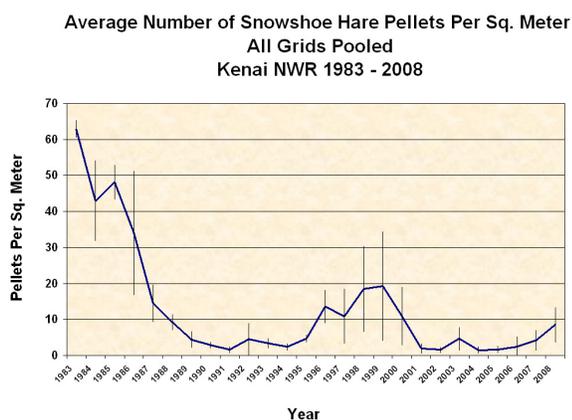


# Kenai snowshoe hare population monitoring presents puzzling results

by Toby Burke



*A graph image of the average number of snowshoe hare pellets per sq. meter. All grids pooled Kenai NWR 1983-2008. Tony Burke/USFWS.*

The snowshoe hare (*Lepus americanus*) is a common resident of the boreal forests of North America. Specifically, it ranges from the forested extents of northern Canada and Alaska southward to the northern U.S. Border States and into the northern Sierra and central Rocky Mountains.

The snowshoe hare provides a classic example of a species with huge cyclic oscillations in its population densities. These cyclic oscillations may be on the order of 20 to 1 in the southern portions of its range or 3400 to 1 in the northern portions of its range. It is amazing to think that field studies have revealed densities of 3,400 snowshoe hares per square mile at the peak of their cycle and densities of 1 per square mile at the bottom of their cycle, little more than 1 year later.

In favorable habitat in northern Canada populations of 10,000 hares per square mile have been estimated by researchers. It has been hypothesized that the less complex food web with fewer buffer species and simpler environmental conditions may be responsible for these spectacular fluctuations experienced in their northern range.

This boom and bust cycle experienced by snowshoe hares and their predators lasts approximately 10 years. This 10 year cycle is also experienced by nu-

merous other prey species such as grouse, ptarmigan, passerine birds, squirrels, small mammals, and even cranes since predators will be forced to switch prey species when snowshoe hares become scarce.

Snowshoe hares are preyed upon by a large array of predators but most significantly by the mammalian predators—lynx and coyote and the avian predators—great-horned owl and northern goshawk. Golden eagle, red-tailed hawk, northern hawk owl, northern harrier, wolf, wolverine, red fox, pine marten, weasel, mink, and even squirrels, also predate heavily upon snowshoe hares, the smallest of these predators only being capable of taking leverets (young hares).

Kenai National Wildlife Refuge biologists initiated a series of snowshoe hare research plots in 1983 for the purpose of determining relative hare abundance in early- to mid-successional forests. These newly reforested habitats are what develop within the first few decades after a major forest disturbance such as a forest fire.

These forests are the preferred habitat of snowshoe hares not only on the Kenai Peninsula but continent-wide since they provide abundant, accessible forage for browsing and cover from predation.

In 1947 and again in 1969, major forest fires altered large forested areas of Kenai National Wildlife Refuge. In the ensuing decades these forests developed in to optimal snowshoe hare habitat. A total of five research grids were established within portions of these former burns to determine relative snowshoe hare abundance. Each grid consists of a series of 49 - 1 square meter plots. Each year during the summer months all snowshoe hare pellets, their pellet-like excrement, are counted and recorded within these square meters plots and then removed so only 1 year of pellets are allowed to accumulate until the next year's survey.

From these five grids biologists can gauge relative abundance of snowshoe hares on a yearly basis within the sampled habitat based on the abundance of their pellets. It follows that when hare pellets are abundant so are hares and when hare pellets are scarce so are hares.

Interesting enough when the results of the five grids are analyzed separately or collectively for the last 25 years refuge biologists are not observing the classic nine to 11 year snowshoe hare cycle observed in most of boreal North America. While that is not unusual since snowshoe hares cycles of six to 13 years are well documented in other parts of North America what is unusual is that the Kenai cycle may be substantially longer.

More than 200 years of meticulous fur buying records from the Hudson's Bay Company revealed the

renowned 10 year snowshoe hare cycle now clearly evident over most of North America. After only 25 years of snowshoe hare monitoring refuge biologists can not yet say that a Kenai snowshoe hare cycle is clearly evident.

*Toby Burke is a refuge biological technician who is intrigued by the status and distribution of Alaska and Kenai Peninsula birds and enjoys birding with his wife and family. Previous Refuge Previous Refuge Notebook columns can be viewed on the Web at <http://www.fws.gov/refuge/kenai/>.*