

MINUTES OF 873rd MEETING OF THE BRODIE CLUB

21 JANUARY 1992

By Harry Lumsden

Meeting was called to order by Chairman W. H. Carrick at 2010 hours.
Secretary H. G. Lumsden.

Present were 14 members and 6 guests : Wm. Rapley, Kelly Whitlock
and Frank de Matteus, guests of Carrick; Margery Ritchie guest of
Bob Ritchie; Isabel Bellocq, guest of Bendell; and Maudie Reynolds,
guest of Reynolds.

Minutes of the last meeting were approved as circulated.

Announcements

McNicholl : Annual meeting of the Ontario Bird Banding Ass c
7 March, 0900 - 1600 hours, at the Royal Botanical Gardens,
Burlington. Guest speaker Kay McKeever.

Norm Martin : Time for recommendations to F. O. N. by Brodie
Club for their awards as well as the Environmental Achieve-
ments Awards. Outdoor Canada Magazine sponsoring Gallery of
Birds at the Sportman Show. TV Ontario has a show on Winter
Birds. The 13th North American Prairie Conference will be
held at the Univ. of Windsor 6 - 9 August.

Howard Savage noted a letter from Don Baldwin on Grand Manan
Island, advertising a guest house.

Speaker of the Evening

Bendell introduced the Speaker, Rudy Boonstra, of the Division of
Life Sciences, Scarborough Campus, Univ. of Toronto. on "Are
Snowshoe Hares the Centre of the Boreal Forest Ecosystem ?"

80% of Canada's forested land is in the Boreal Zone. Within
it, Hares and Lynx have regular population cycles. The study was
about the ramifications of the hare cycle and what the other ele-
ments in the Boreal Forest are doing.

How is the Boreal Forest community structured ? Is it con-
trolled from the bottom of the community up or from the top down
by predators ? Is the keystone herbivore the Snowshoe Hare ?

Several large scale experiments were undertaken on two
1 square ^{km} plots. Fertilizer (nitrogen, phosphorus and potassium)

were applied by air. Hares were also artificially fed with rabbit chow (16% protein) scattered behind snow machines in winter and by fertilizer spreaders pulled by all terrain vehicles in summer.

Two predator e^xlosures were fenced. This was very difficult as Moose in rut would go right through a fence with 6,000 - 7,000 volts, which would cause a grizzly bear to run. The fence had to be checked daily. Hare enclosures of 4 hectares of orange plastic netting had to be reinforced with chicken wire because of chewing by hares. There was one predator e^xclosure with rabbit chow supplements. The study started in 1986 and will continue to 1995 - 96. The study area is in a valley east of Kluane Lake, adjacent to Kluane National Park.

Methods

Hares were trapped and marked four times per year, as were Arctic Ground Squirrels. Between 100 and 170 radio transmitters were used on Hares. These permitted an instant record of death, and also a follow-up check. Lynx were also radio-collared. Goshawks and Great Horned Owls were excluded with a net covering 10 hectares of the predator e^xclosure plot. These did not work in winter because of heavy snow. Finally 40 lb. test monofilament line was stretched over the plots.

At the peak of the cycle there were 4 - 6 hares per hectare but only 0.1 hare at the trough.

Observations

Lloyd Keith's hypothesis suggests a two phase system with decline initially related to a shortage of over-wintering food supply. Predators finally increase to have an effect on the hares. Vegetation recovers as the hares decline.

The Kluane study suggests that there is always enough food out there and it appears that predators are driving the system.

In 1992 it appears that the hare population is declining. Fertilization has not had much effect.

Exclosure of predators plus artificial food had the greatest effect with 4.5 to 5.3 hares per hectare on the 1st April census.

30 day survival was good up to 1989 - 90 winter, but was declining in 1990 - 91.

Starvation was assessed from examination of the fat content of the bone marrow. Predator kills and those found dead were used. In 1992 Arctic Ground Squirrels will receive a major telemetry effort. They eat the same food items as Hares, including rabbit chow. Their highest densities were in the predator exclosures, plus rabbit chow.

Red-backed Voles, Chipmunks, Deer Mice and Vole sp. were present in the study area, but were doing things independent of what the Hares were doing. None of the experiments seemed to make any difference to them.

Spruce Grouse were not very common; they peaked in 1989 and have been low in numbers since. They were being hit by predators at the same time as the Hares were suffering.

Coyotes hunted predominantly in the open and closed spruce stands. Lynx were most common in open spruce and were not found in the open shrub or deciduous communities. In the winter Hares predominated in the coyote as well as Lynx diets. In the summer diets were more variable.

Great Horned Owls were studied with telemetry to determine territory size. Young owls were tethered on a platform to get food habits. Removing young owls from the nest was very dangerous. Summer diet of juveniles was predominantly Hare. Survival of young owls drops as soon as they fledge. When food is scarce, Lynx and Wolverine eat fledglings from the nest.

Goshawks have a more varied diet than Horned Owls. Some, however, seem to specialize on one species of prey. For example, one fed predominantly on Ptarmigan, another on Squirrels. There were Hawk Owls on the study area which sometimes killed juvenile Hares.

Snowshoe Hares made up the largest component of the herbivorous pyramid. In the predator biomass, Lynx were very important, followed by Great Horned Owls and Coyotes.

Snowshoe Hares have three litters per year and the critical period for them was as juveniles, when even Ground Squirrels and Red Squirrels ate them. Survival to 30 days was 0.4.

The increase in Hares on the plots where food supplements were provided was due to both immigration and reproduction. In the fed plots the Hares devastated other food sources such as birch, aspen and willow. Hares maintained their numbers best in the predator exclosures where chow was offered.

No measurement was made of the impact that investigators had on this ecosystem; however there must be some effect. The density of Hares was estimated using a trap mark and re-capture technique over ten day periods.

The Speaker was thanked by Bruce Falls, and the members showed their appreciation with hearty applause.

Members' Notes and Observations

Bruce Falls received a phone call suggesting that muskrats produced middens of clam shells. Carrick reported that he had seen clam shells that seemed to have been chewed by muskrats. Lumsden said he had seen pollution-killed fish and clams that had been eaten by muskrats.

McNicholl noted that Margaret Hertzburg was well into a book on Dr. Brodie.

Reynolds reported that a past member of the Brodie Club had died. Ott Devitt was remembered by many.

Bendell reported that Ray Langford recently deceased. He had seen a Cooper's Hawk feeding on starlings.

Lumsden reported on an attack by a Mink on a Trumpeter Swan.

Meeting adjourned at 21.47 hours.