



Natural Resources
Canada

Ressources naturelles
Canada



Bulletin
44

FRONTLINE EXPRESS

Canadian Forest Service – Great Lakes Forestry Centre

Managing forests for Pine Marten

INTRODUCTION

The American marten (*Martes americana*), sometimes referred to as the Pine Marten, is a shy, nocturnal, weasel-like mammal found throughout Canada in coniferous and mixedwood forests. Marten has traditionally been prized by trappers for its high-value fur. Healthy populations of marten are believed to be best maintained through the provision of specific habitat conditions such as older mixed species forests.

In Ontario, the current forest management guidelines were published in 1996, and were based on the best available scientific knowledge of the day. They require the retention of core habitat areas, generally large patches (3000 to 5000 ha) of mature and old (>80 years) coniferous and mixed forest. These older forests are the preferred habitat for marten because they contain large living and dead standing trees that offer shelter for marten, and suitable cover from avian predators. The guidelines also require forest management operations to be conducted so as to maintain suitable habitat for marten prey. This involves leaving dead and decaying woody material, often referred to as coarse woody debris, on site to provide habitat for preferred marten prey, such as red-backed voles. This coarse woody debris also provides both denning and resting sites for marten.

Limited information is available on the long-term effects of forestry activities on boreal wildlife species such as marten. Intensive silviculture likely decreases desired habitat characteristics for marten because coarse woody debris and standing dead wood are reduced. The effects of changes in forest structure, such as tree species composition, are also of concern. To address the need for further information, a large-scale collaborative field study was initiated in Northern Ontario in 2000 by Natural Resources Canada – Canadian Forest Service, the Ontario Ministry of Natural Resources and the University of Guelph to gather scientific data about marten populations in managed and unmanaged forests.

GREAT LAKES FORESTRY CENTRE (GLFC) ROLE

GLFC scientist Dr. Ian Thompson was a key member of the research team that investigated marten ecology and population characteristics



Image 1. Radio-collared American marten.

throughout the boreal forests of Ontario. He contributed his considerable expertise in marten research and wildlife population ecology to the study. The research team's work was conducted at two locations in the province; one near Red Lake and the other near Kapuskasing. Each site was several thousand square kilometres in size, and contained both managed and unmanaged forests. The two study sites differed somewhat in their ecology. The Red Lake ecosystem is characterized by historically frequent wildfire occurrence, drier soil types, and forests dominated by jack pine and black spruce. By

comparison, the Kapuskasing study site demonstrated less frequent occurrence of wildfire, moister soil types, and predominantly black spruce, balsam fir and aspen forests.

Marten were captured at night using baited live traps. More than 100 individuals, distributed between adults, juveniles, males and females, were captured. The animals' weight, age, and sex were recorded and they were then fitted with small radio collars that had a 30-g radio transmitter (Image 1). Age was determined by extracting the first lower premolar tooth. Most of these individuals were followed over the course of the project by obtaining radio signals daily to weekly, from field crews who travelled on foot, or by truck, snowmobile or aircraft.

Results were used to estimate the mammals' home range sizes and habitat use, as well as hunting and reproductive success. A few of the animals moved out of the study area, sometimes for distances farther than 200 km, and many others were caught by trappers, reducing sample sizes in each year. Data were collected on population density, survival rates, and habitat availability for both marten and its preferred prey to better understand the mechanisms affecting population levels.

Observations from the managed forest sites indicated that there was typically less coarse woody debris and fewer younger forests compared to the unmanaged sites. A key question is whether or not these conditions will eventually redevelop in the managed forests. Marten in managed sites exhibited poorer body conditions and higher rates of juvenile mortality, both of which indicate that they hunted

less efficiently in these conditions. However, marten responded positively in managed areas that had been re-planted with conifer trees about 50 years previously, suggesting that basic silviculture can provide habitat favourable to marten. Marten populations were also influenced by commercial trapping, showing a higher susceptibility to capture in managed forests, likely in part due to the higher density of road networks that provide increased access to trappers.

Results of this study indicated that marten populations may be sustainable in both older unmanaged and mature regenerating forests; however, the older forests are much more productive for marten. The research also demonstrated that the observed levels of commercial fur harvesting could negatively affect the sustainability of marten populations, thus warranting careful consideration of the effects of forest road networks on trapper success, or the possible use of trapping restrictions in some years.

Researchers created a population viability analysis (PVA) model that uses habitat and population data to predict marten populations. This model will be helpful in predicting future population size, as well as determining the forest management strategies that would be most effective in allowing forest harvesting while maintaining viable marten populations. The model will provide a useful means of predicting population changes that may result from alternative forest management actions.

CONCLUSION

Older forests seem to provide the most favourable habitat for marten survival. Populations can also persist at lower levels in mature regenerating forests, but only if trapping is controlled. The retention of large core areas of preferred marten habitat does not seem to be necessary for the long-term viability of populations as long as maturing forests are available. A range of forest ages distributed across the landscape with various sizes of uncut areas would likely be the most effective means of ensuring viable populations of marten, particularly when both fur harvesting and timber harvesting are managed together. The knowledge from this study has already had policy implications for age and types of forests that can be assessed as capable of supporting marten during forest planning activities.

COLLABORATORS

- Forest Ecosystem Science Cooperative Inc.
- NSERC/CFS Partnership Program
- Sustainable Forest Management Network
- Ontario Ministry of Natural Resources
- NSERC Discovery Grant
- Living Legacy Trust
- Forestry Research Partnership

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