

**Canada Lynx**  
**(*Lynx canadensis*)**

**5-Year Review:**  
**Summary and Evaluation**

**U.S. Fish and Wildlife Service**  
**Mountain-Prairie Region**  
**Lakewood, Colorado**

**5-YEAR REVIEW**  
**Canada lynx (*Lynx canadensis*) –**  
**Contiguous U.S. Distinct Population Segment (DPS)**

**GENERAL INFORMATION**

**Methodology Used to Complete the Review:**

In accordance with section 4(c)(2) of the Endangered Species Act (ESA), the purpose of a 5-year review is to assess each threatened and endangered species to determine whether its status has changed since the time of its listing, or its last status review and whether it should be classified differently or removed from the list of threatened and endangered species. The U.S. Fish and Wildlife Service (Service) evaluated the biology and status of the contiguous United States (U.S.) distinct population segment (DPS) of the Canada lynx as part of a Species Status Assessment (SSA) to inform this 5-year review and, if needed, recovery planning. The SSA Report was written by the Canada Lynx Species Status Assessment Team (Lynx SSA Team), which consists of a Core Team of Service biologists who work on lynx issues across the DPS range and an SSA Framework Implementation Team of Service and U.S. Geological Survey staff who have developed and advanced the SSA framework. The SSA Report represents the Service's evaluation of the best available scientific information, including the formally-elicited professional judgments and opinions of recognized lynx experts. The SSA Report underwent independent peer and partner review before being used as the scientific basis to support a decision making process involving Service Regions 1, 3, 5, and 6 regarding the recommendation presented in this 5-year review.

Region 6 is the lead region for this action in coordination with Regions 1, 2, 3, and 5. The lead field office (FO) is the Montana Ecological Services FO, with support from the Maine, Minnesota, Northern Idaho and Western Colorado Ecological Services FOs.

**Background:**

**Listing History**

The Service listed the lynx DPS as a threatened species under the ESA in 2000 because of the potential for impacts to lynx habitat conditions and the availability of snowshoe hare and other prey populations within the lynx DPS and existing regulatory mechanisms on Federal lands, at that time, did not provide sufficient guidance for the conservation of lynx habitats and populations or snowshoe hare habitat in light of potential threats (65 FR 16052-16086). On May 8, 2014, the United States District Court for the District of Montana ordered the Service to complete recovery planning for the lynx DPS (U.S. District Court MT 2014a, p. 8). On June 25, 2014, the same court ordered the Service to complete a recovery plan by January 15, 2018 "...unless the Service finds that such a plan will not promote the conservation of the [lynx]" (i.e., the DPS is recovered or no longer warrants ESA protections; U.S. District Court MT 2014b, p. 2). We published the initiation of the 5-year review in the Federal Register on April 18, 2007

(72 FR 19549), and additionally published a news release announcing initiation of a 5-yr review on January 13, 2015.

We completed the SSA Report to summarize the best available scientific information on the current status and likely future viability of the DPS. The SSA provides the scientific basis for this 5-year review.

## **REVIEW ANALYSIS**

### **Application of the 1996 Distinct Population Segment (DPS) Policy in the 2000 Listing**

The Service listed lynx in the contiguous United States as a DPS because of differences in the management of lynx and lynx habitats across the international boundary with Canada (meeting discreteness criteria in the DPS policy) and because of the climatic, vegetative, and ecological differences in lynx habitat compared to the northern parts of the species' range in Canada and Alaska (meeting significance criteria) (65 FR 16052; 68 FR 40076; 72 FR 1186).

### **Updated Information and Current Species Status**

#### Summary of SSA Results:

In the SSA, we describe the current and future viability of the lynx DPS in terms of resiliency, redundancy, and representation. Resident lynx populations persisted historically and continued to persist in four of the six geographic units evaluated in the SSA (Unit 1 (Northern Maine), Unit 2 (Northeastern Minnesota), Unit 3 (Northwestern Montana/Northeastern Idaho), and Unit 4 (North-central Washington)) (SSA Report, p. 235). Based on verified records, it is uncertain if the Greater Yellowstone Area (Unit 5) historically supported a persistent resident lynx population and it currently appears not to support resident lynx (SSA Report, p. 235). Available information also suggests that Colorado (Unit 6) did not historically support persistent lynx presence; however, a resident population has persisted there for more than a decade since the 1999-2006 release of 218 Canadian and Alaskan lynx in the San Juan Mountains (SSA Report, p. 235).

Considering the available information, we found no reliable information that the current distribution and abundance of resident lynx in the contiguous United States are substantially reduced from historical conditions (SSA Report, p. 235). In fact, because of the introduction of lynx in Colorado and anthropogenically influenced lynx abundance in Maine, there may be more resident lynx currently in the DPS range than occurred historically (SSA Report, pp. 228, 229). This suggests historical and current resiliency among lynx populations in the DPS. The current broad distribution of resident lynx in large, geographically discrete areas (redundancy) makes the DPS invulnerable to extirpation caused by a single catastrophic event (SSA Report, pp. 106, 235). Because we lack information that formerly persistent lynx populations have been lost from any large areas, it also seems that redundancy in the DPS has not been meaningfully diminished from historical levels (SSA Report, pp. 106, 235). As a result of the current population in Colorado, redundancy in the DPS is likely greater, at least temporarily, now than it was historically (SSA Report, p. 235). Similarly, resident lynx remain broadly distributed across the

range of habitats that have supported them historically, suggesting maintenance of the breadth and diversity of ecological settings occupied within the DPS range (representation) (SSA Report, p. 235).

Additionally, observed high rates of dispersal and gene flow and therefore generally low levels of genetic differentiation across most of the lynx's range, including the DPS, suggest the past and recent genetic health of lynx populations in the DPS (representation) (SSA Report, section 2.1). Because there are no indications of significant loss of, or current stressors to, the genetic health or adaptive capacity of lynx populations in the DPS, we find that the current level of representation within the DPS does not appear to indicate a decrease from historical conditions (SSA Report, pp. 107, 230).

We conclude that resident lynx populations are very likely to persist in all five units that currently support them (Units 1 to 4 and 6) in the near term (2025) and likely to persist in those five units at mid-century (2050) (SSA Report, p. 236). We have low confidence in assessing the risk to DPS populations beyond 2050 (SSA Report, p. 236). Therefore, we consider 2050 as the foreseeable future for this 5-year review. Nonetheless, we expect lynx populations in each geographic unit to become smaller and more patchily distributed in the future (2050 and beyond) due largely to projected climate-driven losses in habitat quality and quantity and related factors (SSA Report, p. 236). However, the timing, rate, and extent of habitat decline due to projected climate warming and corresponding effects to lynx populations all are highly uncertain (SSA Report, p. 236). That said, smaller, more isolated populations would be less resilient and more vulnerable to demographic and environmental stochasticity and genetic drift and therefore at higher risk of extirpation (SSA Report, p. 236). Despite some reduced resiliency, we conclude that resident lynx populations are likely to persist through mid-century in the geographic units that supported them historically (Units 1 to 4); with the corresponding maintenance of redundancy and representation in the DPS over that time span (SSA Report, p. 236). Although the SSA report also discusses the future out to 2100, predictions that far into the future are highly uncertain (SSA Report, p. 236), and beyond what we consider to be reasonably foreseeable.

#### Consideration of the Five 4(a)(1) Factors:

Through our SSA analysis, we have evaluated the effects of all factors identified in section 4(a)(1) of the ESA. In the SSA we focused on the influences identified as having the potential to exert population and DPS-level impacts on lynx and lynx habitats (SSA Report, chapter 3). Those anthropogenic influences include climate change (Factor E), vegetation management (Factor A), wildland fire management (Factor A), and habitat loss and fragmentation (Factor A). We also considered other potential stressors such as trapping (Factor B), and disease and predation (Factor C). Additionally, we considered how each of the above influences is ameliorated or exacerbated by existing regulatory mechanisms (Factor D).

In using the SSA framework to analyze the scientific information, as documented in the SSA Report, we fully assess not only individual effects on the Canada lynx, but also their potential cumulative impacts. Specifically, we incorporate cumulative effects into our analysis when we characterize the current and future conditions for each population, which we do both individually and cumulatively. Our analysis described the ways in which anthropogenic and natural factors

singly and collectively affect the habitat and/or demographics needed by individuals and populations. Because the SSA framework considers not just the presence of the factors but also the degree to which they collectively influence the species' viability, our assessment integrates the cumulative impacts of stressors.

In light of potential threats considered at the time of listing, lynx conservation measures and habitat management guidance adopted by the U. S. Forest Service (USFS) and the Bureau of Land Management (BLM), via formally amended or revised management plans or conservation agreements with the Service, have substantially addressed the conservation of lynx habitats and populations and snowshoe hare habitat (SSA Report, p. 4).

### **Synthesis (Application of SSA Results to ESA Classification)**

As defined by the ESA, an endangered species is any species that is "in danger of extinction throughout all or a significant portion of its range." In the SSA Report, we evaluated the best available scientific information regarding the current and predicted future condition of the lynx DPS to describe its viability and how it may change over time (2025, 2050, and 2100). We assess the viability of the lynx DPS by evaluating its ability to maintain a sufficient number and distribution of viable populations to withstand environmental stochasticity (resiliency), catastrophes (redundancy), and changes in its environment (representation) into the future. Ultimately, we compare our evaluation of the DPS' risk of extinction against the definitions of an endangered or threatened species as defined by the ESA.

As stated above, the Service listed the lynx DPS as threatened in 2000 because of the *potential for impacts* to lynx habitat conditions and the availability of prey populations within the lynx DPS and existing regulatory mechanisms on Federal lands, *at that time*, did not provide sufficient guidance for the conservation of lynx habitats and populations or prey habitat in light of *potential threats* (65 FR 16052-16086). Federal lands management plans, at that time, allowed for forest management practices that could potentially reduce lynx habitat on a population level scale, thereby creating a future risk to the species existence in the DPS. Nearly all Federal land management plans throughout the DPS have since been revised to include science- and research-based measures and management practices consistent with lynx conservation, thereby greatly reducing the risk of future population scale habitat deterioration on Federal lands.

The apparent long-term (historical and current) persistence of resident lynx populations in at least four of the six geographic units (Units 1 to 4), the current persistence of lynx in one of the units (Unit 6), and the absence of reliable information indicating that the current distribution and relative abundance of resident lynx are substantially reduced from historical conditions suggest the historical and recent resiliency to stochastic events of lynx populations in the DPS (SSA Report, pp. 107, 230). The large sizes and broad distributions of the geographic units occupied by resident lynx populations likewise indicate historical and current redundancy in the DPS sufficient to reduce the possibility of extirpation from catastrophic events (SSA Report, pp. 230, 235). There are no indications of current threats to the genetic health or adaptive capacity of lynx populations in the DPS, and the current level of representation does not suggest a decrease from historical conditions (SSA Report, p. 230). Due to the current resiliency, redundancy, and

representation of the lynx DPS, we conclude that the risk of extinction (in this case, extirpation of all resident lynx populations in the DPS) is low, such that the DPS currently is not in danger of extinction throughout all of its range and, therefore, does not meet the definition of an endangered species.

Having determined that the lynx DPS is not endangered, we next compare the status of the DPS to the definition of a threatened species. Under the ESA, a threatened species is any species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The foreseeable future refers to the extent to which the Secretary can reasonably rely on predictions about the future in making determinations about the future conservation status of the species (U.S. Department of Interior, Solicitor’s Memorandum, M-37021, and January 16, 2009). The key statutory difference between a threatened species and an endangered species is the timing of when a species may be in danger of extinction, either now (endangered species) or in the foreseeable future (threatened species). In the SSA, we considered the future condition of the lynx DPS out to 2025, 2050, and 2100 (SSA Report, chapter 5). It became apparent through discussions with lynx experts, in peer and partner reviews of the draft SSA Report, and among Service biologists and management that any future projections of lynx status beyond mid-century were complicated by a very high degree of uncertainty concerning the timing and extent of various stressors that may affect lynx and hare habitat and snow regimes, especially those related to projected future climate change (SSA Report, chapter 5.1). Therefore, in this evaluation, we identified mid-century (2050) as the foreseeable future because this time horizon gives us a higher degree of certainty in reasonably projecting the future condition of the lynx DPS.

As discussed in the SSA Report, resident lynx populations in all geographic units that currently support them are expected to be smaller and more fragmented and isolated in the future, and each geographic unit and the DPS as a whole will be less resilient in the future (SSA Report, pp. 173, 236). However, all five geographic units that currently support resident lynx populations (all units except the GYA) are expected to continue to do so through mid-century (2050) (SSA Report, p. 236). Our analyses, as informed by expert input, suggest that resiliency will likely be sufficient to foster persistence (i.e., preclude extirpation) of resident lynx through mid-century in all or most of the five geographic units that currently support them (SSA Report, p. 236). At mid-century, we expect lynx to retain a wide geographical distribution of populations, maintaining redundancy within the DPS (SSA Report, p. 236). Should lynx populations in each geographic unit become smaller and more patchily distributed, reduced genetic health and/or adaptive capacity would be expected; however, we have no information to suggest reduced representation would be a DPS-level concern at mid-century (SSA Report, chapter 6). Therefore, we conclude that the risk of extinction (extirpation of the DPS) by 2050 is sufficiently low that the lynx DPS is not likely to become endangered throughout all of its range within the foreseeable future and therefore does not meet the definition of a threatened species.

### **Recovery Criteria**

Recovery Plan or Outline: There is no recovery plan for the Canada lynx DPS, and therefore recovery criteria have not been developed. The Service completed a Recovery Outline on September 14, 2005, which provided preliminary recovery objectives and actions based on our

understanding, at that time, of current and historical lynx occurrence and lynx population dynamics in the contiguous United States DPS. Lynx conservation measures and habitat management guidance adopted by the USFS and the BLM have substantially addressed the potential threats considered at the time of listing (and the time of the recovery outline) to the maintenance of lynx DPS habitat conditions and the availability of snowshoe hare and other prey populations (SSA Report, p. 4). Additionally, our understanding of lynx biology, ecology, effects of stressors into the foreseeable future, and historic and current occupancy in the contiguous United States has improved in the 12 years since the Recovery Outline was drafted, rendering some of the preliminary recovery objectives and actions in the 2005 Recovery Outline obsolete. Finally, as described above, the lynx DPS no longer meets the definition of a threatened species; therefore, recovery criteria are not necessary.

## RESULTS

**Recommended Classification:** After assessing the best available information, we conclude that the Canada lynx DPS is not in danger of extinction throughout all of its range or likely to become so in the foreseeable future; that is, it is not an endangered species throughout all of its range or a threatened species throughout all of its range. We recommend removing the Canada lynx DPS, currently listed as threatened, from the list of threatened and endangered species.

- Downlist to Threatened**
- Uplist to Endangered**
- Delist** (*Indicate reasons for delisting per 50 CFR 424.11*):
  - Extinction*
  - Recovery*
  - Original data for classification in error*
- No change is needed**

**New Recovery Priority Number** (*indicate if no change; see Appendix E*):

**Brief Rationale:**

**Listing and Reclassification Priority Number**, if reclassification is recommended (*see Appendix E*)

- Reclassification (from Threatened to Endangered) Priority Number:** \_\_\_\_\_
- Reclassification (from Endangered to Threatened) Priority Number:** \_\_\_\_\_
- Delisting (Removal from list regardless of current classification) Priority Number:**

**Brief Rationale:**

**RECOMMENDATIONS FOR FUTURE ACTIONS** – Proceed with a proposed rule to remove the Canada lynx DPS from the list of threatened and endangered species.

**REFERENCES** – A large part of the lynx SSA involved seeking expert input on lynx biology, stressors, and current and future condition of the DPS. We describe the expert elicitation process and the experts involved in our Canada Lynx Expert Elicitation Workshop Final Report (Service 2016, entire). A draft SSA Report went through an extensive review process with peer reviewers, tribes, State agencies, and Federal agencies within the range of the lynx DPS. The final SSA Report has been revised in response to the reviews, comments, and suggestions of 5 independent peer reviewers, 11 State wildlife and natural resources management agencies, and 3 other Federal agencies.



**U.S. FISH AND WILDLIFE SERVICE  
5-YEAR REVIEW  
Canada Lynx (*Lynx canadensis*) –  
Contiguous U.S. Distinct Population Segment (DPS)**

**Current Classification:**

**Recommendation resulting from the 5-Year Review:**

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

**Appropriate Listing/Reclassification Priority Number, if applicable:**

**Review Conducted By:**

**REGIONAL OFFICE APPROVAL:**

*The Regional Director or the Assistant Regional Director, if authority has been delegated to the Assistant Regional Director, must sign all 5-year reviews.*

**Lead Regional Director, U.S. Fish and Wildlife Service**

Approve



Date



*The Lead Region must ensure that other regions within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. Written concurrence from other regions is required.*

