ECOLOGY OF THE FISHER (*MARTES PENNANTI*) IN SOUTHEASTERN MANITOBA

INTERIM REPORT

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PROJECT TITLE: Ecology of the Fisher (Martes pennanti) in southeastern Manitoba

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This report summarizes the progress made on the "Ecology of the fisher (Martes pennanti) in southeastern Manitoba" study that was initiated in 1975 and was funded in part by Parks Canada. As analysis and collection of data is not yet complete, discussion of the results must necessarily be limited in scope.

Although the fisher has increased in much of the boreal coniferous forest during the last two decades, there still remains a paucity of data concerning the natural history and ecology of this carnivore. Most published studies have concentrated on fisher populations in the eastern portion of their geographic range. Hamilton and Cook (1955) and Eadie and Hamilton (1958) studied fisher reproduction and food-habits in New York. A limited amount of field and laboratory research was done in Ontario by de Vos (1952). Coulter (1966) led an important study in Maine that researched several aspects of fisher ecology and management. The fisher still remains, however, one of the poorest known carnivores in North America. In Manitoba, for example,

many of these mustelids are trapped each year, but nothing is understood about their ecology in this area. Because of the presence of different climatic and forest types, the eastern studies cited do not apply to the situation in Manitoba. I initiated this study to help alleviate the problem. The two main objectives of the study are:

1. An ecological study of the fisher in the Wallace Lake region using radio-telemetry.
2. Laboratory autopsy of trapper-caught specimens for data on food-habits, reproductive biology, age and sex ratios and parasitism.

Field research is nearly complete, but only three months have been spent on laboratory research.

In some areas, such as Riding Mountain National Park, the fisher must be reintroduced by man to be common in the fauna. There is, however, serious biological implications in reintroducing any carnivore into a fauna from which it has been absent for a number of years. The success of a transplant depends greatly on the understanding and knowledge of the behaviour and ecology of introduced species. I will outline how the results of this study will aid in the successful reintroduction of the fisher in Riding Mountain National Park.

Home Range and Movements of Fishers

I equipped adults and juveniles of both sexes with radio-collars to study the home range and movement patterns of fishers. Telemetric relocations of these animals were made twice daily if possible. Records of physical and biological factors that may influence movements were recorded and a cursory analysis conducted. Preliminary results indicate that there is a variety of home range patterns that may be related to sex and age classes. An adult female released on 9 April 1976 used a home range of 20 Km^2 and rarely moved out of this area. This fisher was tracked nearly continuously for five months and showed a high percentage of daytime movements. No obvious correlations were made with any factors of the biotic and abiotic environment that could explain these movements. This individual was retrapped on 10 March, 1977, and studied during the remainder of the nival period. Movements occurred less often and less extensive than during the previous tracking period; home range size decreased as a result of decreased activity. Winter conditions, predominately snow conditions and temperature, may be responsible for a decreased home range. Ground tracking data have indicated that for two winters fisher activity was lowest in January, the month of severest nival conditions and temperature. A juvenile female was studied by radio-telemetry from late winter to the present. The home range was considerably

larger than that of the adult female, and this fisher was also more active. A high proportion of daytime movements occurred. Unfortunately this animal moved out of radio reception in early April, 1977. We had little evidence that the adult female moved out of her home range in a time period of over a year, but this juvenile female travelled out of an extensive range that was established for the months of February and March, 1977. This may indicate that it takes time for juveniles to establish permanent home ranges within the population.

Data for males unfortunately has not been so clear. A juvenile male released on 1 November, 1976 was caught by a professional trapper on 27 November 1976, approximately 60 Km west of the capture site. This movement may represent juvenile dispersal after the break up of the family unit. An adult male tagged on 18 March 1977 spent several days in a den and then in one day travelled out of radio reception. Data from ground tracking indicate that males may use a home range much larger than those of females; few of the larger tracks made by males were seen in the intensive study area. If a large set of tracks was observed, it was usually quite some time before another set was recorded.

These results have immediate implications for the reintroduction of the fisher into Riding Mountain National Park. Home range size of various age classes is important in identifying the minimum number of animals that must be

released in the park. If too small a number are entered the odds of males finding females during the breeding season will be reduced; the rate of population growth will then be low or even negative. An understanding of the differences between male and female movement and home range may give a better understanding of the optimum sex ratio for a reintroduction. Habitat preference data for the Wallace Lake region may be used to identify the most appropriate release area at Riding Mountain National Park as well as the area that will be most likely used by the reintroduced animals. Other results, such as fisher activity in relation to thinly forested and non-forested areas will also be of value.

Food-habits of the Fisher in Manitoba

I collected approximately 200 carcasses from several thousand square miles of fisher habitat in the Province of Manitoba. Data on the winter diet of the fisher is obtained by analysis of identifiable food-items in the ailimentary tract and the examination of the body musculature and organs for the presence of porcupine (Erethizon dorsatum) quills. Information from the field on prey species will give an index of their availability. Although only three months of laboratory work has been completed, preliminary results indicate important findings. All fisher diet studies to date

have been in areas where porcupines were common. At Wallace Lake, however, only one porcupine has been observed since University of Manitoba zoological studies began there in 1970. Surprisingly, several fisher carcasses had porcupine quills embedded in the body musculature and organs. This indicates that the fisher actively preys upon porcupines even when the prey is in very low densities. Since there has been a high porcupine population reported from Riding Mountain National Park, it is predictable that fishers will prey upon these rodents and may even decrease the population. It is not yet known at what point the porcupine population would stabilize. Other animals important in the winter diet of the fisher are snowshoe hares (Lepus americanus), birds, and small mammals. Analysis of data is not yet complete enough to determine quantitatively the relative importance of prey species, but populations of these animals will certainly be affected if the fisher establishes itself in the park fauna. Available carrion is also used by these mustelids. I have observed the rates of consumption of carrion by fishers in the field and have found that in some cases carrion may supplant living prey for a short time period. Fisher tracks and feeding sign have also been observed around a wolf-killed caribou (Rangifer tarandus) carcass in the Wallace Lake area. In general, at Wallace Lake the carrion available was low due to a low density of ungulates. Since Riding Mountain

has three common cervids and a potential for a winter kill of some species the amount of carrion may be much higher in the park than in other regions. The diet of the fisher in the park and the effect of this predator on populations of prey species may be influenced by the amount of carrion available for consumption. A complete knowledge of the diet of the fisher is therefore necessary to help predict the effect this predator will have if introduced into the forest community of the park.

Some Aspects of Reproduction of the Fisher in Manitoba

Much data on the reproductive cycle of the fisher comes from fur farms. Both monogamous and polygamous matings have occurred on these farms (Douglas, 1943; La Beree, 1941). Coulter (1966) felt that polygamous mating was the most likely type of mating. Few data are available concerning the breeding season of fishers in the wild. Hodgson (1937) reported 12 matings on an Ontario fur farm between 26 March and 23 April. The mean date of 26 ranch matings in British Columbia was 12 April (La Beree, 1941). Coulter (1966) observed increased fisher activity in March, and related this to the breeding season. I observed increased activity in March and at least 2 males moved into the home range of an adult female during this period. Parturition occurs in

February, March, and April (Hall, 1942; Douglas, 1943; Hamilton and Cook, 1955). Coulter (1966) found implanted embryos as early as January in Maine. On 28 March 1976, a female I held captive whelped a litter of 4 young. This date is within the ranges described. No reproductive tracts that I have examined earlier than March have shown macroscopic development or obvious implantation. Apparently, few fisher kits are born in Manitoba earlier than March. Future work will give an index to the reproductive potential of the species in Manitoba.

These results are important to the reintroduction of the fisher in Riding Mountain National Park. Since females are pregnant throughout the year and will bear young in later winter, choosing the correct time period for a transfer is crucial. Prospective transplants must establish new home ranges in the park well before the critical period of parturition. It is desirable to have an early winter trapping and transfer. There will be no disruption of family units at this time and the severest winter conditions will be avoided. When data concerning age of first reproduction and the potential of each age class are known, it will be less difficult to determine the number of annual transplants necessary to establish the predator in the park.

Age and Sex Ratios of Manitoba Fisher Populations

Aging techniques for the fisher are not yet well known in great detail. No study on aging methods has dealt with a large number of known age specimens; indeed there are no reports in the literature concerned with more than juvenile and adult age classes. Attempts are now in progress in Ontario to age by sectioning teeth and counting annulations (Strickland, 1974). I am reviewing the methods used to date and will attempt to age the samples I have collected.

A knowledge of the age and sex ratios of fisher populations is of great advantage in planning a reintroduction. Age and sex ratios of introduced fishers should at least approximate the wild situation to help eliminate the problems caused by such imbalances. For example, if there is a lack of adult females in the peak reproductive ages, there will be a low annual increment. Through an imbalance in sex and age structure other more subtle problems may occur, such as an upsetting of the social order of the reintroduced population which may result in decreased survival of some sexes or age classes.

Parasitism

A survey of the parasite fauna of trapper-caught fisher specimens has been undertaken. The results of this phase of the study will help ascertain if the reintroduction of the

fisher into the park will transmit new parasites into the park fauna that may in general be detrimental to other species. I have yet found no parasite species present in the fisher populations that would effect the decision of reintroduction. Analysis of this aspect of the study is far from complete, however, and more data will be collected.

The Fisher in the Interpretive Program of Riding Mountain National Park

The fisher is now recognized as an important predator on medium sized prey species. They may even be capable of limiting porcupine populations under certain circumstances. It is desirable to have information on the fisher in the interpretive program at Riding Mountain National Park as fisher and porcupine predator-prey relationships may be more easily understood by the general public than other predator-prey systems. It remains a classic example, as the fisher is the only important predator of the porcupine. The results of the fisher study will be available in thesis form to park personnel who are involved with interpretive programs.

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