for example (see Table A5 for a complete list). This disturbance data was used to validate Jones PVT as described above.

Fire Severity

Burned Area Reflectance Classification (BARC) and Monitoring Trends in Burn Severity (MTBS) were used as sources of disturbance data. Both fire severity data sources compare pre-fire conditions to post-fire conditions captured by satellite imagery. The BARC geospatial data is classified as unburned, very low, low, moderate, and high severity to support immediate post-fire assessment of individual fires. These classifications are verified through ground and aerial surveys immediately after the fire to improve data accuracy for fires 500 acres or greater. MTBS

geospatial data is used for a variety of monitoring, policy, and research purposes and includes fires greater than 1,000 acres since 1984 for the western United States. When fire severity data was lacking, external fire perimeters were used to indicate disturbance. Because the BARC data is field validated, this was used as the primary source of burn severity data. Mapped fire events that removed 50 percent or greater canopy cover were considered when reviewing potentially misclassified vegetation data. Fire severity in high, moderate, and unknown categories was used to indicate occurrences where 50 percent or greater canopy cover was removed. This disturbance data was used to validate Jones PVT as described above.

Other Disturbances

Alternative 2 also considered other regeneration disturbances that were mapped or otherwise identified. These include timber harvest on non-Forest Service owned lands, insect-caused mortality at severities sufficient to reset stands to regeneration (primarily mountain pine bark beetle and Douglas-fir bark beetle), and other identified sources, such as damage caused by wind, flood, or other disturbances.

Snow Data

Klein-Baer et al. (2019) modeled snow density and snow depth for the Forest using the National Weather Service's National Operational Hydrologic Remote Sensing Center Snow Data Assimilation System (SNODAS), which includes snowpack properties, such as depth and snow water equivalent. This data is at a 1-kilometer spatial resolution and 24-hour temporal resolution and available online. Sources used to develop the SNODAS model include satellite and aerial platforms as well as ground stations. Additional model inputs included climate data, topographic and spectral derivatives. Natural Resources Conservation Service (NRCS) Snow Telemetry (SNOTEL) stations were used as training data to inform the model.

Satellite pictures from SNODAS establish that on the Forest, the period of reliable and persistent snow on the ground, conditions that support lynx occupancy (FWS 2023), is from December through May (20190925 KleinBaerEmailArcherSnowModel Personal communication, 2019). This was corroborated with actual measurements from the NRCS SNOTEL sites. Ten years of SNODAS (2009-2019) data together with SNOTEL data was used to determine both the timeframe and measures of snow depth, snow water equivalent (SWE) and thus density (SWE/depth). Low density snow, i.e., "light fluffy" snow, characterizes snow conditions in lynx habitats (FWS 2017).

A lower elevation threshold for minimum snow depth of 50 centimeters for each Forest landscape was established; snow depth is based on Squires et al. (2010). Forest landscapes are identified in the 2009 Forest Plan. These thresholds were then reviewed by Forest personnel with site-specific knowledge of winter conditions on these landscapes for each (HUC10) watershed. In watersheds where the modeled threshold elevation was not consistent with local observation of snow depth (USFS 2021) (Table A4), site visits determined the corrected threshold elevation value.

Table A4The Low Density Snow Index together with a snow depth lower threshold of 50 centimeters were used to determine favorable snow conditions for lynx on the Forest (USFS 2019) and was an input to the lynx habitat model.

Alternative 1

Canada Lynx Habitat, Alternative 1

Lynx habitat was modeled for Alternative 1 using specified combinations of SILC existing vegetation and aspect derived from DEMs. These combinations were used in lieu of potential vegetation type because habitat types were not available for the entire Forest in 2000 and forest wide modeled potential vegetation did not exist when the initial habitat map was created. Forest biologists and silviculturists determined existing vegetation cover type and aspect combinations that represented potentially suitable habitat for Canada lynx. Vegetation cover type and aspect combinations used to model potential lynx habitat are summarized in Table A3 below.

Cover types typically occurring as dense, continuous canopy were identified as lynx habitat for all aspects, while cover types that vary in density as temperature and moisture regimes vary were identified as lynx habitat in northern aspects only. North facing slopes retain more moisture during the growing season and potentially could support denser vegetation with high cover and therefore potentially could provide habitat for snowshoe hare. Drier sites tend to support vegetation that is more sparse and less desirable to snowshoe hare.

Table A3. Existing vegetation cover type and aspect combinations used to model lynx habitat in Alternative 1.

SILC Cover Type	Aspect
4101 aspen	all
4102 broadleaf forest	all
4201 Engelmann spruce	all
4203 lodgepole pine	all
4208 subalpine fir	all
4212 Douglas-fir	northeast, north, northwest, flat
4219 alpine forest	all
4220 mixed subalpine forest	all
4221 mixed mesic forest	all
4223 Douglas-fir/lodgepole pine	northeast, north, northwest, flat
4224 burned timber stands	all
4225 Douglas-fir/grand fir	all
4229 western larch/Douglas-fir	northeast, north, northwest, flat
4301 mixed forest	all
6101 needleleaf-dominated riparian	all
6102 broadleaf-dominated riparian	all
6103 needleleaf/broadleaf riparian	all
6104 mixed riparian	all
6202 shrub riparian	all
6203 mixed non-forest riparian	all

Existing vegetation plus aspect is a poor substitute for potential vegetation type because only the current on-the-ground conditions are described at the time of classification and not the capability to support particular plant associations. The Forest did not have potential vegetation type

information available when it created the 2000 habitat map. The Alternative 1 lynx mapping effort did not differentiate between primary and secondary habitats (Claar et al. 2004).

Lynx Analysis Units, Alternative 1

The Forest developed a four-step process to identify LAUs in 2000 but only completed step one, which selected all subwatersheds that intersect the Forest boundary. Alternative 1 used the most current geospatial subwatershed for the Forest available at that time. These were sourced from the Interior Columbia Basin Ecosystem Management Project subbasins geographic information system published in 1998. The other steps would have included: 2) removing subwatersheds that did not contain lynx habitat; 3) trimming portions that do not contain or are not adjacent to lynx habitat; and 4) combining or modifying boundaries to meet LCAS criteria for LAU size and minimum amounts of primary vegetation lynx habitat within each. The Alternative 1 process resulted in 353 LAUs, with 2,415,312 acres of lynx habitat identified on all ownerships.

Alternative 2

Canada Lynx Habitat, Alternative 2

This section provides a description of the data and geoprocessing steps used to model lynx habitat in Alternative 2.

1. VMap (version 18) polygon boundaries were used as the base mapping units to assign attributes to. The complete attribute table of the original VMap dataset was retained and added to or edited throughout the lynx habitat mapping process steps. When additional attributes from potential vegetation type and disturbance data are added to VMap, a zonal majority spatial update assigned attributes to VMap polygons maintaining them as the base mapping unit. This means attributes of input polygons, such as potential vegetation type, that overlapped the majority of a given VMap polygon were accepted as the input value for that VMap polygon and input polygons overlapping the minority of a VMap polygon were not included in the habitat model. VMap data that identified a polygon as “urban” or “water” was classified as non-habitat and removed from further analysis.
2. Where FSveg habitat type information exists, potential vegetation type (PVT) was assigned to VMap polygons using the crosswalk from habitat type to PVT in Milburn et al. (2015). Where FSveg data was not available, PVT was assigned from Jones PVT (2004).
3. Polygons classified as subalpine fir and Engelmann spruce potential vegetation types (abla1, abla2, abla3, abla4, abla5, and picea) were preliminarily identified as primary vegetation habitat.
4. Polygons classified as moist Douglas-fir and grand fir potential vegetation types (psme2, abgr2, abgr3) were preliminarily identified as secondary vegetation habitat.
5. Remaining polygons not identified as either preliminary primary or secondary habitat were assigned to a non-habitat classification and removed from further analysis.
6. Preliminary primary and preliminary secondary vegetation habitat polygons were reviewed for Jones PVT classification errors using disturbance data (timber harvest, wildfire and other disturbances discussed above). In cases where a disturbance reset the cover type to a regeneration phase and was incorrectly classified as non-forest by Jones PVT, we reclassified these polygons and retained them as preliminary habitat. Erroneously assigned forested PVT

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

assignments of polygons that were in fact non-forest were also corrected, classified as non-habitat and removed from further analysis. Finally, some corrections to PVT were made based on field knowledge of conditions, but this was rare.

7. A snow depth elevation-low snow density index filter (USFS 2019) was used to refine the preliminary habitat identified in previous steps. For each 5th code watershed (HUC10) on the BDNF, average snow depths from SNOWDAS data greater than 50 centimeters from December to May 2009-2019 were used to determine the lower threshold elevation for habitat. BDNF personnel with site-specific knowledge of winter conditions on the landscape reviewed the modeled threshold elevations for each HUC 10 watershed. In watersheds where the modeled threshold elevation was not consistent with local observation of snow depth (Table A4), site visits determined the corrected threshold elevation value. Preliminary habitat polygons falling below the validated 50 centimeter snow depth threshold elevation within each HUC10 watershed were reclassified as non-habitat and removed from further analysis. Due to the diverse landscape on the BDNF, the elevation where snow depth met the minimum requirement varied by location. All remaining preliminary primary habitat was classified as primary habitat.

Table A4. Watersheds where habitat polygons were changed to reflect ground-verified snow elevations.

Landscape	Area Description	Watershed Name	Watershed HUC
Big Hole	Fishtrap/La Marche/Seymour	North Fork Big Hole River	1002000405
		Christiansen Creek–Big Hole River	1002000406
		Deep Creek	1002000407
		Fishtrap Creek-Big Hole River	1002000408
Jefferson River	Highlands	Big Pipestone Creek	1002000502
		Middle Jefferson River	1002000505
		Upper Jefferson River	1002000501
Gravelly	West Fork Madison	Lake Creek	1002000705
		West Fork Madison	1002000706

8. A 300-meter proximity filter was applied to refine preliminary secondary vegetation. If any part of a preliminary secondary vegetation polygon was within 300 meters of a primary vegetation polygon, the entire secondary vegetation polygon was retained as secondary vegetation that contributes to lynx habitat. Retaining the entire polygon where any portion was within 300 meters of primary vegetation resulted in retaining secondary vegetation polygons, extending from 0 to approximately 600 meters away from primary vegetation polygons (Figure A1). 600 meters is consistent with research for snowshoe hares using secondary vegetation proximal to primary vegetation habitat (Lewis et al. 2011). Secondary vegetation polygons located (in their entirety) more than 300 meters from primary vegetation polygons were reclassified as non-habitat and removed from further analysis.
9. Primary vegetation habitat identified in step 7 and secondary vegetation habitat identified in step 8 were dissolved into one geospatial layer and classified as lynx habitat.

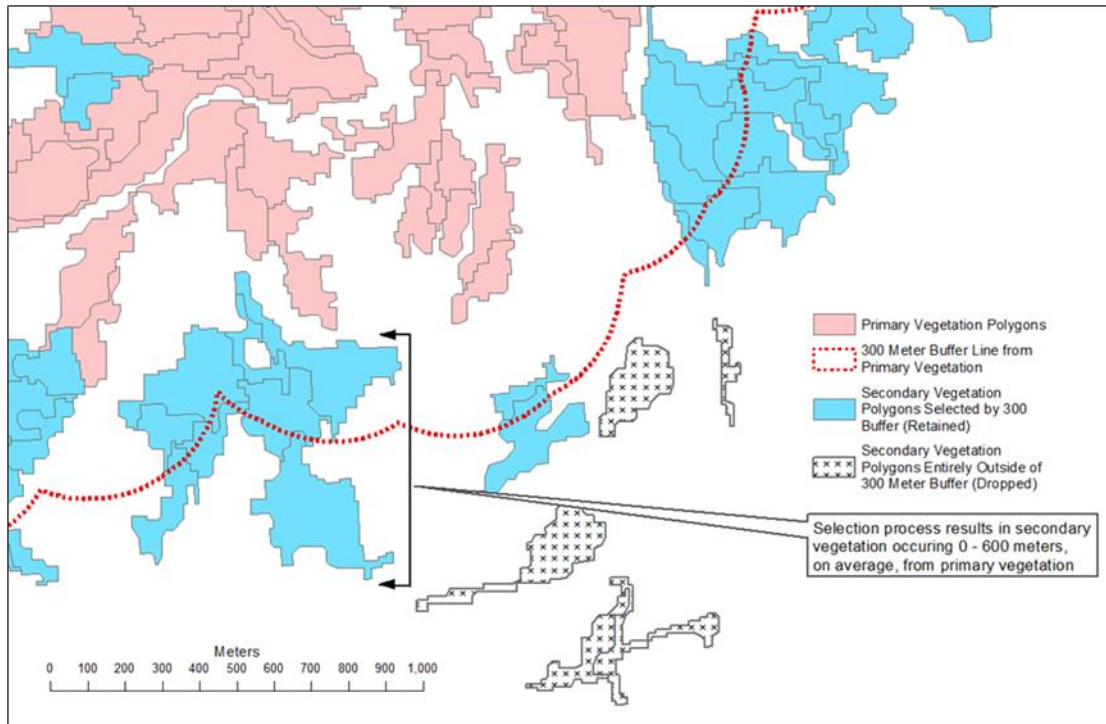


Figure A1. Example of refining secondary vegetation polygons within a 300 meter buffer from primary vegetation polygons.

Lynx Analysis Units, Alternative 2

The following method was used to delineate LAUs in Alternative 2 using the lynx habitat identified in the Alternative 2 lynx habitat process described above.

1. Initial landscape perimeter boundaries to divide into LAUs were created by buffering lynx habitat by 0.25 mile. This distance was used to optimize boundary smoothing while minimizing the inclusion of non-habitat areas.
2. Initial LAU perimeter boundaries were modified to remove overlap with LAUs of adjacent national forests. This resulted in a coincident boundary between the Beaverhead-Deerlodge National Forest and LAUs of adjacent Bitterroot, Caribou-Targhee, Helena-Lewis and Clark, Lolo, and Custer-Gallatin national forest management units.
3. The resulting polygons were divided into LAUs using subwatershed boundaries to approximate the optimum range of 16,000 to 32,000 habitat acres as described in the LCAS (Ruediger et al. 2000). Watershed boundary data maintained by the U.S. Geologic Survey was used as a starting point. This dataset is continually updated based on topographic, hydrologic, and other relevant landscape characteristics. Although subwatershed data may change, LAU boundaries once established, would not. Some LAUs were larger than 32,000 acres due to natural barriers, isolation, or other reasons; however, these LAUs were retained if minimum standards for lynx life history needs and spatial arrangement criteria were met. Preliminary LAUs that incorporated at least 6,400 acres of primary habitat were retained and those containing less than 6,400 acres primary habitat (from Step 7, in the lynx habitat mapping process) and those containing small patches of isolated habitat further than 6 miles from other habitat patches were not retained as LAUs.

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

4. Polygons that did not meet minimum life history lynx standards or spatial arrangement criteria as outlined by the LCAS were re-classified as non-habitat and removed from further analysis. This included fragmented habitat consisting of areas further than 6 miles from other habitat and less than 6,400 acres of primary vegetation. Areas where habitat polygons did not meet delineation definitions (as described above) included: Bull Mountains (on-forest), southern Lima Tendoys (on-forest), Ruby Mountains (off-forest), and Rock Creek valley bottom (off-forest).

This resulted in 77 LAUs that encompass 1,599,268 acres lynx habitat on all ownerships.

FACTS Activity Codes Descriptions

Table A5: FACTS activity codes and descriptions of activities that remove 50 percent or greater canopy cover.

FACTS Activity Code	Activity	Description, if available in FACTS user guide
2400	Tree Encroachment Control	Not available
3350	Vista clearing	Not available
4101	Coppice Cut (EA/RH/FH)	A regeneration method in which all trees in the previous stand are cut and the majority of the regeneration is from sprouts or root suckers.
4102	Coppice Cut (w/leave trees) (EA/RH/FH)	A regeneration method in which most trees in the previous stand are cut and the majority of the regeneration is from sprouts or root suckers. A minor (less than approximately 10% of full stocking) live component is retained for reasons other than regeneration.
4110	Inactive code	Not applicable
4111	Patch Clearcut (EA/RH/FH)	A type of stand clearcutting where patches (or strips) are clearcut within an individual stand boundary in two or more entries to produce an even-aged stand. As even-aged, the range of tree ages is usually less than 20 percent of the rotation after harvest of all patches.
4113	Stand Clearcut (EA/RH/FH)	An even-aged regeneration or harvest method that removes all trees in the stand producing a fully exposed microclimate for the development of a new age class in one entry.
4115	Patch Clearcut (w/ leave trees) (EA/RH/FH)	A type of stand clearcutting where patches (or strips) are clearcut within an individual stand boundary in two or more entries to produce an even-aged stand. As even-aged, the range of tree ages is usually less than 20 percent of the rotation after harvest of all patches. A minor (less than approximately 10% of full stocking) live component may be retained for reasons other than regeneration.
4116	Inactive code	Not applicable
4117	Stand Clearcut (w/ leave trees) (EA/RH/FH)	An even-aged regeneration or harvest method that removes most trees in the stand producing an exposed microclimate for the development of a new age class in one entry. A minor (less than approximately 10% of full stocking) live component is retained for reasons other than regeneration.
4121	Shelterwood Preparatory Cut (EA/NRH/NFH)	An optional cut to enhance conditions for seed production and/or develop windfirmness for a future shelterwood establishment cut.
4122	Seed-tree Preparatory Cut (EA/NRH/NFH)	An optional cut to enhance conditions for seed production and/or develop windfirmness for a future seed-tree seed cut.
4123	Inactive code	Not applicable

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

FACTS Activity Code	Activity	Description, if available in FACTS user guide
4131	Shelterwood Establishment Cut (with or without leave trees) (EA/RH/NFH)	A type of cut that removes trees except those needed for the purposes of shelter and or seed production. Prepares the seed bed and creates a new age class in a moderated microenvironment. Additional trees may be retained to provide a minor (less than approximately 10% of full stocking) live component after the removal cut for reasons other than regeneration.
4132	Seed-tree Seed Cut (with and without leave trees) (EA/RH/NFH)	A type of cut that removes trees except those needed for the purposes of seed production. Prepares the seed bed and creates a new age class in an exposed microenvironment. Additional trees may be retained to provide a minor (less than approximately 10% of full stocking) live component after the removal cut, for reasons other than regeneration
4133	Inactive code	Not applicable
4134	Inactive code	Not applicable
4141	Shelterwood Removal Cut (EA/NRH/FH)	A final removal cut that releases established regeneration from competition with the overwood after it is no longer needed for shelter under the shelterwood regeneration method
4142	Seed-tree Final Cut (EA/NRH/FH)	A final removal cut that releases established regeneration from competition with seed-trees after they are no longer needed for seed under the seed-tree regeneration method
4143	Overstory Removal Cut (from advanced regeneration) (EA/RH/FH)	The cutting of trees constituting an upper canopy layer to release understory trees. The primary source of regeneration is advance reproduction. A minor (less than approximately 10% of full stocking), live component of the upper canopy may be retained for reasons other than regeneration.
4145	Shelterwood Removal Cut (w/ leave trees) (EA/NRH/FH)	A final removal cut that releases established regeneration from competition with the overwood after it is no longer needed for shelter under the shelterwood regeneration method. A minor (less than approximately 10% of full stocking) live component may be retained for reasons other than regeneration. Historical use: (prior to 2009) 4145 was an "overstory removal cut" not associated with a shelterwood sequence although it was used inconsistently across regions.
4146	Seed-tree Removal Cut (w/ leave trees) (EA/NRH/FH)	A final removal cut that releases established regeneration from competition with seed-trees after they are no longer needed for seed under the seed-tree regeneration method. A minor (less than approximately 10% of full stocking) live component may be retained for reasons other than regeneration.
4147	Inactive code	Not applicable
4148	Shelterwood Staged Removal Cut (EA/NRH/NFH)	A removal cut which partially removes the overwood which is no longer needed to protect and is competing with the establishing regeneration.
4151	Single-tree Selection Cut (UA/RH/FH)	An uneven-aged regeneration method where individual trees of all size classes are removed more or less uniformly throughout the stand creating or maintaining a multiage structure to promote growth of remaining trees and to provide space for regeneration. Multiple entries of this activity ultimately results in an uneven-aged stand of 3 or more age classes.

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

FACTS Activity Code	Activity	Description, if available in FACTS user guide
4152	Group Selection Cut (UA/RH/FH)	An uneven-aged regeneration method in which trees are cut in small groups and new age classes are established. The width of groups is commonly less than approximately twice the height of the mature trees. Individual trees in the matrix may or may not be harvested to provide improved growing conditions for remaining trees. Multiple entries of this activity ultimately results in an uneven-aged stand of 3 or more age classes.
4162	Two-aged Coppice Cut (w/res) (2A/RH/FH)	A two-aged regeneration method in which the majority of the regeneration is from sprouts or root suckers. Sufficient residual trees, representing at least approximately 10% of full stocking, are retained to attain goals other than regeneration and create a two-aged stand.
4175	Two-aged Patch Clearcut (w/res) (2A/RH/FH)	A type of stand clearcutting where patches, strips or groups are clearcut within an individual stand boundary in two or more entries to produce a two-aged stand. Sufficient residual trees, representing at least approximately 10% of full stocking, are retained to attain goals other than regeneration and create a two-aged stand.
4176	Two-aged Stand Clearcut (w/res) (2A/RH/FH)	Not available
4177	Two-aged Seed-tree Seed and Removal Cut (w/res) (2A/RH/FH)	A two-aged regeneration or harvest method that removes sufficient trees to produce an exposed microclimate for the development of a new age class. Sufficient residual trees, representing at least approximately 10% of full stocking, are retained to attain goals other than regeneration and create a two-aged stand.
4183	Two-aged Seed-tree Seed and Removal Cut (w/res) (2A/RH/FH)	A final removal cut that removes trees except those needed for regeneration and sufficient reserve trees, representing at least approximately 10% of full stocking, to attain goals other than regeneration and create a two-aged stand. It also produces an exposed microclimate for the development of a new age class. This is both the seed cut and the final harvest since the seed-trees and the reserves will be retained to create a two-aged stand.
4192	Two-aged Preparatory Cut (w/res) (2A/NRH/NFH)	An optional cut to enhance conditions for seed production and/or develop windfirmness. Sufficient residual trees, representing at least approximately 10% of full stocking, are retained to attain goals other than regeneration and eventually create a two-aged stand.
4193	Two-aged Shelterwood Establishment and Removal Cut (w/ res) (2A/RH/FH)	A type of cut that removes trees except those needed for regeneration and sufficient residual trees representing at least approximately 10% of full stocking. Prepares the seed bed and creates a new age class in a moderated microenvironment. This is both the establishment and the final removal harvest since the overwood trees and the reserves will be retained to create a two- aged stand.
4194	Two-aged Shelterwood Establishment Cut (w/res) (2A/RH/NFH)	A type of establishment cut that removes trees except those needed for regeneration and sufficient residual trees representing at least approximately 10% of full stocking. Prepares the seed bed and creates a new age class in a moderated microenvironment. This establishment cut will be followed by the final harvest which will leave at least approximately 10% full stocking to create a two-aged stand.

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

FACTS Activity Code	Activity	Description, if available in FACTS user guide
4196	Shelterwood Final Removal Cut (w/res) (2A/NRH/FH)	A final removal cut that releases established regeneration from competition with overwood after it is no longer needed for shelter under the shelterwood regeneration method. At least approximately 10% of full stocking is retained to attain goals other than regeneration and create a two-aged stand.
4231	Salvage Cut (intermediate treatment, not regeneration)	An intermediate harvest removing trees which are dead or dying because of injurious agents other than competition, to recover economic value that would otherwise be lost.
4240	Inactive code	Not applicable
4242	Harvest Without Restocking	The harvesting of trees from lands where the restocking of trees is not desired to meet desired vegetative conditions (reference FSH 1909.12, 64.2.).
4270	Permanent Land Clearing	A permanent change in site conditions that would prevent continued site occupancy of forest vegetation.
6104	Wildlife Habitat Regeneration cut	Not defined, see regeneration cut description elsewhere
6130	Wildlife Habitat Create openings	Not specifically defined
6132	Wildlife Habitat Create corridors	Not specifically defined

Abbreviations: 2A=2 ages, EA=even age, FH=final harvest, NFH=not final harvest, NRH=not regeneration harvest, RH=regeneration harvest, UA=uneven aged

References

- Ahl, R., Gregory, J., Brown, S., David, K., Kaiden, J., and Kellner, F. 2018. The Beaverhead-Deerlodge National Forest Region 1 existing vegetation database (VMap) revision of 2018. Missoula, MT: USDA Forest Service, Northern Region (R1), Geospatial Group. 45 p.
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd707216.pdf
- Anderson, A.K., Waller, J.S., and Thornton, D.H. 2023. Canada lynx occupancy and density in Glacier National Park. *The Journal of Wildlife Management* 87(4): 24 (e22383).
<https://doi.org/10.1002/jwmg.22383>
- Apps, C.D. 2000. Space-use, diet, demographics, and topographic associations of lynx in the southern Canadian Rocky Mountains: A study. Chapter 12. *In* Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Lyon, L.J. and Zielinski, W.J., eds., *Ecology and conservation of lynx in the United States*. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. 351-371 pp. <https://doi.org/10.2737/RMRS-GTR-30>
- Apps, C.D., Dibb, A., and Fontana, A.J. 1999. Lynx Ecology in the Southern Canadian Rocky Mountains: Preliminary Results and Conservation Implications: Biology and Management of Species and Habitats at Risk. February 15-19, 1999; Kamloops, B.C. Kamloops, B.C. 8 p.
- Aubry, K.B., Koehler, G.M., and Squires, J.R. 1999. Ecology of Canada lynx in southern boreal forests. Chapter 13. *In* Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S. and Squires, J.R., eds., *Ecology and conservation of lynx in the United States*. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 373-396 pp. <https://www.treearch.fs.fed.us/pubs/4546>
- Bailey, T.N., Bangs, E.E., Portner, M.F., Malloy, J.C., and McAvinchey, R.J. 1986. An apparent overexploited lynx population on the Kenai Peninsula, Alaska. *The Journal of Wildlife Management* 50(2): 279-290. <https://doi.org/10.2307/3801914>
- Barber, J., Bush, R., and Berglund, D. 2011. The Region 1 existing vegetation classification system and its relationship to Region 1 inventory data and map products. In *Region One Vegetation Classification, Mapping, Inventory and Analysis Report*. Report Number. Missoula, MT. USDA Forest Service, Northern Region (R1). 39 p.
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5332073.pdf
- Brainerd, S. 1985. Reproductive ecology of bobcats and lynx in western Montana. M.S. Thesis, University of Montana, Missoula, MT. 85 p.
- Brand, C.J., Keith, L.B., and Fischer, C.A. 1976. Lynx responses to changing snowshoe hare densities in central Alberta. *The Journal of Wildlife Management* 40(3): 416-428.
<https://doi.org/10.2307/3808267>
- Burdett, C.L., Moen, R.A., Niemi, G.J., and Mech, L.D. 2007. Defining space use and movements of Canada lynx with global positioning system telemetry. *Journal of Mammalogy* 88(2): 457-467.
<https://doi.org/10.1644/06-MAMM-A-181R.1>
- Buskirk, S.W., Ruggiero, L.F., Aubry, K.B., Pearson, D.E., Squires, J.R., and McKelvey, K.S. 1999. Comparative ecology of lynx in North America. Chapter 14. *In* Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., S., M.K. and Squires, J.R., eds., *Ecology and conservation of lynx in the United States*. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 397-418 pp.
https://www.fs.fed.us/rm/pubs/rmrs_gtr030.pdf
- Carbyn, L.N. and Patriquin, D. 1983. Observation on home range sizes, movements and social organizations of lynx, *Lynx canadensis*, in Riding Mountain National Park, Manitoba. *The Canadian Field-Naturalist* 97(3): 262-267. <https://doi.org/10.5962/p.355004>
- Carroll, C. 2007. Interacting effects of climate change, landscape conversion, and harvest on carnivore populations at the range margin: Marten and lynx in the northern Appalachians. *Conservation Biology* 21(4): 1092-1104.

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

- Claar, J., Naney, B., and Wenger, C.R. 2004. Interagency Lynx Biology Team Review: Habitat mapping review for Canada lynx on the Beaverhead-Deerlodge National Forest, 2004. Series Editor: Service, U.S.F., ed. Dated: Jun 2, 2004. Missoula, MT. 1-3 pp.
- Crawford, B.A., Maerz, J.C., and Moore, C.T. 2020. Expert-informed habitat suitability analysis for at-risk species assessment and conservation planning. *Journal of Fish and Wildlife Management* 11(1): 130-150. <https://doi.org/10.3996/092019-JFWM-075>
- Di Febbraro, M., Sallustio, L., Vizzarri, M., De Rosa, D., De Lisio, L., Loy, A., Eichelberger, B., and Marchetti, M. 2018. Expert-based and correlative models to map habitat quality: Which gives better support to conservation planning? *Global Ecology and Conservation* 16: e00513 (13 p.). <https://doi.org/10.1016/j.gecco.2018.e00513>
- FWS, U.S. Fish and Wildlife Service. 2005. Recovery outline: Contiguous United States distinct population segment of Canada lynx. Helena, MT: U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS), Region 6, Montana Field Office. 21 p.
- FWS, U.S. Fish and Wildlife Service. 2007. Biological opinion on the effects of the Northern Rocky Mountains Lynx Amendment on the Distinct Population Segment (DPS) of Canada lynx (lynx) in the contiguous United States. Report Number. Helena, MT. U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS), Ecological Services, Montana Field Office. 1-85 pp.
- FWS, U.S. Fish and Wildlife Service. 2017. Species status assessment for the Canada lynx (*Lynx canadensis*) contiguous United States distinct population segment. Version 1.0. Lakewood, CO: U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS), Regions 1, 3, 5 and 6. 292 p.
- FWS, U.S. Fish and Wildlife Service. 2023. Species status assessment addendum for the Canada lynx (*Lynx canadensis*) contiguous United States distinct population segment. Report Number. Denver, CO. U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS), Regions 1, 2, 3, 5 and 6. 122 p.
- FWS, U.S. Fish and Wildlife Service Mountain-Prairie Region. 2024. Recovery Plan for the Contiguous United States Distinct Population Segment of Canada Lynx (*Lynx canadensis*). Report Number. Denver, CO. 51 p.
- Gonzalez, P., Neilson, R.P., McKelvey, K.S., Lenihan, J.M., and Drapek, R.J. 2007. Potential impacts of climate change on habitat and conservation priority areas for *Lynx canadensis* (Canada lynx). Washington, DC: USDA Forest Service, National Forest System, Watershed, Fish, Wildlife, Air, and Rare Plants, and NatureServe.
- Hodges, K.E. 1999. The ecology of snowshoe hares in northern boreal forests. Chapter 6. *In* Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S. and Squires, J.R., eds., *Ecology and conservation of lynx in the United States*. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 117-162 pp.
- Hodges, K.E., Mills, L.S., and Murphy, K.M. 2009. Distribution and abundance of snowshoe hares in Yellowstone National Park. *Journal of mammalogy* 90(4): 870-878. <https://doi.org/10.1644/08-MAMM-A-303.1>
- Holbrook, J.D., Squires, J.R., Bollenbacher, B., Graham, R., Olson, L.E., Hanvey, G., Jackson, S., Lawrence, R.L., and Savage, S.L. 2019. Management of forests and forest carnivores: Relating landscape mosaics to habitat quality of Canada lynx at their range periphery. *Forest Ecology and Management* 437: 411-425. <https://doi.org/10.1016/j.foreco.2019.01.011>
- Holbrook, J.D., Squires, J.R., Olson, L.E., DeCesare, N.J., and Lawrence, R.L. 2017a. Understanding and predicting habitat for wildlife conservation: the case of Canada lynx at the range periphery. *Ecosphere* 8(9): 1-25.
- Holbrook, J.D., Squires, J.R., Olson, L.E., DeCesare, N.J., and Lawrence, R.L. 2017b. Understanding and predicting habitat for wildlife conservation: the case of Canada lynx at the range periphery. *Ecosphere* 8(9): e01939. <https://doi.org/10.1002/ecs2.1939>

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

- Hornseth, M.L., Walpole, A.A., Walton, L.R., Bowman, J., Ray, J.C., Fortin, M.-J., and Murray, D.L. 2014. Habitat loss, not fragmentation, drives occurrence patterns of Canada Lynx at the southern range periphery. *PLOS ONE* 9(11): 11.
- Hoving, C.L., Harrison, D.J., Krohn, W.B., Joseph, R.A., and O'Brien, M. 2005. Broad-scale predictors of Canada lynx occurrence in eastern North America. *The Journal of Wildlife Management* 69(2): 739-751.
- Hurtado, C., Hemming, V., and Burton, C. 2023. Comparing wildlife habitat suitability models based on expert opinion with camera trap detections. *Conservation Biology* 37(5): e14113 (13 p.).
<https://doi.org/10.1111/cobi.14113>
- Interagency Lynx Biology Team. 2013. Canada lynx conservation assessment and strategy. 3rd ed. Dated: August, 2013. Forest Service Pub. R1-13-19. Missoula, MT: U.S. Department of Agriculture, Forest Service (USDA Forest Service), U.S. Department of Interior, U.S. Fish and Wildlife Service (FWS), U.S. Department of Interior, Bureau of Land Management (BLM), and U.S. Department of Interior, National Park Service (NPS). 128 p.
<https://www.fs.fed.us/biology/resources/pubs/wildlife/index.html>
- Ivan, J.S. and Shenk, T.M. 2016. Winter diet and hunting success of Canada lynx in Colorado. *The Journal of Wildlife Management* 80(6): 1049-1058. <https://doi.org/10.1002/jwmg.21101>
- Johnson, C.G., Jr. and Simon, S.A. 1987. Plant associations of the Wallowa-Snake Province, Wallowa-Whitman National Forest. Dated: June. R6-ECOL-TP-255A-86. Portland, OR: USDA Forest Service, Pacific Northwest Region (R6).
- Jones, J. 2004. US Forest Service--Region One potential vegetation type (PVT) classification of western Montana and northern Idaho. Dated: Oct. 4. Kalispell, MT: USDA Forest Service, Northern Region (R1). 9 p.
- Kesterson, M.B. 1988. Lynx Home Range and Spatial Organization in Relation to Population Density and Prey Abundance. M.S. Thesis, University of Alaska, Fairbanks, AK.
- King, T.W. 2019. Broad-scale influence of abiotic and biotic drivers of carnivore occupancy in Washington state. Washington State University.
- Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. *Canadian Journal of Zoology* 68(5): 845-851. <https://doi.org/10.1139/z90-122>
- Koehler, G.M. and Aubry, K.B. 1994. Lynx. Chapter 4. *In* Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Lyon, L.J. and Zielinski, W.J., eds., *The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx, and Wolverine in the Western United States*. Gen. Tech. Rep. RM-GTR-254. Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. 74-98 pp.
- Koehler, G.M. and Brittell, J.D. 1990. Managing spruce-fir habitats for lynx and snowshoe hares. *Journal of Forestry* 88(10): 10-14.
- Koehler, G.M., Hornocker, M.G., and Hash, H.S. 1979. Lynx movements and habitat in Montana. *The Canadian Field-Naturalist* 93(4): 441-442. <https://doi.org/10.5962/p.347006>
- Koehler, G.M., Maletzke, B.T., von Kienast, J.A., Aubry, K.B., Wielgus, R.B., and Naney, R.H. 2008. Habitat fragmentation and the persistence of lynx populations in Washington state. *The Journal of Wildlife Management* 72(7): 1518-1524. <https://doi.org/10.2193/2007-437>
- Kosterman, M.K., Squires, J.R., Holbrook, J.D., Pletscher, D.H., and Hebblewhite, M. 2018. Forest structure provides the income for reproductive success in a southern population of Canada lynx. *Ecological Applications* 28(4): 1032-1043. <https://doi.org/10.1002/eap.1707>
- Kuchler, A.W. 1964. Potential natural vegetation of the conterminous United States [Special publication issue number 36]. New York, NY: American Geographical Society.
- Kynoch, M.C., Williams, C.T., Breed, G.A., and Kielland, K. 2025. Seasonal changes in the movement rates and activity patterns of Canada lynx. *Canadian Journal of Zoology* 103: 1-14.
<https://doi.org/10.1139/cjz-2023-0194>

Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes

- Lewis, C.W., Hodges, K.E., Koehler, G.M., and Mills, L.S. 2011. Influence of stand and landscape features on snowshoe hare abundance in fragmented forests. *Journal of Mammalogy* 92(3): 561-567. <https://doi.org/10.1644/10-mamm-a-095.1>
- Maletzke, B.T. 2004. Winter habitat selection of lynx (*lynx canadensis*) in northern Washington. M.S. Thesis. Natural Resources Sciences, Washington State University, Pullman, WA.
- Marten, L.M. 2016. Clarification on lynx habitat mapping in R1. Team, R.L. Missoula, MT, September 6.
- McCord, C.M. and Cardoza, J.E. 1982. Bobcat and lynx (*Felis rufus* and *F. lynx*). Chapter 39. In Chapman, J.A. and Feldhamer, G.A., eds., *Wild mammals of North America: Biology, management, economics*. Baltimore, MD: John Hopkins University Press. 728-766 pp.
- McKelvey, K., Aubry, K.B., and Ortega, Y.K. 2000. History and distribution of lynx in the contiguous United States. Chapter 8 in LF Ruggiero, KB Aubry, SW Buskirk, GM Koehler, CJ Krebs, KS McKelvey, and JR Squires, eds. *Ecology and conservation of lynx in the United States*. Report Number. Boulder, CO. University of Colorado Press. 58 p.
- McKelvey, K.S., Aubry, K.B., Agee, J.K., Buskirk, S.W., Ruggiero, L.F., and Koehler, G.M. 1999. Lynx conservation in an ecosystem management context. Chapter 15. In Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S. and Squires, J.R., eds., *Ecology and conservation of lynx in the United States*. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 419-442 pp.
- Milburn, A., Bollenbacher, B., Manning, M., and Bush, R. 2015. Region 1 existing and potential vegetation groupings used for broad-level analysis and monitoring. Report Number. Missoula, MT. USDA Forest Service, Northern Region (R1). 174 p.
http://fsweb.r1.fs.fed.us/forest/inv/r1_tools/R1_allVeg_Groups.pdf
- Mowat, G., Poole, K.G., and O'Donoghue, M. 1999. Ecology of lynx in northern Canada and Alaska. Chapter 9. In Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S. and Squires, J.R., eds., *Ecology and conservation of lynx in the United States*. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 265-306 pp.
- Murray, D.L. and Boutin, S. 1991. The influence of snow on lynx and coyote movements: Does morphology affect behavior? *Oecologia* 88(4): 463-469. <http://www.jstor.org/stable/4219820>
- O'Donoghue, M., Boutin, S., Krebs, C.J., Zuleta, G., Murray, D.L., and Hofer, E.J. 1998. Functional responses of coyotes and lynx to the snowshoe hare cycle. *Ecology* 79(4): 1193-1208. [https://doi.org/10.1890/0012-9658\(1998\)079\[1193:FROCAL\]2.0.CO;2](https://doi.org/10.1890/0012-9658(1998)079[1193:FROCAL]2.0.CO;2)
- Olson, L.E., Bjornlie, N., Hanvey, G., Holbrook, J.D., Ivan, J.S., Jackson, S., Kertson, B., King, T., Lucid, M., Murray, D., Naney, R., Rohrer, J., Scully, A., Thornton, D., Walker, Z., and Squires, J.R. 2021. Improved prediction of Canada lynx distribution through regional model transferability and data efficiency. *Ecology and Evolution* 11(4): 1667-1690.
- Pearman-Gillman, S.B., Katz, J.E., Mickey, R.M., Murdoch, J.D., and Donovan, T.M. 2020. Predicting wildlife distribution patterns in New England USA with expert elicitation techniques. *Global Ecology and Conservation* 21: e00853 (19 p.).
- Peers, M.J.L., Majchrzak, Y.N., Menzies, A.K., Studd, E.K., Bastille-Rousseau, G., Boonstra, R., Humphries, M., Jung, T.S., Kenney, A.J., Krebs, C.J., Murray, D.L., and Boutin, S. 2020. Climate change increases predation risk for a keystone species of the boreal forest. *Nature Climate Change* 10(12): 1149-1153.
- Pfister, R.D., Kovalchik, B.L., Arno, S.F., and Presby, R.C. 1977. Forest habitat types of Montana. Report Number. Ogden, UT. USDA Forest Service, Intermountain Forest and Range Experiment Station. 174 p. https://www.fs.fed.us/rm/pubs_int/int_gtr034.pdf
- Poole, K.G. 1994. Characteristics of an unharvested lynx population during a snowshoe hare decline. *The Journal of Wildlife Management* 58(4): 608-618. <https://doi.org/10.2307/3809673>
- Poole, K.G. 1997. Dispersal patterns of lynx in the northwest territories. *The Journal of Wildlife Management* 61(2): 497-505. <https://doi.org/10.2307/3802607>

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

- Reed, G.C., Litvaitis, J.A., Callahan, C., Carroll, R.P., Litvaitis, M.K., and Broman, D.J.A. 2017. Modeling landscape connectivity for bobcats using expert-opinion and empirically derived models: how well do they work? *Animal Conservation* 20(4): 308-320. <https://doi.org/10.1111/acv.12325>
- Ruediger, B., Claar, J., Gniadek, S., Holt, B., Lewis, L., Mighton, S., Naney, B., Patton, G., Rinaldi, T., Trick, J., Vandehey, A., Wahl, F., Warren, N., Wenger, D., and Williamson, A. 2000. Canada lynx conservation assessment and strategy. Report Number. Missoula, MT. USDA Forest Service and U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS), Bureau of Land Management, and the National Park Service. 118 p.
- Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S., and Squires, J.R. 1999. Ecology and conservation of lynx in the United States. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 474 p. <https://doi.org/10.2737/RMRS-GTR-30>
- Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., McKelvey, K.S., and Squires, J.R. 2000. Ecology and conservation of lynx in the United States. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: University Press and USDA Forest Service, Rocky Mountain Research Station. 474 p. <https://doi.org/10.2737/RMRS-GTR-30>
- Scully, A.E., Fisher, S., Miller, D.A., and Thornton, D.H. 2018. Influence of biotic interactions on the distribution of Canada lynx (*Lynx canadensis*) at the southern edge of their range. *Journal of Mammalogy* 99(4): 760-772.
- Squires, J.R., Decesare, N.J., Kolbe, J.A., and Ruggiero, L.F. 2010. Seasonal resource selection of Canada lynx in managed forests of the northern Rocky Mountains. *The Journal of Wildlife Management* 74(8): 1648-1660. <https://doi.org/10.2193/2009-184>
- Squires, J.R., DeCesare, N.J., Olson, L.E., Kolbe, J.A., Hebblewhite, M., and Parks, S.A. 2013. Combining resource selection and movement behavior to predict corridors for Canada lynx at their southern range periphery. *Biological Conservation* 157: 187-195. <https://doi.org/10.1016/j.biocon.2012.07.018>
- Squires, J.R. and Laurion, T. 1999. Lynx home range and movements in Montana and Wyoming: Preliminary results. Chapter 11. *In* Ruggiero, L.F., Aubry, K.B., Buskirk, S.W., Koehler, G.M., Krebs, C.J., S., M.K. and Squires, J.R., eds., *Ecology and conservation of lynx in the United States*. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 337-350 pp. http://www.fs.fed.us/rm/pubs/rmrs_gtr030.html
- Squires, J.R. and Ruggiero, L.F. 2007. Winter prey selection of Canada lynx in northwestern Montana. *The Journal of Wildlife Management* 71(2): 310-315. <https://doi.org/10.2193/2005-445>
- Steele, R., Pfister, R.D., Ryker, R.A., and Kittams, J.A. 1981. Forest habitat types of central Idaho. Gen. Tech. Rep. INT-GTR-114. Ogden, UT: USDA Forest Service, Intermountain Forest and Range Experiment Station.
- Stenseth, N.C., Shabbar, A., Chan, K.-S., Boutin, S., Rueness, E.K., Ehrich, D., Hurrell, J.W., Linglaerde, O.C., and Jakobsen, K.S. 2004. Snow conditions may create an invisible barrier for lynx. *Proceedings of the National Academy of Sciences USA* 101(29): 10632-10634. <https://doi.org/10.1073/pnas.0308674101>
- USFS, USDA Forest Service. 2007. Northern Rockies lynx management direction: Final environmental impact statement (vols. 1 and 2). Dated: March. Missoula, MT: Northern Region (R1). https://www.fs.usda.gov/wps/portal/fsinternet!/ut/p/c5/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gjAwhwtDDw9_AI8zPwhQoY6IeDdGCqCPOBqwDLG-AAjgb6fh75uan6BdnZaY6OiooA1tkqlQ!!/dl3/d3/L2dJQSEvUUt3QS9ZQnZ3LzZfMjAwMDAwMDBBODBPSEhWTjJNMDAwMDAwMDA!/?navtype=BROWSEBYSUBJECT&cid=stelprdb5160650&navid=1601200000000000&pnavid=1600000000000000&ss=1101&position=Not%20Yet%20Determined.Html&ttype=detail&pname=Region%201-%20Resource%20Management
- USFS, USDA Forest Service. 2019. Snow Density Model for Lynx Habitat Mapping. Dated: October 25, 2019. Salt Lake City, Utah: Geospatial Technology and Applications Center. 9 p.

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix A: Habitat Model and LAU Delineation Processes*

- USFS, USDA Forest Service., 2021. Biological assessment for Canada lynx, effects of the 2009 revised forest plan and the northern Rockies lynx management direction. Series Editor: Gatlin, J., ed. Dillon, MT: Beaverhead-Deerlodge National Forest. 208 p.
- Vanbianchi, C., Gaines, W.L., Murphy, M.A., and Hodges, K.E. 2018. Navigating fragmented landscapes: Canada lynx brave poor quality habitats while traveling. *Ecology and Evolution* 8(22): 11293-11308.
- Vashon, J.H., McLellan, S., Crowley, S., Meehan, A., and Laustsen, K. 2012. Canada lynx assessment. Bangor, ME: Maine Department of Inland Fisheries and Wildlife, Research and Assessment Section.
- Vashon, J.H., Meehan, A., Jakubas, W.J., Organ, J.F., Vashon, A.D., McLaughlin, C.R., Matula, G., Jr., and Crowley, S.M. 2008. Spatial ecology of a Canada lynx population in northern Maine. *The Journal of Wildlife Management* 71(7): 1479-1487. <https://doi.org/10.2193/2007-462>
- Ward, R.M.P. and Krebs, C.J. 1985. Behavioural responses of lynx to declining snowshoe hare abundance. *Canadian Journal of Zoology* 63(12): 2817-2824. <https://doi.org/10.1139/z85-421>
- Williams, C.K., Kelley, B.F., Smith, B.G., and Lillybridge, T.R. 1995. Forested plant associations of the Colville National Forest. Gen. Tech. Rep. PNW-GTR-360. Portland, OR: USDA Forest Service, Pacific Northwest Research Station in cooperation with Colville NF.

Appendix B – Maps

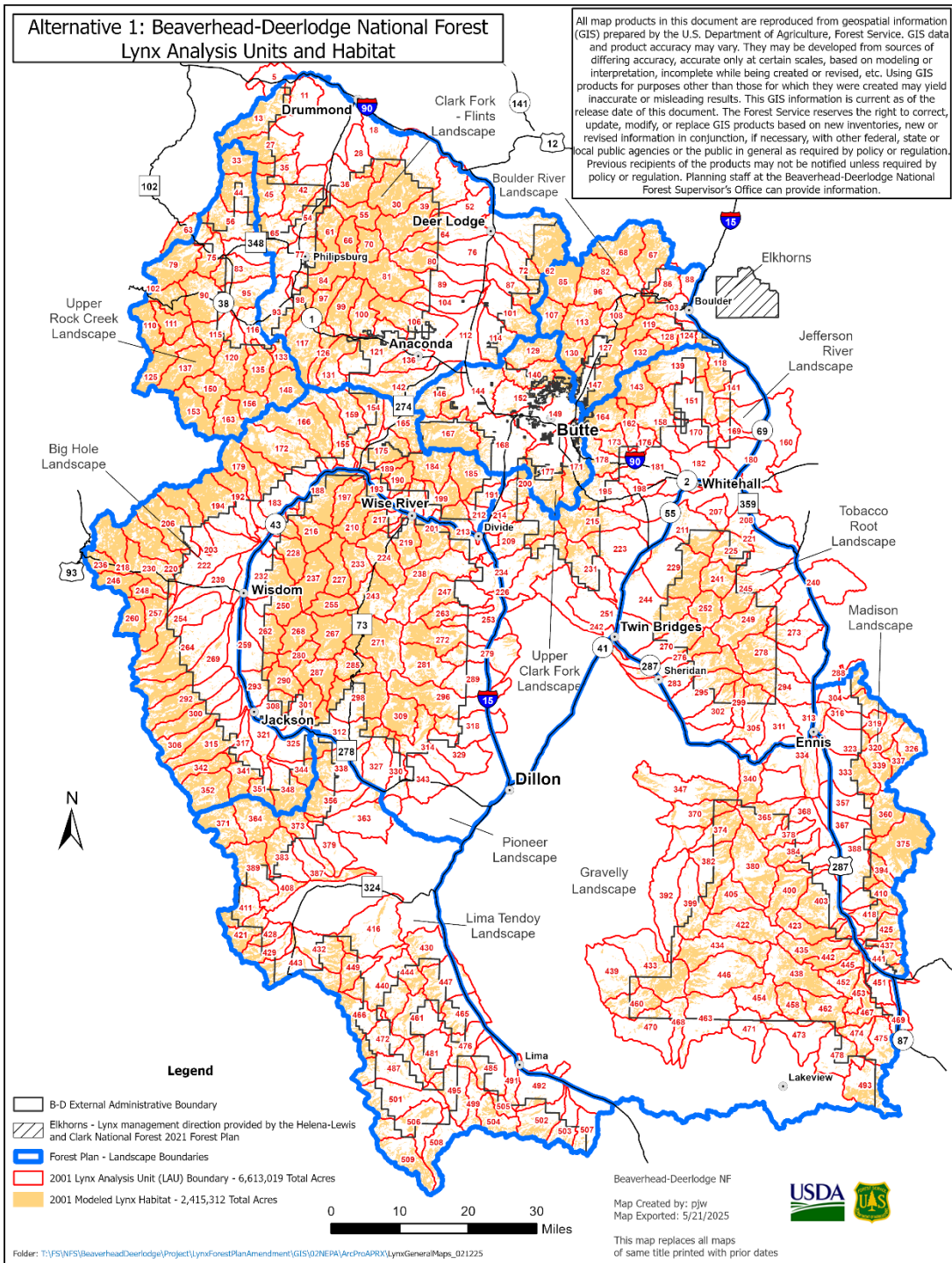


Figure B1. Alternative 1 Canada lynx analysis units (LAUs) and mapped habitat.

**Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix B: Maps**

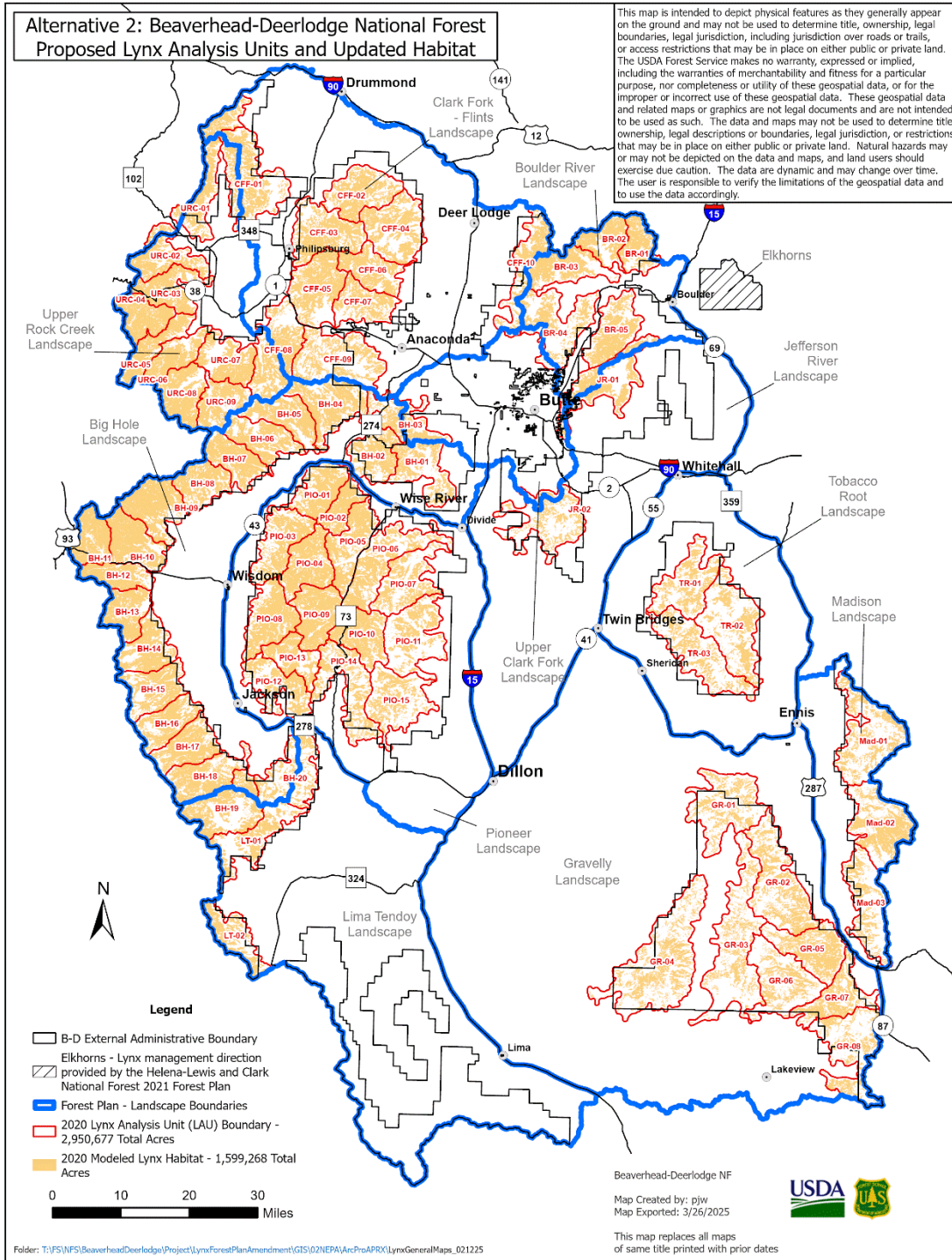


Figure B2. Alternative 2 Canada lynx analysis units (LAUs) and mapped habitat.

**Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix B: Maps**

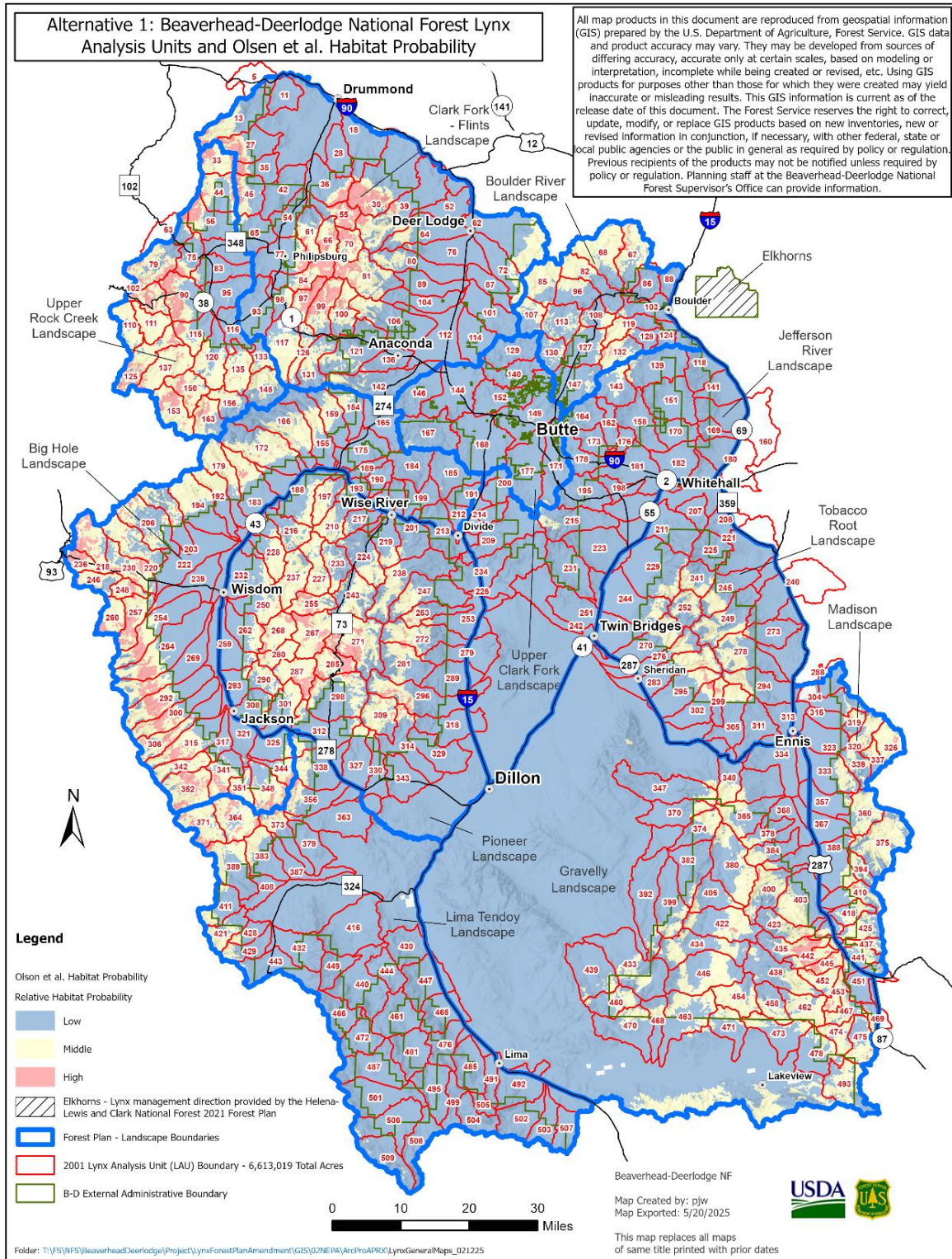


Figure B3. Beaverhead-Deerlodge National Forest Lynx Analysis Units and Olson et al. Habitat Probability for Alternative 1.

**Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix B: Maps**

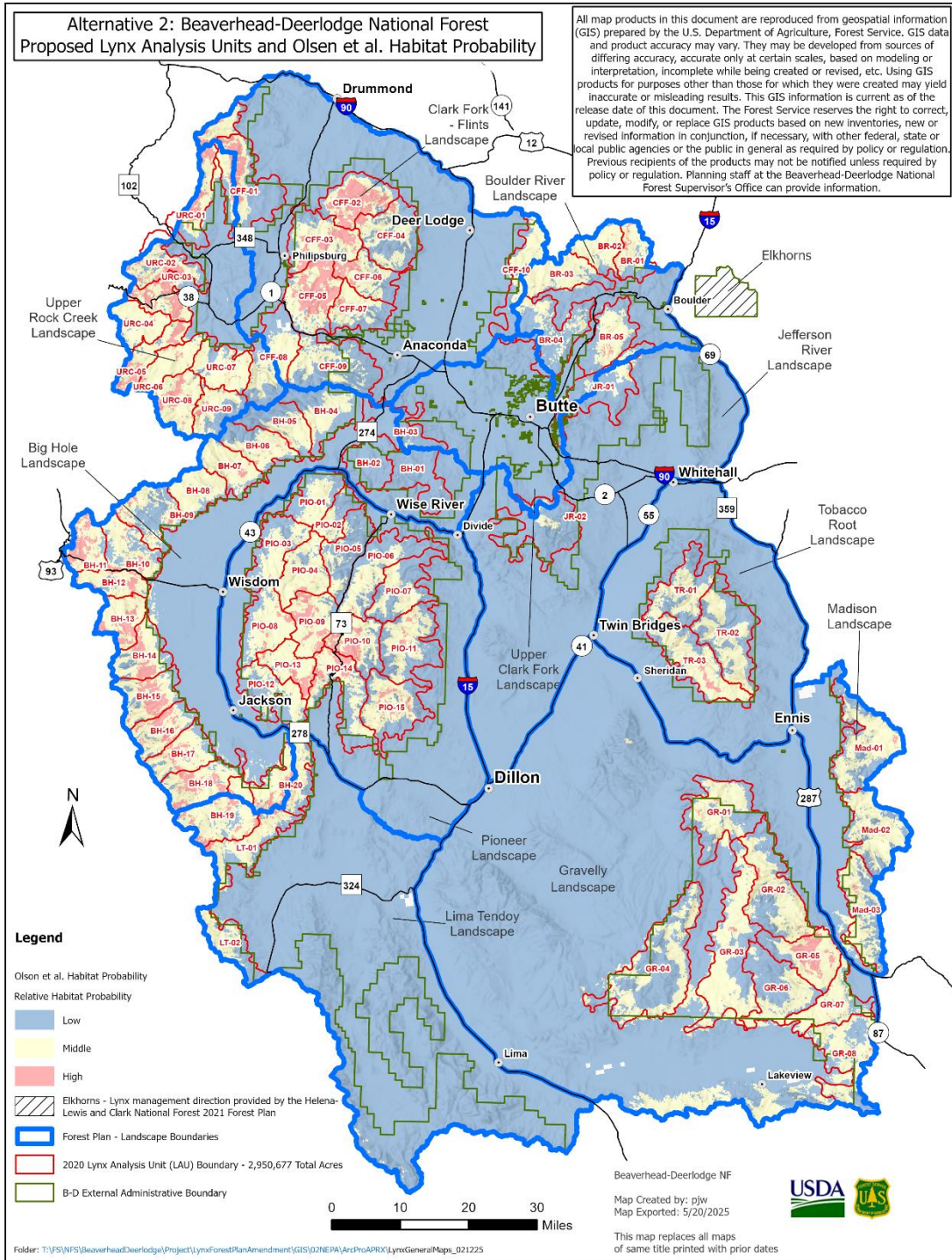


Figure B4. Beaverhead-Deerlodge National Forest Lynx Analysis Units and Olson et al. Habitat Probability for Alternative 2.

**Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix B: Maps**

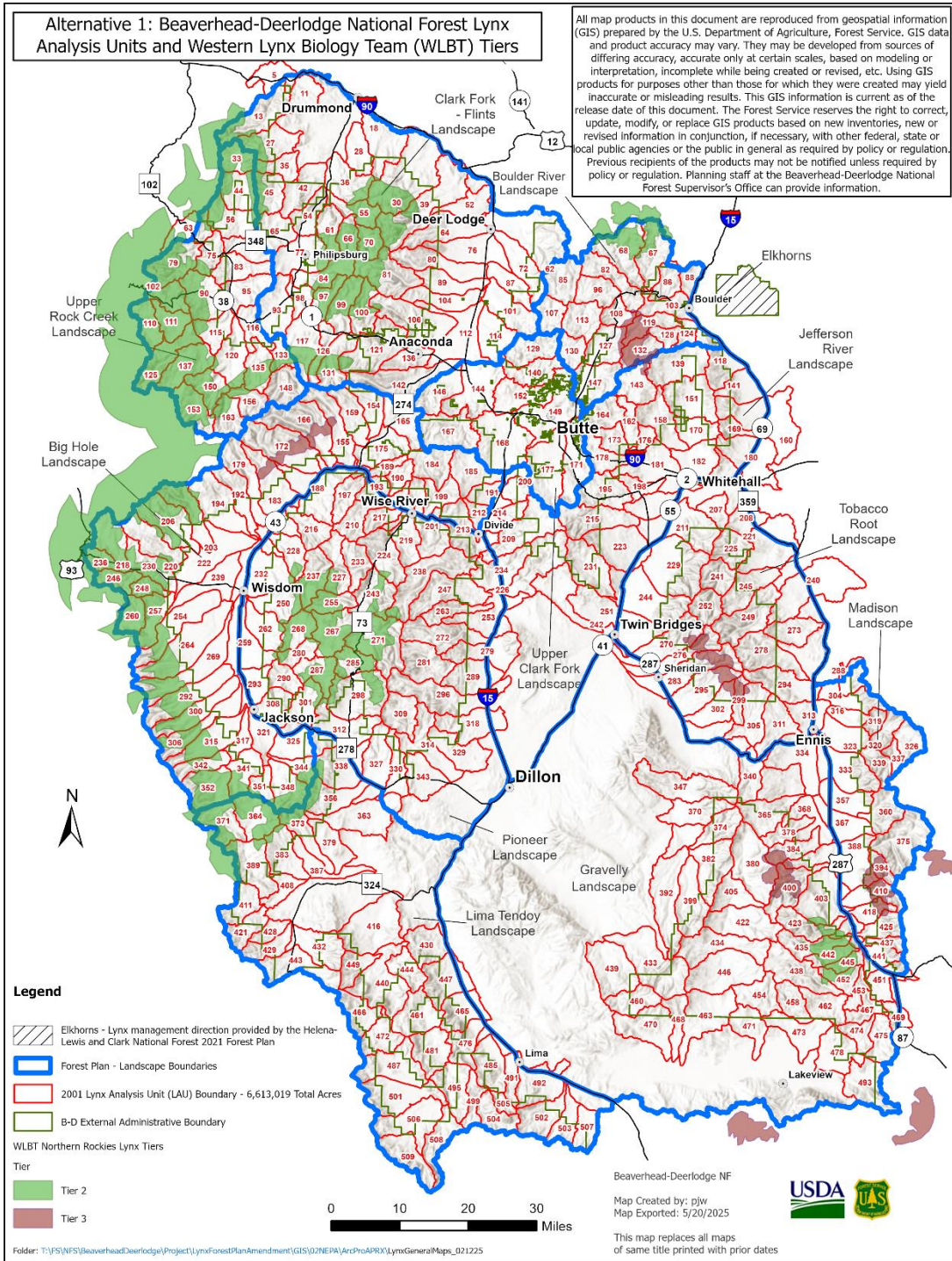


Figure B5. Alternative 1 Beaverhead-Deerlodge National Forest Proposed Lynx Analysis Units and Western Lynx Biology Team Tiers.

**Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix B: Maps**

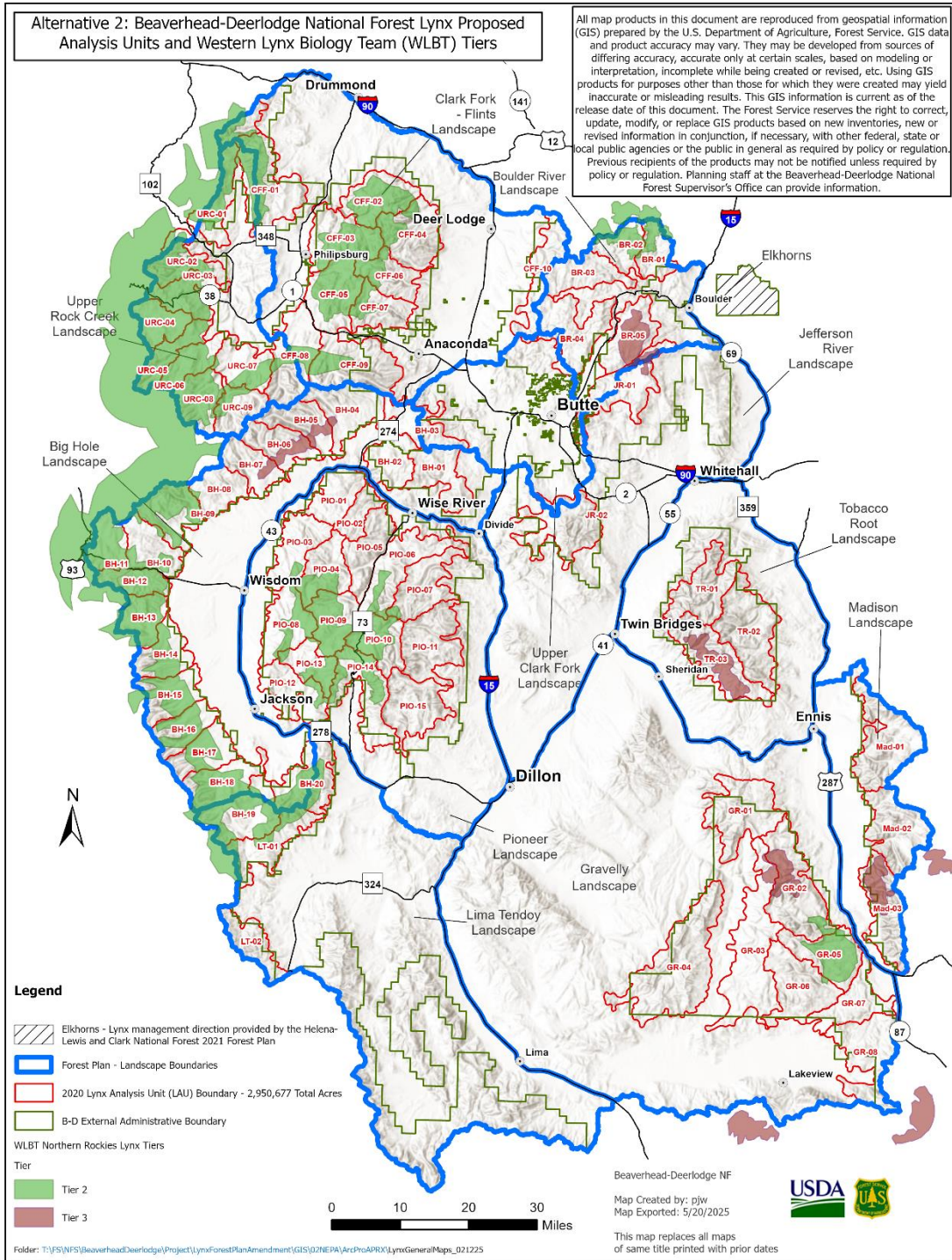


Figure B6. Alternative 2 Beaverhead-Deerlodge National Forest Proposed Lynx Analysis Units and Western Lynx Biology Team Lynx Tiers.

Beaverhead-Deerlodge National Forest
 Canada Lynx Habitat Forest Plan Amendment
 Appendix B: Maps

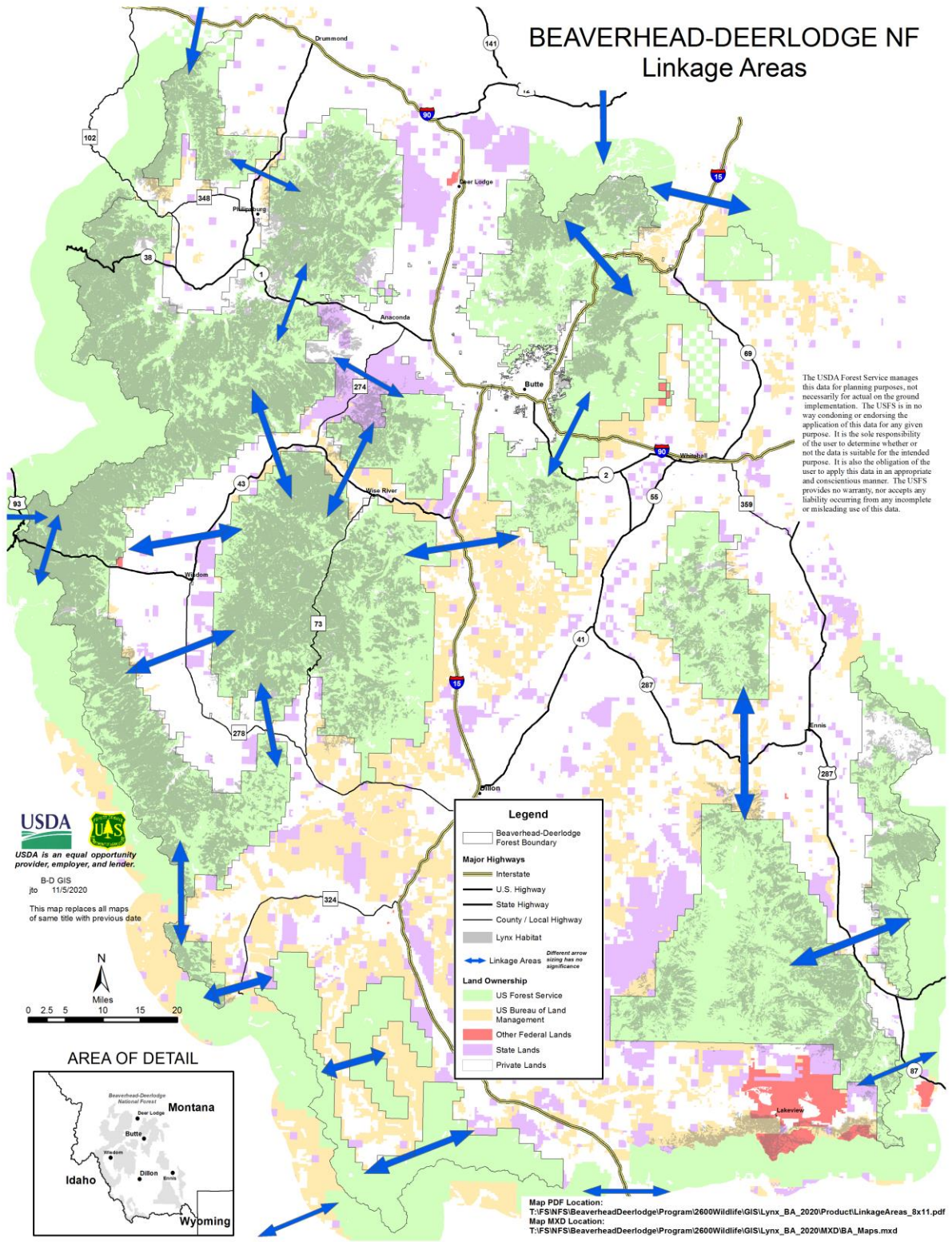


Figure B7. Linkage areas around the Beaverhead-Deerlodge National Forest as identified in the Northern Rockies Lynx Management Direction.

Appendix C – Detailed Lynx Analysis Unit Information

Alternatives 1’s LAUs and ownerships are summarized below in Table C1 and visually displayed in Figure B1 in Appendix B. Alternative 2’s LAUs and ownerships are summarized in Table C2 and displayed in Figure B2.

Table C1. Alternative 1 Lynx Analysis Unit (LAU) identification, total area and mapped lynx habitat area within each LAU by ownership

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
5	All ownerships	13,608	496
5	National Forest	495	359
5	non-Forest Service	13,113	137
11	All ownerships	11,970	783
11	National Forest	2	2
11	non-Forest Service	11,968	780
13	All ownerships	25,557	16,304
13	National Forest	19,523	14,007
13	non-Forest Service	6,034	2,297
18	All ownerships	24,623	4,870
18	National Forest	3,901	2,949
18	non-Forest Service	20,722	1,921
27	All ownerships	19,147	10,286
27	National Forest	9,330	7,694
27	non-Forest Service	9,817	2,592
28	All ownerships	13,971	1,481
28	National Forest	1,014	639
28	non-Forest Service	12,957	842
30	All ownerships	49,509	22,655
30	National Forest	23,705	18,536
30	non-Forest Service	25,803	4,118
33	All ownerships	12,245	10,730
33	National Forest	11,908	10,527
33	non-Forest Service	336	202
35	All ownerships	10,869	4,741
35	National Forest	2,962	2,593
35	non-Forest Service	7,907	2,148
36	All ownerships	20,774	8,357
36	National Forest	8,425	6,746
36	non-Forest Service	12,349	1,611
39	All ownerships	42,468	19,845

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
39	National Forest	23,264	17,205
39	non-Forest Service	19,204	2,641
42	All ownerships	19,290	6,572
42	National Forest	10,562	5,508
42	non-Forest Service	8,728	1,065
44	All ownerships	17,252	10,082
44	National Forest	12,559	9,267
44	non-Forest Service	4,694	815
45	All ownerships	15,159	7,143
45	National Forest	12,750	6,222
45	non-Forest Service	2,409	920
52	All ownerships	14,022	516
52	National Forest	100	89
52	non-Forest Service	13,922	427
54	All ownerships	13,263	5,225
54	National Forest	3,775	1,629
54	non-Forest Service	9,488	3,595
55	All ownerships	12,271	9,551
55	National Forest	10,132	8,303
55	non-Forest Service	2,139	1,248
56	All ownerships	19,265	8,426
56	National Forest	9,934	5,915
56	non-Forest Service	9,331	2,511
61	All ownerships	13,356	10,229
61	National Forest	13,009	10,047
61	non-Forest Service	347	182
62	All ownerships	40,452	18,401
62	National Forest	18,469	14,974
62	non-Forest Service	21,983	3,426
63	All ownerships	14,710	9,035
63	National Forest	1,437	1,196
63	non-Forest Service	13,273	7,838
64	All ownerships	23,347	6,699
64	National Forest	7,296	4,231
64	non-Forest Service	16,051	2,468
65	All ownerships	16,270	4,544
65	National Forest	4,556	1,550
65	non-Forest Service	11,713	2,995
66	All ownerships	9,643	9,146

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
66	National Forest	9,593	9,102
66	non-Forest Service	50	44
67	All ownerships	21,506	12,412
67	National Forest	17,366	10,739
67	non-Forest Service	4,140	1,672
68	All ownerships	26,631	18,522
68	National Forest	24,325	17,648
68	non-Forest Service	2,306	874
70	All ownerships	9,737	8,375
70	National Forest	9,515	8,198
70	non-Forest Service	222	177
72	All ownerships	20,000	6,303
72	National Forest	6,022	4,160
72	non-Forest Service	13,979	2,143
75	All ownerships	11,140	5,455
75	National Forest	6,571	4,185
75	non-Forest Service	4,569	1,270
76	All ownerships	23,917	1,650
76	National Forest	1,304	829
76	non-Forest Service	22,613	821
77	All ownerships	23,181	7,954
77	National Forest	2,252	2,059
77	non-Forest Service	20,929	5,895
79	All ownerships	21,680	16,100
79	National Forest	21,308	15,910
79	non-Forest Service	372	190
80	All ownerships	23,035	6,747
80	National Forest	11,171	6,433
80	non-Forest Service	11,865	314
81	All ownerships	25,743	19,719
81	National Forest	25,095	19,216
81	non-Forest Service	648	503
82	All ownerships	19,339	13,588
82	National Forest	17,514	13,158
82	non-Forest Service	1,825	431
83	All ownerships	16,104	4,658
83	National Forest	3,841	2,182
83	non-Forest Service	12,262	2,476
84	All ownerships	15,615	11,728

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
84	National Forest	9,740	9,293
84	non-Forest Service	5,875	2,435
85	All ownerships	17,790	15,352
85	National Forest	17,389	15,220
85	non-Forest Service	401	132
86	All ownerships	11,347	2,204
86	National Forest	1,046	569
86	non-Forest Service	10,301	1,634
87	All ownerships	12,880	3,145
87	National Forest	2,654	1,828
87	non-Forest Service	10,226	1,317
88	All ownerships	7,433	108
88	National Forest	0	0
88	non-Forest Service	7,433	108
89	All ownerships	15,186	792
89	National Forest	2,309	428
89	non-Forest Service	12,877	364
90	All ownerships	22,789	13,482
90	National Forest	14,971	11,066
90	non-Forest Service	7,818	2,415
93	All ownerships	22,490	5,126
93	National Forest	90	39
93	non-Forest Service	22,400	5,087
95	All ownerships	16,877	4,486
95	National Forest	374	164
95	non-Forest Service	16,504	4,322
96	All ownerships	14,570	6,026
96	National Forest	12,292	5,466
96	non-Forest Service	2,278	559
97	All ownerships	10,270	8,114
97	National Forest	6,957	5,744
97	non-Forest Service	3,313	2,370
98	All ownerships	8,447	4,666
98	National Forest	4,395	3,466
98	non-Forest Service	4,052	1,200
99	All ownerships	16,629	12,141
99	National Forest	14,797	10,674
99	non-Forest Service	1,832	1,467
100	All ownerships	14,567	8,627

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
100	National Forest	13,723	8,374
100	non-Forest Service	844	253
101	All ownerships	22,291	7,023
101	National Forest	8,301	5,322
101	non-Forest Service	13,990	1,701
102	All ownerships	12,072	10,194
102	National Forest	12,061	10,190
102	non-Forest Service	11	3
103	All ownerships	13,776	4,758
103	National Forest	6,251	4,059
103	non-Forest Service	7,525	699
104	All ownerships	16,499	1,840
104	National Forest	30	27
104	non-Forest Service	16,469	1,814
106	All ownerships	31,112	9,864
106	National Forest	11,062	6,292
106	non-Forest Service	20,050	3,572
107	All ownerships	12,094	8,751
107	National Forest	11,342	8,358
107	non-Forest Service	752	393
108	All ownerships	9,076	5,025
108	National Forest	8,773	4,992
108	non-Forest Service	303	33
110	All ownerships	13,080	11,639
110	National Forest	13,049	11,620
110	non-Forest Service	31	19
111	All ownerships	11,916	10,445
111	National Forest	11,916	10,445
111	non-Forest Service	0	0
112	All ownerships	30,427	596
112	National Forest	0	0
112	non-Forest Service	30,427	596
113	All ownerships	16,801	12,062
113	National Forest	15,874	11,629
113	non-Forest Service	927	433
114	All ownerships	19,465	2,781
114	National Forest	4,171	739
114	non-Forest Service	15,294	2,042
115	All ownerships	13,749	6,731

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
115	National Forest	5,732	4,396
115	non-Forest Service	8,017	2,335
116	All ownerships	11,921	2,110
116	National Forest	1,204	926
116	non-Forest Service	10,717	1,184
117	All ownerships	22,186	12,256
117	National Forest	16,092	10,272
117	non-Forest Service	6,094	1,984
118	All ownerships	19,388	6,877
118	National Forest	8,862	4,537
118	non-Forest Service	10,526	2,340
119	All ownerships	11,797	7,886
119	National Forest	11,528	7,769
119	non-Forest Service	269	117
120	All ownerships	20,786	12,499
120	National Forest	13,559	10,248
120	non-Forest Service	7,227	2,252
121	All ownerships	30,538	6,157
121	National Forest	13,264	2,623
121	non-Forest Service	17,274	3,534
124	All ownerships	6,436	1,253
124	National Forest	4,367	1,156
124	non-Forest Service	2,069	96
125	All ownerships	20,518	16,792
125	National Forest	20,248	16,658
125	non-Forest Service	270	134
126	All ownerships	9,273	5,274
126	National Forest	7,185	4,323
126	non-Forest Service	2,088	951
127	All ownerships	17,871	8,770
127	National Forest	11,076	7,584
127	non-Forest Service	6,794	1,186
128	All ownerships	6,676	3,660
128	National Forest	6,655	3,651
128	non-Forest Service	21	9
129	All ownerships	18,342	11,051
129	National Forest	14,984	9,405
129	non-Forest Service	3,358	1,646
130	All ownerships	10,676	8,322

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
130	National Forest	9,583	7,520
130	non-Forest Service	1,093	802
131	All ownerships	17,076	8,061
131	National Forest	16,160	7,474
131	non-Forest Service	917	588
132	All ownerships	12,413	9,489
132	National Forest	12,052	9,239
132	non-Forest Service	360	250
133	All ownerships	7,813	5,091
133	National Forest	5,833	4,663
133	non-Forest Service	1,980	428
135	All ownerships	14,956	11,209
135	National Forest	13,887	10,734
135	non-Forest Service	1,068	475
136	All ownerships	12,049	2,292
136	National Forest	30	5
136	non-Forest Service	12,019	2,287
137	All ownerships	19,985	17,761
137	National Forest	19,824	17,686
137	non-Forest Service	160	75
139	All ownerships	25,768	9,599
139	National Forest	20,237	8,708
139	non-Forest Service	5,531	890
140	All ownerships	16,127	6,982
140	National Forest	8,044	4,529
140	non-Forest Service	8,084	2,453
141	All ownerships	13,868	872
141	National Forest	1,065	384
141	non-Forest Service	12,803	488
142	All ownerships	30,803	7,227
142	National Forest	430	0
142	non-Forest Service	30,373	7,227
143	All ownerships	16,409	11,595
143	National Forest	16,368	11,581
143	non-Forest Service	41	14
144	All ownerships	29,743	5,277
144	National Forest	161	0
144	non-Forest Service	29,581	5,257
146	All ownerships	18,225	7,095

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
146	National Forest	0	0
146	non-Forest Service	18,225	7,095
147	All ownerships	22,492	13,855
147	National Forest	13,107	10,700
147	non-Forest Service	9,385	3,155
148	All ownerships	16,623	11,983
148	National Forest	16,602	11,962
148	non-Forest Service	21	21
149	All ownerships	32,911	5,324
149	National Forest	2,763	2,394
149	non-Forest Service	30,148	2,930
150	All ownerships	13,957	10,994
150	National Forest	13,697	10,810
150	non-Forest Service	260	184
151	All ownerships	25,716	4,983
151	National Forest	8,945	3,206
151	non-Forest Service	16,770	1,777
152	All ownerships	20,065	2,186
152	National Forest	1,834	179
152	non-Forest Service	18,232	2,007
153	All ownerships	17,768	15,518
153	National Forest	17,659	15,412
153	non-Forest Service	109	106
154	All ownerships	14,247	6,697
154	National Forest	7,102	4,167
154	non-Forest Service	7,146	2,530
155	All ownerships	21,851	8,739
155	National Forest	16,488	7,776
155	non-Forest Service	5,363	964
156	All ownerships	11,251	7,954
156	National Forest	11,210	7,913
156	non-Forest Service	41	41
158	All ownerships	20,227	3,468
158	National Forest	13,029	3,274
158	non-Forest Service	7,198	194
159	All ownerships	17,026	5,811
159	National Forest	12,935	4,247
159	non-Forest Service	4,091	1,564
160	All ownerships	40,579	1,814

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
160	National Forest	2,140	726
160	non-Forest Service	38,439	1,088
162	All ownerships	9,163	4,438
162	National Forest	8,819	4,428
162	non-Forest Service	345	9
163	All ownerships	14,181	10,290
163	National Forest	14,120	10,274
163	non-Forest Service	61	16
164	All ownerships	15,153	10,765
164	National Forest	13,319	9,484
164	non-Forest Service	1,834	1,281
165	All ownerships	17,201	6,957
165	National Forest	68	54
165	non-Forest Service	17,133	6,903
166	All ownerships	31,873	18,598
166	National Forest	29,624	18,036
166	non-Forest Service	2,249	562
167	All ownerships	26,274	17,284
167	National Forest	20,762	15,476
167	non-Forest Service	5,512	1,808
168	All ownerships	36,542	4,463
168	National Forest	6,879	3,081
168	non-Forest Service	29,662	1,382
169	All ownerships	6,884	220
169	National Forest	1,787	96
169	non-Forest Service	5,097	124
170	All ownerships	13,195	398
170	National Forest	3,982	334
170	non-Forest Service	9,213	64
171	All ownerships	24,630	9,458
171	National Forest	14,447	8,377
171	non-Forest Service	10,183	1,081
172	All ownerships	33,402	15,281
172	National Forest	28,951	14,856
172	non-Forest Service	4,450	425
173	All ownerships	10,587	3,380
173	National Forest	7,712	3,101
173	non-Forest Service	2,875	279
175	All ownerships	19,195	10,258

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
175	National Forest	6,685	5,380
175	non-Forest Service	12,509	4,879
176	All ownerships	5,795	445
176	National Forest	3,081	445
176	non-Forest Service	2,713	0
177	All ownerships	31,357	10,136
177	National Forest	13,797	8,279
177	non-Forest Service	17,560	1,857
178	All ownerships	13,178	3,741
178	National Forest	11,016	3,378
178	non-Forest Service	2,161	363
179	All ownerships	21,501	12,445
179	National Forest	16,407	12,131
179	non-Forest Service	5,093	314
180	All ownerships	28,794	118
180	National Forest	1,494	8
180	non-Forest Service	27,300	110
181	All ownerships	28,437	650
181	National Forest	1,451	133
181	non-Forest Service	26,986	517
182	All ownerships	18,484	235
182	National Forest	328	73
182	non-Forest Service	18,156	162
183	All ownerships	36,732	12,342
183	National Forest	16,668	11,292
183	non-Forest Service	20,064	1,050
184	All ownerships	17,581	13,047
184	National Forest	17,210	12,804
184	non-Forest Service	370	243
185	All ownerships	19,418	11,532
185	National Forest	16,549	11,162
185	non-Forest Service	2,869	370
188	All ownerships	33,116	16,346
188	National Forest	16,214	12,606
188	non-Forest Service	16,902	3,741
189	All ownerships	5,409	3,917
189	National Forest	3,561	2,947
189	non-Forest Service	1,848	971
190	All ownerships	7,842	5,456

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
190	National Forest	6,975	5,157
190	non-Forest Service	867	299
191	All ownerships	14,584	3,653
191	National Forest	3,761	2,723
191	non-Forest Service	10,824	930
192	All ownerships	14,992	7,966
192	National Forest	8,785	7,710
192	non-Forest Service	6,206	255
193	All ownerships	19,029	7,427
193	National Forest	4,704	3,418
193	non-Forest Service	14,325	4,009
194	All ownerships	27,890	15,024
194	National Forest	17,627	14,552
194	non-Forest Service	10,263	472
195	All ownerships	20,308	4,425
195	National Forest	9,891	3,856
195	non-Forest Service	10,417	569
197	All ownerships	12,127	9,888
197	National Forest	11,965	9,835
197	non-Forest Service	162	53
198	All ownerships	8,079	248
198	National Forest	94	0
198	non-Forest Service	7,985	248
199	All ownerships	12,243	6,311
199	National Forest	9,255	5,871
199	non-Forest Service	2,988	440
200	All ownerships	8,029	2,401
200	National Forest	3,699	1,590
200	non-Forest Service	4,330	812
201	All ownerships	23,881	11,752
201	National Forest	13,730	8,942
201	non-Forest Service	10,151	2,810
203	All ownerships	18,728	11,436
203	National Forest	12,868	10,971
203	non-Forest Service	5,860	466
206	All ownerships	26,371	17,514
206	National Forest	22,754	17,217
206	non-Forest Service	3,616	296
207	All ownerships	9,056	508

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
207	National Forest	126	124
207	non-Forest Service	8,930	384
208	All ownerships	13,516	595
208	National Forest	10	0
208	non-Forest Service	13,506	595
209	All ownerships	29,071	8,825
209	National Forest	11,757	5,464
209	non-Forest Service	17,314	3,361
210	All ownerships	14,425	12,701
210	National Forest	13,690	12,346
210	non-Forest Service	734	355
211	All ownerships	31,843	7,115
211	National Forest	7,646	5,446
211	non-Forest Service	24,196	1,669
212	All ownerships	10,926	722
212	National Forest	1,833	291
212	non-Forest Service	9,092	431
213	All ownerships	23,157	8,000
213	National Forest	8,676	5,039
213	non-Forest Service	14,481	2,961
214	All ownerships	6,459	1,973
214	National Forest	1,604	718
214	non-Forest Service	4,855	1,255
215	All ownerships	24,695	10,944
215	National Forest	14,889	9,167
215	non-Forest Service	9,806	1,776
216	All ownerships	13,707	11,001
216	National Forest	12,316	10,759
216	non-Forest Service	1,390	242
217	All ownerships	8,665	5,856
217	National Forest	6,456	5,557
217	non-Forest Service	2,209	299
218	All ownerships	16,760	13,438
218	National Forest	16,671	13,373
218	non-Forest Service	89	65
219	All ownerships	14,728	7,961
219	National Forest	11,087	7,600
219	non-Forest Service	3,641	362
220	All ownerships	20,068	15,694

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
220	National Forest	19,698	15,606
220	non-Forest Service	371	87
221	All ownerships	31,023	1,323
221	National Forest	272	19
221	non-Forest Service	30,752	1,304
222	All ownerships	29,600	2,180
222	National Forest	1,087	835
222	non-Forest Service	28,514	1,345
223	All ownerships	28,489	2,549
223	National Forest	3,524	1,681
223	non-Forest Service	24,965	869
224	All ownerships	20,395	13,035
224	National Forest	19,445	12,815
224	non-Forest Service	950	220
225	All ownerships	14,682	5,401
225	National Forest	7,991	3,766
225	non-Forest Service	6,691	1,636
226	All ownerships	27,014	4,992
226	National Forest	7,338	3,346
226	non-Forest Service	19,675	1,646
227	All ownerships	15,719	14,572
227	National Forest	15,561	14,439
227	non-Forest Service	158	133
228	All ownerships	13,633	10,436
228	National Forest	12,101	10,361
228	non-Forest Service	1,532	75
229	All ownerships	39,769	15,131
229	National Forest	15,263	11,340
229	non-Forest Service	24,506	3,791
230	All ownerships	18,604	13,278
230	National Forest	16,947	12,503
230	non-Forest Service	1,657	775
231	All ownerships	24,032	4,776
231	National Forest	14,935	4,502
231	non-Forest Service	9,097	275
232	All ownerships	30,229	7,295
232	National Forest	9,342	6,825
232	non-Forest Service	20,887	470
233	All ownerships	13,192	8,814

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
233	National Forest	13,174	8,798
233	non-Forest Service	18	15
234	All ownerships	21,140	895
234	National Forest	2,168	118
234	non-Forest Service	18,972	777
236	All ownerships	8,172	7,045
236	National Forest	7,917	6,867
236	non-Forest Service	255	178
237	All ownerships	17,542	16,303
237	National Forest	17,500	16,299
237	non-Forest Service	42	3
238	All ownerships	31,918	10,823
238	National Forest	30,672	10,504
238	non-Forest Service	1,246	319
239	All ownerships	20,780	383
239	National Forest	80	34
239	non-Forest Service	20,700	349
240	All ownerships	41,060	1,441
240	National Forest	1,755	789
240	non-Forest Service	39,305	651
241	All ownerships	12,839	7,486
241	National Forest	10,368	6,127
241	non-Forest Service	2,472	1,359
242	All ownerships	20,992	105
242	National Forest	7	0
242	non-Forest Service	20,985	105
243	All ownerships	20,527	11,572
243	National Forest	20,378	11,509
243	non-Forest Service	149	62
244	All ownerships	36,172	7,418
244	National Forest	7,340	4,604
244	non-Forest Service	28,832	2,814
245	All ownerships	19,193	6,969
245	National Forest	8,736	5,651
245	non-Forest Service	10,457	1,318
246	All ownerships	10,270	9,846
246	National Forest	10,247	9,829
246	non-Forest Service	23	17
247	All ownerships	26,404	7,644

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
247	National Forest	16,317	7,480
247	non-Forest Service	10,086	164
248	All ownerships	6,844	5,658
248	National Forest	6,737	5,569
248	non-Forest Service	106	89
249	All ownerships	26,447	11,361
249	National Forest	20,483	10,450
249	non-Forest Service	5,964	911
250	All ownerships	16,295	10,499
250	National Forest	12,545	10,436
250	non-Forest Service	3,750	64
251	All ownerships	38,051	1,719
251	National Forest	2,662	1,115
251	non-Forest Service	35,389	604
252	All ownerships	12,417	8,027
252	National Forest	11,433	7,306
252	non-Forest Service	984	721
253	All ownerships	23,114	1,027
253	National Forest	2,838	575
253	non-Forest Service	20,277	452
254	All ownerships	27,355	9,801
254	National Forest	11,312	8,161
254	non-Forest Service	16,043	1,639
255	All ownerships	11,375	10,389
255	National Forest	11,375	10,389
255	non-Forest Service	0	0
257	All ownerships	15,504	11,563
257	National Forest	13,879	11,036
257	non-Forest Service	1,625	527
259	All ownerships	26,310	2,827
259	National Forest	2,558	2,322
259	non-Forest Service	23,752	505
260	All ownerships	11,325	9,632
260	National Forest	10,221	9,132
260	non-Forest Service	1,104	500
262	All ownerships	16,538	7,189
262	National Forest	8,989	7,010
262	non-Forest Service	7,549	179
263	All ownerships	11,295	4,815

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
263	National Forest	9,068	4,806
263	non-Forest Service	2,227	9
264	All ownerships	37,638	12,854
264	National Forest	14,470	10,319
264	non-Forest Service	23,168	2,535
267	All ownerships	20,225	18,188
267	National Forest	20,225	18,188
267	non-Forest Service	0	0
268	All ownerships	13,122	11,910
268	National Forest	13,122	11,910
268	non-Forest Service	0	0
269	All ownerships	29,260	11,484
269	National Forest	14,081	9,871
269	non-Forest Service	15,179	1,613
270	All ownerships	26,919	4,646
270	National Forest	10,512	3,396
270	non-Forest Service	16,407	1,250
271	All ownerships	32,311	21,323
271	National Forest	32,121	21,195
271	non-Forest Service	189	127
272	All ownerships	23,483	12,047
272	National Forest	19,956	12,021
272	non-Forest Service	3,527	27
273	All ownerships	14,777	1,974
273	National Forest	2,053	918
273	non-Forest Service	12,724	1,056
276	All ownerships	17,380	6,543
276	National Forest	7,728	5,718
276	non-Forest Service	9,652	825
278	All ownerships	25,116	9,908
278	National Forest	17,002	9,308
278	non-Forest Service	8,113	599
279	All ownerships	22,428	3,364
279	National Forest	5,320	1,598
279	non-Forest Service	17,108	1,766
280	All ownerships	8,752	7,439
280	National Forest	8,740	7,438
280	non-Forest Service	12	1
281	All ownerships	22,129	10,937

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
281	National Forest	21,988	10,931
281	non-Forest Service	141	6
283	All ownerships	28,846	8,218
283	National Forest	12,498	7,329
283	non-Forest Service	16,348	889
285	All ownerships	12,128	8,840
285	National Forest	11,786	8,655
285	non-Forest Service	342	185
287	All ownerships	14,659	10,481
287	National Forest	14,336	10,441
287	non-Forest Service	323	40
288	All ownerships	10,843	3,239
288	National Forest	4,977	3,044
288	non-Forest Service	5,866	195
289	All ownerships	20,407	809
289	National Forest	7,148	681
289	non-Forest Service	13,259	129
290	All ownerships	10,206	7,851
290	National Forest	9,964	7,738
290	non-Forest Service	242	113
292	All ownerships	26,312	12,597
292	National Forest	16,913	12,195
292	non-Forest Service	9,398	402
293	All ownerships	13,703	2,141
293	National Forest	1,231	1,043
293	non-Forest Service	12,472	1,098
294	All ownerships	22,871	4,809
294	National Forest	7,216	3,297
294	non-Forest Service	15,655	1,513
295	All ownerships	23,966	4,366
295	National Forest	9,057	3,639
295	non-Forest Service	14,909	727
296	All ownerships	34,404	12,629
296	National Forest	23,849	12,440
296	non-Forest Service	10,556	189
298	All ownerships	32,533	18,485
298	National Forest	19,574	16,137
298	non-Forest Service	12,959	2,348
299	All ownerships	6,816	2,138

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
299	National Forest	3,504	1,872
299	non-Forest Service	3,312	266
300	All ownerships	20,351	10,227
300	National Forest	13,302	9,826
300	non-Forest Service	7,049	401
301	All ownerships	13,913	7,143
301	National Forest	8,466	6,082
301	non-Forest Service	5,447	1,061
302	All ownerships	15,935	2,435
302	National Forest	4,093	1,940
302	non-Forest Service	11,842	496
304	All ownerships	15,654	2,773
304	National Forest	5,811	2,413
304	non-Forest Service	9,843	360
305	All ownerships	20,055	4,610
305	National Forest	5,620	2,928
305	non-Forest Service	14,435	1,682
306	All ownerships	21,023	8,523
306	National Forest	13,199	8,005
306	non-Forest Service	7,824	518
308	All ownerships	11,823	3,010
308	National Forest	4,344	2,490
308	non-Forest Service	7,478	520
309	All ownerships	16,808	11,756
309	National Forest	16,801	11,754
309	non-Forest Service	8	2
311	All ownerships	19,309	671
311	National Forest	700	50
311	non-Forest Service	18,609	621
312	All ownerships	28,708	10,371
312	National Forest	11,217	8,237
312	non-Forest Service	17,491	2,134
313	All ownerships	14,547	856
313	National Forest	14	0
313	non-Forest Service	14,533	856
314	All ownerships	22,723	5,077
314	National Forest	12,365	4,794
314	non-Forest Service	10,358	283
315	All ownerships	23,237	12,122

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
315	National Forest	16,275	11,371
315	non-Forest Service	6,961	751
316	All ownerships	7,997	124
316	National Forest	122	2
316	non-Forest Service	7,875	122
317	All ownerships	8,172	1,243
317	National Forest	854	761
317	non-Forest Service	7,317	482
318	All ownerships	22,649	1,620
318	National Forest	5,958	1,564
318	non-Forest Service	16,691	55
319	All ownerships	5,595	1,837
319	National Forest	726	274
319	non-Forest Service	4,868	1,563
320	All ownerships	9,866	4,066
320	National Forest	3,280	1,959
320	non-Forest Service	6,587	2,108
321	All ownerships	14,783	720
321	National Forest	447	174
321	non-Forest Service	14,336	547
323	All ownerships	16,294	1,357
323	National Forest	0	0
323	non-Forest Service	16,294	1,357
325	All ownerships	18,395	2,685
325	National Forest	2,664	1,592
325	non-Forest Service	15,731	1,092
326	All ownerships	11,706	4,032
326	National Forest	2,384	1,266
326	non-Forest Service	9,322	2,766
327	All ownerships	22,931	3,044
327	National Forest	2,160	1,360
327	non-Forest Service	20,771	1,684
329	All ownerships	20,256	329
329	National Forest	3,601	300
329	non-Forest Service	16,655	28
330	All ownerships	13,757	1,773
330	National Forest	3,560	914
330	non-Forest Service	10,198	859
333	All ownerships	28,818	6,698

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
333	National Forest	8,476	5,547
333	non-Forest Service	20,342	1,151
334	All ownerships	26,195	2,449
334	National Forest	0	0
334	non-Forest Service	26,195	2,449
337	All ownerships	5,645	3,749
337	National Forest	3,254	2,408
337	non-Forest Service	2,390	1,342
338	All ownerships	24,969	5,819
338	National Forest	8,208	4,202
338	non-Forest Service	16,761	1,617
339	All ownerships	10,001	5,423
339	National Forest	7,833	4,493
339	non-Forest Service	2,169	931
340	All ownerships	14,853	6,364
340	National Forest	274	146
340	non-Forest Service	14,580	6,218
341	All ownerships	15,490	7,732
341	National Forest	10,005	7,092
341	non-Forest Service	5,485	639
342	All ownerships	11,118	7,856
342	National Forest	10,950	7,771
342	non-Forest Service	168	85
343	All ownerships	18,401	215
343	National Forest	1,769	63
343	non-Forest Service	16,632	152
344	All ownerships	8,536	4,498
344	National Forest	5,763	4,444
344	non-Forest Service	2,772	54
347	All ownerships	31,091	8,391
347	National Forest	1,104	812
347	non-Forest Service	29,986	7,580
348	All ownerships	18,948	10,519
348	National Forest	12,266	9,695
348	non-Forest Service	6,681	824
351	All ownerships	8,218	4,684
351	National Forest	5,701	4,265
351	non-Forest Service	2,516	419
352	All ownerships	21,650	15,508

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
352	National Forest	20,855	15,107
352	non-Forest Service	795	401
356	All ownerships	18,992	7,505
356	National Forest	10,539	6,763
356	non-Forest Service	8,453	742
357	All ownerships	16,869	995
357	National Forest	1,708	849
357	non-Forest Service	15,161	147
360	All ownerships	16,530	10,346
360	National Forest	13,404	8,772
360	non-Forest Service	3,126	1,575
363	All ownerships	29,116	1,788
363	National Forest	1,424	870
363	non-Forest Service	27,693	918
364	All ownerships	20,874	12,242
364	National Forest	20,834	12,242
364	non-Forest Service	40	0
365	All ownerships	19,650	7,925
365	National Forest	11,782	5,560
365	non-Forest Service	7,868	2,365
367	All ownerships	17,283	622
367	National Forest	441	404
367	non-Forest Service	16,842	218
368	All ownerships	15,465	869
368	National Forest	1,228	434
368	non-Forest Service	14,237	435
370	All ownerships	18,321	5,551
370	National Forest	2,856	2,012
370	non-Forest Service	15,465	3,539
371	All ownerships	18,229	11,836
371	National Forest	18,155	11,782
371	non-Forest Service	74	54
373	All ownerships	15,215	5,609
373	National Forest	9,139	4,711
373	non-Forest Service	6,075	898
374	All ownerships	14,284	7,241
374	National Forest	10,068	6,508
374	non-Forest Service	4,216	733
375	All ownerships	31,869	24,102

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
375	National Forest	31,770	24,055
375	non-Forest Service	99	47
378	All ownerships	9,816	2,408
378	National Forest	6,094	2,224
378	non-Forest Service	3,722	184
379	All ownerships	15,853	522
379	National Forest	1,418	104
379	non-Forest Service	14,435	418
380	All ownerships	32,794	14,524
380	National Forest	32,306	14,353
380	non-Forest Service	488	171
382	All ownerships	33,410	8,039
382	National Forest	11,938	5,723
382	non-Forest Service	21,472	2,316
383	All ownerships	19,756	5,529
383	National Forest	9,919	4,945
383	non-Forest Service	9,837	584
384	All ownerships	12,933	4,102
384	National Forest	7,717	3,367
384	non-Forest Service	5,216	735
387	All ownerships	13,574	3,063
387	National Forest	398	154
387	non-Forest Service	13,176	2,908
388	All ownerships	33,602	5,267
388	National Forest	5,862	3,763
388	non-Forest Service	27,740	1,504
389	All ownerships	24,250	10,479
389	National Forest	13,845	8,056
389	non-Forest Service	10,405	2,423
392	All ownerships	32,259	1,279
392	National Forest	3,175	765
392	non-Forest Service	29,084	514
394	All ownerships	6,676	3,635
394	National Forest	6,301	3,557
394	non-Forest Service	375	78
399	All ownerships	24,236	4,925
399	National Forest	9,403	3,859
399	non-Forest Service	14,833	1,066
400	All ownerships	20,694	10,296

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
400	National Forest	19,207	10,081
400	non-Forest Service	1,487	215
403	All ownerships	36,794	10,405
403	National Forest	16,718	8,135
403	non-Forest Service	20,076	2,270
405	All ownerships	14,557	4,965
405	National Forest	13,567	4,766
405	non-Forest Service	990	199
408	All ownerships	9,415	1,676
408	National Forest	226	0
408	non-Forest Service	9,190	1,676
410	All ownerships	14,737	5,121
410	National Forest	7,449	3,901
410	non-Forest Service	7,288	1,220
411	All ownerships	14,487	5,861
411	National Forest	4,442	3,183
411	non-Forest Service	10,045	2,678
416	All ownerships	36,032	5,744
416	National Forest	2,525	1,793
416	non-Forest Service	33,507	3,952
418	All ownerships	8,961	2,845
418	National Forest	3,319	1,842
418	non-Forest Service	5,642	1,003
421	All ownerships	12,719	7,464
421	National Forest	8,310	5,880
421	non-Forest Service	4,409	1,584
422	All ownerships	26,538	9,435
422	National Forest	26,538	9,435
422	non-Forest Service	0	0
423	All ownerships	15,785	9,607
423	National Forest	14,310	9,087
423	non-Forest Service	1,475	521
425	All ownerships	11,534	5,045
425	National Forest	8,537	4,315
425	non-Forest Service	2,997	731
428	All ownerships	7,295	1,973
428	National Forest	1,607	926
428	non-Forest Service	5,688	1,047
429	All ownerships	12,066	4,505

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
429	National Forest	5,430	3,281
429	non-Forest Service	6,637	1,224
430	All ownerships	17,702	3,524
430	National Forest	2,226	797
430	non-Forest Service	15,476	2,727
432	All ownerships	21,258	7,580
432	National Forest	9,904	5,711
432	non-Forest Service	11,354	1,869
433	All ownerships	38,995	12,629
433	National Forest	15,512	9,053
433	non-Forest Service	23,483	3,576
434	All ownerships	26,406	10,704
434	National Forest	26,406	10,704
434	non-Forest Service	0	0
435	All ownerships	15,375	8,814
435	National Forest	14,970	8,667
435	non-Forest Service	405	147
437	All ownerships	5,301	2,572
437	National Forest	4,571	2,296
437	non-Forest Service	730	277
438	All ownerships	25,457	12,706
438	National Forest	25,422	12,695
438	non-Forest Service	36	11
439	All ownerships	27,852	3,070
439	National Forest	1,865	843
439	non-Forest Service	25,987	2,227
440	All ownerships	32,358	8,127
440	National Forest	13,221	4,898
440	non-Forest Service	19,136	3,229
441	All ownerships	11,352	3,195
441	National Forest	4,895	2,469
441	non-Forest Service	6,457	726
442	All ownerships	7,672	4,747
442	National Forest	7,672	4,747
442	non-Forest Service	0	0
443	All ownerships	23,310	8,145
443	National Forest	11,939	6,240
443	non-Forest Service	11,371	1,905
444	All ownerships	12,674	3,675

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
444	National Forest	6,981	3,140
444	non-Forest Service	5,693	536
445	All ownerships	6,160	3,331
445	National Forest	6,053	3,311
445	non-Forest Service	106	20
446	All ownerships	33,334	9,927
446	National Forest	33,334	9,927
446	non-Forest Service	0	0
447	All ownerships	23,813	4,327
447	National Forest	9,575	3,639
447	non-Forest Service	14,238	688
449	All ownerships	11,230	5,650
449	National Forest	7,782	5,325
449	non-Forest Service	3,449	325
451	All ownerships	14,562	1,613
451	National Forest	2,401	1,210
451	non-Forest Service	12,162	403
452	All ownerships	9,089	2,864
452	National Forest	9,041	2,860
452	non-Forest Service	48	4
453	All ownerships	6,585	2,093
453	National Forest	6,337	2,060
453	non-Forest Service	248	32
454	All ownerships	17,115	3,859
454	National Forest	17,115	3,859
454	non-Forest Service	0	0
458	All ownerships	12,960	5,971
458	National Forest	11,932	5,738
458	non-Forest Service	1,029	234
460	All ownerships	14,983	5,598
460	National Forest	8,827	3,847
460	non-Forest Service	6,156	1,752
461	All ownerships	21,369	3,900
461	National Forest	11,334	2,959
461	non-Forest Service	10,035	941
462	All ownerships	15,410	7,363
462	National Forest	14,593	6,913
462	non-Forest Service	817	449
463	All ownerships	29,410	1,937

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
463	National Forest	16,513	1,230
463	non-Forest Service	12,897	707
465	All ownerships	18,865	2,311
465	National Forest	7,057	2,059
465	non-Forest Service	11,808	252
466	All ownerships	15,664	5,314
466	National Forest	9,339	4,392
466	non-Forest Service	6,325	922
467	All ownerships	9,649	4,401
467	National Forest	8,168	4,190
467	non-Forest Service	1,481	211
468	All ownerships	11,439	1,168
468	National Forest	5,546	1,008
468	non-Forest Service	5,892	159
469	All ownerships	7,406	710
469	National Forest	1,413	391
469	non-Forest Service	5,992	318
470	All ownerships	25,471	1,464
470	National Forest	3,701	761
470	non-Forest Service	21,770	703
471	All ownerships	15,017	155
471	National Forest	3,909	26
471	non-Forest Service	11,108	129
472	All ownerships	15,669	3,554
472	National Forest	6,742	2,328
472	non-Forest Service	8,928	1,226
473	All ownerships	20,239	855
473	National Forest	1,806	20
473	non-Forest Service	18,433	835
474	All ownerships	9,688	3,236
474	National Forest	9,443	3,226
474	non-Forest Service	245	10
475	All ownerships	14,457	3,133
475	National Forest	13,326	2,985
475	non-Forest Service	1,131	148
476	All ownerships	14,943	2,379
476	National Forest	4,338	1,342
476	non-Forest Service	10,605	1,038
478	All ownerships	20,679	2,087

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
478	National Forest	5,293	1,203
478	non-Forest Service	15,386	884
481	All ownerships	19,249	2,699
481	National Forest	8,015	2,479
481	non-Forest Service	11,234	220
485	All ownerships	19,084	2,052
485	National Forest	6,073	1,597
485	non-Forest Service	13,011	455
487	All ownerships	26,166	4,179
487	National Forest	12,108	2,801
487	non-Forest Service	14,058	1,378
491	All ownerships	8,293	454
491	National Forest	365	16
491	non-Forest Service	7,929	438
492	All ownerships	23,992	1,338
492	National Forest	2,675	982
492	non-Forest Service	21,317	357
493	All ownerships	23,014	7,708
493	National Forest	6,938	2,381
493	non-Forest Service	16,076	5,327
495	All ownerships	19,489	2,510
495	National Forest	11,618	1,555
495	non-Forest Service	7,871	955
499	All ownerships	9,643	1,554
499	National Forest	9,222	1,502
499	non-Forest Service	420	53
501	All ownerships	27,270	3,953
501	National Forest	8,057	2,550
501	non-Forest Service	19,213	1,403
502	All ownerships	19,168	4,344
502	National Forest	15,073	4,288
502	non-Forest Service	4,095	57
503	All ownerships	12,428	1,467
503	National Forest	6,873	1,462
503	non-Forest Service	5,555	5
504	All ownerships	13,685	4,864
504	National Forest	13,347	4,859
504	non-Forest Service	339	4
505	All ownerships	4,721	1,526

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 1 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
505	National Forest	3,578	1,248
505	non-Forest Service	1,142	278
506	All ownerships	25,804	5,580
506	National Forest	11,744	1,893
506	non-Forest Service	14,060	3,687
507	All ownerships	11,870	829
507	National Forest	4,240	635
507	non-Forest Service	7,630	194
508	All ownerships	16,966	3,717
508	National Forest	15,026	3,653
508	non-Forest Service	1,941	64
509	All ownerships	19,965	9,087
509	National Forest	19,541	8,980
509	non-Forest Service	425	107
All LAUs	All ownerships	6,613,019	2,415,312
All LAUs	Forest Service	3,359,252	2,021,598
All LAUs	non-Forest Service	3,253,767	393,693

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Table C2. Alternative 2 Lynx Analysis Unit (LAU) identification, total area and mapped lynx habitat area within each LAU by ownership.

Alternative 2 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
BH-01	All ownerships	34,879	16,505
BH-01	National Forest	34,313	16,352
BH-01	non-Forest Service	566	153
BH-02	All ownerships	29,378	17,296
BH-02	National Forest	17,853	12,082
BH-02	non-Forest Service	11,526	5,215
BH-03	All ownerships	29,631	14,852
BH-03	National Forest	10,994	6,477
BH-03	non-Forest Service	18,637	8,374
BH-04	All ownerships	42,454	27,061
BH-04	National Forest	35,977	24,054
BH-04	non-Forest Service	6,477	3,007
BH-05	All ownerships	30,345	20,515
BH-05	National Forest	29,620	20,438
BH-05	non-Forest Service	725	77
BH-06	All ownerships	30,768	20,202
BH-06	National Forest	29,300	19,859
BH-06	non-Forest Service	1,468	343
BH-07	All ownerships	27,913	21,227
BH-07	National Forest	27,199	21,096
BH-07	non-Forest Service	713	131
BH-08	All ownerships	27,341	18,922
BH-08	National Forest	26,293	18,840
BH-08	non-Forest Service	1,048	82
BH-09	All ownerships	37,477	29,877
BH-09	National Forest	35,986	29,661
BH-09	non-Forest Service	1,491	216
BH-10	All ownerships	32,989	26,865
BH-10	National Forest	32,319	26,731
BH-10	non-Forest Service	670	134
BH-11	All ownerships	24,910	22,288
BH-11	National Forest	24,597	22,221
BH-11	non-Forest Service	313	66
BH-12	All ownerships	21,776	17,520
BH-12	National Forest	21,491	17,502
BH-12	non-Forest Service	284	19
BH-13	All ownerships	25,440	20,759

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 2 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
BH-13	National Forest	23,974	19,868
BH-13	non-Forest Service	1,466	891
BH-14	All ownerships	30,995	21,252
BH-14	National Forest	25,849	19,621
BH-14	non-Forest Service	5,146	1,631
BH-15	All ownerships	32,965	20,189
BH-15	National Forest	30,947	19,704
BH-15	non-Forest Service	2,018	484
BH-16	All ownerships	27,840	18,315
BH-16	National Forest	26,492	17,900
BH-16	non-Forest Service	1,348	415
BH-17	All ownerships	30,253	22,392
BH-17	National Forest	27,629	21,479
BH-17	non-Forest Service	2,625	913
BH-18	All ownerships	34,710	23,164
BH-18	National Forest	30,859	22,590
BH-18	non-Forest Service	3,851	574
BH-19	All ownerships	45,422	27,537
BH-19	National Forest	44,377	27,060
BH-19	non-Forest Service	1,045	477
BH-20	All ownerships	43,409	14,158
BH-20	National Forest	40,052	13,314
BH-20	non-Forest Service	3,356	844
BR-01	All ownerships	21,989	15,203
BR-01	National Forest	17,163	12,796
BR-01	non-Forest Service	4,826	2,407
BR-02	All ownerships	23,464	16,510
BR-02	National Forest	21,718	15,659
BR-02	non-Forest Service	1,746	851
BR-03	All ownerships	31,666	20,491
BR-03	National Forest	31,274	20,428
BR-03	non-Forest Service	392	63
BR-04	All ownerships	50,272	17,699
BR-04	National Forest	46,077	17,003
BR-04	non-Forest Service	4,195	696
BR-05	All ownerships	34,111	21,171
BR-05	National Forest	32,997	20,777
BR-05	non-Forest Service	1,114	394
CFF-01	All ownerships	57,085	29,031

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 2 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
CFF-01	National Forest	47,416	26,606
CFF-01	non-Forest Service	9,670	2,424
CFF-02	All ownerships	37,506	22,963
CFF-02	National Forest	34,947	21,555
CFF-02	non-Forest Service	2,559	1,408
CFF-03	All ownerships	42,741	26,773
CFF-03	National Forest	34,240	23,027
CFF-03	non-Forest Service	8,502	3,747
CFF-04	All ownerships	44,651	24,437
CFF-04	National Forest	40,816	23,386
CFF-04	non-Forest Service	3,835	1,052
CFF-05	All ownerships	42,999	28,793
CFF-05	National Forest	34,184	24,446
CFF-05	non-Forest Service	8,815	4,347
CFF-06	All ownerships	27,925	18,325
CFF-06	National Forest	24,900	16,734
CFF-06	non-Forest Service	3,025	1,591
CFF-07	All ownerships	27,877	15,396
CFF-07	National Forest	23,106	12,699
CFF-07	non-Forest Service	4,771	2,697
CFF-08	All ownerships	49,780	28,380
CFF-08	National Forest	39,158	25,631
CFF-08	non-Forest Service	10,622	2,749
CFF-09	All ownerships	53,824	22,062
CFF-09	National Forest	29,552	12,288
CFF-09	non-Forest Service	24,272	9,774
CFF-10	All ownerships	33,286	16,681
CFF-10	National Forest	28,253	15,139
CFF-10	non-Forest Service	5,033	1,543
GR-01	All ownerships	54,027	17,107
GR-01	National Forest	32,921	10,174
GR-01	non-Forest Service	21,106	6,933
GR-02	All ownerships	63,255	28,401
GR-02	National Forest	62,257	28,347
GR-02	non-Forest Service	998	54
GR-03	All ownerships	81,151	20,408
GR-03	National Forest	77,270	20,172
GR-03	non-Forest Service	3,880	236
GR-04	All ownerships	94,618	29,000

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 2 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
GR-04	National Forest	79,658	26,858
GR-04	non-Forest Service	14,960	2,142
GR-05	All ownerships	39,364	23,677
GR-05	National Forest	37,427	23,157
GR-05	non-Forest Service	1,937	520
GR-06	All ownerships	50,123	14,606
GR-06	National Forest	47,168	14,217
GR-06	non-Forest Service	2,955	389
GR-07	All ownerships	33,039	17,393
GR-07	National Forest	24,157	15,484
GR-07	non-Forest Service	8,882	1,910
GR-08	All ownerships	52,505	16,467
GR-08	National Forest	34,371	10,941
GR-08	non-Forest Service	18,134	5,527
JR-01	All ownerships	46,707	23,064
JR-01	National Forest	41,650	20,825
JR-01	non-Forest Service	5,057	2,239
JR-02	All ownerships	49,791	14,080
JR-02	National Forest	43,670	13,428
JR-02	non-Forest Service	6,121	652
LT-01	All ownerships	36,286	15,318
LT-01	National Forest	33,465	14,887
LT-01	non-Forest Service	2,821	431
LT-02	All ownerships	26,572	14,231
LT-02	National Forest	21,984	13,038
LT-02	non-Forest Service	4,588	1,193
Mad-01	All ownerships	58,447	21,742
Mad-01	National Forest	32,132	12,620
Mad-01	non-Forest Service	26,315	9,122
Mad-02	All ownerships	49,346	25,599
Mad-02	National Forest	46,731	24,910
Mad-02	non-Forest Service	2,615	689
Mad-03	All ownerships	45,319	12,588
Mad-03	National Forest	37,344	10,224
Mad-03	non-Forest Service	7,975	2,364
PIO-01	All ownerships	29,542	20,597
PIO-01	National Forest	26,504	19,855
PIO-01	non-Forest Service	3,038	742
PIO-02	All ownerships	17,188	14,088

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 2 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
PIO-02	National Forest	15,782	13,735
PIO-02	non-Forest Service	1,406	353
PIO-03	All ownerships	36,711	21,616
PIO-03	National Forest	35,985	21,553
PIO-03	non-Forest Service	726	63
PIO-04	All ownerships	33,261	28,557
PIO-04	National Forest	33,061	28,403
PIO-04	non-Forest Service	200	153
PIO-05	All ownerships	34,382	23,248
PIO-05	National Forest	32,678	22,818
PIO-05	non-Forest Service	1,704	430
PIO-06	All ownerships	47,358	24,914
PIO-06	National Forest	45,576	24,579
PIO-06	non-Forest Service	1,782	334
PIO-07	All ownerships	38,702	17,629
PIO-07	National Forest	38,123	17,444
PIO-07	non-Forest Service	580	185
PIO-08	All ownerships	36,836	27,336
PIO-08	National Forest	35,658	27,174
PIO-08	non-Forest Service	1,177	162
PIO-09	All ownerships	32,465	28,378
PIO-09	National Forest	32,465	28,378
PIO-09	non-Forest Service	0	0
PIO-10	All ownerships	32,311	24,367
PIO-10	National Forest	32,121	24,197
PIO-10	non-Forest Service	189	170
PIO-11	All ownerships	49,521	17,069
PIO-11	National Forest	49,391	17,069
PIO-11	non-Forest Service	130	0
PIO-12	All ownerships	35,167	17,093
PIO-12	National Forest	27,448	15,473
PIO-12	non-Forest Service	7,719	1,619
PIO-13	All ownerships	23,412	15,646
PIO-13	National Forest	23,077	15,629
PIO-13	non-Forest Service	335	17
PIO-14	All ownerships	46,977	21,211
PIO-14	National Forest	37,743	18,459
PIO-14	non-Forest Service	9,234	2,752
PIO-15	All ownerships	44,560	16,547

*Beaverhead-Deerlodge National Forest
Canada Lynx Habitat Forest Plan Amendment
Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 2 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
PIO-15	National Forest	44,202	16,516
PIO-15	non-Forest Service	359	30
TR-01	All ownerships	41,504	17,392
TR-01	National Forest	36,265	14,803
TR-01	non-Forest Service	5,240	2,590
TR-02	All ownerships	59,246	19,255
TR-02	National Forest	53,707	17,854
TR-02	non-Forest Service	5,538	1,401
TR-03	All ownerships	50,849	17,772
TR-03	National Forest	47,420	16,826
TR-03	non-Forest Service	3,429	946
URC-01	All ownerships	40,517	25,737
URC-01	National Forest	31,172	21,389
URC-01	non-Forest Service	9,345	4,348
URC-02	All ownerships	30,718	20,376
URC-02	National Forest	25,916	17,439
URC-02	non-Forest Service	4,802	2,936
URC-03	All ownerships	28,535	21,041
URC-03	National Forest	24,542	19,297
URC-03	non-Forest Service	3,993	1,744
URC-04	All ownerships	24,976	23,187
URC-04	National Forest	24,976	23,187
URC-04	non-Forest Service	0	0
URC-05	All ownerships	23,815	17,725
URC-05	National Forest	23,293	17,673
URC-05	non-Forest Service	522	52
URC-06	All ownerships	23,594	18,297
URC-06	National Forest	21,861	17,593
URC-06	non-Forest Service	1,733	704
URC-07	All ownerships	30,715	19,766
URC-07	National Forest	26,950	18,509
URC-07	non-Forest Service	3,764	1,257
URC-08	All ownerships	30,611	24,655
URC-08	National Forest	30,428	24,565
URC-08	non-Forest Service	183	90
URC-09	All ownerships	26,582	17,275
URC-09	National Forest	26,298	17,151
URC-09	non-Forest Service	284	124
All LAUs	All ownerships	2,950,677	1,599,268

*Beaverhead-Deerlodge National Forest
 Canada Lynx Habitat Forest Plan Amendment
 Appendix C: Detailed Lynx Analysis Unit Information*

Alternative 2 LAU Identification	Ownership	LAU Acres	Mapped Canada Lynx Habitat in Acres
All LAUs	National Forest	2596770	1481875.66
All LAUs	non-Forest Service	353,907	117,392