

Research on stoat control in forests

MOST PEOPLE know that stoats are small, rather fierce carnivores of the Mustelid family, which were introduced to New Zealand farmlands in the 1880s to control rabbits. Most will also know that they failed in this task and instead spread into the forests, where they are now common and eat many birds. The possible effects of their preying on native birds are a source of great concern, especially in the national parks.

AS REQUIRED under the National Parks Act of 1952, park rangers have made some attempts from time to time to control stoats, but without any way of knowing whether their efforts were efficient, effective, or even necessary. There was obviously a great need for some basic information about the biology of stoats in national parks; so I began a general survey in 1972.

Rangers in all the parks co-operated most generously in collecting dead stoats, in their own trap-lines and from opossum hunters, and so did the Forest Service meteorological officers on their daily rounds in Craigieburn Forest Park and Wildlife Service officers at Mount Bruce, Kai-koura, and Takahe Valley.

By March 1976 more than 1600 stoats had been sent to me at the D.S.I.R. Ecology Division in Lower Hutt, not all in the freshest condition. Most were processed by J. E. Moody, surely the most patient and uncomplaining technician the D.S.I.R. has ever had.

By mid 1977 all the laboratory work was done (autopsying, skull cleaning and measuring, weighing and histology of reproductive organs, and identification of gut contents) and all the data were entered into a computer.

The analysis of this considerable amount of information took a year even in the hands of a most competent statistician, M. G. Efford, and

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the writing and reviewing and rewriting of the seven papers describing the results have taken me and various expert critics a further 3 years.

Now at last the papers are ready and are to appear in volume 9 (1982) of the *New Zealand Journal of Zoology*. They go under the general heading "The biology of the stoat (*Mustela erminea*) in the national parks of New Zealand", and they describe the food habits, body size, reproduction, moult and winter whitening, and two of the major parasites of the 1599 stoats included in this general survey.

Though we ceased to collect stoats from the national parks generally in March 1976, we did not stop field work altogether. Instead we concentrated on three areas where we had some chance of unravelling at least some of the factors which control the populations of stoats in nature. If we are ever to control stoats artificially, we must first know what controls them naturally; otherwise we may waste time and money in attempting artificial control, which merely replaces natural control or is totally ineffective.

Beech seedfalls

From earlier observations it seemed that there might be a link between heavy beech seedfalls and increases in forest

rodents and thence from increases in forest rodents to increases in stoats. So in Craigieburn Forest Park and in two valleys in Fiordland National Park we collected information on beech seedfall (each season), and on populations of rodents (quarterly) and of stoats (monthly), for most of the years between 1974 and 1980.

It turned out that a good beech seedfall has quite predictable results. Most of the seed falls between March and June; by August mice and rats are increasing in numbers, largely because, when there is plenty of seed on the ground, the young rodents survive better than usual and the adult females continue to breed through the winter instead of stopping as usual after May.

Most young stoats are born in mid to late October in the South Island, and in years when mice are numerous at that time, their mothers have plenty of mice to eat, and many more young stoats than usual are born or more that are born survive.

The young stoats begin to appear in the traps in December, and in the December after a good seedfall the sudden increase in numbers of stoats caught (mostly young ones) can be staggering. But the peak does not last long: natural processes begin to cut down the numbers of young stoats as soon as they leave the nest, and by the following summer most of the extra