

# **The Canadian Lynx: Management Issues**

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## **Introduction**

The Canadian lynx (*Lynx canadensis*, hereafter referred to as the lynx) has habitat in all provinces and territories in Canada but has been extirpated from P.E.I and is at risk in New Brunswick (Poole, 2003). The animal is also found in Alaska and areas just south of the 49<sup>th</sup> parallel with a finger like extension down into Colorado through the Rocky Mountains (Keith, 1993). All studies indicate that lynx populations are tied to the 10 year population cycles of the snowshoe hare (*Lepus americanus*) as the hare is its main source of food during all stages of the population cycle (Poole, 1997, 2003, Keith 1993, Quinn & Thompson, 1987, BCWB 1989). When the lynx population is at its peak, the animal is very stable and secure, when at its low the lynx is susceptible to overexploitation that could lead to its local demise.

## **Appearance**

The lynx resembles a very large domestic cat, but with a short tail and black ear tufts. It has a thick, light grey winter coat with a brown underbelly; the summer coat is much shorter with a reddish brown cast. The lynx's feet are covered during winter with thick hair that help the lynx travel over snow. For increased stability on snow, the lynx can spread its paw out expanding its 'snowshoe'. The lynx has large eyes and ears which are very sensitive and aid in hunting. Claws on the lynx, like most cats, are retractable and the lynx can vocalize much louder than domestics (Keith, 1993). The Canadian lynx is related to the bobcat (*Lynx rufus*) which immigrated to North America thousands of years before the Canadian Lynx over Beringia. Both of these cats evolved from the

Eurasian Lynx (*Lynx lynx*) though they did so over separate times as land bridges were inundated and reemerged (Poole, 2003).

### **Habitat**

The lynx generally inhabits forested areas that are separate and isolated from areas of human development but may live in areas directly adjacent to intrusive development as long as they are left unmolested. As long as there is minimal amounts of cover the lynx may inhabit the area. As hare populations increase in areas recovering from fires or logging operations the lynx may be found hunting from the edges (Keith, 1993). The lynx lives in the boreal, sub-boreal and western montane forests of North America and as climate patterns shift with less snow cover in some areas, others species that share similar habitat are moving in (bobcat and coyote). The highest densities of lynx are, and always have been found in boreal and mixed wood forests containing spruce, pine and balsam fir (Poole, 2003). Lynx are also found in sub-alpine forest zones at elevations of 1200 to 3000 meters in the western mountains. Since the lynx prefers to follow the snowshoe hare they tend to enjoy the same habitat or occupy adjacent habitats: “Lynx prefer older regenerating forest stands, greater than about 20 years of age, and generally avoid younger ones” (Ibid). The lynx may not live in the younger stands but as noted above will hunt at the edges; avoiding open fields, meadows, and lakes at most costs though will occasionally cross them if absolutely necessary (Ibid). Den sites for the lynx seem to have similar attributes regardless of stand type or age. Overhead cover is a necessity, and areas of dense vegetation cover or significant numbers of felled trees are favoured (Ibid).

## **Range**

In Canada the lynx covers 95% of its former range, approximately 5 500 000 square kilometers while in the U.S.A. the range has been greatly reduced and fragmented due to human development. As populations move through the stages of the 10 year cycle the lynx can be found outside its traditional range while looking for food (Ibid).

Individual home ranges for lynx drastically differ from animal to animal and for different times in the population cycle. When less hares are available in an area a lynx will spread further away from its traditional home range. Home ranges rarely overlap where adjacent animals are of the same sex (Keith, 1993), but female offspring may share their mother's land lessening individual stress about defense (Poole, 2003). When the animals extend their ranges they often end up in danger as they may have left a protected area and strolled into trapping lands.

## **Breeding**

Mating occurs during February and March with births occurring 60-65 days later. Males are incapable of mating in their first year but females may begin in their first mating season. Underground dens are rare but, as already noted, overhead cover is important for providing shelter from the elements. Females rear the kittens on their own. Breeding conditions depend on snowshoe hare abundance and the physical and nutritional conditions of the lynx (Keith, 1993). In times of low snowshoe hare numbers, many females will not even ovulate and very few kits are born, even fewer make it through their first year (Poole, 2003).

## **Limits to population**

Starvation following a snowshoe hare population crash is the leading source of natural mortality among the lynx population. “About 40% of the total lynx population may starve to death following a crash in the snowshoe hare population” (Keith, 1993). Over the subsequent years females may not be able to support themselves and their kittens, leading to an almost 100% mortality rate for animals younger than 1 years of age. Trapping is another significant factor in lynx mortality: “Trapping can remove a large proportion of a population...[and] may be primarily compensatory to natural mortality only during the dramatic decline in populations in lightly trapped areas” (Poole, 2003). Poaching has been identified as a threat to the Cape Breton lynx population; but, in other areas where the trapping season is quite liberal, poaching is not a major factor. In the U.S. over exploitation and habitat destruction has led to a very restricted and fragmented lynx population. In most of Canada, lynx habitat is not infringed upon to such a degree but fire suppression techniques have reduced the amount of quality early and mid-successional forests. This limiting of habitat has had some degree of impact on lynx populations through limiting hare populations (Ibid). Interspecific competition between lynx, and intruding bobcats and coyotes has been an issue of late. As climates shift and intrusion of these other two species into lynx land becomes easier (through reduced snow cover which the lynx has adapted to), more data will become available to indicate the impacts. On Cape Breton Island, lynx populations declined as bobcats were better able to access the lands. A causal link has not been firmly established linking intrusion to population declines but, according to Poole, the circumstantial evidence that is available is very compelling (Ibid).

## **Management issues**

A wide range of management issues and strategies have been applied to the Canadian Lynx in different parts of its range. Over-exploitation due to high pelt prices led to the extirpation of some populations, habitat destruction and mismanagement led to slow recovery rates, but overall, the species has done well in Canada. In the U.S.A. it is another storey all together.

When snowshoe hare populations have crashed there exists a lag period of one-two years before the effect is felt in the lynx populations (Poole, 2003). Quinn and Thompson argue that as hare populations decrease male yearling mobility increases. This leads to increased exposure to traps and higher than normal mortality rates (1987). As lynx move out into new trapping areas because of scarce resources in their home ranges, vulnerable populations become more vulnerable and open to over-exploitation. Trapping management is required in such times to allow the population a chance to recover. Live release traps are advocated in this instance. Unfortunately “determining optimum levels of harvest of increasing lynx populations also is a difficult problem” (Ibid). When trapping mortality in an area is high the addition of starvation related mortality can be devastating to a local population.

Poole argues that “untrapped refugia may be necessary for adequate recovery of lynx populations from cyclic low densities or after localized overharvest” (Poole, 1997). When combined with the suggestions of Quinn and Thompson (1987), Poole’s ideas could be the base of a viable management plan. The size of the refugia is under discussion as extensive mobility after a hare crash leads lynx to areas beyond their

protected zones. Poole adds that not only must there be untrapped refugia but also quotas established (Ibid) essentially mimicking the suggestions of Quinn and Thompson.

Poole (2003) argues that a major driving force behind over-exploitation of lynx pelts is the cyclical demand for pelts. As populations crash and pelt stockpiles reduce, the market demands more pelts and will pay better for them. In the 1980's pelt prices peaked at over \$1000 while populations crashed. The overexploitation that occurred at this time spurred wildlife managers into action. Trapping seasons in the 1990's were reduced or eliminated, quotas were set, and the populations were able to slowly recover (Ibid).

Poole (2003) also points out the following facts about lynx management: in the U.S.A. lynx are listed as endangered under the Endangered Species act and only Alaska and Montana allow trapping (statewide quota of 2 in Montana). Under CITIES the lynx is listed in appendix II as it is a look-alike species that could be confused with other endangered felids. In Canada it is listed as common to very common by the Nature Conservancy; COSEWIC assigned a 'not at risk' label to the lynx in 1989 and this was reaffirmed in 2001 by the sub-national conservation data centre. Concerns were raised by the reduction of range, and of cyclical population crashes which could expose the vulnerable species to more dangers. In Canada only small numbers of lynx are fully protected from trapping on park lands or military bases (2-4% of its range).

Mowat et al. (1996) looked at the placental scar counts for female lynx in an effort to estimate pregnancy rates. They concluded that while this process does yield results, they may be greatly in error as managers can not remove the bias of over representation of trapped animals versus those are not pressured by trapping. Population

and birth rate estimates based on such models are unreliable as number of kits conceived may not reflect the number of kits born as food shortages will increase mortality.

In a paper released by the British Columbia Wildlife Branch in 1989, lynx management issues were broken down into harvest management, population monitoring, habitat management, and research needs. The paper puts forth that during low points in the population cycle, harvest numbers must be reduced, or the season closed or shortened to ensure viable populations in the future. It is established that B.C.'s lynx populations are more stable than most because of inaccessible lynx refuges in the mountains. Trapper cooperation is stressed here (as it is in all studies referenced) as an integral factor in long-term lynx management; live release traps are also once again advocated as this allows for the release of adult females.

Apparently the "most neglected aspect of lynx biology and management" is habitat management in relation to population numbers (BCWB, 1989). Habitat protection requirements for the lynx are not known, but the forest industry clearly has impact on the lynx. As noted above, the lynx requires cover for habitat; large scale logging removes this cover. Logging may, however, counteract fire suppression techniques as forests may once again start at early stage succession; fire suppression eliminated the return to low level forests thus eliminating hare and lynx habitat. Another impact of logging is the chemical treatments applied to replanted trees. These chemicals could reduce hare numbers through poisoning (Ibid).

The paper also indicates a need for more research done in the field of population dynamics, and of more understanding of the needs of the snowshoe hare as the well being of this prey animal is essential to the future of the lynx (Ibid).

In the U.S.A, the Canadian lynx was at the center of a 12 million dollar arson case. Vail Associates (VA) planned to develop in prime lynx habitat, the last such habitat remaining in Colorado. Opposition to this development was high but VA was eventually granted the right to develop the land. On October 19<sup>th</sup> 1998, activists representing the Earth Liberation Front (ELF) torched 7 buildings on Vail's peak and later sent out a communiqué

claiming they (the fires) had been set "on behalf of the [Canadian] lynx" — an endangered species in whose name a coalition of environmental groups had been suing to stop VA's expansion into a national forest area known as Category III. Much to VA's dismay, ELF announced that the fires were only a warning, a shot across the bow. "We will be back if this greedy corporation continues to trespass into wild and unroaded areas," it wrote. "For your safety and convenience, we strongly advise skiers to choose other destinations." (Boyton, 1999).

This is only one possible consequence when responsible management is ignored in the face of economic 'progress'.

## **Conclusions**

In general, human activities do not seem to have a threatening impact on the Canadian lynx (Keith, 1993). These animals are highly adaptive, and their mobility allows them to find new resources when required. The impacts of humans can, however, become very disruptive when combined with natural low points in the lynx's population cycle. As the snowshoe hare population becomes sparse, the lynx is required to travel to new, unfamiliar lands where their exposure to trappers may be increased. If they can't find food in their new location (hare, squirrel, vole, bird, deer, or caribou) they will die. Research must be undertaken to fully understand the biological requirements of not only the lynx but of the snowshoe hare which the lynx depends so heavily upon. The Canadian lynx is not endangered in Canada, with proper management and land-use hopefully it will remain so.

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