FINAL

Environmental Assessment

Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx

Prepared by

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Region 6

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1. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1. Introduction

The U.S. Fish and Wildlife Service (Service) is revising the designation of critical habitat for the Contiguous United States Distinct Population Segment (DPS) of the Canada lynx (*Lynx canadensis*) (hereafter referred to as lynx). On March 24, 2000, the Service listed the lynx DPS as threatened under the Endangered Species Act (ESA) of 1973, as amended (65 FR 16052) and published a clarification of findings in the *Federal Register* on July 3, 2003 (68 FR 40076). The ESA requires that critical habitat be designated for listed species. The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend. Critical habitat designation identifies areas that contain the physical and biological features essential to the conservation of listed species and that may require special management or protection.

The Service published a proposed rule for designating critical habitat for the lynx DPS on November 9, 2005 (70 FR 68294), and a final rule designating 1,841 square miles (mi^2) (4,768 square kilometers (km^2)) of critical habitat on November 9, 2006 (71 FR 66008). On July 20, 2007, the Service announced that it would review the final rule after questions were raised about the integrity of scientific information used and whether the decision made was consistent with the appropriate legal standards. Based on our review of the rule, we determined that it was necessary to revise the critical habitat designation for lynx. We published a proposed rule to revise the designation on February 28, 2008 (73 FR 10860), and a final rule designating 39,000 mi^2 (101,010 km^2) of critical habitat on February 25, 2009 (74 FR 8616). In 2010, the U.S. District Courts in the Districts of Montana and Wyoming remanded the revised critical habitat designation to the Service. On September 26, 2013, the Service published a proposed rule to revise the designation for the lynx DPS to include 41,547 mi^2 (107,607 km^2) of critical habitat within five units in Maine, Minnesota, Montana, Idaho, Washington, and Wyoming (78 FR 59430). In September, 2014, the Service will finalize the revised critical habitat designation for the lynx DPS.

This Environmental Assessment (EA) presents the purpose of and need for critical habitat designation, the proposed action and alternatives, and an evaluation of the direct, indirect, and cumulative effects of the alternatives pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA) as implemented by the Council on Environmental Quality's regulations (40 CFR 1500, *et seq*.) and according to the U.S. Department of Interior (USDI) NEPA procedures. This EA will be used by the Service to decide whether or not critical habitat will be designated as proposed, if the proposed action requires refinement, or if further analyses are needed through preparation of an Environmental Impact Statement (EIS). If the proposed action is selected as described, or with minimal changes, and no further environmental analyses are needed, then a Finding of No Significant Impact (FONSI) would be the appropriate conclusion of this process.

1.1.1. Purpose of the Action

The purpose of this proposed action is to revise the designation of critical habitat for the Canada lynx DPS. A primary purpose of the ESA is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved"

(section 2(b)). Critical habitat designation describes the physical and biological features essential to the conservation of listed species and identifies areas containing those features that may require special management considerations or protection (section 3(5)(A)). The proposed action describes the physical and biological features essential to the conservation of the lynx DPS and identifies the areas the Service has determined meet the criteria for designation as critical habitat.

1.1.2. Need for the Action

The need for this action is to comply with section 4 of the ESA, which requires that critical habitat be designated for endangered and threatened species unless such designation is not prudent. On March 24, 2000, the Service published the final rule listing the lynx DPS as threatened in portions of 14 States--Colorado, Idaho, Maine, Michigan, Minnesota, Montana, New Hampshire, New York, Oregon, Utah, Vermont, Washington, Wisconsin, and Wyoming (65 FR 16052). In that rule, we determined that designation of critical habitat for the lynx was prudent. We designated critical habitat for the lynx in 2006, withdrew it in 2007, and re-designated it in 2009. In 2010, the courts remanded the 2009 designation, and in the currently-proposed revised designation the Service addresses the issues raised by the courts.

Critical habitat is one of several provisions of the ESA that aid in protecting the habitats of listed species until populations have recovered and threats have been addressed so that the species can be removed from the list of threatened and endangered species. Critical habitat designation is intended to assist in achieving long-term protection and recovery of the lynx DPS and the ecosystems upon which it depends. Section 7(a)(2) of the ESA requires consultation for Federal actions that may affect critical habitat to avoid destruction or adverse modification of these habitats. Under section 4(b)(2) of the ESA, the Secretary shall designate critical habitat on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat upon a determination that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless the Secretary determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species.

1.2. Background

1.2.1. Canada Lynx

The Canada lynx is a medium-sized cat with long legs and large, well-furred paws. Its long, black ear tufts and short, black-tipped tail distinguish the lynx from the similar but much more common bobcat (*Lynx rufus*). Lynx generally measure 30 to 35 inches (in) (75 to 90 centimeters (cm)) long and weigh 14 to 31 pounds (lb) (6 to 14 kilograms (kg)) (Quinn and Parker 1987; Moen *et al*. 2010a; Maine Department of Inland Fisheries and Wildlife 2012, *unpublished data*). The lynx's large feet and long legs make it highly adapted for traversing and hunting in deep snow. Lynx hybridization with bobcats has been documented in Minnesota, Maine, and New Brunswick (Schwartz *et al*. 2004; Homyack *et al*. 2008), where male bobcats bred with female lynx to produce fertile offspring with lynx-like ear tufts, intermediate foot-size, and bobcat-like fur (Interagency Lynx Biology Team 2013).

The Canada lynx is broadly distributed across northern North America from eastern Canada to Alaska (McCord and Cardoza 1982). It is strongly associated with the expansive, continuous boreal forests of those areas, and its range largely overlaps that of its primary prey, the snowshoe hare (*Lepus americanus*), also a boreal forest specialist (Bittner and Rongstad 1982; Mowat *et al*. 2000; Aubry *et al*. 2000). The southern periphery of the boreal forest extends into parts of the northern contiguous United States, where it transitions to the Acadian forest in the Northeast (Seymour and Hunter 1992), deciduous temperate forest in the Great Lakes regions, and subalpine forest in the Rocky Mountains and Cascade Mountains in the west (Agee 2000). In the contiguous United States, these transitional boreal forests become discontinuous and patchy, preventing both lynx and hares from broadly achieving densities similar to those of the northern boreal forests (Wolff 1980; Buehler and Keith 1982; Koehler 1990; Koehler and Aubry 1994; Aubry *et al*. 2000). These forests eventually become too fragmented and isolated in the contiguous United States to support hares at the landscape densities and distributions necessary to support lynx home ranges (Interagency Lynx Biology Team 2013) or lynx populations over time.

Snow conditions also determine the distribution of lynx (Ruggiero *et al*. 2000). Lynx are morphologically and physiologically adapted for hunting snowshoe hares and surviving in areas that have cold winters with deep, fluffy snow for extended periods. These adaptations provide lynx a competitive advantage over potential competitors, such as bobcats or coyotes (*Canis latrans*) (McCord and Cardoza 1982; Buskirk *et al*. 2000b; Ruediger *et al*. 2000; Ruggiero *et al*. 2000). Bobcats and coyotes have a higher foot load (more weight per surface area of foot), which causes them to sink into the snow more than lynx. Therefore, bobcats and coyotes cannot hunt efficiently in fluffy or deep snow and are at a competitive disadvantage to lynx. Long-term snow conditions presumably limit the winter distribution of potential lynx competitors such as bobcats (McCord and Cardoza 1982) or coyotes. These adaptations may also help lynx avoid predators such as mountain lions (*Puma concolor*; Squires and Laurion 2000) and fisher (*Martes pennanti*; Vashon *et al.* 2012), which also have higher foot-loading, making them less efficient in deep, fluffy snow conditions (Krohn *et al.* 2005).

Lynx occurrence has been documented in 24 States in the northern contiguous United States (McKelvey *et al*. 2000a). However, northern (Canadian and Alaskan) lynx populations are cyclic, with large population swings occurring over 8- to 11-year intervals and lagging a year or two behind snowshoe hare population cycles (Elton and Nicholoson 1942; Mowat *et al*. 2000; Interagency Lynx Biology Team 2013). When hares are abundant, northern lynx populations increase quickly and dramatically; when hare numbers subsequently decline, large numbers of lynx disperse widely in search of food (Slough and Mowat 1996; Mowat *et al*. 2000). Historically, during and after these events, often referred to as lynx population "irruptions," many lynx dispersed into the northern contiguous United States, often occurring temporarily in habitats that are incapable of supporting lynx populations over time (Thiel 1987; McKelvey *et al*. 2000a). Many records of lynx in the contiguous United States appear to be related to such events (McKelvey *et al*. 2000a).

Persistent, productive lynx populations (interbreeding lynx populations that have occupied particular areas consistently over time) in the contiguous United States occur in northern Maine, northeast Minnesota, northwest Montana/northeast Idaho, north-central

Washington, and the Greater Yellowstone Area of southwest Montana and northwest Wyoming. Recently, lynx reproduction also has been documented in northern New Hampshire (in 2010 and 2011), northern Vermont (in 2009, 20011, and 2012), eastern Maine (in 2010), and breeding is likely in some areas of western Maine (U.S. Fish and Wildlife Service 2013a). Whether the small breeding populations in New Hampshire and Vermont will persist is uncertain (Interagency Lynx Biology Team 2013), and regional-scale modeling suggests that habitat and snow conditions there are likely insufficient to support viable lynx populations over time (Hoving *et al.* 2005). Additionally, from 1999 to 2006, researchers captured 218 lynx in Alaska and Canada and released them into high-elevation forests in western Colorado (Devineau *et al*. 2010). Although 122 (56 percent) of these lynx had died by June 2010 (Shenk 2010), some subsequently established home ranges in Colorado and produced kittens in some years. Some also dispersed into northern New Mexico, northeastern Utah, and southern and western Wyoming, though no reproduction has been documented among any of the lynx that left Colorado. Other lynx from this introduced population traveled through Wyoming, Montana, and Idaho, and into southern Canada, and others traveled to Arizona, southern Utah, eastern Nevada, Kansas, Nebraska, Iowa, and South Dakota, with most of the latter animals ultimately dying in inhospitable habitats in those places (Devineau *et al*. 2010).

Populations that are composed of a number of discrete subpopulations, connected by dispersal, are called metapopulations (Hanski and Gilpin 1991; McKelvey *et al*. 2000b). Lynx populations in the contiguous United States appear to function as metapopulations (McKelvey *et al.* 2000b; 65 FR 16052–16082; 68 FR 40077–40099; 71 FR 66025–66035; 74 FR 8616–8641). They are generally small populations isolated from one another, though most are directly connected to larger lynx populations in Canada (McKelvey *et al*. 2000b; U.S Fish and Wildlife Service 2005). Lynx disperse in both directions across the Canada–U.S. border (Aubry *et al.* 2000; Moen *et al.* 2010b; Vashon *et al.* 2012), and this connectivity and interchange with lynx populations in Canada is thought to be essential to the maintenance and persistence of lynx populations in the contiguous United States (McKelvey *et al.* 2000b; U.S Fish and Wildlife Service 2005; Interagency Lynx Biology Team 2013; Squires *et al.* 2013).

Lynx are highly specialized predators of snowshoe hares and are dependent on landscapes with high-density snowshoe hare populations for survival and reproduction (McCord and Cardoza 1982; Quinn and Parker 1987; Aubry *et al*. 2000). Estimates of landscape-scale hare densities needed to support lynx populations in the contiguous United States have ranged from 0.2 to 0.7 hares per acre (ac) (0.5 to 1.8 hares per hectare (ha)) (Ruggiero *et al*. 2000; Steury and Murray 2004; Moen *et al.* 2012; Simons-Legaard *et al.* 2013). Lynx and snowshoe hares are strongly associated with what is broadly described as boreal forest (Bittner and Rongstad 1982; McCord and Cardoza 1982; Quinn and Parker 1987; Agee 2000; Aubry *et al*. 2000; Hodges 2000a, 2000b; McKelvey *et al*. 2000a). The predominant vegetation of boreal forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.) (Elliot-Fisk 1988). Lynx habitat can generally be described as moist boreal forests that have cold, snowy winters and a snowshoe hare prey base (Quinn and Parker 1987; Agee 2000; Aubry *et al*. 2000; Buskirk *et al*. 2000a; Ruggiero *et al*. 2000). The boreal forests that lynx use in the contiguous United States are characterized by patchily-distributed moist forest types with high hare densities in a matrix of other habitats (e.g., hardwoods, dry forest, non-forest) with low landscape hare densities. In these areas, lynx incorporate the matrix habitat (non-boreal forest habitat elements)

into their home ranges and use it for traveling between patches of boreal forest that support high hare densities where most lynx foraging occurs.

In the contiguous United States, the boreal forest landscape is naturally patchy and transitional because it is the southern edge of the boreal forest range, where there also is increased prevalence of non-forested land uses (e.g., agriculture, development). This generally limits snowshoe hare populations in the contiguous United States from achieving landscape densities similar to those of the expansive northern boreal forest in Canada, where snowshoe hares are generally more abundant and more evenly distributed across the landscape (Wolff 1980; Buehler and Keith 1982; Koehler 1990; Koehler and Aubry 1994). Consequently, important foraging habitat for lynx is often more limited and fragmented in the contiguous United States than it is in the northern boreal forests of Canada and Alaska (Berg and Inman 2010) and overall habitat quality is lower. In some areas, patches of habitat containing snowshoe hares become so small and fragmented that the landscape cannot support lynx home ranges (Interagency Lynx Biology Team 2013) or populations. Additionally, the presence of more snowshoe hare predators and competitors at southern latitudes may inhibit the potential for high-density hare populations (Wolff 1980). As a result, lynx generally occur at relatively low densities in the contiguous U.S. compared to the high lynx densities that occur in the northern boreal forest of Canada (Aubry *et al*. 2000) or the densities of species such as the bobcat, which is a habitat and prey generalist.

The boreal forest landscape is naturally dynamic. Forest stands within the landscape change as they undergo succession (transition from one stage in the development of a mature forest to another) after natural or human-caused disturbances such as fire, insect epidemics, wind, ice, disease, and forest management (Elliot-Fisk 1988; Agee 2000). As a result, lynx habitat within the boreal forest landscape is a shifting mosaic of habitat patches of variable and continually changing quality. That is, boreal forests contain stands of differing ages and conditions, some of which provide lynx foraging or denning habitat (or may provide these in the future depending on patterns of disturbance and forest succession) and some of which serve as travel routes for lynx moving between foraging and denning habitats (McKelvey *et al*. 2000c; Hoving *et al*. 2004).

Because lynx population dynamics, survival, and reproduction are closely tied to snowshoe hare availability, snowshoe hare habitat is the primary component of lynx habitat. Lynx generally concentrate their foraging and hunting activities in areas where snowshoe hare densities are high (Koehler *et al*. 1979; Ward and Krebs 1985; Murray *et al*. 1994; O'Donoghue *et al*. 1997, 1998; Simons-Legaard *et al*. 2013). Snowshoe hares feed on conifers, deciduous trees, and shrubs (Hodges 2000b) and are most abundant in forests with dense understories that provide forage, cover to escape from predators, and protection during extreme weather (Wolfe *et al*. 1982; Litvaitis *et al*. 1985; Hodges 2000a, 2000b).

Over much of the lynx's range, hare densities are higher in regenerating, earlier successional forest stages because they often have greater understory structure than mature forests (Buehler and Keith 1982; Wolfe *et al*. 1982; Koehler 1990; Hodges 2000b; Homyack 2003; Griffin 2004). Because understory density within a forest stand changes over time as the stand undergoes succession, (i.e., as earlier successional stages with dense understories advance

to more mature stands with reduced understory structure), hare habitat quality and corresponding hare densities also shift continually across boreal forest landscapes. However, snowshoe hares can be abundant in mature forests with dense understories, particularly in the Northern Rocky Mountains portion of the DPS (Griffin 2004; Hodges *et al*. 2009; Squires *et al*. 2010; Berg *et al*. 2012), and these mature forests may be a source of hares for other adjacent forest types (Griffin and Mills 2009). Lynx do not occur everywhere within the range of snowshoe hares in the contiguous United States (Bittner and Rongstad 1982; McCord and Cardoza 1982). This may be due to inadequate abundance, density, or spatial distribution of hares in some places, or the absence of snow conditions that would allow lynx to express a competitive advantage over other hare predators, or a combination of these factors.

Within the boreal forest, lynx den sites are located where coarse woody debris, such as downed logs and windfalls, provides security and thermal cover for lynx kittens (McCord and Cardoza 1982; Koehler 1990; Slough 1999; Squires and Laurion 2000; Organ *et al*. 2008; Squires *et al*. 2008; Moen and Burdett 2009). The amount of structure (e.g., downed, large, woody debris) appears to be more important than the age of the forest stand for lynx denning habitat (Mowat *et al*. 2000), although in western Montana, 80 percent of documented dens occurred in mature stands (Squires *et al*. 2008).

Because of the patchiness and temporal nature of high-quality snowshoe hare habitat across much of the range of lynx in the contiguous United States, lynx populations in the DPS require large boreal forest landscapes with high average snowshoe hare densities to ensure that sufficient high-quality snowshoe hare habitat is available and to ensure that lynx may move freely among patches of habitat and among subpopulations of lynx. Individual lynx maintain large home ranges, reported as generally ranging from 12 to 83 mi^2 (31 to 216 km^2) (Koehler 1990; Aubry *et al*. 2000; Squires and Laurion 2000; Squires *et al*. 2004; Vashon *et al*. 2005, 2008). The size of lynx home ranges varies depending on abundance of snowshoe hares, the lynx's gender and age, the season, and the density of lynx populations (Koehler 1990; Poole 1994; Slough and Mowat 1996; Aubry *et al*. 2000; Mowat *et al*. 2000; Vashon *et al*. 2005, 2008). When hare densities decline, for example, lynx enlarge their home ranges to obtain sufficient amounts of food to survive and reproduce (Slough and Mowat 1996; Mowat *et al*. 2000). When hare densities are very low and lynx hunting success declines, many lynx abandon home ranges and disperse, often over long distances, in search of areas with greater food resources (Slough and Mowat 1996; Mowat *et al*. 2000). Although some of these dispersing lynx survive and reestablish home ranges elsewhere, many never find areas of high hare densities and die en route, often soon after initiating dispersal (Mowat *et al*. 2000).

Lynx are highly mobile and regularly move long distances (greater than 60 mi (100 km)) (Aubry *et al*. 2000; Mowat *et al*. 2000; Moen *et al*. 2010b; Vashon *et al*. 2012). Lynx disperse primarily when previously adequate habitats become temporarily inadequate due to snowshoe hare population declines (Ward and Krebs 1985; Slough and Mowat 1996; O'Donoghue *et al*. 1997; Poole 1997). Lynx may disperse at any time of year (Moen *et al*. 2010b). Subadult lynx disperse even when hares are abundant (Poole 1997), presumably to establish new home ranges. Lynx also make exploratory movements outside their home ranges (Aubry *et al*. 2000; Squires *et al*. 2001).

Snowshoe hares comprise a majority of the lynx diet throughout its range (Nellis *et al*. 1972; Brand *et al*. 1976; Koehler 1990; Apps 2000; Aubry *et al*. 2000; Mowat *et al*. 2000; von Kienast 2003; Squires *et al*. 2004a), and hare abundance is the major driver of lynx population dynamics (see below). Lynx prey opportunistically on other small mammals and birds, particularly during lows in snowshoe hare populations, but alternate prey species do not sufficiently compensate for low availability of snowshoe hares, and lynx populations cannot persist over time in areas with consistently low hare densities (Brand *et al*. 1976; Brand and Keith 1979; Koehler 1990; Mowat *et al*. 2000).

Lynx populations in Canada fluctuate in response to the cycling of snowshoe hare populations (Elton and Nicholson 1942; Hodges 2000a; Mowat *et al*. 2000), with synchronous fluctuations in lynx numbers emanating from the core of the Canadian population and spreading over vast areas, generally lagging hare numbers by one year (McKelvey *et al*. 2000a; Mowat *et al*. 2000). When hares are abundant, lynx have larger litter sizes, higher kitten survival, and lower adult mortality, resulting in rapid lynx population growth during the increase phase of the hare cycle (Slough and Mowat 1996; Mowat *et al*. 2000). When snowshoe hare populations are low, female lynx produce few or no kittens that survive to independence (Nellis *et al*. 1972; Brand *et al*. 1976; Brand and Keith 1979; Poole 1994; Slough and Mowat 1996; O'Donoghue *et al*. 1997; Aubry *et al*. 2000; Mowat *et al*. 2000). When hares decline, lynx mortality rates increase, largely because of starvation, as do home range sizes and dispersal/emigration rates (Ward and Krebs 1985; O'Donoghue *et al*. 1997; Poole 1997; Mowat *et al*. 2000). Lynx numbers decline dramatically during the "crash" phase of the hare cycle (Slough and Mowat 1996; Mowat *et al*. 2000), with large numbers of lynx dispersing in search of food. Historically, this has resulted in irruptions—large numbers of lynx entering the northern contiguous U.S.—such as the unprecedented "explosions" of lynx observed in the 1960s and 1970s (McKelvey *et al*. 2000a). During these events, many lynx occurred in anomalous habitats, suffered high mortality, and numbers declined dramatically within a few years of irruptive peaks (Thiel 1987; McKelvey *et al*. 2000a).

Although snowshoe hare populations in Canada show strong, regular population cycles, these types of synchronous, intrinsically generated fluctuations are generally much less pronounced or absent entirely among hare populations in the contiguous United States (Hodges 2000b; Hodges *et al*. 2009; Scott 2009). In the contiguous United States, the degree to which regional lynx population fluctuations are influenced by local snowshoe hare population dynamics is unclear. However, it is anticipated that because of variability in the timing and intensity of lynx irruptions from Canada, and natural fluctuations in snowshoe hare populations, there will be periods when lynx densities within the DPS are extremely low. This dynamic likely predated the historical lynx record and we consider such fluctuations, including periods of very low lynx density, to be a natural part of lynx dynamics within the DPS. Where lynx populations are contiguous with cyclic hare populations in Canada, lynx presence and population dynamics in the contiguous United States appear to be more influenced by the occurrence of irruptions from Canada than by intrinsically generated snowshoe hare population cycles within the DPS range.

Additional information on the biology and status of the lynx can be found in the final listing rule published in the *Federal Register* on March 24, 2000 (65 FR 16052), the clarification of findings published in the *Federal Register* on July 3, 2003 (68 FR 40076), and the proposed

rule to revise the critical habitat designation published in the *Federal Register* on September 26, 2013 (78 FR 59430).

1.2.2. Previous Federal Actions

On July 8, 1998, the Service published a proposed rule to list the lynx as threatened (63 FR 36994). The Service published a final rule listing the lynx as threatened on March 24, 2000, and found that the designation of critical habitat for the lynx was prudent (65 FR 16052). As a result of an order from the U.S. District Court for the District of Columbia, the Service again determined the lynx was threatened in a clarification of findings published on July 3, 2003 (68 FR 40076). The Court ordered the Service to propose critical habitat by November 1, 2005, and issue a final critical habitat rule by November 1, 2006. The Service published the final rule designating critical habitat for the lynx DPS on November 9, 2006 (71 FR 66007). On July 20, 2007, the Service announced that it would review the final rule after questions were raised about the integrity of scientific information used and whether the decision made was consistent with the appropriate legal standards. Based on our review of the rule, we determined that it was necessary to revise the critical habitat designation for lynx. The Service subsequently published a proposed rule to revise the designation on February 28, 2008 (73 FR 10860), and a final rule designating 39,000 mi^2 (101,010 km^2) of critical habitat on February 25, 2009 (74 FR 8616). In 2010, in a lawsuit brought by environmental plaintiffs, the District Court in Montana remanded the designation to the Service due to flaws it perceived in our rationale for not designating CH in Colorado and in six National Forests in Idaho and Montana. Also in 2010, in a lawsuit brought by the Washington and Wyoming State Snowmobile Associations, the District Court in Wyoming enjoined the 2009 designation, but only with regard to CH in Washington State, due to its concerns with our consideration of economic impacts to snowmobile interests. On September 26, 2013, the Service published a proposed rule to revise the designation for the lynx DPS to include 41,547 mi^2 (107,607 km^2) of critical habitat within five units in Maine, Minnesota, Montana, Idaho, Washington, and Wyoming (78 FR 59430). The Service will finalize the revised critical habitat designation for the lynx DPS in September, 2014.

1.3. Critical Habitat

Section 4(a)(3) of the ESA states that critical habitat shall be designated to the maximum extent prudent and determinable and that such designation may be revised periodically, as appropriate. Section 4(b)(2) of the ESA requires that critical habitat designation be based on the best scientific information available and that economic and other impacts must be considered. Areas may be excluded from critical habitat designation if it is determined that the benefits of excluding them outweigh the benefits of their inclusion, unless failure to designate such areas will result in the extinction of the species.

Critical habitat is defined in section 3(5)(A) of the ESA as: (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Section 3(5)(C) also states that critical habitat "shall not include the entire geographical area which can be occupied by the threatened or endangered species" except when the Secretary of DOI determines that the areas are essential for the conservation of the species. The term "conservation" as defined in section 3(3) of the ESA means "to use and the use of all methods and procedures which are necessary to bring an endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." Within the geographic area occupied by the species, the Service will designate only areas currently known to support the physical and biological features essential to the conservation of the species. If information available at the time of designation does not show an area provides features essential for the conservation of the species or that the area may require special management considerations or protection, then the area should not be included in the critical habitat designation.

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize designation of critical habitat may not include all habitat eventually determined as necessary to recover the species. For these reasons, areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) and the regulatory protections afforded by section 7(a)(2) jeopardy standard and the section 9 take prohibition, as determined on the basis of the best available information at the time of the action. We specifically anticipate that Federally funded or assisted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans, or other species conservation planning efforts if new information available to planning efforts calls for a different outcome. Critical habitat contributes to the recovery strategy but does not by itself achieve recovery plan goals.

1.3.1. Consequences of Designation, the Section 7 Consultation Process

Section 7(a)(2) of the ESA requires every Federal agency, in consultation with and with the assistance of the Secretary, to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. In fulfilling these requirements, each agency is to use the best scientific and commercial data available. This section of the ESA sets out the consultation process, which is further implemented by regulation (50 CFR Part 402).

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

on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species.

Each Federal agency is to review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat. If the action may affect a listed species or critical habitat, consultation with the Service is needed. Informal consultation is an optional process that includes all discussions and correspondence between the Service and a Federal agency or designated non-Federal representative, designed to assist the Federal agency in determining whether formal consultation or a conference is required. If during consultation it is determined by the Federal agency, with the written concurrence of the Service, that the action is not likely to adversely affect listed species or critical habitat, the consultation process is terminated, and no further action is necessary.

During informal consultation, the Service may suggest modifications to the action that the Federal agency and any applicant could implement to avoid the likelihood of adverse effects to listed species or critical habitat. If the proposed action is likely to adversely affect a listed species or designated critical habitat, formal consultation with the Service is required. Formal consultation is a process between the Service and a Federal agency or applicant that--(1) determines whether a proposed Federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; (2) begins with a Federal agency's request and submittal of a complete initiation package; and (3) concludes with the issuance of a biological opinion and incidental take statement by the Service.

With the request to initiate formal consultation, the Federal agency is to include--(1) a description of the proposed action, (2) a description of the area that may be affected, (3) a description of any listed species or critical habitat that may be affected, (4) a description of the manner in which the listed species or critical habitat may be affected and an analysis of cumulative effects, (5) relevant reports including any environmental impact statement, environmental assessment, or biological assessment, and (6) any other relevant and available information.

Unless an extension is provided, formal consultation concludes 90 days after its initiation. Within 45 days after concluding formal consultation, the Service is to deliver a biological opinion to the Federal agency and any applicant. The biological opinion will include the Service's opinion on whether the action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat. If the action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat, the biological opinion will include a reasonable and prudent alternative, if any exist. A reasonable and prudent alternative is a recommended alternative action that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that would avoid the likelihood of jeopardizing the continued existence of the listed species or the destruction or adverse modification of designated critical habitat.

Additionally, in cases where the Service concludes that an action (or the implementation of any reasonable and prudent alternatives) and the resultant incidental take of listed species will

not violate section 7(a)(2), the Service will provide with the biological opinion a statement concerning incidental take that--(1) specifies the impact of the take on the species, (2) specifies the reasonable and prudent measures to minimize the impact, (3) sets forth terms and conditions that must be complied with by the Federal agency or any applicant to implement the reasonable and prudent measures, and (4) specifies procedures to handle any individuals actually taken. Reasonable and prudent measures, along with the terms and conditions that implement them, cannot alter the basic design, location, scope, duration, or timing of the actions and may involve only minor changes. Any taking covered in the incidental take statement and in compliance with the terms and conditions of the statement is not prohibited taking under the ESA and no other authorization or permit under the ESA is required.

1.3.2. Physical and Biological Features Essential to Lynx

In accordance with sections 3(5)(A) and 4(b)(2) of the ESA and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, the Service is required to base critical habitat determinations on the best scientific data available to identify the physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features include, but are not limited to--(1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing (or development) of offspring; and (5) habitats protected from disturbance or that are representative of the historic geographical and ecological distributions of a species.

Generally, lynx habitat is broadly described as the boreal forest landscape. In the contiguous United States, the boreal forest is more transitional and patchily-distributed compared to the extensive and homogenous true boreal forests of northern Canada and Alaska (Agee 2000). This difference is because the boreal forest is at its southern limits in the contiguous United States, where it transitions to the Acadian forest in the Northeast (Seymour and Hunter 1992), deciduous temperate forest in the Great Lakes regions, and subalpine forest in the Rocky Mountains and Cascade Mountains in the west (Agee 2000). The Service uses the term “boreal forest” because it generally encompasses most of the vegetative descriptions of the transitional forest types that comprise lynx habitat in the contiguous United States (Agee 2000).

The specific biological and physical features essential to the conservation of the lynx DPS are:

> Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:
>
> > (a) Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface;

(b) Winter conditions that provide and maintain deep fluffy snow for extended periods of time;

(c) Sites for denning that have abundant coarse woody debris, such as downed trees and root wads; and

(d) Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.

1.3.3. Criteria for Defining Essential Habitat

The criteria the Service used to define and identify areas of habitat essential to the conservation of lynx in the contiguous United States are described in the proposal to revise the designation of critical habitat for the lynx DPS (78 FR 59446-59448; September 26, 2013).

2. DESCRIPTION OF ALTERNATIVES

This section describes the proposal for critical habitat for the lynx. This section also describes alternatives to the proposed action.

2.1. Alternative A - No Action Alternative

Alternative A, the No Action alternative is defined as no designation of critical habitat for Canada lynx. An analysis of a No Action alternative is required by NEPA, and it provides a baseline for analyzing effects of action alternatives.

2.2. Alternative B – Proposed Action

Alternative B, the proposed action, would designate critical habitat units (CHUs) in portions of northern Maine (CHU 1), northeastern Minnesota (CHU 2), the Northern Rocky Mountains (CHU 3, northwestern Montana and northeastern Idaho), north-central Washington (CHU 4), and the Greater Yellowstone Area (CHU 5, southwestern Montana and northwestern Wyoming) as described in the September 26, 2013, proposed rule (78 FR 59430). The sizes of the proposed CHUs under Alternative B are shown in Table 1. Table 2 shows the land ownership by State within the areas proposed for designation under Alternative B.

TABLE 1. Alternative B: Approximate Areas of Five CHUs Proposed for Lynx.[1]

CRITICAL HABITAT UNIT	Miles[2]	Kilometers[2]
1. Maine	11,162	28,908
2. Minnesota	8,147	21,101
3. Northern Rocky Mountains (Idaho/Montana)	10,474	27,129
4. Northern Cascades (Washington)	1,999	5,176
5. Greater Yellowstone Area (Montana/Wyoming)	9,766	25,293
Total[2]	**41,547**	**107,607**

TABLE 2. Alternative B: Critical Habitat Proposed for Canada Lynx by Land Ownership and State (mi^2).[1]

STATE	Federal	State	Private	Tribal	Other
Idaho	45	0.04	0	0	0
Maine	0	823	10,230	87	22
Minnesota	3,864	2,732	1,473	78	0
Montana	11,326	395	1,276	370	0.5
Washington	1,830	164	4	0	0
Wyoming	6,746	15	68	0	0
Total	**23,811**	**4,129**	**13,050**	**535**	**23**
Percent of Proposed Designation	**57.3**	**9.9**	**31.4**	**1.3**	**0.06**

[1]These figures are subject to change in the Final Environmental Assessment and the Final Critical Habitat Rule if unit boundaries are further refined.

[2]Due to differences in rounding precision, the total miles^2 presented in Table 1 are slightly less than the total in Table 2.

Each of the proposed CHUs in Alternative B is considered to have been occupied by lynx at the time of listing and each contains the physical and biological features essential to the conservation of lynx as defined above in 1.3.2 and in the proposed rule. As a result, each CHU contains habitat that provides space for individual and population growth and for normal behavior; food; cover or shelter; sites for denning and rearing of offspring; and conditions that complement the physiological adaptations of lynx for hunting in snow. The CHUs proposed for designation in Alternative B provide boreal forest habitat for breeding, non-breeding, and dispersing lynx in metapopulations across the species' range in the contiguous United States.

Areas within each CHU may be excluded from the final critical habitat designation after consideration of economic impacts or any other relevant impacts if the Secretary determines that the benefits of such exclusion outweigh the benefits of specifying such areas as part of the critical habitat and upon a determination that such exclusion would not result in the extinction of the lynx DPS. Other areas may be added to or removed from the proposed CHUs if new or improved information, such as refined mapping of lynx habitats, becomes available to the Service in the time between the proposed and final designations.

2.3. Alternatives Considered but Not Fully Evaluated

2.3.1. Designation of All Areas within the Geographic Range of the Lynx DPS

The lynx was listed in the 14 States that have both some boreal forest-like habitat types and verified records of lynx. Designating critical habitat in every area considered within the geographic range of lynx was not carried forward as an alternative because the ESA specifies that such designation may only occur when the Secretary has determined that all areas within the range are essential to the conservation of the listed species. The Secretary has not made that determination with regard to the lynx DPS. Furthermore, many of the areas considered within the geographic range of the lynx DPS do not meet the criteria for critical habitat because they do not support lynx populations and appear, based on our assessment of the historical record of verified lynx occurrence and past and present habitat conditions, never to have been capable of supporting resident lynx populations.

2.3.2. Designation of Recovery Areas as Described in the Lynx Recovery Outline

In 2005, the Service completed a Recovery Outline for the lynx DPS (U.S. Fish and Wildlife Service 2005). Recovery Outlines are brief, internally-developed documents intended as preliminary strategies for conservation of listed species until a formal Recovery Plan is completed. The lynx Recovery Outline was prepared by Service staff experienced in lynx conservation and/or recovery planning under the ESA and two lynx experts from the U.S. Forest Service (USFS). It presented historical and current lynx distribution, ecology, and population dynamics as understood at that time, and it described preliminary recovery objectives and actions. It also introduced concepts regarding the relative importance of different geographic areas to the persistence of lynx in the DPS, and identified areas as “core,” “provisional core,” “secondary,” or “peripheral” based primarily on lynx records over time and evidence of reproduction.

Designating the areas identified in the Recovery Outline was not analyzed as an alternative because most of those areas do not meet the criteria for critical habitat as described in the proposed rule, and because the Recovery Outline was not developed to satisfy the needs of this critical habitat designation. The Recovery Outline provides important information that was considered during the critical habitat designation process but, because the recovery areas identified in it do not all meet the criteria for designation of critical habitat, an alternative including them does not meet the purpose and need for the proposed action and, therefore, is not sufficient to be carried forward as an alternative.

2.4. Comparison of Alternatives

Table 3 summarizes the potential effects of the alternative critical habitat designations. Potential effects on resources are summarized from the analyses presented in Chapter 4.

TABLE 3. Comparison of Potential Effects of Lynx Critical Habitat Designation.

Resource Category	Alternative A - No Action	Alternative B
Number of Critical Habitat Units	0	5

Total Miles^2 Designated	0	41,547

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

For purposes of this discussion, proposed action area refers to the area described under Alternative B and in the proposed rule. The areas proposed for designation as lynx critical habitat are rural, forested lands. Uses and activities are primarily related to forest management, wildland fire management, and recreation. Federal, Private, State, Tribal, and County lands are included in the proposed action.

The designation of critical habitat directly affects only Federal agencies. The ESA requires Federal agencies to ensure that actions they fund, authorize, or carry out do not destroy or adversely modify critical habitat to the extent that the action appreciably diminishes the value of the critical habitat for the survival and recovery of the species. Individuals, organizations, States, local and Tribal governments, and other non-Federal entities are only affected by the designation of critical habitat if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding (for example, section 404 Clean Water Act permits from the U.S. Army Corps of Engineers or funding of activities by the Natural Resource Conservation Service).

3.1. Physical Environment

The areas considered for designation as lynx critical habitat are generally described as boreal or cold temperate forests having cold winters with deep snow and providing a snowshoe hare prey base (Quinn and Parker 1987, McKelvey *et al*. 2000a, Mowat *et al*. 2000) (see also sections 1.2.1 and 1.3.2, above). The predominant vegetation of this forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.) (Elliot-Fisk 1988). In the northern contiguous United States, true boreal forest is at the southern limit of its range, and it transitions to the Acadian forest in the Northeast, deciduous temperate forest in the Northeast and Great Lakes, and subalpine forest in the west (Seymour and Hunter 1992, Agee 2000).

Counties, by state, within the proposed action area, Alternative B, are:

1) Idaho (CHU 3) - Boundary
2) Maine (CHU 1) - Aroostook, Franklin, Penobscot, Piscataquis and Somerset
3) Minnesota (CHU 2) - Cook, Koochiching, Lake, and St. Louis
4) Montana (CHU 3) - Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Missoula, Pondera, Powell, and Teton; (CHU 5) - Carbon, Gallatin, Park, Stillwater, and Sweet Grass
5) Washington (CHU 4) - Chelan and Okanogan
6) Wyoming (CHU 5) – Fremont, Lincoln, Park, Sublette, and Teton

3.2. Fish, Wildlife and Plants

Many species of birds, mammals, fish, reptiles, amphibians, insects, and plants occur in the transitional boreal forests used by lynx within the proposed action area, Alternative B. Because of the sizes and broad longitudinal distribution of the proposed CHUs, it would be impractical to list and evaluate impacts of the proposed action on all species that occur in or seasonally use the proposed action area. Below, we focus on species listed or proposed for listing under the ESA.

3.2.1. Threatened and Endangered Species

The status, biology, distribution, and habitat requirements of lynx are described above in Chapter 1; therefore, these topics will not be discussed in detail in this section. Other Federally-listed threatened and endangered species, as well as those proposed for listing under the ESA, that may occur within the proposed action area (Alternative B), are listed in Table 4. Other listed species whose mapped ranges overlap the proposed CHUs but whose habitats are not expected to overlap lynx habitat are discussed below for each CHU, as are species that are candidates for listing under the ESA.

TABLE 4. Federally Listed Species That May Occur in the Proposed Action Area, Alternative B.

COMMON NAME	SCIENTIFIC NAME	ESA STATUS[1]	CHU(s)
MAMMALS			
American wolverine	*Gulo gulo luscus*	P(T)	3, 4, 5
Gray wolf[2]	*Canis lupus*	E	1,4
Grizzly bear	*Ursus arctos horribilis*	T	3, 4, 5
Northern long-eared bat	*Myotis septentrionalis*	P(E)	1, 2
BIRDS			
Northern spotted owl	*Strix occidentalis caurina*	T	4
Yellow-billed cuckoo	*Coccyzus americanus*	P(T)	3, 4, 5
FISH			
Atlantic salmon	*Salmo salar*	E/CH	1
Bull trout	*Salvelinus confluentus*	T/CH	3, 4
Kootenai River white sturgeon	*Acipenser transmontanus*	E	3
PLANTS			
Eastern prairie fringed orchid	*Platanthera leucophaea*	T	1
Furbish lousewort	*Pedicularis furbishiae*	E	1
Spalding's catchfly	*Silene spaldingii*	T	3
Ute ladies'-tresses	*Spiranthes diluvialis*	T	4, 5
Water howellia	*Howellia aquatilis*	T	3

[1]E = Endangered, T = Threatened, P(E) = Proposed Endangered, P(T) = Propsed Threatened, CH = Critical Habitat designated.
[2]De-listed in CHUs 2, 3, and 5; proposed for de-listing in CHUs 1 and 4.
[3]Proposed Threatened due to similarity of appearance to the bull trout.

MAINE

In Maine (CHU 1), the mapped range of the endangered Atlantic salmon (*Salmo salar*) partially overlaps the proposed lynx critical habitat. Within the proposed lynx CHU boundary, there are 1,524 miles of river/stream and 20,821 ac of pond/lake designated as critical habitat for the Atlantic salmon. However, because salmon critical habitat includes only water bodies and proposed lynx critical habitat specifically excludes water bodies, there is no actual physical overlap between salmon critical habitat and proposed lynx critical habitat. The ranges of two listed plants, the endangered Furbish lousewort (*Pedicularis furbishiae*) and the threatened Eastern prairie fringed orchid (*Platanthera leucophaea*) also occur within CHU 1. The Furbish lousewort occurs only in discrete habitat patches on the banks of the St. John River. The Eastern prairie fringed orchid occurs only at a single site in a bog that encompasses <10 acres. Combined, the ranges of these two listed plants comprise less than one percent of the proposed lynx critical habitat. The range of the endangered gray wolf (*Canis lupus*) also overlaps this unit and, although individual dispersing wolves may rarely occur in this unit, it is not occupied by a wolf pack or population. In June, 2013, the Service proposed to de-list the gray wolf (78 FR 35664). The range of the endangered Eastern puma (*Puma (=felis) concolor couguar*) also overlaps this unit; however, the Service considers this subspecies to be extinct. Additionally, the Service has proposed to list the Northern long-eared bat (*Myotis septentrionalis*) as endangered, and its mapped range completely overlaps proposed lynx critical habitat in CHU 1 (78 FR 61045).

MINNESOTA

In northeastern Minnesota (CHU 2), there are no listed species or designated critical habitats that overlap proposed lynx critical habitat. The entire state is considered within the range of the Northern long-eared bat, which is proposed for listing as endangered. If listed, the bat's range would completely overlap proposed lynx critical habitat in CHU 2.

NORTHWEST MONTANA AND NORTHEAST IDAHO

In northwestern Montana and northeastern Idaho (CHU 3), about 95 percent of proposed lynx critical habitat is overlapped by the mapped range of the threatened bull trout (*Salvelinus confluentus*). Within the proposed lynx CHU boundary, there are 897 miles of river/stream and 18,116 ac of lake designated as critical habitat for the bull trout. However, because trout critical habitat includes only water bodies and proposed lynx critical habitat excludes water bodies, there is no actual physical overlap between trout critical habitat and proposed lynx critical habitat. Also in CHU 3, the mapped range of the threatened grizzly bear (*Ursus arctos horribilis*) completely overlaps proposed lynx critical habitat. No critical habitat has been designated for the bear. In this CHU, the mapped ranges of the endangered white sturgeon (*Acipenser transmontanus*) and black-footed ferret (*Mustela nigripes*) and the threatened piping plover (*Charadrius melodus*), Spalding's catchfly (*Silene spaldingii*), and water howellia (*Howellia aquatilis*) also overlap proposed lynx critical habitat. However, the habitats of these species differ markedly from those of the lynx, and they are not expected to occur in lynx habitats. Additionally, five species either proposed or candidates for listing under the Act have mapped ranges that overlap proposed lynx critical habitat. These include the North American wolverine

(*Gulo gulo luscus*) and the yellow-billed cuckoo (*Coccyzus americanus*), both proposed for listing as threatened; and the Sprague's pipit (*Anthus spragueii*), whitebark pine (*Pinus albicaulis*), and meltwater lednian stonefly (*Lednia tumana*), each a candidate for listing. The Service de-listed the Northern Rocky Mountains DPS of the gray wolf (to which wolves in Montana and Idaho belong) in May, 2011 (76 FR 25590).

WASHINGTON

In north central Washington (CHU 4), proposed lynx critical habitat is completely overlapped by the mapped ranges of the endangered gray wolf (*Canis lupus*) and the threatened grizzly bear, bull trout, and Northern spotted owl (*Strix occidentalis caurina*). Within the proposed lynx CHU boundary, there are 56 miles of river/stream and 56 ac of lake designated as critical habitat for the bull trout. However, because trout critical habitat includes only water bodies and proposed lynx critical habitat excludes water bodies, there is no actual physical overlap between trout critical habitat and proposed lynx critical habitat. Also within proposed lynx critical habitat, there are 15,219 ac of designated critical habitat for the Northern spotted owl; this represents 1.1 percent of the proposed lynx critical habitat. In this CHU, the mapped ranges of the threatened Ute ladies'-tresses (*Spiranthes diluvialis*) also overlap proposed lynx critical habitat. However, the habitat of this species differs markedly from that of the lynx, and it is not expected to occur in lynx habitats. Additionally, the mapped ranges of the North American wolverine and the yellow-billed cuckoo, both proposed for listing as threatened, completely overlap proposed lynx critical habitat. The mapped ranges of the greater sage grouse (*Centrocercus urophasianus*) and whitebark pine, both candidates for listing, also overlap proposed lynx critical habitat.

SOUTHWEST MONTANA AND NORTHWEST WYOMING

In southwestern Montana and northwestern Wyoming (CHU 5), proposed lynx critical habitat is completely overlapped by the mapped range of the threatened grizzly bear. In this CHU, the mapped ranges of the endangered black-footed ferret and the threatened Ute ladies'-tresses also overlap proposed lynx critical habitat. However, the habitats of these species differ markedly from those of the lynx, and they are not expected to occur in lynx habitats. Additionally, the mapped ranges of the North American wolverine and the yellow-billed cuckoo, both proposed for listing as threatened, overlap proposed lynx critical habitat. The mapped ranges of the greater sage grouse, Sprague's pipit, and whitebark pine, each a candidate for listing, also overlap proposed lynx critical habitat. The Service de-listed the gray wolf in Montana in May, 2011 (76 FR 25590), and in Wyoming in September, 2012 (77 FR 55530).

3.3. Forest Resources and Timber Management

MAINE

Maine's forest stands generally are diverse and more closely resemble "natural" forests than more intensively managed forests in other parts of the world. The composition of Maine's forests is heavily influenced by three factors: extensive areas of thin, rocky, and poorly drained soils intermixed with scattered areas of deeper, better-drained soils; a cool climate and abundant

precipitation; and recurrent insect outbreaks (Maine Land Use Regulation Commission 2006). A mixture of hardwoods and softwoods comprise the forest, changing in composition as one moves to higher elevations. North and east the principal softwoods found in Maine are spruce, fir, white pine, cedar, tamarack, and hemlock; the principal hardwoods are maple, birch, beech, oak, ash, and aspen.

MINNESOTA

The composition of Minnesota's forests in the proposed action area includes boreal, coniferous, and mixed coniferous/deciduous vegetation types dominated by pine, balsam fir, black and white spruce, northern white cedar, tamarack, aspen, paper birch, conifer bogs and shrub swamps (USFS 2004c).

NORTHERN ROCKY MOUNTAINS

Wildfire plays a major role in determining forest structure, composition, and landscape patterns in the Northern Rocky Mountains (USFS 2004a). Fire history data from the Interior Columbia Basin region shows extensive fire activity at least every decade or two between the mid-1500s and the early 1900s (Barrett *et al*. 1997). An estimated 12 million ac burned in the Northern Rockies between 1908 and 1947 (Lotan *et al*. 1985). Wildfire also plays a major disturbance role in the higher elevations (Ruediger *et al*. 2000). Although lynx habitat typically has mixed severity to stand-replacing fire regimes, some fires are low intensity, which allow some tree species to survive fire. Species such as western larch, lodgepole pine, ponderosa pine, quaking aspen, western white pine, and whitebark pine have adapted to fire as a major disturbance agent (Fischer and Bradley 1987; Smith and Fischer 1997).

Logging has changed the landscape in some places. Extensive salvage logging took place after mountain pine beetles killed many trees during the 1960s through the 1980s in large areas in the southern and eastern parts of the Northern Rocky Mountains. The cedar-hemlock zone in north Idaho and the larch-lodgepole forests of western Montana, also have a history of logging on the more accessible terrain. Timber harvest in these areas has contributed to the quantity of young regenerating forests, although fire has had a much greater impact.

Western White Pine

Western white pine (*Pinus monticola)* grows in the moist forests in northern Idaho and western Montana. This tree has been in major decline over the past 60 years. The proportion of western white pine declined from 44 percent in 1941 to 5 percent in 1979 (Graham 1990). Since the 1930s, more than 95 percent of western white pine cover types have converted to grand fir, Douglas fir, or western red cedar/western hemlock (USFS 1998). Only about 90,000 ac in north Idaho and western Montana still exist in the western white pine cover type.

Western white pine blister rust (*Cronartium ribicola*) spread to the Pacific Northwest from Europe by the 1920s (Graham *et al*. 1993) and killed many trees in northern Idaho. Naturally occurring rust-resistant wild trees were discovered in the 1940s; genetic resistance is carried in a low percentage of the population. It is the intent of selection to increase the

frequency of resistant genes in western white pine planting stock (Byler *et al*. 1993). As such, rust-resistant trees are an important part of the genetic resource program.

Fire suppression and logging changed the distribution of western white pine. In pre-settlement times, low- and intermediate-intensity burns produced an irregular, patchy mosaic of vegetation. Fires frequently shortened how long the dense stem-exclusion stages lasted by thinning them and breaking holes in uniform canopies (Zack and Morgan 1994). Western white pine is well adapted to mixed-severity fire regimes. In fact, it depends on the disturbance that fire or timber harvest provides to remove competing conifers and allow it to become established (Graham 1990). It's relatively thin bark and moderately flammable foliage make it intermediate in fire resistance (Graham 1990). In the past, fire removed competing conifer species, favoring western white pine (Graham 1990).

Whitebark Pine

Whitebark pine (*Pinus albicaulis*) is a hardy subalpine conifer that tolerates poor soils, steep slopes, and windy exposures and, thus, can become established on dry, cold subalpine sites. It grows at higher elevations across much of the Northern Rockies, mainly at the timberline. It is a component of many habitat types and is distributed across a variety of site conditions in the Northern Rockies area. It is a relatively slow growing tree and can be out-competed for growing space by conifers that are more shade tolerant. Where it competes with other species that need full sun, whitebark pine is often able to maintain its presence (Tomback *et al*. 2001).

In lynx habitat, whitebark pine is found in productive places where it grows densely with western white pine, spruce, and fir. It also grows in sparse clusters in exposed, rocky sites in the upper subalpine zone. The harsh conditions typical at whitebark pine sites do not produce stem densities capable of supporting hare populations and are not considered lynx habitat.

Historically, whitebark pine accounted for ten to 15 percent of the forest cover in the Northern Rocky Mountains (Arno and Weaver 1990); now it amounts to only about 5 percent (about 1.5 million ac). Blister rust and fire suppression have substantially reduced its presence, and mountain pine beetle epidemics have further reduced isolated populations. Mixed severity fires historically maintained whitebark pine at high elevations by removing competing species. Without fire, whitebark pine is eventually replaced by subalpine fir and spruce, and the fire regime changes from mixed severity to stand-replacing (Arno and Hoff 1990; Keanne *et al*. 2002).

Quaking Aspen

Quaking aspen *(Populus tremuloides)* is distributed throughout the Northern Rockies in small, isolated areas. It is more abundant east of the Continental Divide in Montana and in the southern half of the Northern Rockies area in Wyoming and Utah (Mueggler 1985). It needs full sun and commonly grows in even-aged forests, although some single-storied aspen forests have two distinct generations consisting of a more or less substantial scattering of older "veterans" that stand among younger, more slender trees. The older trees usually are the survivors of fire a decade or more previously that killed much of the stand and gave rise to the younger trees.

Many of the younger trees grow as tall as the older ones and, with them, form a closed canopy (Sheppard and Jones 1985).

Fire has been the most important disturbance factor in aspen, changing structural stages and composition and minimizing competition by conifers. If fire takes place infrequently (every 50 years or so) and is intense enough to kill most or all of the aspen trees and the competing conifers, aspen is retained (Sheppard and Jones 1985). Mixed-severity fires where aspen grow at mid- and high elevations historically regenerated aspen and maintained the balance between aspen and conifers. Severe or repeated burns may reduce site quality, resulting in reduced growth rates.

Conifers growing beneath aspen are generally younger than the aspen because aspen regenerates so quickly from existing roots (Sheppard and Jones 1985). Many aspen forests are threatened with invasion by shade-tolerant conifers. From 50-70 percent of the quaking aspen in USFS Region 1 has been lost because of fire suppression and grazing (USFS 1998). Grass, forbs, shrubs, or conifers may replace aspen in the absence of fire (Sheppard and Jones 1985).

Western Larch

Western larch *(Larix occidentalis)*, found in northern Idaho and western Montana, grows in diverse habitats ranging from moist Douglas fir and grand fir, western red cedar and western hemlock, to cooler subalpine fir sites. In the Northern Rockies, larch is the conifer species that most needs full sun. It regenerates in full sunlight and large openings after major disturbances. To survive, larch must maintain a dominant position in the stand; if overtopped by other trees, larch growth will slow and the trees usually die.

Larch is extremely well adapted to fire. Mature larch have bark that is often more than 6 inches thick, containing little resin, with branches far above the ground, and foliage of low flammability. Larch is able to tolerate crown scorch and defoliation, producing new foliage and re-branching on the trunk. At least some of the old larch usually survives even intense fires, at least long enough to produce a seed crop to regenerate receptive seedbeds. Even young larch wounded at the base of the stem in a surface fire, heal and continue to grow for centuries. On burned seedbeds, larch seedlings generally outgrow their competitors (Arno and Fischer 1995).

Historically, fire maintained larch. Stand-replacing fires burned moist larch sites at mean intervals of from 120-350 years, and low- to intermediate-intensity fires favored larch by thinning out much of the competition (Arno and Fischer 1995; Carlson *et al*. 1995). After fire, a residual cover of 20 percent or fewer large trees was common historically (Quigley *et al*. 1996). This structure of large residual trees occurring singly or in small groups has declined in many areas. In moist places lacking fire or thinning, trees that are more shade-tolerant can replace larch in 90-140 years. With fire or thinning, larch can maintain dominance for 200 years or more.

Western larch has declined in the Northern Rockies because of fire suppression and logging (USFS 1998), and the big larch have been logged out in many places. Tree species composition has shifted to shade-tolerant Douglas fir, grand fir, and lodgepole pine. Because of

the shift, current fire-return intervals are longer than 100 years and fire behavior is more extreme than the combination of fires that historically favored larch (USFS 1998).

Ponderosa Pine

Ponderosa pine *(Pinus ponderosa)* is not significantly represented in lynx habitat in the Northern Rockies because it generally grows in places too dry to support snowshoe hares and, therefore, lynx. However, it is represented in lynx habitat in the warm, moist cedar forests of northern Idaho and western Montana.

Historically, ponderosa pine forests developed because frequent low-intensity surface fires killed the competing conifers and prepared a seedbed for the pine (Steele 1987). Low-intensity fires helped maintain them because sapling and larger ponderosa pine are more fire resistant than most other species (Oliver and Ryker 1990; Saveland and Bunting 1987). Fire has also played a major role in cedar forests with ponderosa pine. The diverse species and structures in these forests indicate pre-settlement fire patterns were highly variable; however, most cedar forests experienced mixed-severity fire. Although shorter fire-return intervals likely favored ponderosa pine, it also was able to survive some stand-replacing fires (Smith and Fischer 1997).

In most of lynx habitat, without some disturbance that reduces stem densities, shade-tolerant trees out-compete ponderosa pine. Even if fire were returned to these ecosystems, the younger ponderosa pine would need to be thinned out for them to grow large enough to be able to endure fire. In many places, timber harvest has removed the large pines. In other places, the big trees are so stressed from high understory stem densities that needle diseases and bark beetles are killing them at high rates.

Lodgepole Pine

Lodgepole pine *(Pinus contorta)* is the main cover type on a large portion of the Northern Rockies affected environment. Extensive landscapes of near-pure lodgepole or lodgepole/spruce/fir are common in the eastern and southern half of the Northern Rockies area. Lodgepole pine grows larger and mixes readily with western larch, grand fir, and western white pine on moister sites in the northern and western portion of the Northern Rockies area. Lodgepole pine is a short-lived tree in western Montana and northern Idaho, and long-lived in eastern Montana and the central Rocky Mountains.

Lodgepole pine is fire-adapted, establishing itself on burned areas (Lotan *et al*. 1985), often at very high densities, with stocking as high as 10,000-40,000 stems per ac. Most lodgepole forests in the Rocky Mountains were established because of fire. Historically, fire burned more frequently in lodgepole pine than previously believed. It was once thought that lodgepole forests were merely the result of stand-replacing fires, but research has shown fire-free intervals of only 22-50 years in many lodgepole-dominated forests (Lotan *et al*. 1985), suggesting fire reduced stand densities. This indicates fire plays a role in both establishing and perpetuating lodgepole pine. The effects of low-intensity fires in lodgepole forests depend on the availability of seed and amount of duff removed. These low-intensity fires removed some

trees, allowing others to grow into large trees. Without some disturbance, lodgepole forests become quite dense with small-diameter stems, small crowns, and little diversity.

Except for extensive timber harvests in eastern Montana in the 1950s and 1960s, and mountain-pine-beetle salvage harvests in the southeast part of the Northern Rockies area in the 1970s and 1980s, fire suppression has resulted in extensive areas of mature lodgepole. Much of it is susceptible to infestation by mountain pine beetles – large-scale infestations result in conditions favorable to stand-replacing wildfires or succession to shade-tolerant species (USFS 1998).

NORTH CASCADES

Approximately 1,999 mi^2 (1,279,360 ac) in Washington State are proposed for critical habitat designation in the North Cascades. Of the area proposed, 91.5 percent is Federally owned. Most of this land is managed in accordance with the Lynx Conservation Assessment and Strategy (LCAS; Ruediger *et al*. 2000, Interagency Lynx Biology Team 2013), or to similar standards of habitat protection. Another 164 mi^2 (8.2 percent) is owned by the WADNR, which manages these lands in accordance with their Lynx Habitat Management Plan (WADNR 2006).

GREATER YELLOWSTONE AREA

Approximately 9,766 mi^2 (6,250,240 ac) in southwest Montana and Northwest Wyoming are proposed for critical habitat designation in the Greater Yellowstone Area. Of the area proposed, 96.9 percent is Federally owned. Most of this land is managed in accordance with the Northern Rockies Lynx Management Direction (USFS 2007) and associated National Forest Land and Resource Plan amendments, the Lynx Conservation Assessment and Strategy (LCAS; Ruediger *et al*. 2000, Interagency Lynx Biology Team 2013), or to similar standards of habitat protection.

3.4. Wildland Fire Management

3.4.1. Background - Fuels, Fire and Fire Ecology

Natural disturbances such as fire, wind, and insects and diseases, help shape forests. In the Rocky Mountain region, periodic fire is the dominant disturbance process that changes forests. While fire is widespread, it's seldom uniform. Every forest has its own characteristic pattern of fire intensity, frequency and size. **Fire regime** and **condition class** are used to characterize fire.

FIRE REGIME

The fire regime describes the historic pattern of fire: how often (frequency); how hot (intensity); and how big (scale). Ecologists often describe three fire regimes for Western forests – **understory, mixed severity** and **stand replacing** (Fischer and Bradley 1987; Agee 1993; Smith and Fisher 1997; Brown and Smith 2000; Keane *et al*. 2002; Hessburg and Agee 2003).

- **Understory** – Understory fires burn frequently, from once a year, to about once every 35 years, as low-intensity surface fires that consume forest litter and kill small trees in small patches. Understory fires generally do not kill large, fire-resistant trees or substantially change the structure of the forest.
- **Mixed Severity** – Mixed-severity fires burn about every 35-100 years, as a mixture of understory and stand-replacing fires, or as intermediate-intensity fires that kill fire-susceptible trees while the fire-tolerant trees survive. Mixed-severity fires produce a diverse forest in terms of both structure and species composition. The fires are medium sized.
- **Stand Replacing** – Stand-replacing fires are infrequent, burning about every 100-200 years. Stand-replacing fires are large and high-intensity, killing most trees. They make way for a new forest.

Historically, fires at lower elevations tended to be understory and fires at higher elevations stand-replacing, although substantial variability has always existed.

CONDITION CLASS

Condition class describes the departure from historic conditions based on the number of missed fire cycles and the amount of change in forest structure and species composition (Schmidt *et al*. 2002).

- **Condition Class 1** – Fires have burned as often as they did historically; the risk of losing key ecosystem components is low. Vegetation composition and structure is intact and functioning.
- **Condition Class 2** – Fires have not burned as often as they did historically, missing one or more cycles. The risk of losing ecosystem components is moderate, with moderate changes in fire size, intensity, landscape patterns or vegetation.
- **Condition Class 3** – Fires have significantly departed from their historic frequency by missing multiple cycles. The risk of losing ecosystem components is high, with dramatic changes to fire size, intensity, landscape patterns or vegetation.

3.4.2. Policy

After 1910, when wildfires burned 3 million ac and killed 85 people in northern Idaho and western Montana, the USFS began to direct serious efforts toward suppressing wildfires. Severe fires occurred again in 1919, 1924, 1925, and 1934. In 1935, the agency adopted the "10 am policy," which said all fires were to be controlled by 10 am the day following their discovery. The policy was repealed in 1973 as the agency shifted from simply controlling fire to managing it and using it as a tool on Federal lands.

Fire suppression for the last 80 years, along with grazing and logging, has changed the way fires burn and changed the age, species composition, and structure of some forests (Quigley *et al*. 1996). Further, as people have built more homes in the woods, the ability to allow fire has decreased even as the fire risk has increased. The results of excluding fire became increasingly apparent during the last decade of the 20th century, which led the Federal government to

reexamine wildland fire policies. In 1995, the *Federal Wildland Fire Management Policy* was written to recognize the essential and inevitable role of fire in maintaining forest health, and the need to restore fire to that natural role rather than eliminate it from forests.

Other recent fire management documents include *Managing the Impact of Wildfires on Communities and the Environment - the National Fire Plan* (USFS and DOI 2000), and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment – 10-Year Comprehensive Strategy* (USFS 2001). The broad goals for wildland fire policy established by these documents are to:

- Improve fire prevention and suppression;
- Promote community assistance;
- Restore fire-adapted ecosystems (rehabilitate the land after fire); and
- Reduce hazardous fuels.

Another recent document, *The Development of a Collaborative Fuel Treatment Program* (USFS *et al*. 2003), describes criteria for selecting fuel treatment projects. The multi-party MOU (memorandum of understanding) for implementing the program defines high-priority areas as the Wildland Urban Interface (WUI) and Condition Classes 2 and 3 outside the WUI.

MAINE

Although the proposed action area in Maine includes approximately 53,000 ac of WUI, fire management activities are not prevalent in CHU 1 due to the low risk of forest fires (Maine's historical fire regime is estimated to be between 330 and 1,253 years) (Industrial Economics, Inc. 2008). Further, because most of the area proposed for designation is privately-owned, no clear Federal nexus for fire management activities exists that may result in section 7 consultation to consider the lynx. Therefore, the Service does not anticipate that fire management activities on non-Federal lands will be affected by designation of lynx critical habitat.

MINNESOTA

In Minnesota, the short interval fire-adapted species like red and white pine had an average fire return interval of 22 years in Itasca State Park (USFS 2004c). In the Boundary Waters Canoe Area Wilderness, a natural fire rotation of 50-100 years was documented by Heinselman (1973), with more frequent, low intensity surface fires in the red and white pine (25 years), and less frequent, high-intensity surface and crown fires occurring in jack pine and spruce/fir types (50-80 years).

Changes in the historical fire regimes in these ecosystems today have produced live and dead fuel buildups in the understory of the red and white pine. In addition, little natural regeneration is occurring in these stands due to lack of disturbance. Jack pine in the Boundary Waters Canoe Area Wilderness is expected to decline as well without fire. At the same time, increases in the spruce/fir type have led to increased frequency of spruce budworm epidemics which, in turn, produces an increased fuel hazard from the bug-killed trees (Stocks 1985). Effects of fire suppression on wildlife also are of concern, with the decline of sharp-tailed grouse

(*Tympanuchus phasianellus*) as a result of fire exclusion from the grassland-brushland ecosystems of Minnesota, as documented by Berg (1979) perhaps the most dramatic example.

The northern and eastern parts of the Superior National Forest, including the Boundary Waters Canoe Area Wilderness, tend to have drier, shallower soils, and can have a significant summer fire season if rainfall is below average. Vegetation in this area tends to be more boreal with a higher component of spruce/fir. Reoccurring spruce budworm outbreaks help create large amounts of dead woody fuel, which is compounded by windthrow from thunderstorm microbursts on a regular basis. This fuel complex helped produce several large, high intensity wildfires in the early 1990s. Timber harvest, followed by post-sale prescribed burning, has been useful in treating this fuel complex outside the Boundary Waters Canoe Area Wilderness. Within the Boundary Waters Canoe Area Wilderness, prescribed natural fire is just beginning to help break up the somewhat homogenous age class and vegetation types which have been conducive to spruce budworm outbreaks.

The net effect of the alteration of historic fire return intervals has increased fuel accumulations above historic levels over large, continuous areas. The possible consequences include increased fire suppression costs and increased risk of:

- large, severe fires;
- losing key components that define ecosystems;
- serious injury or loss of life to firefighters and the general public;
- health effects due to smoke and visibility impairment; and
- property loss and damage to landscapes that have economic value to people.

Changes in national fire management policy, based on advances in the field of fire ecology, direct that "…fire, as a critical natural process, will be integrated in land and resource management plans and activities on a landscape scale" (USFS and USDI 2001).

NORTHERN ROCKY MOUNTAINS

Lynx habitat occurs in three kinds of forests in the proposed action area:

- Mixed conifer, which includes Douglas fir, western larch, grand fir and western red cedar
- Spruce/fir, which includes Engelmann spruce, subalpine fir, alpine larch, hemlock, and whitebark pine
- Lodgepole pine

Fire suppression has changed the natural age distribution of forests at the landscape level. Stand-replacing fires used to create a mosaic of even-aged forests across the landscape. Today there are proportionately fewer young, even-aged forests and more forests that are older (Hessburg *et al*. 1999; Losensky 2002; Hillis *et al*. 2003). Excluding fire has reduced the role played by low- and intermediate-intensity fires, and it also has resulted in a more homogenous landscape with an increased potential for larger stand-replacing fires.

In dry, warm low-elevation forests, frequent low-intensity fires are the norm, maintaining stands of large, widely-spaced trees. Fire suppression has resulted in making many of these forests unnaturally dense, and the species composition has shifted away from ponderosa pine to Douglas fir. These forests are where the greatest detrimental effects of excluding fire can be seen. These forests are in Condition Classes 2 and 3; these forests are **not** lynx habitat.

In mid-elevation mixed conifer forests, fires range from understory to stand-replacing (USFS 2004a). Today, mixed conifer forests are generally denser and contain fewer fire tolerant species like western larch and ponderosa pine than historically, when low- to intermediate-intensity fires kept parts of the forest thinned out (Quigley *et al*. 1996). Forest conditions today contribute to greater numbers of large high-intensity fires.

In high-elevation spruce/fir and lodgepole pine forests, infrequent, severe fires are the norm. Because fires tend naturally to burn only about every 100-200 ears in these cold, moist, high-elevation forests, fire suppression has had less of an effect than in other fire regimes. These naturally-dense forests are close to historic conditions, generally in Condition Class I. Low- and intermediate-intensity fires do sometimes occur at higher elevations; such fires kill competing fir and spruce trees so whitebark pine can grow and some lodgepole pine can develop old growth characteristics.

Generally, fire suppression has altered fire return intervals. Some places have missed one or more fire cycles and fall into Condition Classes 2 or 3. Others are closer to historic conditions, in Condition Class 1. Table 5 describes the fire regimes and condition classes of the three kinds of forests that constitute lynx habitat in Montana.

TABLE 5. Lynx Habitat in Montana by Forest Type, Fire Regime, and Condition Class.

Forest Type	Fire Regime	Condition Class	% Lynx Habitat
Mixed Conifer	Mostly Mixed-severity	1, 2, or 3	26
Spruce/Fir	Mostly Stand-replacing with Some Mixed-severity	1	40
Lodgepole Pine	Mostly Stand-replacing with Some Mixed-severity	1	34

3.4.3 Fuels Program

Congress annually sets goals, program size, and emphasis through its appropriations (USFS 2004a). Table 6 summarizes the annual USFS fuels program projected for Montana based on these priorities. In Montana, about 70 percent of the fuel treatments would occur inside the WUI. Inside the WUI, fuel treatments most likely would be within a mile of structures and designed to reduce the intensity and spread of fire to communities. Many treatments would occur in the dry, low- to mid-elevation forests (not considered lynx habitat) that have missed one or more fire cycles and are in Condition Classes 2 and 3.

TABLE 6. Projected Annual Fuels Program (in acres) in Montana.

	Inside WUI[1]	Outside WUI	Total
Fuels Program	38,000	16,000	54,000

Forested, not Wilderness	3,578,000	8,335,000	11,913,000

[1] Wildland-Urban Interface.

At current funding levels, about 38,000 ac, or 1 percent, of the WUI would be treated annually. The other 30 percent of fuel treatments would occur outside the WUI, where treatments normally would be designed to restore or maintain a semblance of the forest structure historically produced by fire. Generally, restoration would occur on lands in Condition Classes 2 or 3, and maintenance in Condition Class 1 lands. Annually about 16,000 ac would be restored or maintained by using prescribed fires and removing vegetation, generally in areas that have missed one or more fire cycles. Vegetation may be removed to reduce fire intensity before burning or as the sole method of treatment.

Each year where wildland fire use is allowed, some areas would be restored or maintained by lightning fires. In Montana, wildland fire use is allowed on about 3 million ac, which includes most wilderness areas and some non-wilderness land. At current funding levels, less than 1 percent of the area outside the WUI could be treated annually.

3.5. Grazing/ Livestock Management

Livestock grazing occurs on Federal, State, and conservation group lands in proposed CHUs 3, 4, and 5. An active grazing allotment is a place where a term grazing permit is in effect and where livestock grazing is expected to occur most years. Depending on how the allotment is classified and the language in the grazing permit, this may consist of either cattle or sheep, or occasionally both. In general, the season of use extends from early June to late September, although this varies depending on elevation, plant communities, and management requirements.

MAINE AND MINNESOTA

Little to no grazing occurs in the proposed action areas in Maine or Minnesota.

NORTHERN ROCKY MOUNTAINS AND GREATER YELLOWSTONE AREA

National Forests in the Northern Rockies and Greater Yellowstone proposed action areas (CHUs 3 and 5) are managed in accordance with the Northern Rockies Lynx Management Direction (NRLMD; USFS 2007). Over all, there are 3,751 Federal grazing allotments on the 18 national forests covered by the NRLMD. Of these, 1,765 or 47 percent contain habitat considered potentially suitable for lynx, and 1,633 of these are active. An analysis of active grazing allotments containing lynx habitat shows that:

- 38 percent have less than one-third of their acreage in mapped (potential) lynx habitat;
- 32 percent have more than one-third but less than two-thirds of their acreage in mapped lynx habitat;
- 29 percent have more than two-thirds of their acreage in mapped lynx habitat; and
- 15 percent lack management strategies similar to those described in the original LCAS (Ruediger *et al*. 2000).

Within proposed CHU 3, there are 267 grazing allotments on National Forest System lands and 16 on lands managed by The Nature Conservancy (Industrial Economics, Inc. 2008). Within CHU 5, there are 399 allotments on National Forest lands and three on Bureau of Land Management (BLM) lands (Industrial Economics, Inc. 2008). National Forest allotments are managed under the NRLMD and BLM allotments are managed under the LCAS.

NORTH CASCADES

Within proposed CHU 4, there are 44 grazing allotments covering 884 mi^2 (44 percent) of the proposed lynx critical habitat. Of these, 35 allotments covering 726 mi^2 are on the Okanogan-Wenatchee National Forest, and 9 allotments covering 160 mi^2 are on Washington Department of Natural Resources (WADNR) lands (Industrial Economics, Inc. 2008, USFS 2014 *unpublished data*). Of the 35 allotments on the Okanogan-Wenatchee National Forest, 29 are active cattle-grazing allotments covering 540 mi^2 of proposed critical habitat, and six are vacant allotments (3 cattle and 3 sheep) covering 187 mi^2. Therefore, within CHU 4, there are 38 active grazing allotments covering about 698 mi2, or 35 percent of the proposed lynx critical habitat. Of the 29 active allotments on the Okanogan-Wenatchee National Forest:

- 14 percent have less than one-third of their acreage in proposed lynx critical habitat;
- 31 percent have more than one-third but less than two-thirds of their acreage in proposed lynx critical habitat; and
- 55 percent have more than two-thirds of their acreage in proposed lynx critical habitat.

Grazing on National Forest lands in CHU 4is managed in accordance with the LCAS, and on WADNR lands in accordance with the WADNR Lynx Habitat Management Plan (WADNR 2006), the latter of which does not place any additional restrictions on grazing leases beyond compliance with current State regulations. Resource Management Plans are developed on a site-specific basis, and are designed to maintain native plant communities and plant species diversity, but not to address the specific needs of individual species such as lynx and snowshoe hare.

3.6. Recreation

3.6.1. Definitions

Designated over-the-snow routes are routes managed under permit, agreement, or by the agency, where use is to some extent encouraged either by on-the-ground markings or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency. Routes may be marked on the ground with blue or orange diamonds, bamboo wands, blazes, or difficulty markers. Both groomed routes and the routes identified in outfitter and guide permits are designated by definition.

Groomed routes are designated over-the-snow routes on which the snow surface is packed, leveled, or scarified (with or without set tracks) by equipment towed behind a snowmobile or snow-cat. Businesses and groups do most of the grooming. Snowmobile or cross-country ski clubs often obtain permission through permits or agreements to groom certain

winter trails. Snow roads maintained by permitted snow-cat tours are considered groomed routes. Designated play areas are places specifically identified for winter recreation, such as tubing or snowmobiling, but not including developed ski areas.

Routes and areas that are openly accessible, but not designated (though many are identified on travel plan maps), are considered "open" for winter use; however, their use is not encouraged in any way. The routes are not marked on the ground; they are not identified in brochures or other media, except the travel plan map; they are not groomed; they are not under permit or agreement. Some of these routes and areas are routinely used; others are never accessed.

Areas of consistent snow compaction are places generally covered with snow during winter that are used enough to compact the snow so that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after snowfall. Such places can be areas or linear routes. Compaction may be caused by any human activity. Areas are generally found near snowmobile or cross-country ski routes; in the nearby openings, parks, and meadows; or near ski huts, plowed roads, or winter parking areas. Examples include:

- Some consistently used routes that are open for public use, but not groomed or designated;
- Sledding or snow play areas close to plowed roads;
- Helicopter landing sites regularly used for heli-skiing;
- Ends of the snow roads used for snow-cat tours; and
- Small lakes with little wind scour where people go ice fishing regularly.

3.6.2. Snowmobile Trails

MAINE

Snowmobiling in Maine occurs primarily on private and State lands (Industrial Economics, Inc. 2008). Snowmobile registrations have grown steadily since the mid-1990s, totaling over 100,000 machines in 2004-2005. Snowmobiling in Maine occurs primarily in the "tourist belt" that reaches from Maine's northern coast and then west towards less populated areas. The western trails are wider and longer and attract more snowmobilers. While there have been few changes to the extent of Maine's snowmobile trails, trail routes change within existing road networks from year to year in response to private landowners' logging activities and other requirements.

There are nearly 3,000 miles of snowmobile trails in Maine, and between 74,000 and 100,000 snow machines registered each winter season since the mid-1990s (Industrial Economics, Inc. 2008). About one-quarter (over 780 miles) of these trails are within proposed CHU 1 (Industrial Economics, Inc. 2008). Roughly 80 percent of the trails in CHU 1 are on private commercial timber lands, where there is generally no lynx management that is applicable to recreational activities or that would restrict creation of new snowmobile trails or extension of existing trails (Industrial Economics, Inc. 2008). Some increase in groomed trails for cross-

country skiing is expected but because the sport is not as formally organized as other winter sports, little information is available.

MINNESOTA

Snowmobiling in Minnesota is focused in the northeast region of the State which experiences high quality snow over a long winter season (Industrial Economics, Inc. 2008) and which includes proposed CHU 2. There are almost 19,000 miles of snowmobile trails Statewide, and over 278,000 snow machines were registered in the State in 2007. About six percent (1,217 miles) of these trails are within proposed CHU 2 (Industrial Economics, Inc. 2008). Thirty-eight percent of the trails in CHU 2 are on Minnesota Department of Natural Resources lands, 35 percent are on private lands of unknown ownership, and another 24 percent are on the Superior National Forest (Industrial Economics, Inc. 2008).

Local trails also cross a combination of Federal, State, and county lands, as well as corporate timber and paper company lands, and private lands within the proposed action area. Some corporate lands are being closed to snowmobile recreation due to changes in management or because selling them for development or leasing them for hunting is more profitable. No such closures are presently planned in the proposed action area, but they could limit or reduce the extent of trails in the future. The demand for snowmobile trails is expected to remain flat or decline Statewide, with the majority of trail work currently related to maintenance and not construction of new trails. There may, however, be demand for some new trails on the Superior National Forest (Industrial Economics, Inc. 2008). Some increase in groomed trails for cross-country skiing is expected but because the sport is not as formally organized as other winter sports, little information is available.

NORTHERN ROCKY MOUNTAINS

The Northern Rockies receive several million visitors in all seasons of the year because of its scenic beauty, pristine wild lands, and uncrowded backcountry (USFS 1998, 2004a). Recreational facilities designed for summer use have very little effect on lynx (Ruediger *et al*. 2000). Therefore, this section focuses on winter recreational activities, which have the greatest potential to affect lynx.

Travel Plans

Management direction for winter recreation on National Forest lands is defined by existing Forest Management plans. Generally, they identify where motorized and non-motorized use may occur during what seasons, and they assign areas to various land-use allocations that limit and direct how those areas can be used. Motorized use is prohibited in more than 5 million ac of lynx habitat within designated wilderness areas. Motorized winter recreation may be allowed in some roadless areas or wilderness study areas.

Over-the-snow Recreation

Nationally, snowmobile use grew 34 percent from 1988 to 1995 (USDA Forest Service 1997), much faster than the overall population. Snowmobiling is the second most popular winter sport (Cordell 1999). Increased use has led to increased demands for expanded routes. Table 7 shows the trend in the number of registered snowmobiles in Idaho and Montana. This information is useful in gauging the popularity of snowmobiling, an outdoor activity for which precise estimates of use over time are difficult to obtain. Snowmobile technology has changed rapidly in recent years, making larger, more powerful, and quieter machines available. These new machines let people access previously inaccessible backcountry.

TABLE 7. Growth in Number of Snowmobiles Registered by State[1].

	REGISTERED SNOWMOBILES		AVERAGE GROWTH	
STATE	1989 – 1991	2000 – 2001	Registered Snowmobiles	State Population
Idaho	21,532 in 1991	38,158 in 2001	2.3%	2.5%
Montana	15,100 in 1991	24,600 in 2001	5.0%	1.2%

[1]Data from Idaho Department of Parks and Recreation (2004); Montana Department of Fish, Wildlife and Parks (Walker 2002).

Routes and Areas

People use snowmobiles, snow cats, snowshoes, cross-country skis, and dog sleds on winter trails. In the year 2000, about 3,500 miles of snowmobile trails were groomed in Idaho and Montana, including routes outside Federal lands. Within proposed CHU 3, there are over 1,400 miles of snowmobile trails, with 82 percent on National Forest lands, 14 percent on State lands, and four percent on private timber lands (Industrial Economics, Inc. 2008). The number, distance and locations of routes that are groomed changes from year to year depending on snow conditions and funding. In National Forests, money to pay for grooming snowmobile trails comes from State snowmobile registration funds and a small percentage of gasoline taxes.

Outfitter Permits

A total of 359 permits or agreements authorize winter recreation in the Northern Rockies area, but not all are within the proposed action area (see Table 8). Within the proposed action area the Idaho Panhandle Forests in Idaho and the Lewis and Clark, and Lolo National Forests in Montana have the most permits and agreements authorizing winter recreation in lynx habitat. The BLM has none. Winter outfitters and guides provide a service to people who may lack the skills, equipment, or access to participate on their own in winter activities such as snowmobiling, cross-country or helicopter skiing, and late winter/early spring big game hunting. Such services provide jobs and income to many small rural western communities.

The number of outfitter and guide permits and their level of use have remained relatively steady over the past decade. Generally, new permits or increases in service-days have been issued only when existing permits terminate, or when other outfitters decrease their permitted service-days. A decade ago there was very little outfitted use during winter. Traditionally outfitters in the Northern Rockies area offered hunting trips. Over the past 5-10 years, public demand for family-oriented vacations has increased and the availability of game animals has

decreased. Outfitters have responded by diversifying their businesses and changing the season-of-use in their permits. This has caused an increase in guided snowmobiling, cross-country skiing, and other winter recreation during the last decade. However, the change in season-of-use has not resulted in major increases in overall outfitter-guide use.

TABLE 8. Number of Recreation Special-use Permits and Agreements.

PERMIT/AGREEMENT TYPE	USFS LANDS		TOTALS
	Idaho	Montana	
All recreation permits & agreements	735	1,114	1,849
Winter recreation permits & agreements	86	121	207
Winter recreation permits & agreements in lynx habitat	77	115	192

NORTH CASCADES

Snowmobiling occurs on Federal, State, and private lands within the proposed action area in Washington State (Industrial Economics, Inc. 2008). There are over 36,000 registered snowmobiles in Washington, with more than a third of these in King, Snohomish, and Pierce Counties (Washington State Snowmobile Association 2014). . The Washington State Snowmobile Association (2104) reports there are currently over 3,500 miles of groomed and marked trails in the State, with the majority occurring on public lands. There currently are an estimated 3,000 to 5,000 total miles of trails available for snowmobiling in Washington, of which approximately 200 miles (about 4 to 7 percent) occur within the proposed critical habitat designation on Federal and State lands (U.S. Fish and Wildlife Service and IEc, Inc. 2014). Of the trails in proposed CHU 4, 86 percent on are National Forest lands, 11 percent are on WADNR lands, and 3 percent are on other ownerships (Industrial Economics, Inc. 2008). A 2003 study by the State of Washington predicted a 42 percent increase in the number of people participating in snowmobiling by 2013 (State of Washington 2003); however, it is not clear whether this level of increase has occurred.

Snowmobiling occurs on the Loup Loup block area and on Loomis State Forest trails that are connected to the Okanogan-Wenatchee National Forest trail network. The area is remote, and most snowmobile riding in the Loomis area is on un-groomed trails. Creation of new snowmobile trails in lynx habitat on WADNR lands is precluded by the WADNR Lynx Habitat Management Plan (WADNR 2006), and there is no encouragement for additional use of existing trails. Some increase in groomed trails for cross-country skiing is expected but as the sport is not as formally organized as other winter sports, little information is available. All of the WADNR lands managed in accordance with the Lynx Habitat Management Plan are being considered for exclusion from the final critical habitat designation.

GREATER YELLOWSTONE AREA

In proposed CHU 5, there are 1,155 miles of designated snowmobile trails, all of which are on National Forest lands (Industrial Economics, Inc. 2008). There are 453 miles of trails in Yellowstone National Park; however, none are within the areas proposed for lynx critical habitat.

3.6.3. Ski Areas

There are 16 downhill and cross-country ski areas occupying 9,908 ac within the proposed lynx critical habitat – one on private lands in Maine (CHU 1); the remainder on National Forest lands in the Rocky Mountains of Idaho, Montana, and Wyoming (CHUs 3 and 5; Industrial Economics, Inc. 2008). Due to a variety of factors, the Rocky Mountain region is uniquely well suited to the development of ski areas (USFS 2004a, 2004b). Because of its continental climate and relatively high elevations, this area experiences long, cold winters accompanied by reliable snow that is relatively dry and remains soft due to the infrequency of freeze-thaw and rain events. Additionally, the expansive mountains of this area contain numerous sites that possess the terrain features, such as slope, aspect, and vertical relief that make them well suited for ski area development. Historic settlement patterns have created the basic infrastructure and population base to support the development and successful operation of ski based resorts.

In 1997, the USFS conducted a nation-wide survey that found downhill ski visits increased by 58 percent, an increase even more dramatic than snowmobiling (USFS 1997). Snowboarding, the improvements in skis, and success in the 2002 winter Olympics, have all contributed to the expanding popularity of skiing. Increased use results in increased demand for more and larger ski areas.

There is considerable diversity in the ski areas and resorts in the Rocky Mountain region. Some are purely ski areas operating only in the late fall winter and early spring while others are four season resorts that operate most of the year. Ski areas and resorts include developments such as ski trails, tramways, and ancillary facilities such as restaurants, maintenance buildings, snow making ponds, and parking lots. Ski areas that operated only during the ski season are generally of smaller scale than four season resorts and development of private land at or adjacent to their base areas is less common and extensive. Four season resorts are usually more highly developed with skiing and snowboarding occurring in the winter and spring and hiking and mountain biking occurring in the summer. These resorts also are associated with development on private land at or adjacent to their base areas. These developments frequently include commercial and private lodging, restaurants, bars, retail shops, golf courses, other recreational amenities, and an associated road network. Downhill ski areas usually are highly developed recreation areas; cross-country ski areas are usually less developed.

3.7. Mining and Energy Development

A wide variety of mineral and energy resources occur on lands with lynx habitat. Exploration and development activities associated with these resources may affect lynx by removing or altering native vegetation, contributing to habitat fragmentation, and increasing the potential for human-caused mortality. Across the proposed action area, small scale stone

quarries and gravel pits are the predominant mining activity, with active mines in CHUs 1, 2, 3, and 5. Additionally, large, open pit metal mines are located in CHUs 2 and 5, and oil and gas activities are primarily concentrated in CHU 5 (Industrial Economics, Inc. 2008). Because some of the areas proposed for designation as critical habitat include public and private lands subject to mining, the following descriptions focus on those lands.

3.7.1. Definitions

Surface-disturbing activities associated with mineral and energy resources typically include (USFS 2004a):

- **Prospecting -** Prospecting is identifying an area with potential for mineral development. It involves limited surface disturbance, such as geologic mapping, or soil or water sampling. Prospecting for oil and gas often involves collecting seismic data.
- **Exploration -** Exploration is physically searching for minerals. It often includes building roads, drill pads, underground workings, and trenching.
- **Development -** Development is the work required to prepare a mineral deposit for production. It may include driving underground workings, stripping the overburden from deposits that will be open-pit or strip mined, building waste dumps, and constructing milling and transporting facilities. Oil and gas development includes drilling a series of production wells and building access roads.
- **Production -** Production is removing a mineral from the ground and making it available for final processing and consumption.
- **Reclamation -** Reclamation is restoring the areas disturbed during exploration, development, and production.

3.7.2. Management Constraints

The status of the land affects the legal authorities that apply to management and disposal of minerals. Land is in one of the following status categories:

- Lands reserved from the public domain;
- Acquired lands;
- Lands with outstanding or reserved rights; or
- Private land with Federally owned minerals

Mineral resources may be classified into three categories:

- Mineral materials;
- Locatable minerals; or
- Leasable minerals

The combination of land status and the type of mineral resource define a land management agency's management authority.

MAINE

All active mining operations in the proposed action area are small-scale crushed stone quarries and sand and gravel pits (Industrial Economics, Inc. 2008). Most sites are on private, dry land that has been cleared expressly for the intent of mining operations. Although pit metal mining has not occurred in the State since 1977, the study area encompasses known metal deposits of gold, zinc, lead, and copper and a potential for copper-zinc sulfide deposits in the northern portion of the State. There is limited exploratory activity on-going; however, there is recent renewed interest in developing gold and silver prospects on Bald Mountain in central Aroostook County, where $25 million has been spent on exploration since 1972, and which is within the proposed lynx critical habitat (http://bangordailynews.com/2012/05/03/business/james-irving-addresses-maine-mining-interests-at-umfk-forum/). Maine recently passed legislation to streamline the State's mining permitting and regulatory process, which is expected to make mining areas like Bald Mountain more economically attractive for landowners. Most new mining operations are expected to take place outside the proposed action area. No oil and gas operations were identified in the proposed action area (Industrial Economics, Inc. 2008).

MINNESOTA

The mining industry is a significant contributor to Minnesota's economy. The estimated value of Minnesota's non-fuel mineral production was $1.89 billion in 2004, which ranked 7th in the United States. That same year, Minnesota was the nation's top- ranked iron ore producer and contributed over 75 percent of the nation's total domestic iron ore exports. The State's iron ore mining industry primarily extracts taconite, a low-grade iron ore, which is processed into taconite pellets for steel production. All current taconite mining and exploration occurs in the Mesabi Range, which extends in a narrow band from Grand Rapids in Itasca County to Babbitt in St. Louis County (Industrial Economics, Inc. 2008). Over half of the Mesabi Range is located within CHU 2. The increased global demand for construction steel is expected to lead to the development of new steel production plants in the Great Lakes area and thus an increased demand for taconite.

Additionally, small sand and gravel operations are actively producing in the proposed action area. One peat operation is currently active. Although the State leases 11,750 ac within the proposed action area for mineral development, no mines are active and none are expected to be active in the near future.

NORTHERN ROCKY MOUNTAINS

Mineral Materials

Mineral materials are common minerals such as stone, gravel, clay, cinders, and decorative rock, whose disposal is authorized under the Materials Act of 1947. This act provides for disposing of mineral materials on public lands through bidding, negotiated contracts, or free use. The USFS and BLM have full authority to make decisions about disposing of mineral materials on lands of all status categories.

The USFS and BLM use mineral materials from their lands for building and surfacing system roads and may sell these mineral materials, or issue free-use permits to State and county governments for public projects such as highway construction and maintenance. All contracts contain requirements for reclaiming sites to pre-mining conditions as much as possible.

There are about 2,600 active mineral-material sites on National Forest lands where lynx habitat has been mapped (including documented and potential lynx habitats, both within and outside areas proposed for critical habitat designation). In Fiscal Year 2000, about 800,000 tons of mineral materials worth more than $2.8 million were removed from these lands. Demand for mineral materials is expected to grow as demand increases for public and private infrastructure. The largest increases have been for the very small, free-use permits issued to private individuals for a ton of material or less (a pick-up load). These free-use permit sites rarely result in a pit or need more than minor reclamation.

Excavation, temporary storage, and transport are associated with removing mineral materials at some sites. Typically, sites are small, less than five ac. Most are near or next to roads and do not require substantial amounts of new road. The small, free use permits are almost all next to existing roads. Mineral material sites seldom overlap the high-elevation, remote places where lynx habitat occurs. Only 2-3 percent of mineral-materials sites permitted in the last 15 years were in lynx habitat. Presently, only one mineral-material site in lynx habitat has winter operations. It is anticipated that this proportion will continue in the future.

Locatable Minerals

Locatable minerals, such as gold, silver, copper, and other metals, are subject to the General Mining Law of 1872, as amended. This law grants a statutory right to explore for and develop these minerals, unless the land has been formally withdrawn from mineral entry. The USFS authority is directed at using the surface of National Forest lands (30 U.S.C. 21-54). The USFS may not deny proposed operations or make them impossible by imposing unreasonably restrictive management requirements or conditions. However, the USFS may require mitigation and list requirements to minimize adverse impacts.

Both BLM and USFS regulations say mining operations should minimize adverse environmental impacts to surface resources. The BLM regulations say they are to prevent "unnecessary and undue degradation" and to avoid adverse effects on threatened and endangered species. The USFS regulations include "taking all practicable measures" to maintain and protect wildlife habitat, and to reclaim surface disturbances including rehabilitating wildlife habitat. The USFS regulations also require that roads be built and maintained to minimize or eliminate damage to other resources including wildlife. Unless otherwise authorized, roads that are no longer needed are to be closed, bridges and culverts removed, and the road surface shaped to a natural contour and stabilized.

Current Situation

The area where lynx habitat occurs has a long history of locatable hard-rock minerals activity, mostly exploring and mining for lode gold, silver, copper, and other metals. Today, this

usually takes place in historic mining areas, or where more recent interpretations of the geology lead to the discovery and production of economically valuable deposits. Mining has waned since the late 1800s. Only a fraction of the historic sites operate today, and those that continue, do so with much more stringent environmental protection measures. Most recent activity involves maintaining existing facilities; however, there are few new exploration and production sites. Typically, motorized vehicles use established routes for access. New access requires project-specific analysis and approval.

The majority of surface disturbances are less than 20 ac. Presently there are five larger locatable minerals operations ranging from 100-600 ac on National Forest lands in lynx habitat, all in Montana. Only two are operating; the other three are in the care-and-maintenance or reclamation phases. Future locatable mineral activity is likely to occur in areas of existing operations and where the geology is favorable for economically viable mines. Significant increases in the level of future exploration or development are not expected; the potential for future large mineral discoveries is considered low but possible.

Leasable Minerals

Leasable minerals are Federally owned fossil fuels (oil, gas, coal, oil shale, etc.), geothermal resources, sulfur, and phosphates that are subject to exploration and development under leases, permits, or licenses issued by the Secretary of DOI, with USFS input on National Forest System lands. The 1920 Mineral Leasing Act, as amended, together with the 1987 Federal Onshore Oil and Gas Leasing Reform Act, provide the authority and management direction for Federal leasable minerals on Federal lands. In 1970, the Geothermal Steam Act added steam to the list of minerals that could be leased on National Forest System lands.

Regulations at 36 CFR 228.108 require oil and gas operators to comply with ESA during operations. They require roads and surface disturbances to be reshaped and re-vegetated when closed or abandoned. Mining operators also are obliged to post reclamation bonds to make sure reclamation takes place. Most existing plans include standards and guidelines for reclaiming mining operations.

Acquired Lands (Hard-rock Minerals)

Hard-rock minerals described as locatable on public-domain lands are described as leasable on lands acquired by USFS or BLM after 1891. On lands where the agencies acquired mineral as well as surface rights, BLM issues the prospecting permits and leases for hard-rock minerals. On National Forest acquired lands, BLM must first obtain the consent of USFS.

Oil, Gas, Coal, or Geothermal

The BLM issues oil and gas, coal, and geothermal leases. The most common leases in this area are oil and gas leases which are issued for 10-year terms. Leasing decisions and development decisions are made in two stages:

- First, the USFS makes a lease decision about which lands will be open for leasing, based on an analysis of the known impacts of exploration and development. This decision identifies which areas will be open to development subject to standard lease terms, which areas will be open to development subject to constraints, called lease stipulations, and which will be closed to leasing. The USFS informs BLM of the results and BLM is responsible for issuing the lease.
- Then, after a lease is issued, the lessee has legal rights to explore and develop, subject to the terms of the lease and other applicable State and Federal laws. The lessee must obtain approval from BLM and USFS for post-lease activities. This is when site-specific resource protection measures are developed and are applied as conditions of approval for the surface-use plan of operations. Such measures must be within the scope of the rights granted under the terms of the lease.

Solid Non-energy Leasable Materials

The BLM also issues 10-year term leases for solid non-energy leasable materials, such as phosphate or sodium. The USFS has no consent authority, but BLM generally accepts USFS recommendations.

Current Situation

The oil and gas industry has been stable during the past decade, but is projected to grow. Currently in the Northern Rockies area, about 820,000 ac are under lease for oil and gas, with additional areas pending. All leases stipulate that surveys or studies may be needed to determine the extent of impacts on resources and whether mitigation would be required before any disturbance may occur. Leases also stipulate that if threatened or endangered species are observed during operations, the lessee shall cease activities that would result in impacts to the species. Transmission pipelines are an integral part of the infrastructure associated with oil and gas production. Presently, there are no pipelines in lynx habitat within proposed CHU 3.

Lands with Outstanding or Reserved Rights

Private parties own some of the minerals on National Forest lands. Most of the National Forest lands in the Northern Rockies were reserved from the public domain under the Forest Reserve Act of 1891. Since then, other lands have been acquired. The titles to some of these lands are encumbered with reservations, that is, in some cases the previous owner reserved the mineral rights. In other cases, mineral rights were separated from the surface estate before the Federal government acquired the surface. These mineral rights are outstanding to third parties. A very small percentage of lands in the areas with lynx habitat have reserved or outstanding rights. These reserved and outstanding rights represent property interests in the land. Although the Federal government owns and administers the surface, the mineral owner has certain rights as well. The most important of these is the right to access and develop the minerals. Other rights may be spelled out in individual deeds. The USFS must consider these property interests during planning and implementation.

NORTH CASCADES

No active mining operations were identified within the North-Cascades section of the proposed action area.

GREATER YELLOWSTONE AREA

Although these industries constitute a significant portion of the regional economy, the level of activity within the CHU 5 boundary is relatively small. Only two active mines exist in CHU 5: the East Boulder Mine in Sweetgrass County, Montana, and the Stillwater Mine in Stillwater County, Montana. Both mines are operated by the Stillwater Mining Company and produce palladium, platinum, and rhodium. Stillwater Mining Company is the only primary producer of platinum group metals (PGMs) in the western hemisphere. PGMs are considered to be strategic minerals that play a role in the country's national and economic security. Among other things, they are used in fuel cells, electronics, hydrogen purification, and medicine. The company is one of top five employers in Montana (approximately 1,625 employees at the end of 2007) and Stillwater County enjoys one of the highest per-capita incomes in the State. The company's property covers a 27-mi^2 parcel that encompasses both the Stillwater and East Boulder mines and the underlying ore body. Their revenue exceeded $619 million in 2007. Given the strategic importance of the PGMs, it is likely that Stillwater Mining Company will be in operation in the long-term (Industrial Economics, Inc. 2008).

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

3.8. Transportation/Highways

Lynx are highly mobile and frequently cross roads during dispersal, exploratory movements, or travel within home ranges. However, because of the rural, forested character of the majority of proposed critical habitat, few major roads intersect the CHUs. Transportation activities that may affect lynx or its habitat include bridge construction, repair, or replacement, and road construction, repair, widening, or improvements (Industrial Economics, Inc., 2008). These activities may reduce connectivity within the boreal forest landscape and increase the species' vulnerability to vehicle collision.

Highway projects may directly affect the amount of feeding and denning habitat for the species by converting natural forests into road surface, rights-of-ways, or associated facilities such as maintenance areas or gravel pits. Highways also can alter landscapes by fragmenting large tracts of land (USFS 2004a). As the standard of road increases from gravel to two-lane highway, traffic volumes and speeds increase. According to the LCAS, lynx may become

intimidated by traffic and may not cross highways when the volume reaches from 2,000-4,000 vehicles per day, particularly if traffic continues during the night. The degree of potential impact increases further as highways are upgraded from two lanes to four. Four-lane highways commonly have fences on each side, service roads, paralleling railroads and other impediments such as 'Jersey barriers' that make crossing even more difficult. A number of highways traverse lynx habitats and linkage areas within proposed critical habitat.

The Federal Land Management agencies, including the Service, are part of the steering team that produced the document entitled *Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects* (USDOT, 2006). It embodies the intent and principles of the NEPA and Executive Order 13352 on Facilitation of Cooperative Conservation, and it offers a framework for achieving greater interagency cooperative conservation. *Eco-Logical* provides a non-prescriptive approach that enables Federal, State, Tribal, and local partners involved in infrastructure planning, design, review, and construction to work together to make infrastructure more sensitive to wildlife and their ecosystems. It recognizes open public and stakeholder involvement as the cornerstone for cooperative conservation.

MAINE

Approximately 288 miles of state and municipal road falls within proposed CHU 1. Three transportation projects requiring formal consultation for Canada lynx impacts are expected to occur in Maine over the next 20 years (Industrial Economics, Inc. 2008), potentially including a new east-west highway that would be located south of the proposed critical habitat but bisect lynx habitat in northern Maine from habitat in western Maine, New Hampshire, and Vermont (http://bangordailynews.com/2012/03/29/news/down-east/canadians-told-east-west-highway-through-maine-a-gateway-to-opportunity/).

MINNESOTA

Approximately 510 miles of road falls within proposed CHU 2. The Northeast Minnesota Long Range Plan outlines Minnesota Department of Transportation (MN DOT) transportation projects from 2008 to 2030. Assuming full funding to meet MN DOT performance based measures by 2030, 15 separate projects are planned to increase safety along the Trunk Highway 61 corridor from Two Harbors to Grand Marais (Industrial Economics, Inc. 2008).

NORTHERN ROCKY MOUNTAINS

Approximately 276 miles of road falls within proposed CHU 3. The States of Idaho and Montana are evaluating ways to provide wildlife crossings and implementing their findings in their highway reconstruction plans.

NORTH CASCADES AND GREATER YELLOWSTONE AREA

Only 10 miles of major road fall within proposed CHU 4, while there are approximately 394 miles of roads within proposed CHU 5. In these two CHUs, forecast projects are based on frequency and location of past consultations. As a result, this analysis anticipates 25 informal

consultations in CHU 4, and 15 informal and 10 formal consultations in CHU 5, over the next 20 years for transportation projects. None of these consultations is expected to result in project modification for the lynx (Industrial Economics, Inc. 2008).

3.9. Human Environment

3.9.1. Social and Economic

A final detailed economic analysis was completed for the critical habitat designation proposed for lynx in 2008 (Industrial Economics, Inc., 2008). The analysis assessed the economic costs incurred since the species was listed as well as any incremental costs expected to be incurred as a result of critical habitat designation. The scope of the economic analysis included most of the areas currently proposed for designation, and the contents of that analysis are incorporated by reference.

A new, updated economic analysis has been completed to address the few changes between the currently-proposed designation and the 2009 final designation (U.S. Fish and Wildlife Service and IEc, Inc. 2014). That analysis concluded that the incremental costs of the proposed critical habitat designation are likely to be minor and mostly associated with the minimal additional Federal administrative effort required during section 7 consultations to evaluate whether Federal activities or other actions with a Federal nexus may result in the destruction or adverse modification of critical habitat. The Service also determined that the designation of critical habitat for the lynx DPS will not have a significant economic impact on a substantial number of small business entities nor will it significantly or uniquely affect small governments because it would not produce a Federal mandate of $100 million or greater in any year; that is, it is not a "significant regulatory action" under the Unfunded Mandates Reform Act. The economic analysis concluded that although incremental impacts may occur due to administrative costs of section 7 consultations as described above, these are not expected to significantly affect small business or small government organizations. Incremental impacts stemming from various species conservation and development control activities are expected to be borne largely by the Federal Government, and not by any other organizations that could be considered small governments. Consequently, we do not believe that the critical habitat designation would significantly or uniquely affect small government entities.

3.9.2. Historical and Cultural Resources

Conservation of sensitive, threatened, or endangered species habitat, and reintroduction of endemic or native species into their historical habitats in ways that do not involve surface disturbance, does not have the potential to affect historic properties. Specific projects to protect critical habitat will describe affected resources and analyze effects to historical and cultural resources.

3.10. Tribal Lands

There are approximately 535 mi^2 of Tribal lands that occur within the geographic range of Alternative B (see Table 2 above and Table 9 below). Tribal lands within the proposed CHUs include those of the Passamaquoddy Tribe and the Penobscot Indian Nation in Maine (about 87

mi^2 in CHU 1), Grand Portage Band of Lake Superior Chippewa in Minnesota (about 78 mi^2 in CHU 2), and the Confederated Salish and Kootenai Tribes of the Flathead Nation - Flathead Reservation in Montana (about 370 mi^2 in CHU 3). No tribal lands are encompassed by proposed critical habitat in CHUs 4 or 5.

For the Proposed Action, in accordance with Secretarial Order 3206, "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act" (June 5, 1997); the President's memorandum of April 29, 1994, "Government-to-Government Relations with Native American Tribal Governments" (59 FR 22951); Executive Order 13175 "Consultation and Coordination with Indian Tribal Governments;" and the relevant provision of the Departmental Manual of DOI (512 DM 2), the Service believes that fish, wildlife, and other natural resources on Tribal lands are better managed under Tribal authorities, policies, and programs than through Federal regulation wherever possible and practicable. We excluded Tribal lands from the final designation in 2009, and we are again considering excluding Tribal lands from the final revised designation.

TABLE 9. Tribal Lands under Consideration for Exclusion from Final Designation as Critical Habitat.

PROPOSED CRITICAL HABITAT UNIT	TRIBAL ENTITY
1 - Maine	Passamaquoddy Tribe Penobscot Indian Nation
2 - Minnesota	Grand Portage Band of Lake Superior Chippewa
3 - Northern Rocky Mountains	Confederated Salish and Kootenai Tribes - Flathead Nation
4 - North Cascades	None
5 - Greater Yellowstone Area	None

4. ENVIRONMENTAL CONSEQUENCES

Designation of critical habitat does not have any direct effects on the environment, except through the section 7 consultation process. This is because critical habitat designation does not impose broad rules or restrictions on land use, nor does it automatically prohibit any land use activity. Each Federal action that could potentially affect designated critical habitat is analyzed individually during the section 7 consultation process. Individuals, organizations, local government, Tribes, States, and other non-Federal agencies are potentially affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit or license, or involve Federal funding (e.g., section 404 Clean Water Act permits from the U.S. Army Corps of Engineers or funding of activities by the Natural Resource Conservation Service).

Under section 7, Federal agencies are required to consult with the Service when their actions could affect critical habitat. For many listed species, critical habitat designation would not be expected to materially affect the number or nature of consultations. For instance, when critical habitat is designated only in areas occupied by the species (as is the case with proposed

critical habitat for lynx), an action that would affect designated critical habitat also would affect the species and a consultation would be required regardless of critical habitat designation.

In the case of the lynx, Federal actions that are likely to destroy or adversely modify critical habitat may also result in jeopardy to the species. Federal agencies have been required to ensure that their actions do not jeopardize the continued existence of the lynx since its listing in 2000. In practice, the outcome of section 7 consultation is often similar whether or not critical habitat is designated. Adverse effects on primary constituent elements (PCEs) or portions of critical habitat generally would not result in an adverse modification determination unless that loss, when added to the environmental baseline, is likely to appreciably diminish the capability of the critical habitat designation to satisfy essential requirements of the species. In other words, activities that may destroy or adversely modify critical habitat include those that alter the PCE to an extent that the value of critical habitat for conservation of the species is appreciably reduced.

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

Potential environmental consequences that may result from implementation of the No Action and Action Alternatives are discussed below. All impacts are expected to be indirect, as critical habitat designation does not in itself directly result in any alteration of the environment.

4.1. Physical Environment

Neither the No Action Alternative (Alternative A) nor the Proposed Action (Alternative B) would impact the physical environment such as soils, water and air.

4.2. Fish, Wildlife and Plants

Alternative A, the No Action alternative, would have no significant impacts on fish, wildlife, or plants beyond those protections already in place as a result of listing of the lynx in 2000 and associated requirements of section 7 of the ESA.

The Proposed Action would have similar effects on fish, wildlife, and plants, in that there may be minimal additional impacts or benefits beyond those already considered in section 7 consultations since the 2000 listing. Fish, wildlife, and plants may indirectly benefit as a result of ecosystem protections provided through conservation of the lynx and the associated requirements of section 7(a)(2) of the ESA. As a result of critical habitat designation, Federal agencies may be able to prioritize landowner incentive programs such as the Healthy Forest Reserve Program, and private landowner agreements that benefit the lynx, as well as other fish,

wildlife, and plant species. Critical habitat designation also may assist States in prioritizing their conservation and land-managing programs.

4.3. Forest Resources and Timber Management

Timber management-related activities are the dominant land use in the areas proposed for critical habitat. Actions that would reduce or remove understory vegetation within boreal forest stands could significantly reduce the quality of snowshoe hare habitat such that the landscape's ability to produce adequate densities of snowshoe hares to support persistent lynx populations is at least temporarily diminished. Such activities could include, but are not limited to, pre-commercial thinning.

Trends in timber harvest volumes, cut volumes and silvicultural techniques would not change under Alternative A, the No Action alternative, beyond that already resulting from the 2000 listing of the lynx and the associated requirements of section 7 of the ESA. Section 7 consultations on the effects of Federal timber projects on the lynx under the jeopardy standard would still be required.

Under Alternative B, the Proposed Action, critical habitat designation would require re-initiation of some Section 7 consultations for timber management. New and ongoing Federal timber management-related projects within designated critical habitat areas would be analyzed under the section 7 consultation process for potential effects to the PCE of lynx critical habitat as well as effects to the species. While habitat is already considered in consultations on effects to the species, consultations for projects within designated critical habitat would have to specifically address the PCE. Pre-commercial thinning may be precluded on Federal lands or where there is a Federal nexus depending on the habitat in the project area, and timber projects may be modified by changing their timing, modifying road access, or requiring that a lynx management plan be developed. For projects where there is no Federal nexus, critical habitat designation does not impose rules or restrictions on land use, so there would be no changes under the Proposed Action.

4.4. Wildland Fire Management

Fuels treatment projects that would reduce or remove understory vegetation within boreal forest stands could significantly reduce the quality of snowshoe hare habitat such that the landscape's ability to produce adequate densities of snowshoe hares to support persistent lynx populations is at least temporarily diminished.

Wildland fire management would not change under Alternative A, the No Action alternative, beyond that already resulting from the 2000 listing of the lynx and the associated requirements of section 7 of the ESA. Section 7 consultations on the effects of Federal fire management projects on the lynx under the jeopardy standard would still be required.

Under Alternative B, critical habitat designation would require re-initiation of some Section 7 consultations for wildland fire management. New and ongoing Federal fire management-related projects within designated critical habitat areas would be analyzed under the

section 7 consultation process for potential effects to the PCE of lynx critical habitat as well as effects to the species. While habitat is already considered during the consultation process, consultations for projects within designated critical habitat would have to specifically address the PCE. The number of projects analyzed would likely not change because habitat is already considered in consultations on effects to the species. Critical habitat designation could require project modifications or restrictions compared to the existing condition. For projects where there is no Federal nexus, critical habitat designation does not impose rules or restrictions on land use, so there would be no changes under the Proposed Action.

4.5. Grazing/ Livestock Management

Actions that would cause permanent loss or conversion of the boreal forest would eliminate and fragment lynx and snowshoe hare habitat. Such activities could include grazing because it changes the structure or composition of native plant communities, thus changing their ability to provide snowshoe hares at densities adequate to support lynx.

Grazing practices would not change under Alternative A, the No Action alternative, beyond that already resulting from the 2000 listing of the lynx and the associated requirements of section 7 of the ESA. Section 7 consultations on the effects of grazing on the lynx under the jeopardy standard would still be required.

Under Alternative B, critical habitat designation would require re-initiation of some Section 7 consultations for grazing. New and ongoing grazing authorizations within designated critical habitat areas would be analyzed via section 7 consultations for potential effects to the PCE for lynx critical habitat as well as effects to the species. Consultation may require management to (1) prevent concentrations of sheep and cows in lynx and snowshoe hare habitats, (2) use fencing instead of wood debris as a more permanent boundary between grazing areas and lynx/hare habitat, and (3) monitor and report on lynx/hare foraging conditions. While habitat is already considered in consultations on effects to the species, consultations for projects within designated critical habitat will need to specifically evaluate the PCE. For projects where there is no Federal nexus, critical habitat designation does not impose rules or restrictions on land use, so there would be no changes under the Proposed Action.

4.6. Recreation

Recreational activities that have the potential to affect lynx and its habitat include those that are related to winter activities that involve over-the-snow trails such as for snowmobiling and cross-country skiing. Theoretically, lynx or its habitat could be impacted by packed over-the-snow trails that enable potential competitors, such as coyotes or bobcat, to access lynx winter habitat. However, in the Northern Rocky Mountains, Kolbe *et al*. (2007) found that coyotes did not preferentially use compacted snow trails to enter and occupy lynx habitat, and those coyotes that did use lynx habitat were primarily scavengers, with snowshoe hare kills comprising only 3 percent of their feed sites.

Recreation management would likely not change under Alternative A, the No Action alternative, beyond that already resulting from the 2000 listing of the lynx and the associated

requirements of section 7 of the ESA. Section 7 consultation on the effects of Federal recreation related projects on the lynx under the jeopardy standard would still be required.

Under Alternative B, critical habitat designation would require re-initiation of some Section 7 consultations for recreational projects. New and ongoing recreation-related projects on Federal lands or with a Federal nexus within designated critical habitat areas would be analyzed via section 7 consultations for potential effects to the PCE of lynx critical habitat as well as effects to the species. While habitat is already considered during the consultation process, consultations for projects within designated critical habitat would have to specifically address the PCE. For projects where there is no Federal nexus, critical habitat designation does not impose rules or restrictions on land use, so there would be no changes under the Proposed Action.

4.7. Commercial and Residential Development/Mining and Energy Development

Actions that would cause permanent loss or conversion of the boreal forest would eliminate and fragment lynx and snowshoe hare habitat. Such activities could include, but are not limited to, commercial, residential or recreational area developments; and certain types of mining and energy development (including wind energy) and associated activities.

Development-related projects would not change under Alternative A, the No Action alternative, beyond that already resulting from the 2000 listing of the lynx and the associated requirements of section 7 of the ESA. Section 7 consultations on the effects of Federal fire management projects on the lynx under the jeopardy standard would still be required.

Under Alternative B, critical habitat designation would require re-initiation of some Section 7 consultations for oil and gas, mining, energy, and development-related projects. New and ongoing Federal development-related projects within designated critical habitat areas would be analyzed via section 7 consultations for potential effects to the PCE of lynx critical habitat as well as effects to the species. While habitat is already considered in consultations on effects to the species, consultations for projects within designated critical habitat will need to specifically evaluate the PCE. For projects where there is no Federal nexus, critical habitat designation does not impose rules or restrictions on land use, so there would be no changes under the Proposed Action.

4.8. Transportation/Highways

Lynx are highly mobile and frequently cross roads during dispersal, exploratory movements or travel within their home ranges. Actions that would increase traffic volume and speed on roads within lynx critical habitat could reduce connectivity within the boreal forest landscape and could result in increased mortality of lynx.

Transportation-related projects would not change under Alternative A, the No Action alternative, beyond that already resulting from the 2000 listing of the lynx and the associated requirements of section 7 of the ESA. Section 7 consultations on the effects of Federal fire management projects on the lynx under the jeopardy standard would still be required.

Under Alternative B, existing Section 7 consultations may need to be re-initiated to address critical habitat. New and ongoing Federal transportation-related projects within designated critical habitat areas would be analyzed under the section 7 consultation process for potential effects to the PCE of lynx critical habitat as well as effects to the species. Conservation efforts for lynx might include remote monitoring, construction of habitat continuity structures (overcrossings and/or underpasses), bridge lengthening, fencing and development of databases to track key habitat linkages. While habitat is already considered in consultations on effects to the species, consultation for projects within designated critical habitat will need to specifically evaluate the PCE. For projects where there is no Federal nexus, critical habitat designation does not impose rules or restrictions on land use so there would be no changes associated with the Proposed Action.

4.9. Human Environment

As discussed above, individuals, organizations, States, local governments, and other non-Federal entities are only affected by the designation of critical habitat if their actions occur on Federal lands, require a Federal permit, license, or authorization, or involve Federal funding. Since 2000, Federal agencies have been required to consider the effects of their actions on lynx and consult with the Service as appropriate. In some cases, differentiating between consultations that result from the listing of a species and consultations that result from the presence of critical habitat can be difficult. However, in the case of lynx it may be moot because consultations resulting from the listing, in the absence of critical habitat, have largely focused on impacts to lynx foraging habitats, particular those used in winter, which are thought to be the most limiting factor in lynx survival and population persistence. Therefore, although some additional administrative effort may be necessary to address potential adverse modification of critical habitat, a similar process is required for both types of consultations, and analysis of effects to critical habitat is not expected to cause increases in the number or complexity of consultations. This is also true because only areas occupied by lynx have been proposed for designation as critical habitat and, therefore, projects with a Federal nexus in these areas would already require consultation. That is, consultations would not be required in any new areas because of the critical habitat designation.

The Service recognizes a perception may exist within some segments of the public that any critical habitat designation would severely limit property rights; however, critical habitat designation has no effect on private actions on private land that do not involve Federal approval or action. We recognize that there are private actions on private lands that involve Federal actions; however, there should already be section 7 consultations taking place in these situations.

4.10. Tribal Lands

Under Alternative A, any impacts to Tribal lands would not change, as the Section 7 process would only be initiated for “may affect” determinations for lynx. The number of potential consultations would continue to be about the same as under current conditions.

Under Alternative B, it is possible that Tribes described above may have the perception of increased Federal control and involvement in Tribal land management and of a diminished

ability to manage and control their lands if critical habitat were to be designated on Tribal lands. Under Alternative B, Tribal lands are being considered for exclusion from the designation in accordance with section 4(b)(2) of the ESA. If excluded in the final rule, impacts to Tribes and Tribal lands would be the same under the Proposed Action as under the No Action alternative.

4.11. Environmental Justice

Federal agencies are required to "identify and address disproportionately high and adverse human health or environmental effects" of their programs and actions on minority populations and low-income populations, as directed by Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations). The areas under consideration for this assessment are rural. This assessment has not identified any adverse or beneficial effects unique to minority or low-income human populations in the affected areas.

TABLE 10. Summary of Environmental Consequences of Critical Habitat Designation by Alternative.

Environmental Category	CONSEQUENCES by ALTERNATIVE	
	Alternative A No Action	**Alternative B Proposed Action**
Physical Environment	No change	No impacts
Fish, Wildlife and Plants	No change	No negative impacts, likely beneficial impacts
Forest Resources/ Timber Management	No change	Designation may alter timber management
Wildland Fire Management	No change	Designation may alter wildland fire management
Grazing/ Livestock Management	No change	Designation may require restrictions or changes to grazing/livestock activities
Recreation	No change	Designation may require restrictions or changes to recreational management
Development/Mining and Energy Development	No change	Development projects may require lynx conservation measures
Transportation/Highways	No change	Transportation projects may require lynx conservation measures
Human Environment	No change	Designation may require restrictions or changes to some human activities
Tribal Lands	No change	Designation may require restrictions or changes to some activities on Tribal lands
Environmental Justice	No change	No impacts

4.12. Cumulative Impacts

Designation of critical habitat for the lynx will add incremental impacts when added to other past, present, and reasonably foreseeable future actions. Actions that could have cumulative impacts would include: 1) the section 7 consultation outcomes and subsequent effects on other species; 2) the effects of designated critical habitat for other species; and 3) the effects of land management plans. The Service expects the impacts to be relatively minimal because they would primarily involve re-initiation of section 7 consultations or initiation of additional section 7 consultations.

There are no Department of Defense lands located within the proposed critical habitat designation, so there will be no impacts to national security, and no health and safety issues are anticipated from the proposed designation. Therefore, these were not included as potential cumulative effects.

4.13. Irreversible and Irretrievable Impacts

Designation of critical habitat for the lynx will not create irreversible or irretrievable impacts. These types of impacts are related to use of natural resources that cannot be replaced, and are typically related to mining or harvest of old growth timber.

5. COMPLIANCE, CONSULTATION AND COORDINATION WITH OTHERS

5.1. Compliance with Other Laws and Regulations

The proposed rule for critical habitat designation (78 FR 59430) and the Draft Economic Analysis describe numerous laws and policies that are considered during the rulemaking process.

5.2. Environmental Justice

Environmental justice is achieved when everyone, regardless of sex, race, culture or income, enjoys the same degree of protection from environmental and health hazards and equal access to a healthy environment. None of the alternatives would have an impact upon women, minority groups, or civil rights of any citizen of the United States (Executive Order 12898). No Native American Tribal resources would be negatively affected by the alternatives (Secretarial Order 3206).

5.3. Public Review and Comment

The proposed rule for the revised designation of lynx critical habitat was published September 26, 2013, in the *Federal Register* (78 FR 59430) with a 90-day comment period. The Service provides this draft EA to the public for review and comment for an additional period of 30 days. The Service also provided written and/or electronic notice of the availability of this draft EA to interested stakeholders including Native American Tribes, private landowners, county commissioners, congressional and State representatives, State and Federal agencies, and other potentially interested parties. We have also posted this draft EA on the Service's website.

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