

## Canada Lynx

*Lynx canadensis*

Federal Listing	T
State Listing	E
Global Rank	G5
State Rank	S1
Regional Status	Very High



*Photo by unknown*

### Justification (Reason for Concern in NH)

The recovery outline for lynx (USFWS) lists the degradation of lynx habitat through forest management which specifically limits the extent of boreal forest and the associated structure needed to support adequate densities of snowshoe hare as the original reason for listing lynx in the contiguous United States. This was specific to National Forest and BLM lands planning and forest management practices such as pre-commercial thinning. In the contiguous US, lynx are on the southern edge of their distribution in the boreal forest. As a result habitat is more patchily distributed and therefore snowshoe hare densities are likely lower (USFWS recovery outline). Forest management to maintain forest cover and snowshoe hare densities to support lynx is more critical to maintain populations specifically in the Northeast. Large-scale timber harvests for agriculture and suburban developments north of the St. Lawrence Seaway combined with intensive lynx harvests and land clearing south of the Seaway may have resulted in isolation of lynx in northern New England (Litvaitis et al. 1991). Lynx are morphologically adapted to deep snow a condition (long legs and large feet, Parker et al. 1983) which assists them in outcompeting bobcats and coyotes within their distribution. Lynx observations are increasing in New Hampshire. Possible habitat changes and corresponding changes in snowshoe hare densities in Maine may explain the expansion into New Hampshire. New Hampshire still has several large landowners throughout Coos County who have the ability, and continue to manage softwood habitat that is conducive to producing higher snowshoe hare densities. Maintaining this habitat at the landscape scale, which would support a viable population of lynx in New Hampshire, is the ultimate limiting factor.

### Distribution

Historic distribution in New Hampshire included Coos and northern Carroll and Grafton counties (i.e. White Mountain National Forest; Siegler 1971, Silver 1974, Hoving et al. 2003).

Approximately 11,162 square miles (mi<sup>2</sup>) or 6.5 million acres of mostly private lands in northern Maine were designated as critical habitat under the Endangered Species Act. This is the only habitat designated in the contiguous United States in the Northeast. Northern NH, portions of Vermont and NY are considered supporting landscapes.

Lynx tracks or sign have been sporadically observed throughout Coos County and portions of the White Mountain National Forest since the 1980's (NHFG historic records). Occurrence appears to be more stable over the last 10 years. Few lynx have been captured or killed in New Hampshire in recent years. In 1966 and 1992, adult lynx were killed after collisions with vehicles in Lee and west of Concord on Interstate 89, respectively (Litvaitis 1994).

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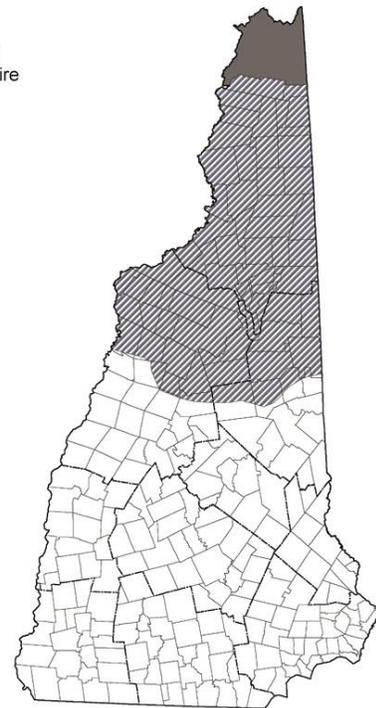
### Habitat

Lynx occupy various habitats in the boreal forests and their southern extensions (Anderson and Lovallo 2003). In eastern forests, dominant vegetation includes spruce (*Picea spp.*) and balsam fir (*Abies balsamea*). Snowshoe hare (*Lepus americanus*) are important prey for lynx, and young or subalpine stands may be preferred because they contain more hare than do mature stands (Anderson and Lovallo 2003). Though data on competition and predation are equivocal, lynx may avoid bobcat (*Lynx rufus*) and coyote (*Canis latrans*) by seeking deep snow, to which lynx are morphologically adapted (long legs and large feet, Parker et al. 1983).

### NH Wildlife Action Plan Habitats

- Lowland Spruce-Fir Forest
- High Elevation Spruce-Fir Forest

Distribution of  
CANADA LYNX  
in New Hampshire



Distribution Map

### Current Species and Habitat Condition in New Hampshire

It would appear that the only consistent population or occupation of New Hampshire by lynx would be in the northern portions of Pittsburg along the Maine and Canadian border. In 2011, 4 lynx kittens were observed in Pittsburg and considered evidence of breeding in New Hampshire.

Historically lynx were found throughout the White Mountain National Forest and Coos County, yet today occurrence in these areas today is less predictable and more sporadic in nature. Areas with the highest probability of occurrence based on today's knowledge includes northern Pittsburg, portions of central Coos County and portions of the White Mountain National Forest (Siren 2014).

### Population Management Status

Annual remote camera surveys and track transects within habitat with the highest probability of

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occurrence appears to be predicting lynx occurrence distribution in NH and can be used into the future to monitor lynx distribution.

In 2012 NHFG implemented a lynx exclusion zone for the fisher trapping season in an effort to minimize incidental capture as a result of the observed expansion in occurrence. The recommendations provided in this zone will likely need to be reviewed and changed due to 2 incidentally taken lynx in Maine in the fall of 2014.

### **Regulatory Protection (for explanations, see Appendix I)**

- Federal Endangered Species Act

### **Quality of Habitat**

Habitats with the highest probability of occurrence in New Hampshire are located in northern Pittsburg (Siren 2014). The majority of this habitat is located on the Connecticut Lakes Natural Area WMA which is owned and managed by NHFG. Surrounding habitat is owned and managed by the Connecticut Lakes Timber Company under a conservation easement held by the State of NH. Occurrence records from the past 10 years have been centered on these two ownerships.

Habitat on the Connecticut Lakes Natural Area has a conservation easement with 15,000 acres of the core lynx habitat also being part of a no management area of the 25,000 acre property. As a result these core 15,000 acres will be allowed to mature to a climax forest type potentially allowing for good denning habitat but restricting the amount of snowshoe hare habitat in the foreseeable future. Current conditions are in a transition state and portions of the 15,000 acres are supporting higher densities of snowshoe hare due to historic management.

Portions of the White Mountain National Forest were also identified as having high probability of occurrence. High elevation habitat is more patchy in distribution and it is unknown if the natural forest dynamics of these habitats will produce adequate densities of snowshoe hare to support a viable population of lynx.

### **Habitat Protection Status**

Conserved land properties contributing to lynx habitat include: The Connecticut Lakes Natural Area, Connecticut Lakes Timber Company, the Vicki Bunnell Preserve, Nash Stream State Forest, Kilkenny National Forest, the White Mountain National Forest, and the Randolph Town Forest and the Errol Town Forest, all of which have specific goals for promoting boreal forest and wildlife species within their boundaries.

Portions of Coos County remain virtually unprotected through easement or conservation ownership. These properties are critical north/south as well as east/west movement corridors between populations and states.

Potentially important ownerships:

Town of Success, no protection

Second College Grant no protection

Bayroot LLC no protection

Balsams Resort in Dixville, partial easement protection

Perry Stream Land and Timber no formal protection

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### **Habitat Management Status**

Management options within the State are restricted to providing quality habitat for snowshoe hare. In northern New Hampshire even aged management is predominant on the larger private ownerships. The creation of large quantities of snowshoe hare habitat on the landscape may be most limited by the distribution of spruce fir and the conversion of those habitats due to management practices. Large areas of spruce fir regeneration may also be limited by some of the ownership and easement restrictions on protected parcels due to the scale at which lynx require habitat management to occur.

In 2000, the USFWS and USFS developed a lynx conservation agreement that requires the USFS to promote the conservation of lynx habitat on national forests within the historic range of lynx (USFS Agreement 00-MU-11015600-013). Application of even-aged timber management on the White Mountain National Forest could enhance prey abundance for lynx. However, all management alternatives considered in the revised White Mountain National Forest Plan do not include an increase in the amount of forest that will be under even-aged management. In fact, the most liberal application of even-aged management that is being considered would not replace the hare habitat that is being lost to succession.

### **Threats to this Species or Habitat in NH**

*Threat rankings were calculated by groups of taxonomic or habitat experts using a multistep process (details in Chapter 4). Each threat was ranked for these factors: Spatial Extent, Severity, Immediacy, Certainty, and Reversibility (ability to address the threat). These combined scores produced one overall threat score. Only threats that received a “medium” or “high” score have accompanying text in this profile. Threats that have a low spatial extent, are unlikely to occur in the next ten years, or there is uncertainty in the data will be ranked lower due to these factors.*

### **Species and habitat impacts due to roads (Threat Rank: High)**

Increased roads and people increasing exposure to variety of threats (road kill, trapping and habitat loss)

### **Mortality from incidental capture in body gripping trap (Threat Rank: High)**

Death in body gripping trap

### **Habitat impacts from native and non native insect pests (Threat Rank: High)**

Loss of spruce fir habitat from mortality and salvage harvesting associated with balsam wooly adelgid and spruce bud worm

### **Species and habitat impacts from the loss of softwood habitat and reduced snow depths associated with climate change (Threat Rank: Medium)**

Reduced amounts of low land spruce fir and more isolated fragments of spruce fir habitat resulting in reduced snowshoe hare densities and distribution and decreased suitability of habitat for lynx

### **Species impacts from incidental capture in leghold traps (Threat Rank: Medium)**

Injury or death in restraint trap

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### **Species impacts and habitat conversion resulting from forestry moving away from even-aged management which reduces snowshoe hare densities (Threat Rank: Medium)**

Lack of timber management that would create snowshoe hare habitat

#### **List of Lower Ranking Threats:**

Species impacts from hybridization (with bobcat)

### **Actions to benefit this Species or Habitat in NH**

#### **Monitor for the movement and infestation of balsam wooly adelgid and spruce budworm**

**Primary Threat Addressed:** Habitat impacts from native and non-native insect pests

**Specific Threat (IUCN Threat Levels):** Invasive & other problematic species, genes & diseases

**Objective:**

**General Strategy:**

**Political Location:**

**Watershed Location:**

#### **Genetic sampling of bobcats and lynx (if possible) to identify potential hybridization in likely areas**

**Primary Threat Addressed:** Species impacts from hybridization (with bobcat)

**Specific Threat (IUCN Threat Levels):** Invasive & other problematic species, genes & diseases

**Objective:**

**General Strategy:**

**Political Location:**

**Watershed Location:**

#### **Minimize road development and fragmentation in spruce fir habitats**

**Primary Threat Addressed:** Species and habitat impacts due to roads

**Specific Threat (IUCN Threat Levels):** Transportation & service corridors

**Objective:**

Prevent the loss and fragmentation of spruce fir habitats

**General Strategy:**

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**Political Location:**

Carroll County, Coos County, Grafton County

**Watershed Location:**

**Identify protect areas likely to maintain adequate snow and softwood cover for snowshoe hare and lynx**

**Primary Threat Addressed:** Species and habitat impacts from the loss of softwood habitat and reduced snow depths associated with climate change

**Specific Threat (IUCN Threat Levels):** Climate change & severe weather

**Objective:**

**General Strategy:**

**Political Location:**

**Watershed Location:**

**Work with Maine and USFWS to implement methods that minimize lynx capture in body gripping traps**

**Primary Threat Addressed:** Mortality from incidental capture in body gripping trap

**Specific Threat (IUCN Threat Levels):** Biological resource use

**Objective:**

**General Strategy:**

**Political Location:**

**Watershed Location:**

**Work with Maine and USFWS on ways to minimize incidental capture in restraint traps**

**Primary Threat Addressed:** Species impacts from incidental capture in leghold traps

**Specific Threat (IUCN Threat Levels):** Biological resource use

**Objective:**

**General Strategy:**

**Political Location:**

**Watershed Location:**

**Provide technical assistance and outreach in areas likely to support early successional habitat for snowshoe hare and lynx**

**Primary Threat Addressed:** Species impacts and habitat conversion resulting from forestry moving away from even-aged management which reduces snowshoe hare densities

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**Specific Threat (IUCN Threat Levels):** Natural system modifications

**Objective:**

**General Strategy:**

**Political Location:**

**Watershed Location:**

### References, Data Sources and Authors

#### **Data Sources**

Literature review and content review by USFWS and NHFG biologists.

Literature review and review by NH Fish and Game and US Fish and Wildlife biologists.

#### **Data Quality**

Species distribution data is good due to a concerted effort by NH Fish and Game to quantify distribution. In 2012 and 2013 snowmobiles were used to search for tracks as the town scale using protocols adapted from Maine's lynx monitoring protocol. In 2014 and 2015 NHFG partnered with the USFS to survey high elevation habitats as well as low elevation areas utilizing a combination of cameras and track transects to help better understand the use of different habitats by a variety of carnivores.

Habitat distribution data is less clearly defined. More information is needed on snowshoe hare densities in different habitats (i.e. high elevation habitats and different types of managed stands). More information is also needed on the connectivity of critical habitats in New Hampshire as well as with source populations in Maine.

#### **Species Condition**

Knowledge of species distribution is increasing due to recent survey efforts. Not well understood is the impact of competing carnivores overlapping with lynx occurrence (i.e. coyote, fisher and bobcats).

Potential impacts and susceptibility of lynx to foothold and body gripping traps is not well understood.

#### **Habitat Condition**

More information is needed on the status of spruce fir habitat throughout northern New Hampshire, the amount being converted due to management practices and the amount being adequately regenerated. Historical accounts seem to indicate that spruce fir was more abundant throughout Coos County.

Spruce budworm and balsam woolly adelgid both have high potential to impact the amount of spruce fir in northern NH over the next ten years. Experts are predicting the recent budworm outbreak to move south into the contiguous US, yet the severity and extent of the outbreak is predicted to be less severe than the outbreak in the late 70ies and early 80ies.

#### **2015 Authors:**

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John Litvaitis, UNH; Jeff Tash, UNH

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