SMALL MAMMALS OF THE TOFT POINT SCIENTIFIC AREA, DOOR COUNTY-WISCONSIN: A PRELIMINARY SURVEY

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ABSTRACT

Live and snap trapping techniques were used to examine the presence and abundance of small mammals at Toft Point. The eleven species found include northern taxa such as *(Lepus, Clethrionomys)* which are typical of boreal forests, and southern forms *(Microtus, Sciurus carolinensis* and *Glaucomys sabrinus).* The southern species, with their main distribution south of Door Peninsula, are probably the most recent additions to the Toft Point small mammal assemblage, indicative of a northward advance after retreat of Wisconsin glaciation.

INTRODUCTION

This project surveyed the terrestrial small mammal community of the Toft Point Scientific Area to determine what mammals were present and whether they were exclusively boreal species. Results are compared to previous studies of Door County mammals (Jackson, 1961; Long, 1974) and to a small mammal study done in similar habitats in northern Michigan (Manville, 1949).

Toft Point lies approximately 2.4 km northeast of Bailey's Harbor, Wisconsin. The history of the Toft Point Natural Area, as related to me primarily by Emma Toft of Bailey's Harbor, is one of a relatively unexploited forest. Miss Toft's parents settled there in the second half of the 19th Century and her father, Kersten Toft, was employed by a Michigan firm interested in the limestone underlying the land. Limestone was mined and ships would dock at the

point for a load to take to Michigan. Remnants of this operation can still be found, including dock pilings, rock piles, mine excavations and an old smelter. Mr. Toft gradually accumulated 300 acres as compensation for his labors.

After mining ceased the family operated a resort with half a dozen small guest log cabins. The resort ceased operation in the 1960s and in 1967 the land was given to the University of Wisconsin-Green Bay to be used in a manner compatable with the Wisconsin Scientific Area designation that it also received.

VEGETATION

The Wisconsin Geological and Natural History Survey map of Wisconsin early vegetation codes the area northeast of Bailey's Harbor as boreal forest balsam fir *(Abies balsamea)* and white spruce *(Picea glauca).*

The Wisconsin Scientific Areas Preservation Council (1973) lists three major plant communities for the Toft Point area:

Northern dry-mesic forest with white pine *(Pinus strobus),* red maple *(Acer rubrum),* and red oak *(Quercus rubra),* and

Northern mesic forest with sugar maple *(A. saccharum),* hemlock *(Tsuga candensis),* and yellow birch *(Betula lutea)* and

Northern wet-mesic forest with white cedar *(Thuja occi dentalis),* balsam fir *(Abies balsamea),* and black ash *(Fraxinus nigra).*

This boreal outlier is far south of the only substantial boreal forest stands in Wisconsin which lie along Lake Superior. Curtis (1959) indicates that the influence of on-shore winds off Lake Michigan keep the summer temperatures and evaporation rates relatively low.

A species list of the known flora of the Toft Point Area was compiled during this study as a result of our observations and those made by David B. Lellinger in 1957-59. Dr. Lellinger's collection is in the University of Illinois herbarium in Urbana. An extensive list of plants has also been compiled by Roy Lukes of the adjacent Ridges Sanctuary.

MATERIALS AND METHODS

The quarter method (Curtis and Cottam, 1962) was used to sample vegetation of a 1 ha grid where we were also trapping red squirrels. Importance values were calculated and indicated that white cedar (IV 108.5) and white pine (IV 106.8) were the dominant trees. Species present but of lesser importance were hemlock (17.0), red pine *(P. resinosa)* (28.2), white spruce (13.0), and paper birch *(B. papyrifera)* (24.7). In the sapling category, balsam fir (202.8) accounted for two-thirds of the total importance value with white spruce (29.1), mountain maple *(A. spicatum)* (30.2) and white cedar (26.5) of much lesser importance.

The ground layer species matched closely the published list for boreal forests, (Curtis) (1959). Canada dogwood *(Cornus canadensis)*, bigleaf aster *(Aster macrophyllus)*, twinflower *(Linnaea borealis)*, Canada mayflower *(Maianthemum canadense)* are among the most conspicuous species. The shrub layer is dominated by thimbleberry *(Rubus parviflorus)* wherever sufficient light is available.

Field work began in June, 1971 and proceeded intermittently until April 10,1976. Live and snap-trapping revealed information on the more common (abundant) species. Personal observations and discussions with Ms. Toft and Mr. Lukes yielded information on additional species that were not trapped. The literature was searched and reviewed for previous small mammal records of the region. Two sources have been most useful; Jackson's *Mammals of Wisconsin* (1961) and Long's *Mammals of the Lake Michigan Drainage Basin* (1974).

Longworth and National live traps, and Museum Special snap-traps were used. Most trapping was done with Museum Special traps set out usually in a line of 20 stations at 15.2 meter intervals with three traps per station. This pattern is similar to the type B lines of the North American census of small mammals suggested by Calhoun (1948). All major habitats mentioned above were sampled including a former pasture which is interspersed with low juniper clumps *(Juniperus communis)*. A total of 1366 trap-nights were accumulated in 13 trapping sessions. An additional 321 trap-days

were recorded using the National live-traps (22.9 x 22.9 x 60.9 cm) on a grid pattern established to monitor red squirrel populations. Animal calls and tracks were also recorded.

RESULTS

The relative abundance values are of marginal use because equal effort was not expended in trapping each habitat type, i.e. only 13.2 percent of the total 1366 trap-nights were in old pasture, yet *Microtus* accounted for the second highest abundance. Most trap-nights were accumulated in the habitats characteristic of the northern dry-mesic, northern mesic and northern wet-mesic forests. The average trapping success was 3.07 mice per 100 trap-nights.

The results (Table 1) are similar to those Manville (1949) reported in an extensive study of the Huron Mountains region west of Marquette, Michigan. In his study, *Peromyscus maniculatus* replaced *P. leucopus*, but in both cases they were the dominant small mammal.

The meadow jumping mouse *(Zapus hudsonicus)* was a new record for Door County and it apparently maintains as sparse a population as it does over much of its range. It was taken in a northern wet-mesic stand. *Microtus pennsylvanicus*, the meadow vole, the second most abundant species captured, was restricted to the old pasture habitat.

As Manville (1949) previously stated, *Blarina brevicauda* and *Sorex cinereus* are the most common shrews in northern forest habitats and they were the only insectivores caught at Toft Point.

The live-trap grid established for red squirrels in a northern dry-mesic stand yielded numerous captures (120) of approximately 30 individuals. Although this grid was not operated on a regular basis, results indicate a density of red squirrels similar to that reported in other studies in coniferous habitats (i.e. at least 2-5 squirrels per hectare). One gray squirrel *(Sciurus carolinensis)* was trapped during this period, suggesting a sparse population.

Forty-two individuals representing eleven species were trapped (Table I).

Table 1. Small mammal species trapped at Toft Point and their relative abundance.

Species trapped		Individuals	Relative abundance
Sorex cinereus Masked shrew	M	4	11.1
Blarina brevicauda Short-tailed shrew	M	3	8.3
Lepus americanus Snowshoe rabbit		1	*
Sciurus carolinensis Gray squirrel		1	*
Tamiasciurus hudsonicus Red Squirrel	M	32	*
Glaucomys sabrinus Northern flying squirrel	M	2	5.5
Peromyscus leucopus White-footed mouse	M	17	47.2
Clethrionomys gapperi *Red-backed vole*		4	11.1
Microtus pennsylvanicus Meadow vole	M	5	13.9
Zapus hudsonicus Meadow jumping mouse	M	1	2.8
Mustela erminea Short-tailed weasel	M	1	*

These species were not included in relative abundance calculations since the snap-traps were not large enough to effectively capture adults.
M-Specimens in the University of Wisconsin-Marinete mammal collection.

Table 2. Small terrestrial mammals of Door County, Wisconsin.[1]

Species	Jackson (1961)	Long (1974)	Present Study Toft Point
Sorex cinereus Masked Shrew	+	+	+

Blarina brevicauda Short-tailed shrew	+	+	+
Sylvilagus floridanus Eastern cottontail	+	+	–
Lepus americanus Snowshoe rabbit	+	+	+
Tamia striatus Eastern chipmunk	+	+	+
Marmota monax Woodchuck	+	+	+
Tamiasciurus hudsonicus Red squirrel	+	+	+
Sciurus niger Fox squirrel	+	+	–
Sciurus carolinensis Gray squirrel	+	+	+
Glaucomys sabrinus Northern flying squirrel	+	+	+
Peromyscus maniculatus Deer mouse	+	–	–
Peromyscus leucopus White-footed mouse	+	+	+
Clethrionomys gapperi Red-backed vole	+	+	+
Microtus pennsylvanicus Meadow vole	+	+	+
Ondatra zibethicus Muskrat	+	+	–
Rattus norvegicus Norway rat	+	as.	–
Mus musculus House mouse	+	as.	+
Zapus hudsonicus Meadow jumping mouse	–	–	+
Erethizon dorsatum Porcupine	+	+	+

[1] specimens trapped and/or observed.
as.—assumed present.

DISCUSSION

Sub-specific designations were not examined because of the paucity of specimens. However, in-depth examination of Toft Point and Door Peninsula specimens, in general, is warranted and has already been shown to be fruitful by Long's (1971) description of an endemic subspecies (*peninsulae*) of the eastern chipmunk (*Tamia striatus*).

Much more research is needed on Toft Point Natural Area mammals. Longer trapping sessions will undoubtedly account for more uncommon species. Workers should be alert for species previously recorded from Door County (Table 2). The boreal forest remnant represented by Toft Point presumably does not prevent non-boreal species from establishing marginal populations on this tract.

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