

Recent Records of Lynx on the Alaska Peninsula

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RECENT RECORDS OF
LYNX ON THE ALASKA PENINSULA

DOMINIQUE E WATTS AND LINK E OLSON

ABSTRACT—The Canada Lynx (*Lynx canadensis*) is poorly documented in southwest Alaska, where dominant habitats are generally not conducive to supporting persistent Snowshoe Hare (*Lepus americanus*) or Lynx populations. We compiled recent and historic records from southwest Alaska that collectively suggest that persistent Lynx populations occur at the base of the Alaska Peninsula where boreal forest transitions to open tundra habitats. Records show that Lynx, at least periodically, also occur throughout the entirety of the Alaska Peninsula and that a self-sustaining and relatively isolated population occurs in an isolated stand of Poplar forest near Mother Goose Lake, which probably represents one of the westernmost Lynx populations in North America. These records extend the known distribution of the species by approximately 380 km southwest along the Alaska Peninsula. These records also suggest that Lynx occur in areas where Snowshoe Hare are rare or absent, and that other prey species may facilitate the persistence of distinct population segments at the extent of their range in Alaska.

Key words: Alaska Peninsula, distribution, Lynx, *Lynx canadensis*, southwest Alaska

The Canada Lynx (*Lynx canadensis*; Lynx hereafter) has a broad geographic distribution in North America, occurring throughout much of the northern boreal forests of Canada and Alaska. Historically, Lynx may have also occurred at the southern limits of the boreal forests in the Rocky Mountains, possibly as far south as Utah and Colorado (McKelvey and others 2000). With the exception of recent Cougar (*Puma concolor*) observations in extreme southeastern Alaska, the Lynx is the only felid native to the state (MacDonald and Cook 2009). Lynx predominantly occur in the interior boreal forests of the state and inhabit a variety of habitats including mixed-deciduous, hardwood, and spruce-dominated forests, and sub-alpine communities (Anderson and Lovallo 2003; MacDonald and Cook 2009). Lynx are generally common in these forest habitats, particularly where fires have maintained mixed vegetative and early-successional communities that provide habitat

for their primary prey, the Snowshoe Hare (*Lepus americanus*). The distribution and abundance of Snowshoe Hares, which may constitute 35–100% of Lynx diets, largely determines the distribution and abundance of Lynx (Koehler and Aubry 1994; Poole 1994; Slough and Mowat 1996; O'Donoghue and others 1997).

Lynx are poorly documented in southwest Alaska. The majority of the Alaska Peninsula is dominated by alpine tundra, heath meadow, grassland, willow and alder communities, and barrens. Such habitats are generally not conducive to supporting persistent Snowshoe Hare or Lynx populations. Suitable Lynx habitats are generally limited to the northern extreme of the Alaska Peninsula where boreal forest transitions to open tundra south of the Naknek River (Fig. 1). Limited information suggests that Lynx are restricted to the upper Alaska Peninsula, but might also occur at low densities along the peninsula, possibly as far southwest as Port Heiden (Fig. 1; MacDonald and Cook 2009; ADFG 1978).

While conducting aerial Moose (*Alces alces*) surveys on 15 January 2012, one of us (D. Watts) observed 5 Lynx together on the upper King Salmon River (57.26595°, –157.4946°) near Mother Goose Lake (Fig. 1). Individual body sizes suggested that this group consisted of an adult female and her offspring. Three additional Lynx were also observed separately the next day (16 January 2012) between Mother Goose Lake and lower Painter Creek (approximately 57.26595°, –157.4946°), and body sizes suggested that all 3 were adults. Although Lynx are periodically observed on the Alaska Peninsula during aerial and ground-based surveys for other species, particularly in the vicinity of Mother Goose Lake (D. Watts, pers. obs.; Leppold and Savage 2001), these and other observations prompted further investigation regarding the current distribution of Lynx on the Alaska Peninsula.

Lynx are periodically observed and harvested on the Alaska Peninsula, but such observations have been poorly documented. We

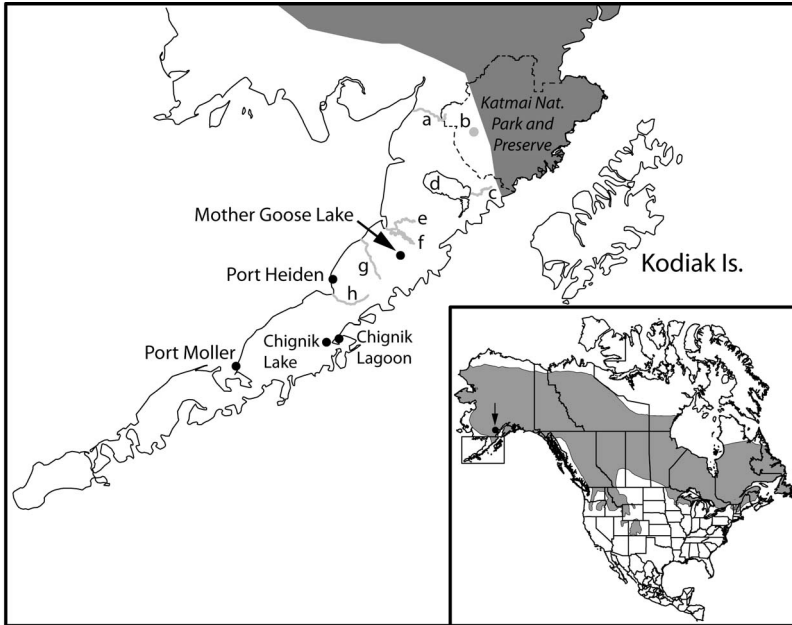


FIGURE 1. Distribution of Canada Lynx (*Lynx canadensis*) in North America (inset) and on the Alaska Peninsula (enlarged) and localities discussed in text: Naknek River (a), Brooks River (b), Kejulik River (c), Becharof Lake (d), Ugashik River (e), Dog Salmon River (f), Cinder River (g), and Meshik River (h). Gray shading shows Canada Lynx range according to the IUCN (Nowell 2008). Arrow in inset indicates nearest Canada Lynx specimen reported in MacDonald and Cook (2009).

compiled recent and historic observations and harvest records of Lynx from the Alaska Peninsula. In order to meet the highest evidentiary standards possible (McKelvey and others 2008) when documenting occurrence data for elusive species such as Lynx without physical voucher specimens, we sought, critically evaluated (as necessary), and archived photographic and videographic evidence as observations in the Mammal Collection at the University of Alaska Museum. Such records are assigned permanent catalog numbers (formatted as UAMObs:Mamm:###) and are viewable on Arctos (<http://arctos.database.museum/home.cfm>). In cases where such evidence was not available, the reporter’s expertise was carefully considered. Because Lynx are distinctive among Alaska’s mammal fauna, false reports by wildlife professionals were considered highly unlikely.

Lynx are periodically observed in Katmai National Park, particularly in the vicinity of Brooks River (Fig. 1, 58.55312°, -155.7867°; D. Watts, pers. obs.) where human visitation is relatively high. Recent Lynx observations near

Brooks River further support the persistence of Lynx in the area (UAMObs:Mamm:231–233, 235). Snowshoe Hares are cyclically available in the area. Arctic Ground Squirrels (*Urocitellus parryii*), North American Red Squirrels (*Tamiasciurus hudsonicus*), Spruce Grouse (*Falci pennis canadensis*), voles (*Microtus* spp. and *Myodes rutilus*), and lemmings (*Lemmus trimucronatus* and *Dicrostonyx groenlandicus*) are also presumably present in the area (MacDonald and Cook 2009) and may represent important prey for Lynx in Katmai National Park during periods of low Snowshoe Hare abundance.

Lynx are periodically observed and trapped in the Naknek River drainage (Fig. 1, 58.6245°, -156.5214°, D. Watts, pers. obs.). Recent observations (UAMObs:Mamm:237) and trapping records (Table 1) further support the persistence of Lynx in the Naknek drainage. Snowshoe Hares are cyclically abundant in the lower Naknek drainage and probably represent the primary prey of Lynx in this area (D. Watts, pers. obs.). Spruce Grouse, Willow Ptarmigan (*Lagopus lagopus*), Arctic Ground Squirrel, North American Red Squirrel, voles, and lemmings

TABLE 1. Summary of Alaska Department of Fish & Game Canada Lynx (*Lynx canadensis*) harvest records from southwest Alaska during 1995–2015.

GMU/drainage	Number of Lynx harvested		
	1995–2000	2001–2010	2011–2015 ^a
9C (total)	20	51	27
Alagnak	1	1	0
Naknek	19	50	27
Other	0	0	0
9E (total)	114	130	14
Becharof/Kejulik	1	0	0
Ugashik	52	118	13
Dog Salmon	54	6	1
Mother Goose	7	5	0
Other	0	1	0
9D (total)	0	0	0

^a total number of Lynx harvested may not be represented by reported numbers because harvest records for 2015 were incomplete at the time of this study.

are also common in the area (D. Watts, pers. obs.), and probably serve as alternate prey when Snowshoe Hare abundance is low. South of the Naknek drainage and the southern boundary of Katmai National Park, small scattered stands of poplar forest occur along the Kejulik River, in the upper Dog Salmon River, and along the upper Cinder River (Fig. 1), which may also provide small patches of suitable habitat. Lynx are periodically observed and trapped in the Kejulik River drainage (Fig. 1, 57.8501°, –155.7895°; Phil Shoemaker, Grizzly Skins of Alaska Inc., King Salmon, Alaska, pers. comm., 17 April 2015). Because Snowshoe Hares are scarce and periodically absent from the Kejulik River drainage (Phil Shoemaker, pers. comm., 17 April 2015), more abundant species such as Arctic Ground Squirrel, ptarmigan, and small rodents may represent the primary prey of Lynx in this area. Alaska Hares (*Lepus othus*) are also infrequently observed, and may represent an additional prey species for Lynx inhabiting tundra habitats or along riparian corridors (D Watts, pers. obs.).

A deciduous forest, predominantly composed of Balsam Poplar (*Populus balsamifera*), exists in the vicinity of Mother Goose Lake and the upper King Salmon River drainage (Fig. 1, 57.20318°, –157.326°). This area provides uniquely suitable forest habitat for Lynx and Snowshoe Hares at the center of the Alaska Peninsula (Fig. 1). Lynx are regularly observed in this area (D. Watts, pers. obs.), particularly during summer and fall near Painter Creek (57.15912°, –157.4114°; John

Kent, Painter Creek Lodge, Pilot Point, Alaska, pers. comm., 2012). Several observations near Painter Creek were documented during 2012–2014, including observations of Lynx successfully hunting Arctic Ground Squirrels (Fig. 2, UAMObs:Mamm:238–240). To the southwest, in the vicinity of Chignik Lake (approximately 56.26788°, –158.6835°, UAMObs:Mamm:236) and Chignik Lagoon (approximately 56.30917°, –158.5357°, UAMObs:Mamm:234), Lynx were observed on several occasions during 2014 (Roger Lind, Chignik, Alaska, pers. comm., 17 December 2014). Lastly, on 31 May 2014, an adult Lynx was recorded by a camera trap near Port Moller (56.007294°, –160.543452°), which captured multiple photographs and 45 seconds of continuous video (UAMObs:Mamm:228).

The Alaska Department of Fish & Game (ADF&G) requires that harvested Lynx be sealed (presented for inspection and an individually numbered tag attached) within 30 d. These harvest records also provide documentation of Lynx on the Alaska Peninsula, which comprises Game Management Units (GMUs) 9C, 9E, 9D. We searched ADF&G sealing records by GMU and sub-unit (drainage) from 1995–2015. Results show that Lynx are regularly harvested in GMUs 9C and 9E, but that no harvests have been documented south of Port Moller in GMU 9D (Table 1). Sub-unit data show that Lynx are regularly trapped in the Naknek, Ugashik, and Dog Salmon drainages (Fig. 1) and also periodically harvested in the Mother Goose drainage. Variation in harvest among years (Table 1) suggests that Lynx abundance may be irruptive or possibly cyclical in some areas (for example, Ugashik), but may remain relatively stable in others (for example, Mother Goose Lake). However, access and trapping effort is neither spatially nor temporally uniform across the landscape, and variation in trapping effort must also be considered when interpreting harvest records or making comparisons among areas.

Regular observations and harvests from the Naknek drainage and Katmai National Park suggest that persistent Lynx populations occur at the base of the Alaska Peninsula where boreal forest transitions to open tundra. Regular observations near Mother Goose Lake, including those of females with kits, also provide evidence that this westernmost stand of poplar forest supports a persistent and self-sustaining Lynx population that probably represents one of the



FIGURE 2. Adult Canada Lynx (*Lynx canadensis*) after capturing an Arctic Ground Squirrel (*Urocitellus parryii*) near Painter Creek (UAMobs:Mamm:239, 57.1591°, -157.4114°) in southwest Alaska, USA.

westernmost Lynx populations in North America. Potential habitats and additional records also suggest that Lynx occur, at least sporadically or ephemerally, throughout the entirety of the Alaska Peninsula (including areas that do not support Snowshoe Hares). ADF&G sealing records also support these observational data, and suggest that Lynx populations persist in the Naknek, Ugashik, Dog Salmon, and Mother Goose drainages (Table 1, Fig. 1). Reports of Lynx harvested south of the Meshik drainage (Fig. 1) were relatively rare, and no documented reports are known from south of Port Moller. Based on previously published information (MacDonald and Cook 2009), records presented here include some of the westernmost records of Lynx and extend the published distribution of the species by approximately 380 km or more along the Alaska Peninsula. However, an important and often overlooked aspect of species range limits is that these limits are often dynamic (even at short timescales), and thus,

those reported here should be interpreted with some level of caution.

A microsatellite study of gene flow among 17 North American Lynx populations suggested that Lynx on the Kenai Peninsula were the most genetically divergent, although gene flow among all populations was high (Schwartz and others 2002). These results and the juxtaposition of Lynx on the Alaska Peninsula relative to the core of their geographic range in Alaska might imply that Lynx on the Alaska Peninsula could also represent a relatively isolated population. Lynx are capable of long-distance dispersal, and intermittent observations of Lynx at the periphery of their distribution (for example, Port Moller) may also be associated with high levels of dispersal resulting from high intraspecific competition at the core of their range (Thiel 1987; Koehler and Aubry 1994; McKelvey and others 2000; Mowat and others 2000). In contrast, Schwartz and others (2002) suggested that some Lynx populations at the periphery of their range may be self-sustaining and largely isolated from

other populations. The relatively high frequency of observations, including reproductive females, in the vicinity of Mother Goose Lake supports the latter scenario, with the Alaska Peninsula Lynx population connected to other populations by periodic immigration and emigration (Schwartz and others 2002).

At the core of their range, Lynx populations are often cyclic and occur in lagged synchrony with Snowshoe Hare population cycles (Poole 1994; Slough and Mowat 1996; O'Donoghue and others 1997). Accordingly, the distribution of Lynx at a given time may also be strongly associated with the distribution and abundance of Snowshoe Hare. At the outer extent of their range, however, Lynx populations may remain relatively stable and rely on other prey species (Koehler and Aubry 1994; Aubry and others 2000). Whether fluctuations in abundance at the periphery of their range result from changes in immigration rates or are the result of changes in local reproduction and survival among population segments is currently unknown. Limited records for the Alaska Peninsula show that Lynx may occur in areas where Snowshoe Hare are rare or absent, suggesting that these populations may not be inexorably linked to Snowshoe Hare abundance. Thus, the distribution and abundance of alternate prey may also influence the distribution and abundance of Lynx populations in southwest Alaska. For example, Arctic Ground Squirrels and Alaska Hares are more widely distributed on the Alaska Peninsula (MacDonald and Cook 2007) and are common in areas where Snowshoe Hares are absent but where Lynx have been observed (D. Watts, pers. obs.). These and other common prey species (for example, ground-nesting birds, small rodents) may also represent reliable resources and could allow, at least periodically, the persistence of distinct population segments at the outer extent of their range in southwest Alaska. The diets of Lynx and how alternate prey might influence the distribution and abundance of the species in southwest Alaska remain poorly understood and warrant further investigation.

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LITERATURE CITED

- [ADFG] ALASKA DEPARTMENT OF FISH AND GAME. 1978. Alaska's wildlife and habitat. Volume 2. Anchorage, Alaska.
- ANDERSON EM, LOVALLO MJ. 2003. Bobcat and lynx. In: Feldhamer GA, Thompson BC, Chapman JA, editors. Wild mammals of North America: Biology, management, and conservation (2nd edition). Baltimore, MD: Johns Hopkins University Press. p 758–786.
- AUBRY KB, KOEHLER GM, SQUIRES JR. 2000. Ecology of Canada Lynx in southern boreal forests. In: Ruggiero LF, Aubry KB, Buskirk SW, Koehler GM, Krebs CJ, McKelvey KS, Squires JR, editors. Ecology and conservation of lynx in the United States. Boulder, CO: University Press of Colorado. p 373–396.
- KOEHLER GM, AUBRY KB. 1994. Lynx. In: Ruggiero LF, Aubry KB, Buskirk SW, Lyon LJ, Zielinski WJ, editors. The scientific basis for conserving forest carnivores: American Marten, Fisher, lynx and Wolverine in the Western United States. General Technical Report RM-254. Fort Collins, CO: US Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station Colorado. p 74–98.
- LEPPOLD A, SAVAGE S. 2001. Small mammal trapping baseline surveys at Mother Goose Lake (with notes on incidental mammal observations 1995–2001). US Fish and Wildlife Service. 19 p. Available from: US Fish and Wildlife Service, Alaska Peninsula and Becharof National Wildlife Refuges, PO Box 277, King Salmon, AK.
- MACDONALD SO, COOK JA. 2009. Recent mammals of Alaska. Fairbanks, AK: University of Alaska Press. 387 p.
- McKELVEY KS, AUBRY KB, ORTEGA YK. 2000. History and distribution of lynx in the contiguous United States. In: Ruggiero LF, Aubry KB, Buskirk SW, Koehler GM, Krebs CJ, McKelvey KS, Squires JR, editors. Ecology and conservation of lynx in the United States. Boulder, CO: University Press of Colorado, Boulder. p 207–264.
- McKELVEY KS, AUBRY KB, SCHWARTZ MK. 2008. Using anecdotal occurrence data for rare or elusive species: The illusion of reality and a call for evidentiary standards. *BioScience* 58:549–555.
- MOWAT G, POOLE KG, O'DONOGHUE M. 2000. Ecology of lynx in Northern Canada and Alaska. In: Ruggiero LF, Aubry KB, Buskirk SW, Koehler GM, Krebs CJ, McKelvey KS, Squires JR, editors. Ecology and conservation of lynx in the United States. Boulder, CO: University Press of Colorado. p 265–306.
- NOWELL K. 2008. *Lynx canadensis*. The IUCN Red List of Threatened Species 2008: e.T12518A3349883. <http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS>.

- T12518A3349883.en . Downloaded on 09 September 2015.
- O'DONOGHUE M, BOUTIN S, KREBS CJ, HOFER EJ. 1997. Numerical responses of Coyotes and lynx to the Snowshoe Hare cycle. *Oikos* 80:150–162.
- POOLE KG. 1994. Characteristics of an unharvested lynx population during a Snowshoe Hare decline. *Journal of Wildlife Management* 58:608–618.
- SCHWARTZ ML, MILLS LS, MCKELVEY KS, RUGGIERO LF, ALLENDORF FW. 2002. DNA reveals high dispersal synchronizing the population dynamics of Canada Lynx. *Nature* 415:520–522.
- SLOUGH BG, MOWAT G. 1996. Population dynamics of lynx in a refuge and interactions between harvested and unharvested populations. *Journal of Wildlife Management* 60:946–61.
- THIEL RP. 1987. The status of Canada Lynx in Wisconsin, 1865–1980. *Wisconsin Academy of Sciences, Arts, and Letters* 75:90–96.
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