

MEMORANDUM | June 11, 2014

TO U.S. Fish and Wildlife Service (Service)
FROM Industrial Economics, Incorporated (IEc)
SUBJECT Screening Analysis of the Likely Economic Impacts of Proposed Revised Critical Habitat Designation for the *Lynx canadensis*.

On September 26, 2013, the Service published a proposed rule to designate revised critical habitat for the Canada lynx (*Lynx canadensis*). As part of the rulemaking process, the Service must consider the economic impacts, including costs and benefits, of the proposed rule in the context of two separate requirements:¹

- **Executive Order (EO)12866 *Regulatory Planning and Review***, which directs Agencies to assess the costs and benefits of regulatory actions and quantify those costs and benefits if that action may have an effect on the economy of \$100 million or more in any one year; and
- **Section 4(b)(2) of the Endangered Species Act (the Act)**, which requires the Secretary of the Interior to consider economic impacts prior to designating critical habitat.²

This memorandum provides information to the Service on the potential for the proposed critical habitat rule to result in costs exceeding \$100 million in a single year. If costs do not exceed this threshold, EO 12866 suggests that a qualitative assessment may be sufficient. This memorandum also identifies the geographic areas or specific activities that could experience the greatest impacts, measured in terms of changes in social welfare, to inform the Secretary's decision under section 4(b)(2).³

To prepare this assessment, we rely on: (1) the proposed rule and associated geographic information systems (GIS) data layers; (2) the Service's incremental effects memorandum described in greater detail later in this memorandum; (3) consultation

¹ Additional laws and executive orders require the consideration of the distribution of impacts on vulnerable subpopulations, such as small entities and state or local governments. These requirements for distributional analysis are beyond the scope of this memorandum.

² Published September 20, 1993. As affirmed by Executive Order 13563, *Improving Regulation and Regulatory Review*, January 18, 2011.

³ The discipline of welfare economics focuses on maximizing societal well-being. (Just, R.E., D.L. Hueth, and A. Schmitz. 2004. *The Welfare Economics of Public Policy: A Practical Approach to Project and Policy Evaluation*. Edward Elgar Publishing: Northampton, MA.) It measures costs and benefits in terms of the opportunity costs of employing resources for the conservation of the species and individual willingness to pay to conserve those species. Opportunity cost is the value of the benefit that could have been provided by devoting the resources to their best alternative uses. Opportunity costs differ from the measurement of accounting costs (e.g., actual expenses). Welfare economics is recognized by the U.S. Office of Management and Budget (OMB) as the appropriate tool for valuing the costs and benefits of proposed regulatory actions. (U.S. Office of Management and Budget. 2003. *Circular A-4*.)

history for the species since 2008; (4) the economic analysis prepared for the 2009 critical habitat designation; and (5) targeted interviews with relevant stakeholders.

FINDINGS OF THE SCREENING ANALYSIS

Revised critical habitat for the lynx is unlikely to generate costs exceeding \$100 million in a single year. Data limitations prevent the quantification of benefits.

Section 7 Costs

The economic costs of implementing the rule through section 7 of the Act will most likely be limited to the additional administrative effort required to consider adverse modification. This finding is based on the following factors:

- All proposed units are considered currently occupied, providing baseline protection;
- Activities occurring within designated critical habitat with a potential to affect critical habitat are also likely to jeopardize the species, either directly or indirectly;
- Project modifications requested to avoid adverse modification are likely to be the same as those needed to avoid jeopardy;
- On Federal lands, ongoing conservation efforts offer additional baseline protection; and
- Critical habitat is unlikely to increase the annual consultation rate for two primary reasons: (1) the existing awareness of the need to consult due to the listing of the species; and (2) the fact that the 2009 critical habitat designation covers 89 percent of the areas proposed as critical habitat.

According to a review of consultation records and discussions with multiple Service field offices, the additional administrative cost of addressing adverse modification during the section 7 consultation process ranges from approximately \$400 to \$5,000 per consultation (2014 dollars). Based on the historical consultation activity, we forecast an annual consultation rate of approximately 161 per year. Thus, the incremental administrative burden resulting from the rule is unlikely to reach \$100 million in a given year.

Other Costs

The revised designation of critical habitat is not expected to trigger additional requirements under state or local regulations. This assumption is based on the array of existing baseline protections for the lynx and the general awareness of state agencies of the presence of the species.

The revised designation of critical habitat may cause land managers, landowners or developers to perceive that private lands will be subject to use restrictions, resulting in costs. As discussed in Section 4 of this memorandum, such impacts, if they occur, are unlikely to reach \$100 million in a given year.

Section 7 and Other Benefits

No additional section 7 efforts to conserve the species are predicted to result from the revised designation of critical habitat. If, however, public perception of the effect of critical habitat causes changes in future land use, benefits to the species and environmental quality may occur. Due to existing data limitations, we are unable to assess the likely magnitude of such benefits.

Geographic Distribution of Costs

Exhibit 3 summarizes the anticipated future consultation rate and the units where they will occur. The majority of these consultations are expected to occur in Unit 5 (Greater Yellowstone Area). Costs resulting from public perception of the impact of critical habitat, if they occur, are more likely to occur in Unit 4 (North Cascades) and private lands located in Unit 1 (Northern Maine).

SECTION 1. BACKGROUND

The Canada lynx (hereafter “the lynx”) are medium-sized cats that occupy boreal forest habitat. Because the lynx are highly specialized predators of snowshoe hare (hereafter “hare”), landscapes with high-density hare populations are optimal for their survival and reproduction. The range of the lynx and hare overlap across boreal forests from eastern Canada to Alaska. While the lynx has been documented in 24 states, persistent populations in the U.S. occur in five areas: northern Maine, northeastern Minnesota, northwestern Montana/northeastern Idaho, the Greater Yellowstone Area of southwestern Montana and northwestern Wyoming, and north-central Washington.⁴

The lynx was listed as a threatened species on March 24, 2000.⁵ In 2006, the Service designated 1,841 square miles as critical habitat for the species in Minnesota, Montana and Washington. On July 20, 2007, the Service announced it would review the 2006 critical habitat rule, and subsequently determined that it was necessary to reconsider the critical habitat designation. The Service published a revised final rule in 2009, designating 39,000 square miles as critical habitat for the lynx. On July 28, 2010, the U.S. District Court in Montana remanded the 2009 revised critical habitat final rule to the Service because of flaws it perceived in the Service’s rationale to not designate areas in Colorado and in the Beaverhead-Deerlodge, Bitterroot, Clearwater, and Nez Perce National Forests in Idaho and Montana, and in portions of the Helena and Lolo National Forests in Montana as critical habitat for the lynx. Separate from the July 2010 court decision, the U.S. District Court in Wyoming further enjoined the 2009 revised critical habitat final rule in the state of Washington in 2010 due to its concerns with the Service’s consideration of the potential economic impacts to recreational snowmobilers in the state of Washington. The courts allowed the 2009 designation to remain in effect (except in Washington) until the Service finalized a new, revised critical habitat rule.⁶

On September 26, 2013, the Service published a proposed rule designating 41,547 square miles (26.6 million acres) of critical habitat for the lynx.⁷ All units are considered occupied by the species. Proposed critical habitat is distributed across five units in six states: Maine, Minnesota, Montana, Idaho, Washington, and Wyoming. Approximately 57 percent of the total proposed designation is located on Federal lands, 31 percent on private lands, ten percent on State lands, and one percent on tribal lands. Roughly 1,915 square miles (1.2 million acres) of tribal lands and lands covered by lynx conservation plans in Maine, Montana and Washington are being considered for exclusion from critical habitat.⁸ If these areas are excluded, the remaining 39,632

⁴ U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx.

⁵ 65 FR 16052.

⁶ U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx.

⁷ 78 FR 59429.

⁸ Areas considered for exclusion from critical habitat include: 535 square miles of tribal lands in Maine, Minnesota, and Montana; 943 square miles of lands managed in accordance with the Maine Healthy Forest Reserve Program (HFRP); 164

square miles (25.4 million acres) reflect an increase of 632square miles (404,480 acres) from the 2009 designation, or approximately 1.6 percent of the total area proposed as critical habitat. New areas included in the 2013 proposed designation consist of privately-owned timber lands in Maine (Unit 1) and Federal lands, including Bureau of Land Management (BLM) and National Park Service (NPS) land in Wyoming (Unit 5).⁹ Exhibits 1 and 2 provide an overview of the proposed critical habitat, by unit. Appendix A includes overview maps of the revised proposed critical habitat designation.

EXHIBIT 1. SUMMARY OF LAND OWNERSHIP IN PROPOSED CANADA LYNX CRITICAL HABITAT (SQUARE MILES)

UNIT NO.	UNIT NAME	FEDERAL					STATE	OTHER	PRIVATE	TOTAL
		USFS	BLM	NPS	OTHER	TOTAL				
PROPOSED FOR DESIGNATION										
1	Northern Maine	-	-	-	-	-	819	188	10,155	11,162
2	Northeastern Minnesota	3,658	1	203	-	3,863	2,732	92	1,459	8,147
3	Northern Rocky Mountains	7,079	153	1,412	7	8,652	381	444	997	10,474
4	North Cascades	1,692	3	134	-	1,830	164	-	4	1,999
5	Greater Yellowstone Area	7,772	163	1,523	7	9,465	28	-	272	9,765
Total		20,201	321	3,272	15	23,809	4,128	724	12,887	41,547
PROPOSED FOR EXCLUSION										
1	Northern Maine	-	-	-	-	-	-	87	943	1,030
2	Northeastern Minnesota	-	-	-	-	-	-	78	-	78
3	Northern Rocky Mountains	-	-	-	-	-	271	370	-	641
4	North Cascades	-	-	-	-	-	164	-	-	164
5	Greater Yellowstone Area	-	-	-	-	-	1	-	-	1
Total		-	-	-	-	-	440	535	939	1,915
<p>Note: The area estimates in this table are rounded to two significant digits. The totals presented in this table may therefore not sum to the total area reported in the proposed rule due to rounding.</p> <p>Source: GIS Analysis of U.S. Fish and Wildlife Service GIS Data provided on March 21, 2014; U.S. Geological Survey, Gap Analysis Program (GAP), November 2012. Protected Areas Database of the United States (PADUS), version 1.3 Combined Feature Class.</p>										

Based on the proposed rule, the following economic activities are identified as having the potential to pose a threat to the lynx and proposed critical habitat:

- Logging;
- Snowmobiling;
- Recreation;
- Oil and gas development;

square miles of lands covered by the Washington Department of Natural Resources (WADNR) Lynx Habitat Management Plan; and 273 square miles of lands managed under the recently-finalized Montana Department of Natural Resources and Conservation (DNRC) Multi-species Habitat Conservation Plan (HCP).

⁹ U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx.

- Transportation;
- Renewable energy development;
- Mining operations;
- Residential development; and
- Other Federal lands management activities, including but not limited to vegetation management, fire management, and grazing.

EXHIBIT 2. SUMMARY OF LAND OWNERSHIP IN NEWLY-ADDED PROPOSED CANADA LYNX CRITICAL HABITAT (SQUARE MILES)

UNIT NO.	UNIT NAME	FEDERAL	STATE	OTHER	PRIVATE	TOTAL
1	Northern Maine	-	5	22	602	629
2	Northeastern Minnesota	-	-	-	-	-
3	Northern Rocky Mountains	-	-	-	-	-
4	North Cascades	-	-	-	-	-
5	Greater Yellowstone Area	240	7	-	12	259
Total		240	12	22	615	888

Source: GIS Analysis of U.S. Fish and Wildlife Service GIS Data provided on March 21, 2014; U.S. Geological Survey, Gap Analysis Program (GAP). November 2012. Protected Areas Database of the United States (PADUS), version 1.3 Combined Feature Class.

SECTION 2. FRAMEWORK

Guidelines issued by the U.S. Office of Management and Budget (OMB) for the economic analysis of regulations direct Federal agencies to measure the costs and benefits of a regulatory action against a baseline (i.e., costs and benefits that are “incremental” to the baseline). OMB defines the baseline as the “best assessment of the way the world would look absent the proposed action.”¹⁰ In other words, the baseline includes any existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users affected by the designation of critical habitat. The baseline includes the economic impacts of listing the species under the Act, even if the listing occurs concurrently with critical habitat designation. Impacts that are incremental to the baseline (i.e., occurring over and above existing constraints) are those that are solely attributable to the designation of critical habitat. This screening analysis focuses on the likely incremental effects of the critical habitat designation.

We consider incremental effects of the designation in two key categories: (1) those that may be generated by section 7 of the Act; and (2) other types of impacts outside of the context of section 7:

- **Incremental section 7 impacts:** Activities with a Federal nexus that may affect listed species are subject to section 7 consultation to consider whether actions may jeopardize the existence of the species, even absent critical

¹⁰ OMB, “Circular A-4,” September 17, 2003, available at http://www.whitehouse.gov/omb/circulars_a004_a-4. Circular A-4 provides “guidance to Federal Agencies on the development of regulatory analysis as required under Section 6(a)(3)(c) of Executive Order 12866...” (p. 1)

habitat.¹¹ As part of these consultations, critical habitat triggers an additional analysis evaluating whether an action will diminish the recovery potential or conservation value of the designated area. Specifically, following the designation, Federal agencies must also consider the potential for activities to result in the destruction or adverse modification of critical habitat. These consultations are the regulatory mechanism through which critical habitat rules are implemented. Any time and effort spent on this additional analysis, as well as the costs and benefits of implementing any recommendations resulting from this review, are economic impacts of the critical habitat designation.

- **Other incremental impacts:** Critical habitat may also trigger additional regulatory changes. For example, the designation may cause other Federal, state, or local permitting or regulatory agencies to expand or change standards or requirements. Regulatory uncertainty generated by critical habitat may also have impacts. For example, landowners or buyers may perceive that the rule will restrict land or water use activities in some way and therefore value the resource less than they would have absent critical habitat. This is a perceptual, or stigma, effect of critical habitat on markets.

SECTION 3. ECONOMIC COSTS OF THE CRITICAL HABITAT RULE

In this section, we discuss the likelihood that the revised designation of critical habitat will result in incremental costs through the section 7 consultation process. The focus of the incremental analysis is to determine the costs on projects and activities from the revised designation of critical habitat that are above and beyond those costs resulting from existing required efforts as a result of a species listing or voluntary conservation efforts undertaken by other Federal, state, and local regulations or guidelines.

Incremental costs arising from the section 7 consultation process generally consist of two components: (1) the implementation of any project modifications requested by the Service through section 7 consultation to avoid or minimize potential destruction or adverse modification of critical habitat; and (2) the administrative costs of conducting section 7 consultation. In the baseline, section 7 of the Act requires Federal agencies to consult with the Service to ensure that their actions will not jeopardize the lynx. Once critical habitat is designated, section 7 also requires Federal agencies to ensure that their actions will not adversely modify critical habitat.

To inform our analysis, the Service provided a memorandum describing its expected approach for lynx conservation following critical habitat designation. We rely on this memorandum to understand how the Service intends to address projects and activities that might lead to adverse modification of critical habitat as distinct from projects that may jeopardize the species.

INCREMENTAL COSTS DURING SECTION 7 CONSULTATIONS

Incremental costs associated with section 7 consultations for the lynx are likely limited to administrative costs. This conclusion is based on multiple factors:

¹¹ A Federal nexus exists for activities authorized, funded, or carried out by a Federal agency.

1. **The Federal listing status of the lynx provides substantial baseline protection across all areas proposed as critical habitat.**
 - **All projects with a Federal nexus will be subject to section 7 requirements regardless of whether critical habitat is designated.** All lands proposed for critical habitat are currently occupied by the species. In particular, the Service’s analysis determined that currently occupied habitat is sufficient to conserve lynx and, as a result, the revised designation does not include any areas not currently occupied by lynx.¹² Therefore, in all areas proposed as critical habitat, any projects or activities with a Federal nexus will be subject to section 7 consultations requirements regardless of critical habitat designation.
 - **Possible project modifications are unlikely to be affected by the revised designation of critical habitat.** The Service does not anticipate recommending project modifications to avoid adverse modification of critical habitat beyond those recommended under the jeopardy standard. The Service states that consultations under the jeopardy standard “already focus on avoiding impacts to lynx habitats, especially foraging habitats, which are thought to be most limiting to lynx populations within the DPS.”¹³
2. **Ongoing conservation efforts on Federal lands offer additional baseline protection.** On Federal lands, the lynx and its habitat receive a significant level of protection from existing management plans. Specifically, the Service states: “Federal land managers, responsible for more than half of proposed critical habitat, have largely formally amended management plans to avoid/minimize impacts to lynx foraging habitats.”¹⁴ Key management plans in place on Federal lands proposed as critical habitat include:
 - **Interagency Lynx Conservation Assessment Strategy (LCAS).** The LCAS represents a collaborative effort between the Service, the USFS, BLM, and NPS to conserve the lynx and streamline the section 7 consultation process on Federal lands. The first edition of the LCAS was completed in January 2000 and revised in August 2000. Several amendments and clarifications to the LCAS have been implemented since 2000, with the most recent revision of the LCAS completed in August, 2013. The LCAS identified and evaluated 17 risk factors for the lynx along with recommendations for conservation measures, standards and guidelines to maintain and improve lynx habitat. Federal lands covered by the LCAS include: USFS lands in Units 2 and 4, BLM lands in Units 3, 4 and 5 and NPS lands in Unit 5.

¹² Service. News Release: Revised Critical Habitat Designation for Canada Lynx Proposed under the Endangered Species Act. September 25, 2013. Accessed on May 1, 2014 at: http://www.fws.gov/mountain-prairie/pressrel/2013/09252013_revisedCriticalHabitatLynx.php.

¹³ U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx. (p. 43)

¹⁴ U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx. (p. 50)

- **Northern Rockies Lynx Management Direction (NRLMD).** Since 2007, National Forest System lands in Units 3 and 5 have been managed in accordance with the NRLMD. The NRLMD is a management plan developed by the USFS and the Service for national forests in Montana, Idaho, and Wyoming. While the NRLMD follows much of the guidance included in the LCAS, some of its standards and guidelines are less restrictive and provide land managers more flexibility to revise management actions based on new information from ongoing lynx research and monitoring.^{15,16}
3. **Across the proposed designation, project proponents are generally aware of the presence of the lynx.** For example, consultation for the lynx has been ongoing across the proposed designation since 2000 when the lynx was listed under the Act. In addition, in the vast majority of the proposed critical habitat designation (approximately 89 percent, excluding the state of Washington), critical habitat has been in place since 2009.

Thus, based on the substantial baseline protections afforded the lynx and the close relationship between adverse modification and jeopardy in occupied habitat, the incremental costs of the critical habitat designation are likely limited to the additional administrative effort required to address adverse modification during section 7 consultation.

MAGNITUDE OF INCREMENTAL COSTS

A robust consultation history exists for the lynx because the species has been listed since 2000, with critical habitat designated since 2009. In support of this analysis, the Service collected consultation histories from October 2008 to January 2014 for the five Service field offices that cover the areas proposed for critical habitat designation, including Maine, Minnesota, Montana, Washington, and Wyoming. During this timeframe, the Service conducted 57 formal consultations, 702 informal consultations and 345 technical assistance reviews.^{17,18} This level of activity translates to an annual consultation rate of approximately 11 formal consultations, 135 informal consultations and 46 technical assistance reviews.¹⁹

¹⁵ U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx. (p. 16)

¹⁶ For example, to reduce wildland fire risks, the NRLMD provides management flexibility in defined wildland urban interface (WUI) areas. For over-the-snow recreation and grazing activities the NRLMD provides guidelines to be used during project evaluation, a less rigid approach than LCAS' prescriptive standards, required for all activities. (U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx. (p. 19))

¹⁷ U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx. (p. 49-50)

¹⁸ Includes an additional 195 technical assistance consultations identified by the Maine field office. (Email communication with US FWS Montana Ecological Services Office on March 26, 2014.)

¹⁹ Data on the types of activities addressed during section 7 consultation are not readily available.

According to discussions with Service staff, the consultation history provided by each field office includes projects and activities occurring in areas where lynx are both known to or may occur; therefore, the consultation history includes additional areas outside of the proposed critical habitat designation. Because geographic locations for each consultation are not readily available, we contacted each field office to estimate the subset of consultations occurring within the proposed critical habitat designation.²⁰ If a field office was uncertain about the location of its consultation history relative to the proposed critical habitat designation (e.g., Wyoming and Maine), we err on the side of assuming consultations occur within the proposed critical habitat designation, thus potentially overstating the rate at which consultations are likely to occur.

In addition to the consultation history, the Wyoming field office provided additional information on projects and activities occurring on BLM and NPS lands newly added to the proposed critical habitat designation in northwestern Wyoming. According to the field office, BLM and NPS lands proposed as critical habitat overlap 29 grazing allotments and approximately seven miles of snowmobiling trails. In addition, the Wyoming field office indicates that oil and gas activities occur within BLM land managed by the Pinedale and Kemmerer field offices. While uncertainty exists regarding the potential for future development of oil and gas leases in these areas, the Service is aware of at least one current proposal for oil and gas development consisting of five existing wells and five new wells.²¹ Based on this information, we conservatively assume one consultation per year for oil and gas activities on newly added BLM lands in Unit 5 (Greater Yellowstone Area).

Based on the consultation history and the supplementary information provided by the Wyoming field office for newly added areas in Unit 5 (Greater Yellowstone Area), we forecast an annual consultation rate in the proposed critical habitat designation of approximately 12 formal consultations, 101 informal consultations, and 48 technical assistances. As shown in Exhibit 3, the forecast level of consultation activity is highest in Unit 1 (Northern Maine), followed by Unit 5 (Greater Yellowstone Area), Unit 3 (Northern Rocky Mountains), Unit 2 (Northeastern Minnesota) and Unit 4 (North Cascades).

²⁰ The consultation history provided by the Minnesota and Washington field offices only included consultations occurring within the proposed critical habitat designation. For Maine, we included all consultations with the exception of consultations with the Farm Service Agency (FSA); according to the Maine field office, FSA consultations occur on agricultural lands outside of the proposed critical habitat designation. For Montana, the field office estimates approximately 75 percent of the consultation history occurring within the proposed critical habitat designation. For Wyoming, we conservatively assume the entire consultation history occurs in the proposed critical habitat designation. (Personal communication with U.S. Fish and Wildlife Service, Washington Ecological Services Field Office on April 14, 2014; Personal communication with U.S. Fish and Wildlife Service, Minnesota Ecological Services Field Office on April 16, 2014; Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014)

²¹ Personal communication with U.S. Fish and Wildlife Service, Wyoming Ecological Services Field Office on April 17, 2014.

EXHIBIT 3. ANNUAL CONSULTATION RATE FORECAST IN PROPOSED CANADA LYNX CRITICAL HABITAT

UNIT		FORMAL ⁽¹⁾	INFORMAL	TECHNICAL ASSISTANCE
1	Northern Maine	2	20	41
2	Northeastern Minnesota	1	9	1
3	Northern Rocky Mountains	5	25	0
4	North Cascades	0	1	0
5	Greater Yellowstone Area	4	46	6
Total		12	101	48

Note: According to discussions with Service staff, the relatively low level of formal consultations is a reflection of existing conservation agreements and management plans in place across the proposed designation. In many cases, such agreements and plans include a process for addressing section 7 consultation in manner that minimizes the administrative burden to consulting action agencies.

Sources: Email communication with US FWS Montana Ecological Services Office on March 26, 2014; Personal communication with U.S. Fish and Wildlife Service, Washington Ecological Services Field Office on April 14, 2014; Personal communication with U.S. Fish and Wildlife Service, Minnesota Ecological Services Field Office on April 16, 2014; Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014.

As previously discussed, as all areas proposed as critical habitat occur in areas currently occupied by the lynx, this analysis anticipates that incremental costs are limited to the additional administrative costs from addressing adverse modification as part of future section 7 consultations. As shown in Exhibit 4, unit costs of such administrative efforts range from \$410 to \$5,000 per consultation (2014 dollars, total cost for all parties participating in a single consultation).

EXHIBIT 4. RANGE OF INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION (2014\$)

CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION NOT RESULTING FROM CRITICAL HABITAT DESIGNATION					
Technical Assistance	\$140	N/A	\$260	\$410	\$410
Informal	\$620	\$790	\$510	\$1,900	\$2,400
Formal	\$1,400	\$1,600	\$880	\$3,800	\$5,000
Programmatic	\$4,200	\$3,500	N/A	\$7,700	\$9,100

Notes:

- The levels of effort per consultation represent approximate averages based on the best available cost information. The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The cost estimates presented in this table may therefore not sum to the total costs reported due to rounding.
- Estimates reflect average hourly time required by staff.

Sources: IEC analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2014, and a review of consultation records from several Service field offices across the country conducted in 2002.

Applying these unit cost estimates, this analysis conservatively estimates (i.e., more likely to overstate than understate costs) that the administrative cost of addressing adverse modification in such section 7 consultations will result in incremental costs of up to \$320,000 (2014 dollars) in a given year. Exhibit 5 presents the estimated incremental administrative cost per year, by unit.

EXHIBIT 5. FORECAST INCREMENTAL ADMINISTRATIVE COSTS, BY UNIT (2014 DOLLARS)

UNIT		INCREMENTAL ADMINISTRATIVE COSTS PEAR YEAR (2014\$)
1	Northern Maine	\$78,000
2	Northeastern Minnesota	\$25,000
3	Northern Rocky Mountains	\$84,000
4	North Cascades	\$1,800
5	Greater Yellowstone Area	\$130,000
Total		\$320,000
<p>Note: The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The unit cost estimates therefore may not sum to the total costs reported due to rounding.</p>		

SECTION 4. OTHER, NON-SECTION 7 INCREMENTAL COSTS

Incremental costs may occur outside of the section 7 consultation process if the revised designation of critical habitat triggers additional requirements or project modifications under state or local laws, regulations, or management strategies. These types of costs typically occur if the designation increases awareness of the presence of the species or the need for protection of its habitat. Such costs may occur even when activities do not have a Federal nexus for consultation.

As previously discussed, the lynx has been listed under the Act for over 10 years, since 2000. In addition, excluding the state of Washington, critical habitat has been designated since 2009 for the vast majority (approximately 93 percent) of the proposed critical habitat designation. In these areas, we therefore assume that the revised designation of critical habitat will not provide new information about the need to conserve the species and its habitat.

However, the Service notes that revised designation may increase awareness of the presence of the lynx in areas that were not previously designated as critical habitat in 2009, approximately 629 square miles including privately-owned timber lands in northern Maine (Unit 1) and approximately 259 square miles of mostly Federal (i.e., BLM and NPS) lands in northwestern Wyoming (Unit 5).²² Accordingly, in this section we consider the potential for the proposed critical habitat designation to generate other, non-section 7 incremental costs in areas newly designed in Unit 1 and Unit 5 (Greater Yellowstone Area). As part of this section, we also consider the potential for incremental costs to adversely affect snowmobiling activities in the State of Washington, the activity and area for which the U.S. District Court of Wyoming previously enjoined the 2009 critical habitat designation.

SNOWMOBILING IN WASHINGTON

Snowmobiling activities occur throughout the proposed designation. Understanding of the potential impacts of snowmobiling on the lynx continues to evolve over time.

²² U.S. Fish and Wildlife Service. April 18, 2014. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Revise the Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx.

Concerns about the negative impacts of snowmobiling on the lynx is primarily based on the hypothesis that compacted over-the-snow trails may enable other snowshoe hare predators, such as coyotes, access to prey in areas with deep snow. However, new research introduces uncertainty on the relationship between coyotes, lynx, and lynx habitat. In response to this uncertainty, the 2013 revisions to the LCAS provided more flexibility with respect to the management of recreational activities in lynx habitat, for example:

- “Manage winter recreation activities within [lynx analysis units] such that lynx habitat connectivity is maintained or improved where needed.
- To minimize habitat loss, concentrate recreational activities within existing developed and high winter-use areas, rather than developing new sites and facilities in lynx habitat. On federal lands in areas with low levels of recreation currently, consider limiting the future development or expansion of developed winter recreation sites or concentrated winter use areas.
- Direct recreational activities and facilities away from identified linkage areas.
- Consider not expanding designated over-the-snow routes or designated play areas in lynx habitat, unless the designation serves to consolidate use.”²³

Snowmobiling stakeholders have largely expressed approval of the 2013 LCAS revisions. For example, through public comment, Minnesota United Snowmobilers Association (MUSA) expressed its approval of the 2013 LCAS’s changes to management standards, especially related to new scientific discoveries that counter the assumption that compacted over-the-snow routes result in increased competition for prey. MUSA also noted, however, that the 2013 LCAS standards are not necessarily being followed in Minnesota.²⁴ The Wyoming State Snowmobile Association also expressed its support of the 2013 revisions to the LCAS and stated that impacts to snowmobiling in Wyoming are not anticipated in newly-added lands in Unit 5, assuming that the areas are managed consistent with the 2013 LCAS guidelines.²⁵

In Washington, between 3,000 and 5,000 miles of trails are available for snowmobiling, of which approximately 200 miles occur within the proposed critical habitat designation on Federal and State lands. A 2003 study by the State of Washington estimated that the number of people participating in snowmobiling would increase 43 percent by the year 2013.²⁶

Snowmobiling contributes to local economies. In 2001, Washington State University and the Washington State Snowmobile Association (WASSA) conducted a snowmobile usage study and concluded that the annual economic impact of snowmobiling in Washington was \$92.7 million dollars. In response to the 2009 critical habitat

²³ U.S. Forest Service, National Park Service, U.S. Fish and Wildlife Service, Bureau of Land Management. August 2013. Canada Lynx Conservation Assessment and Strategy. 3rd Edition.

²⁴ Minnesota United Snowmobilers Association. Public comment submitted on December 18, 2013.

²⁵ Wyoming State Snowmobile Association. Public comment submitted on December 10, 2013.

²⁶ Interagency Committee for Outdoor Recreation. Salmon Recovery Funding Board. Estimates of future participation in outdoor recreation in Washington State. March 2003.

designation, WASSA estimated that snowmobiling accounted for nearly \$8.5 million in direct expenditures and \$4.1 million in indirect spending in Methow Valley, an area that neighbors proposed critical habitat.²⁷

WASSA, which represents approximately 30,000 registered snowmobilers and nearly 100 snowmobile-related businesses in Washington, has expressed concern that designation of critical habitat will generate significant economic impacts to the snowmobiling industry. Specifically, WASSA is concerned that people will perceive that the designation will limit snowmobiling and in turn will be less likely to invest in snowmobiling equipment, that the designation will prevent an increase in over-the-snow trails thus resulting in congestion, and that the designation will present an additional regulatory burden to future attempts to expand or increase the number of trails in the area.²⁸

While annual data on snowmobiling participation in Washington since 2009 are not readily available, we contacted the Washington field office and the USFS, the Federal land manager responsible for the majority of snowmobiling trails affected by the proposed critical habitat designation, to understand the potential impacts of the revised designation on snowmobiling activities in Washington (Unit 4).²⁹ According to these discussions, the proposed critical habitat designation is not anticipated to adversely change snowmobiling in Washington.³⁰ We also contacted the Maine and Minnesota field offices to determine whether or how snowmobiling activities were affected as a result of snowmobiling trails proposed as critical habitat in 2009. According to these discussions, no significant changes in snowmobiling activities have been observed since the 2009 designation of critical habitat in Maine and Minnesota.^{31,32}

²⁷ Stoel Rives LLP. Public comment on behalf of Washington State Snowmobile Association submitted on December 23, 2013.

²⁸ WSSA. Public comment submitted on December 23, 2013.

²⁹ Publicly available data suggest that there were between 28,000 and 31,500 snowmobiles registered in the state of Washington in 2013. However, historical data that would show trends in snowmobile registrations over time are not readily available. (American Council of Snowmobile Associations. Registered Snowmobiles in the U.S. Accessed on May 6, 2014 at: http://www.snowmobilers.org/facts_reg_snowmobiles.html; International Snowmobiler Manufacturers Association. 2013 United States Snowmobile Registrations. Accessed on May 6, 2014 at: http://www.snowmobile.org/stats_registrations_us.asp.)

³⁰ Personal communication with U.S. Fish and Wildlife Service, Washington Ecological Services Field Office on April 14, 2014; Personal communication with J. Rohrer, Range and Wildlife Program Manager, U.S. Forest Service, Okagnon-Wenatchee National Forest on April 21, 2014.

³¹ Personal communication with U.S. Fish and Wildlife Service, Wyoming Ecological Services Field Office on April 17, 2014; Personal communication with U.S. Fish and Wildlife Service, Washington Ecological Services Field Office on April 14, 2014; Personal communication with U.S. Fish and Wildlife Service, Minnesota Ecological Services Field Office on April 16, 2014; Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014; Personal communication with J. Rohrer, Range and Wildlife Program Manager, U.S. Forest Service, Okagnon-Wenatchee National Forest on April 21, 2014.

³² As previously discussed, Section 7 consultations on snowmobiling activities are expected to occur even in the absence of critical habitat, because the lynx presence is known across all areas proposed as critical habitat. Accordingly, any conservation measures recommended by the Service for snowmobiling would occur regardless of the designation of critical habitat, in response to the species presence. Therefore, incremental costs due to the proposed critical habitat designation would be limited to the additional administrative costs stemming from addressing the potential for adverse modification. These administrative costs of consultation are included in the analysis presented in Section 3.

In response to the 2013 revised critical habitat designation, WASSA resubmitted the sector assessment study they previously commissioned on the regional economic impacts of the 2008 proposed critical habitat rule. The WASSA study assumes that lynx conservation efforts will result in an overall loss of winter visitors and tourism spending within the region. The study employs a regional input/output model, estimating the potential cost of the critical habitat designation to be \$262,000 to \$1,645,000 (2013 dollars) through the year 2025, assuming a seven percent discount rate.^{33,34,35} This present value sum translates to approximately \$27,000 to \$168,500 on an annualized basis, assuming a seven percent discount rate.

TIMBER ACTIVITIES IN NORTHERN MAINE

A Federal nexus for timber activities on privately-owned timberlands in Maine primarily stems from a harvester's participation in the Natural Resources Conservation Service's (NRCS) Healthy Forests Reserve Program (HFRP).³⁶ The purpose of HFRP is to "help landowners restore, enhance and protect forestland resources on private lands through easements and financial assistance." Specifically, the program aims to "promote the recovery of endangered or threatened species."³⁷ All areas covered under the HFRP were excluded from the 2009 proposed designation because of the anticipated beneficial impacts of the program to the lynx and its habitat, and the Service is again considering these same areas for exclusion from the Proposed Rule.^{38,39} Some landowners have expressed concern to the Maine field office about the proposed critical habitat designation. In particular, it is possible that some private landowners may choose not to participate in voluntary lynx conservation programs, such as the NRCS HFRP. For example, the Maine field office is aware of at least one lynx-related proposal withdrawn following the Service's proposal of critical habitat in 2009. Specifically, the Maine Forest Products Council, in conjunction with forestry companies, withdrew a proposal to fund research and outreach on lynx habitat enhancements at the University of Maine.⁴⁰ Withdrawal from NRCS programs could result in reduced income for landowners and organizations participating in voluntary

³³ Gustanski, J.A., and E.A. Bergmann. 2008. Revised Critical Habitat for Contiguous United States Distinct Population Segment of the Canada Lynx. Sector Assessment of Regional Economic Impacts of Proposed Rule Associated with Snowmobiling and Winter Recreation in Unit 4: North Cascades. Resource Dimensions, LLC. Gig Harbor, Washington.

³⁴ Gustanski et al. estimated impacts in 2008 dollars. Estimated impacts adjusted to 2013 dollars using the National Income and Product Accounts Table, Table 1.1.9 Implicit Price Deflators for Gross Domestic Product. U.S. Department of Commerce Bureau of Economic Analysis.

³⁵ The Service's economic analysis of the 2009 critical habitat designation also considered potential impacts to snowmobiling activities in Washington. This analysis estimated baseline costs between \$0 and \$109,000 (2008 dollars) in the state of Washington, due to lynx conservation efforts; the analysis did not estimate any incremental costs of the proposed critical habitat designation on snowmobiling activities in Washington.

³⁶ Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014.

³⁷ United States Department of Agriculture, Natural Resources Conservation Service. March 2014. Healthy Forest Reserve Program (Fact Sheet).

³⁸ Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014.

³⁹ Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014.

⁴⁰ Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014.

lynx conservation programs.⁴¹ At this time we are unable to predict the likelihood that applications will be withdrawn.⁴² As a result, we do not quantify costs associated with potential withdrawals from voluntary conservation programs.

POSSIBLE IMPACTS OF PUBLIC PERCEPTION

Comments received regarding proposed designations of critical habitat in various locations throughout the United States indicate that the public perceives critical habitat designation as potentially resulting in incremental changes to private property values, above and beyond those associated with specific forecast project modifications under section 7 of the Act.⁴³ These commenters believe that, all else being equal, a property that is inhabited by a threatened or endangered species, or that lies within a critical habitat designation, will have a lower market value than an identical property that is not inhabited by the species or that lies outside of critical habitat. This lower value results from the perception that critical habitat will preclude, limit, or slow development, or somehow alter the highest and best use of the property. Public attitudes about the limits and costs that the Act may impose can cause real economic effects to the owners of property, regardless of whether such limits are actually imposed. Over time, as public awareness grows of the regulatory burden placed on designated lands, particularly where no Federal nexus compelling section 7 consultation exists, the effect of critical habitat designation on properties may subside.

The proposed critical habitat designation includes additional private lands not previously designated in 2009 in Maine (Unit 1), including the Van Buren area of eastern Aroostook County (217 square miles) and the Herseytown-Stacyville area of northern Penobscot County (304 square miles) (see Exhibit A-6). These newly added areas in Maine are generally rural in nature. While the primary land use activity in these areas is timber management, future development could occur on privately-owned lands currently zoned for development or used for timber management.^{44,45}

⁴¹ Depending on the extent of perceptual effects, however, such funds could be reallocated to projects elsewhere in the region. In that case, any costs associated with withdrawal from programs, such as NRCS, would represent a distributive cost rather than a reduction in economic efficiency.

⁴² The Maine Field Office indicates that, since initial HFRP plans were completed, additional northern Maine landowners have shown interest in enrolling in HFRP. The Service and NRCS intend to complete implementation of plans for current enrollees before working with additional landowners seeking HFRP funding (Written communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on May 29, 2014.)

⁴³ See, for example, public comments on the potential impact of designating private lands as critical habitat for the Northern spotted owl (as summarized in Industrial Economics, Incorporated. *Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl: Final Report*. Prepared for the U.S. Fish and Wildlife Service. November 20, 2012. (p. 5-21) and the cactus ferruginous pygmy owl (as summarized in Industrial Economics, Incorporated. *Economic Analysis of Critical Habitat Designation for the Cactus Ferruginous Pygmy-Owl*. Prepared for the U.S. Fish and Wildlife Service. June 1999. p. 44)).

⁴⁴ Development of timber lands has been seen in northern Maine. For example, the Plum Creek Timber Company ("Plum Creek") is currently pursuing development of approximately 16,910 acres for a residential and resort community in the Moosehead Lake Region. The State of Maine approved a concept plan for the proposed development in 2012. As part of the concept plan, Plum Creek has implemented a number of conservation measures, most recently working with the Nature Conservancy to put in place a conservation easement to permanently protect 363,000 acres in the Moosehead Lake region. According to discussions with the Maine field office, Plum Creek also recently explored development of an HCP for the lynx but ultimately decided not to develop the HCP because of the relatively low level of incidental take that was estimated for the Moosehead Lake development project. (Personal communication with U.S. Fish and Wildlife Service,

To determine the potential likelihood for the proposed critical habitat designation to influence future development activities in these areas, we first examined county level population projections from the State of Maine, Office of Policy and Management.⁴⁶ Through the year 2030, population losses are forecast for Aroostook County. In Penobscot County, population is anticipated to increase by 2.4 percent through 2030, equal to approximately 0.12 percent per year. The portion of Penobscot County proposed as critical habitat is located in a single census tract. According to the 2010 Census, the total population of this census tract is 2,084; this reflects a population density of approximately 0.001 people per acre, based on a total census tract area of approximately 1.6 million acres.⁴⁷

Population growth, however, does not necessarily capture the full extent of development pressure; construction of seasonal homes serves as an additional driver of development in Maine.⁴⁸ According to Maine’s 2010 Comprehensive Land Use Plan, 70 percent of Maine’s housing units are seasonal (or second) homes, for which 70 percent are used by Maine residents. Exhibit 7 below summarizes data from the U.S. Census Bureau on building permit activity in Aroostook and Penobscot counties and for the state of Maine as a whole.

EXHIBIT 6. HISTORICAL ANNUAL NEW PRIVATELY-OWNED RESIDENTIAL BUILDING PERMITS

	2013	2012	2011	2010	2009
Aroostook	73	57	42	79	101
<i>Permits per square mile</i>	0.01	0.01	0.01	0.01	0.02
<i>Percent of State Total</i>	2.5%	2.0%	1.4%	2.7%	3.5%
Penobscot	244	223	235	259	291
<i>Permits per square mile</i>	0.07	0.07	0.07	0.08	0.09
<i>Percent of State Total</i>	8.4%	7.7%	8.1%	8.9%	10.0%
State of Maine	2,900	2,591	2,342	2,872	2,884

Source: U.S. Bureau of the Census. Building Permit Estimates - U.S., State, and Metropolitan Areas. Accessed on June 4, 2014 at: <http://censtats.census.gov/bldg/bldgprmt.shtml>.

Residential development in Maine is generally located close to organized areas and public roads, for example, approximately 88 percent of permitted new dwellings were

Maine Ecological Services Field Office on April 17, 2014; Plum Creek Timber Company. “Moosehead Lake” Accessed on May 5, 2014 at: <http://www.plumcreek.com/land/development/moosehead-lake>)

⁴⁵ The Maine field office identified one development project currently under consideration on the border between areas previously proposed as critical habitat in 2009 and the newly added private lands included in the 2013 proposed critical habitat designation. The potential project consists of approximately 50,000 acres owned by J.D. Irving in the Fish River Lakes Chain area. Currently, J.D. Irving leases these lands as timberland but is considering applying to re-zone these lands for future development. The concept plan for land development is a long-term one that involves mapping out proposed areas for future development over a period of 25 years. The Service is unaware of the current status of this project. (Personal communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on April 17, 2014; Christoforos, A. “J.D. Irving Concept Plan for Fish River Lakes Chain land development presented to LUPC.” October 9, 2013. Accessed on May 2, 2014 at: <http://wagmtv.com/news/j-d-irving-concept-plan-for-fish-river-lakes-chain-land-development-presented-to-lupc>.)

⁴⁶ State of Maine. Office of Policy and Management. Maine Demographic Projections. Accessed on May 5, 2014 at: <http://www.maine.gov/economist/projections/index.shtml>.

⁴⁷ US Census Bureau. 2012. 2010 TIGER/Line Shapefiles (Census Tracts). Downloaded on January 31, 2014.

⁴⁸ Written communication with U.S. Fish and Wildlife Service, Maine Ecological Services Field Office on May 29, 2014.

located in minor civil divisions (MCDs) within one mile of a public road.⁴⁹ In Aroostook County, of developable land located within one mile of a public road, approximately nine percent (103,000 acres) is located within newly-proposed critical habitat.⁵⁰ In Penobscot County, the number is lower—approximately six percent (58,000 acres).⁵¹ Approximately 50 percent of newly-added critical habitat in Aroostook and Penobscot counties (see Exhibit A-6) fall within the Maine Land Use Planning Commission’s zoning jurisdiction.⁵² Of this area, less than one percent is zoned for development.⁵³ The majority of these areas are zoned for general management, which allows for forestry and agricultural management activities.⁵⁴ Based on this information, this analysis does not anticipate that designation of critical habitat in newly added areas in Unit 1 will result in measurable perception effects.

SECTION 5. SECTION 7 AND OTHER ECONOMIC BENEFITS

The primary intended benefit of critical habitat is to support the conservation of threatened and endangered species, such as the lynx. Quantification and monetization of species conservation benefits requires information on: (1) the incremental change in the probability of lynx conservation that is expected to result from the designation; and (2) the public’s willingness to pay for such beneficial changes.⁵⁵

As described in this memorandum, additional efforts to conserve the lynx are not predicted. If, however, perceptual effects cause changes in future land use, benefits to the species and environmental quality may occur. Due to existing data limitations, we are unable to assess the likely magnitude of such benefits.⁵⁶

⁴⁹ MCDs are legally defined county subdivisions. (Maine Land Use Regulation Commission. 2010. Comprehensive Land Use Plan.)

⁵⁰ Developable land includes any land that is privately owned, not protected by a permanent conservation easement, and of a land cover suitable for development (i.e. we exclude land that has already been developed, as well as barren rock, wetlands, and open water.) Land ownership and protection status was determined using U.S. Geological Survey. National Land Cover Database 2006 (NLCD2006). Downloaded from www.mrlc.gov/padus/ on June 5, 2014. Land cover was determined using U.S. Geological Survey. National Land Cover Database 2006 (NLCD2006). Downloaded from: www.mrlc.gov/finddate.php on July 30, 2013.

⁵¹ Maine Department of Transportation. 2011. Maine Public Roads (GIS Data). Downloaded from <http://www.maine.gov/megis/catalog/> on June 5, 2014; U.S. Geological Survey. National Land Cover Database 2006 (NLCD2006). Downloaded from www.mrlc.gov/padus/ on July 30, 2013.

⁵² Maine Office of GIS. 2014. Town Boundaries (METWP24) (GIS Data). Downloaded from <http://www.maine.gov/megis/catalog/> on June 5, 2014.

⁵³ In addition, 17 percent of this area (33,500 acres) is zoned as protected from development.

⁵⁴ Maine Land Use Planning Commission. 2013. LUPC Digital Zone Shapefiles (GIS Data). Downloaded from http://www.maine.gov/dacf/lupc/plans_maps_data/index.shtml on June 5, 2014.

⁵⁵ The actions undertaken to achieve conservation can also generate other types of environmental improvements. Estimation of the value of these additional benefits requires quantification of the physical changes and information about the public’s willingness to pay for such improvements.

⁵⁶ For a detailed discussion of these data limitations, see Flight, M. and R. Unsworth, Industrial Economics, Incorporated. 2011. *Quantifying Benefits of Critical Habitat Designation for Listed Species*. Memorandum to Douglas Krofta, U.S. Fish and Wildlife Service.

SECTION 6. SUMMARY

In conclusion, revised critical habitat for the lynx is unlikely to generate costs exceeding \$100 million in a single year. The section 7-related costs of designating revised critical habitat for the lynx are likely to be limited to the additional administrative effort required to consider adverse modification. This finding is based on several factors, including:

1. All areas proposed as critical habitat lands are considered to be currently occupied by the species, providing baseline protection under the Act;
2. The Service believes that project modifications requested to avoid adverse modification are likely to be the same as those needed to avoid jeopardy to the species;
3. On Federally-managed lands, the lynx receives additional baseline protection from existing conservation efforts and management plans; and
4. An increase in awareness of the need to consult with the Service is unlikely given the listing of the species in 2000 and the designation of critical habitat since 2009 across the vast majority (approximately 93 percent) of the proposed critical habitat designation.

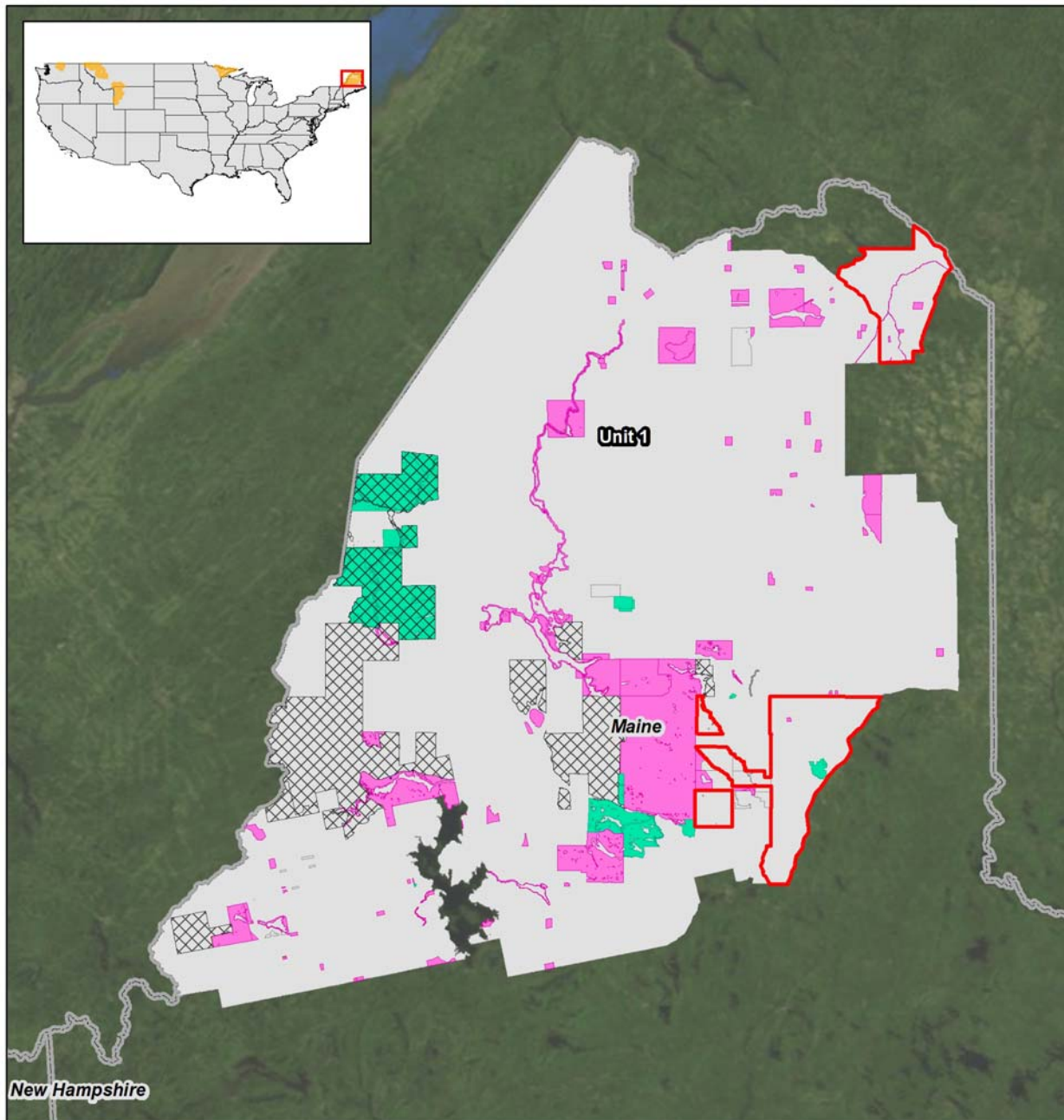
In addition, as a result of the array of baseline protections that already exist for the lynx, the proposed rule is unlikely to trigger additional requirements under state or local regulations. Costs resulting from public perception of the effect of critical habitat, if they occur, are also unlikely to reach \$100 million in a given year.

Additional efforts to conserve the lynx are not predicted. If, however, other effects, such as public perception, cause changes in future land use, benefits to the species and environmental quality may occur. The magnitude of likely benefits is highly uncertain, and quantification would require primary research and the generation of substantial amounts of new data, which is beyond the scope of this memorandum and Executive Order 12866.⁵⁷



⁵⁷ Executive Order 12866 directs agencies to base regulatory decisions on “the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation” (58 FR 51736). For a detailed discussion of data limitations associated with the estimation of critical habitat benefits, see Flight, M. and R. Unsworth, Industrial Economics, Incorporated. 2011. *Quantifying Benefits of Critical Habitat Designation for Listed Species*. Memorandum to Douglas Krofta, U.S. Fish and Wildlife Service.

APPENDIX A | OVERVIEW MAPS OF PROPOSED CANADA LYNX CRITICAL HABITAT

EXHIBIT A-1. OVERVIEW MAP OF UNIT 1, NORTHERN MAINE



2013 Canada lynx proposed critical habitat designation

-  Considered for exclusion
-  Newly-added proposed critical habitat

Land Ownership

-  Private Landowner
-  State Land
-  The Nature Conservancy (TNC)

Data sources:
 1. U.S. Fish and Wildlife Service
 2. ESRI
 3. PAD-US

Map Projection:
 Albers Equal Area Conical

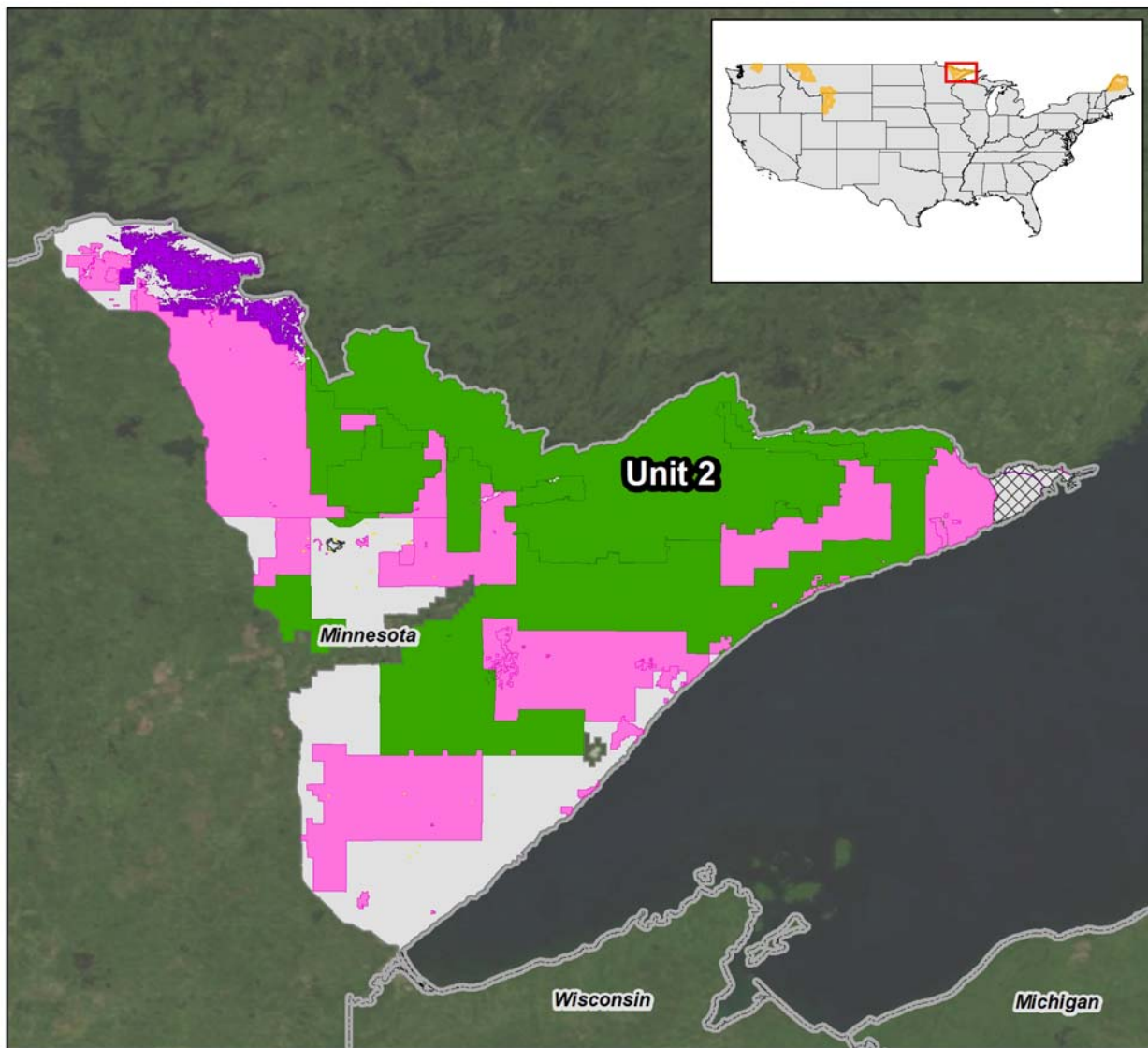


0 20 40 Miles

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EXHIBIT A-2. OVERVIEW MAP OF UNIT 2, NORTHEASTERN MINNESOTA



Legend

2013 Canada lynx proposed critical habitat designation

 Considered for exclusion

Land Ownership

-  Bureau of Land Management (BLM)
-  Forest Service (USFS)
-  National Park Service (NPS)
-  Other Federal Land
-  State Land
-  Private
-  The Nature Conservancy (TNC)



0 25 50 Miles

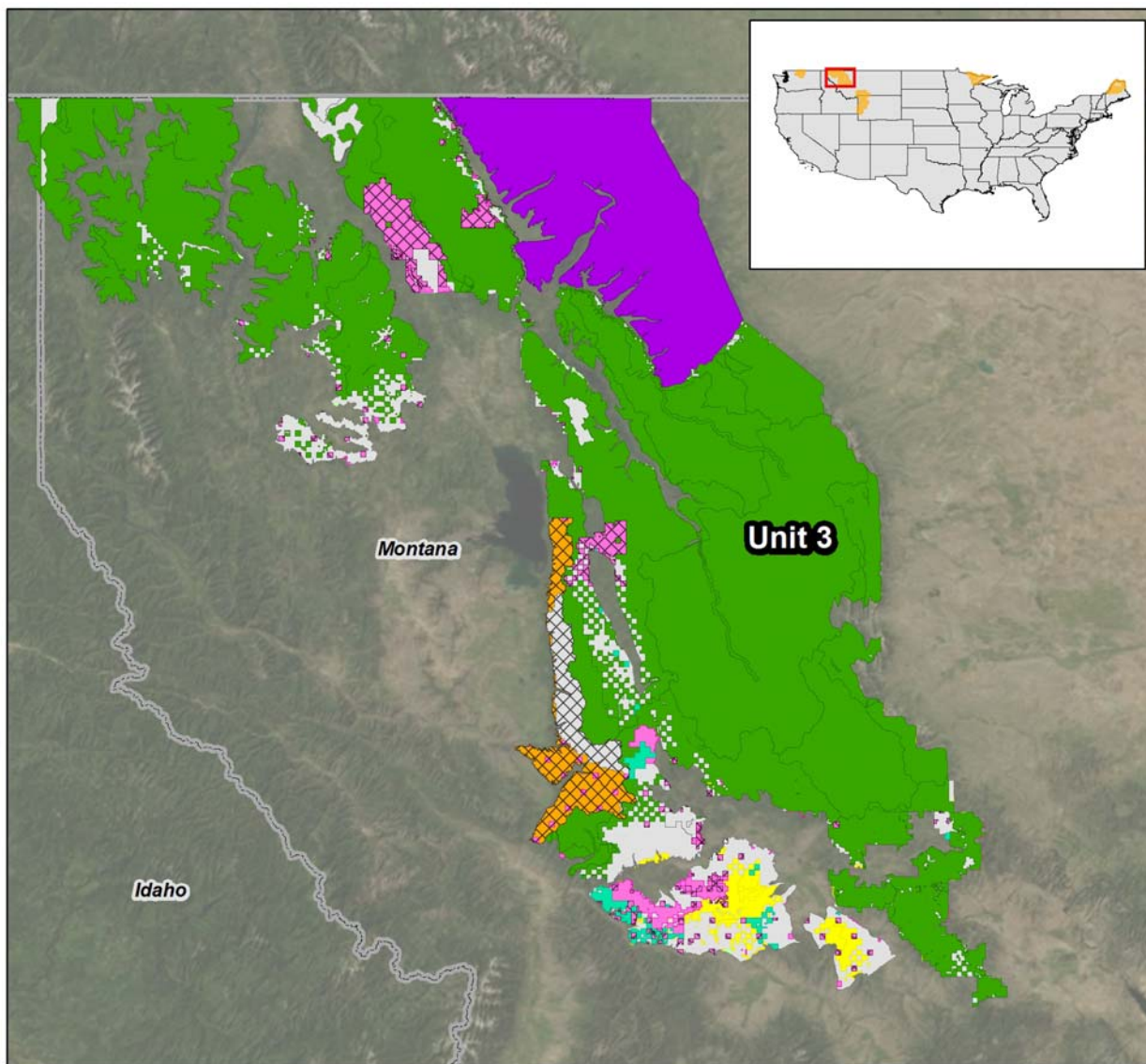
Data sources:
 1. U.S. Fish and Wildlife Service
 2. ESRI
 3. PAD-US

Map Projection:
 Albers Equal Area Conical



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EXHIBIT A-3. OVERVIEW MAP OF UNIT 3, NORTHERN ROCKY MOUNTAINS



2013 Canada lynx proposed critical habitat designation

 Considered for exclusion

Land Ownership

-  Tribal
-  Bureau of Land Management (BLM)
-  Other Federal Land
-  Forest Service (USFS)
-  National Park Service (NPS)
-  State Land
-  The Nature Conservancy (TNC)
-  Private



0 30 60 Miles

Data sources:

1. U.S. Fish and Wildlife Service
2. ESRI
3. PAD-US

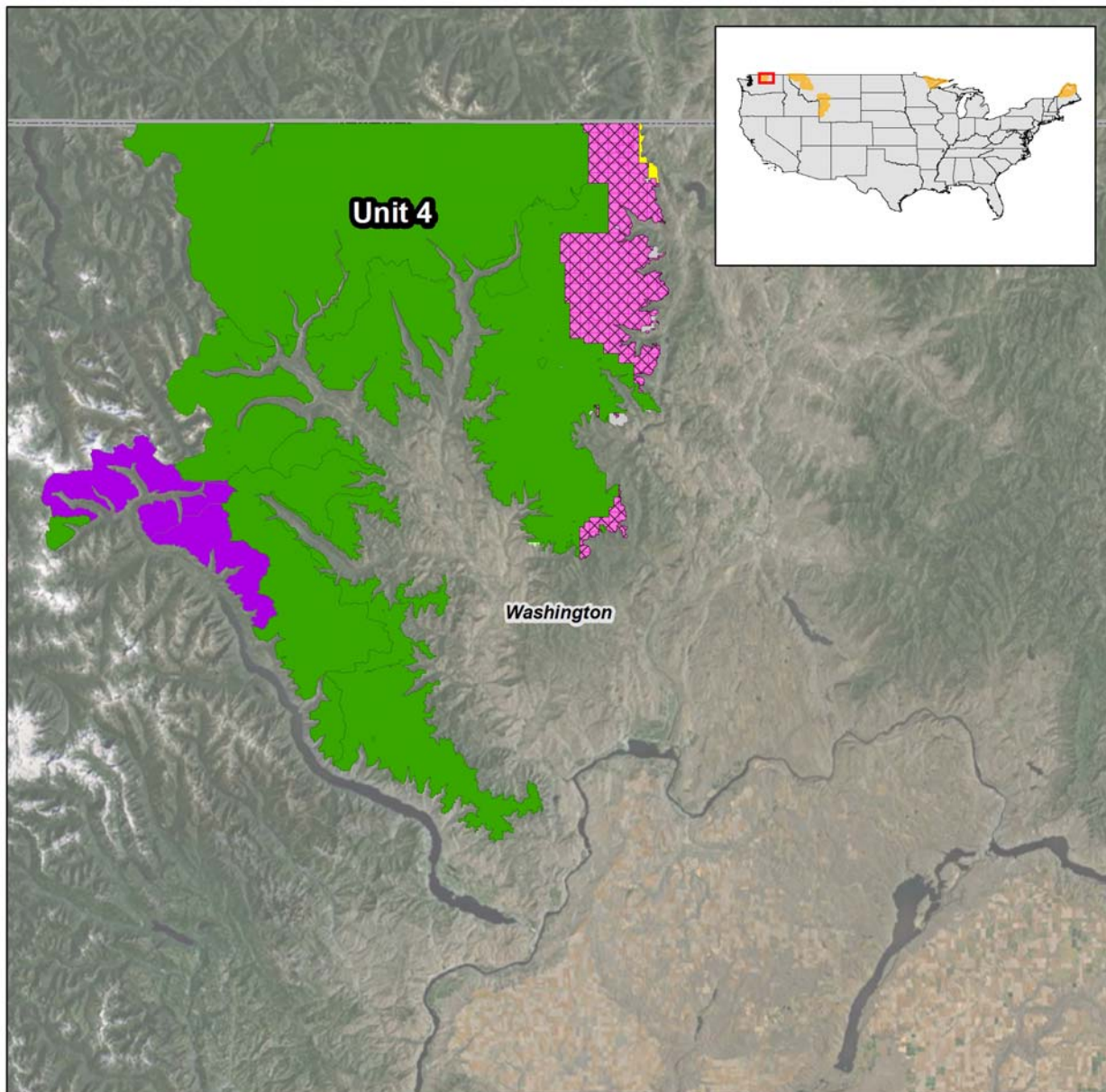
Map Projection:

Albers Equal Area Conical

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EXHIBIT A-4. OVERVIEW MAP OF UNIT 4, NORTH CASCADES



2013 Canada lynx proposed critical habitat designation

 Considered for exclusion

Land Ownership

 Bureau of Land Management (BLM)

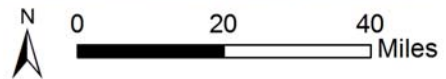
 Other Federal Land

 Forest Service (USFS)

 National Park Service (NPS)

 State Land

 Private



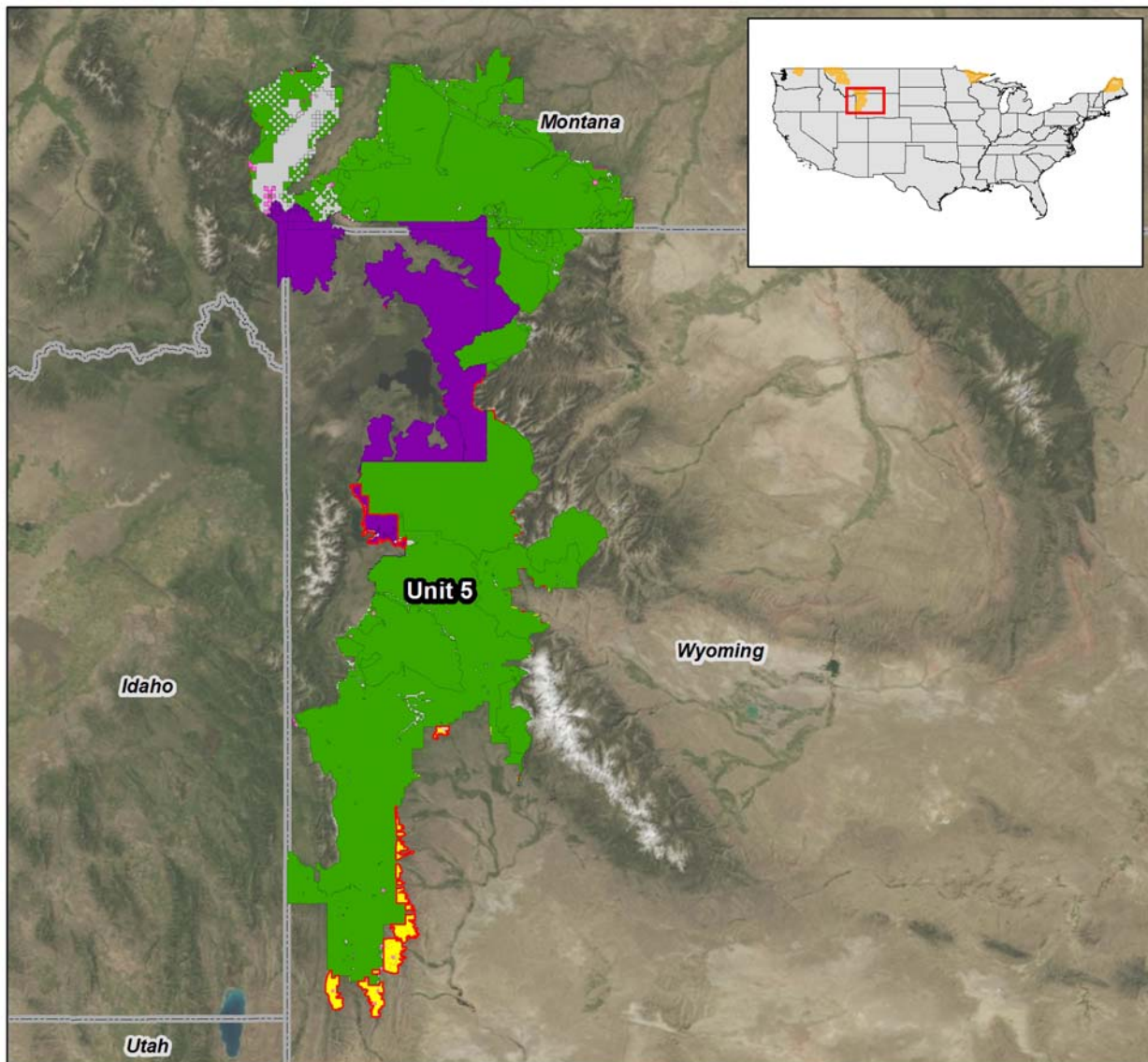
Data sources:
 1. U.S. Fish and Wildlife Service
 2. ESRI
 3. PAD-US

Map Projection:
 Albers Equal Area Conical



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EXHIBIT A-5. OVERVIEW MAP OF UNIT 5, GREATER YELLOWSTONE AREA

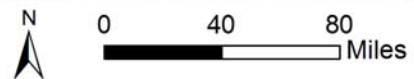


2013 Canada lynx proposed critical habitat designation

-  Considered for exclusion
-  Newly-added proposed critical habitat

Land Ownership

-  Bureau of Land Management (BLM)
-  Forest Service (USFS)
-  National Park Service (NPS)
-  Other Federal Land
-  Other State Land
-  Private
-  The Nature Conservancy (TNC)



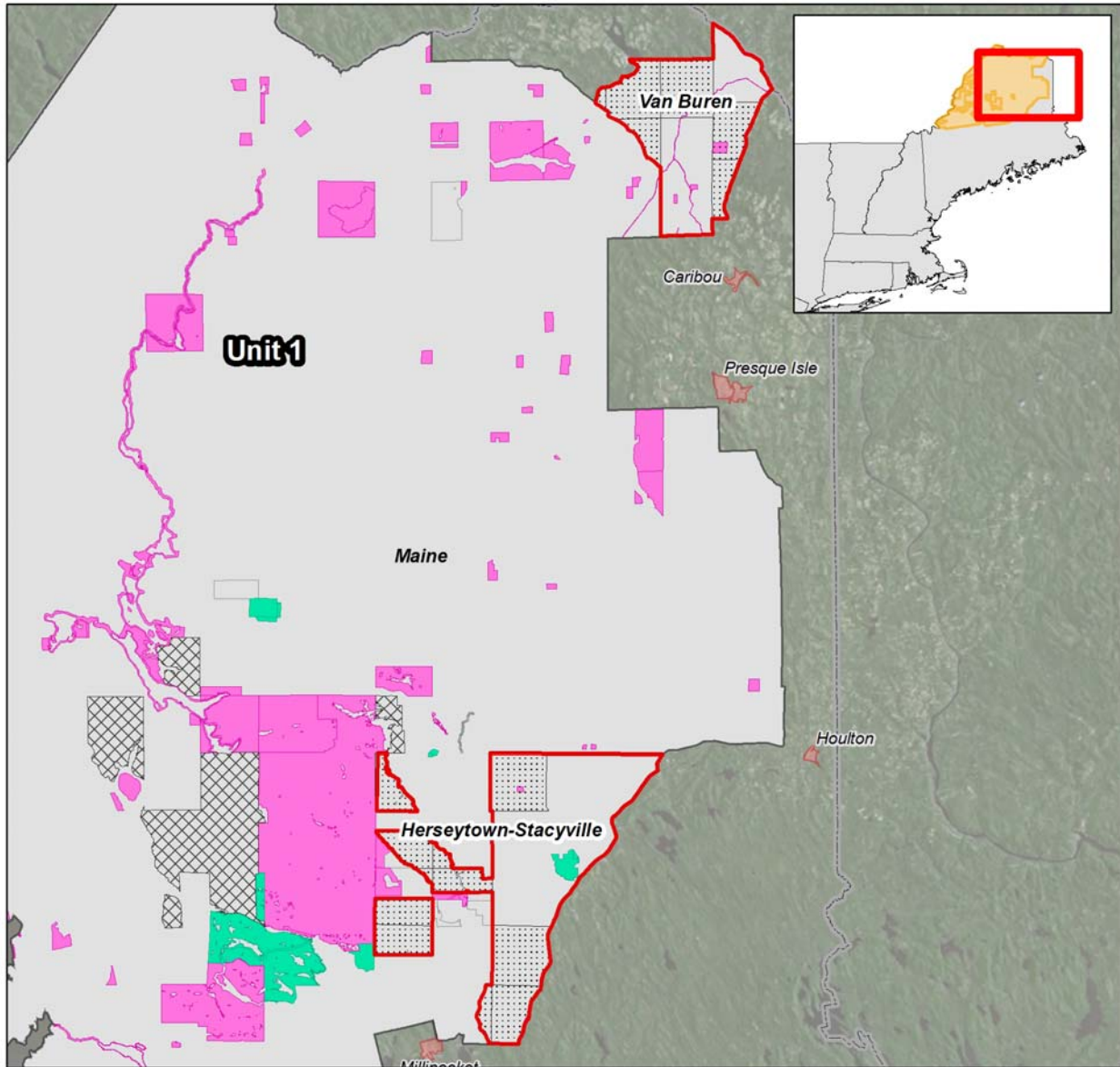
Data sources:
 1. U.S. Fish and Wildlife Service
 2. ESRI
 3. PAD-US

Map Projection:
 Albers Equal Area Conical

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EXHIBIT A-6. MAP OF NEWLY-ADDED PROPOSED CANADA LYNX CRITICAL HABITAT IN UNIT 1

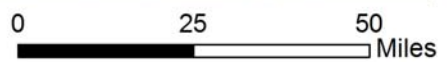


Legend

-  Urban Areas
-  Zoning data available
- 2013 Canada lynx proposed critical habitat designation**
-  Considered for exclusion
-  Newly-added proposed critical habitat

Land Ownership

-  Private Landowner
-  State Land
-  The Nature Conservancy (TNC)



- Data sources:
1. U.S. Fish and Wildlife Service
 2. ESRI
 3. PAD-US
 4. Maine Office of GIS

Map Projection:
Albers Equal Area Conical



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