

Algonquin Park Wolves: Losing Their Ecological and Population Integrity

John B. Theberge, Mary T. Theberge and Hilary Sears
Faculty of Environmental Studies,
University of Waterloo, Waterloo, Ontario N2L 3G1

Abstract

Since 1987, the two senior authors plus various graduate and undergraduate students and volunteers have radio-collared 172 wolves in 30 packs inhabiting approximately 60-70% of Algonquin Provincial Park, Ontario. Since 1987 the population has declined about 32%. The major source of mortality is killing by humans. Almost all deaths occur within townships adjacent to the Park. A major conclusion is that park managers are failing to adequately protect the biological and ecological integrity of the wolf population. One critical remedial action is to stem coyote gene swapping in the buffer-zone around the park. Another is to develop a conservation strategy for the Algonquin wolves and avoid their extirpation in the wild as is the case of the same species of red wolf in the southern USA.

- No park is an ecological island. What goes on around it will affect it. Algonquin Park wolves are a good case in point.
- Since 1987, the two senior authors plus various graduate and undergraduate students and volunteers have radio-collared 172 wolves in 30 packs inhabiting approximately 60 to 70% of Algonquin Park. We have concentrated on the eastern 3000 km² since 1991, and included adjacent lands to the southeast since 1995. We have computer-mapped more than 17,000 wolf locations.
- Annual population size is determined from repeated aerial total counts of wolves in radio-collared packs in mid and late winter supplemented with ground track counts. Annual mortality rates are determined from the percentages of radio-collared wolves that die. Missing collars due to dispersal beyond our study area, or battery failure, or being destroyed by people who kill the wolves are not included in mortality estimates.
- Since 1987 the population has declined by 32%. The decline has been gradual and includes four years of increase and seven of decline. Annual percent decrease in numbers has been as great as 49%. Since a ban on killing wolves placed on three townships adjacent to the southeastern portion of Algonquin Park in 1993, the population has continued to decline. Currently, it is at its lowest level, 1.4 wolves per 100 km².
- Between 1963 and 1987 when our study began, the wolf population had declined by approximately 25%, making the total decline between 1963 and 1999 more than 50%.
- Average longevity of yearlings, based upon life table analysis, is two years.
- Average pack sizes in mid to late winter are currently only three animals.

- The population decline is due both to a decrease in average pack size and increase in average territory size.
- Annual percent changes in the size of the wolf population correlate with annual mortality and are not masked by compensatory recruitment or random recruitment.
- Yearling recruitment has remained relatively low, averaging 21 percent. This estimation of recruitment, based upon the ratio of adults to yearlings in summer populations, is valid because the percentage of adults in the population, estimated from numbers radio-collared and numbers killed, has been relatively steady. We are unsure of the causes of low recruitment, but the result is a population that is particularly sensitive to being drawn down by mortality.
- The major source of wolf mortality is human killing, averaging 70 percent. Snaring and shooting exceed all other causes of death combined (and underestimated because of smashed collars that we cannot recover).
- Two factors make the Algonquin Park wolf population vulnerable to human exploitation: a mean territory size and distribution that result in approximately half the population spending time on-territory outside the Park where wolves are not protected, and a migratory habit for between one-third and one-half of the population in response to an annual deer migration to wintering yards outside the park.
- A result of snaring has commonly been the death of entire or almost entire packs simultaneously. Consequently, vacant territories are common and persist up to three years. Currently two territories are vacant and two additional territories are occupied by one pack that expanded its range coincident with the demise of these packs.
- Almost all deaths occur within townships adjacent to the park. Over the course of our study, more deaths have occurred in townships other than those three with an annual winter ban on wolf killing. That fact, coupled with the continuing decline in the population of the eastern half of the park, shows that current protection beyond park boundaries is inadequate.
- Characteristics of the population's social structure are typical of highly exploited populations, especially high rates of dispersal from packs to other packs or to form new packs, wandering packless adult wolves, consequent considerable genetic variability within packs showing that there are no tightly knit family units, little traditional use of den or rendezvous sites, and rapid pack turnover.
- Even more threatening to both long term fitness and persistence is the invasion into the park, especially into territorial vacancies, of small, genetically distinct coyote/wolf hybrids, some of whom were in post breeding condition when radio-collared. This observation helps explain genetics findings of coyote mtDNA and microsatellite alleles throughout the wolf population.
- This coyote gene introgression may account for three characteristics: 47% of adult females are under 23 kg (50 lbs) compared with 36% in the early 1960s; skull sizes have shrunk slightly compared to pre-1963, and an abnormally low incidence of lethal aggression occurs despite high levels of territorial trespass, a coyote-like trait.

- Hybridization in Algonquin Park has not yet occurred to the same extent as it has throughout the Frontenac Axis southeast of the Park, or the Magnetewan region to the west, where Algonquin type wolves have been replaced with smaller animals (with average body weights of 20.5 kg for males and 17.5 kg for females), with small territories (average less than 50 km²), a greater percentage of small mammals in food habits, and other coyote-like features.
- A major conclusion of our study is that park management is failing to adequately protect the biological and ecological integrity of the wolf population. One crucial remedial action to stem population decline and coyote gene swapping is buffer-zone protection around the Park, proposed by a consortium of conservation organizations. Unless a conservation strategy is developed quickly for this population, and species, we will enact the same sequence of events that caused the extirpation in the wild of the red wolf (same species as the Algonquin wolf) in the southern United States between 1945 and 1970.

References

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