

Atlas of the Mammals of Ontario

Jon (Sandy) Dobbyn



Federation of Ontario Naturalists

The Atlas of the Mammals of Ontario
was generously supported by the following organizations:

Ontario Ministry of Natural Resources

Employment and Immigration Canada

Environmental Youth Corps

Ontario Heritage Foundation

Federation of Ontario Naturalists

Environment Canada

Ontario Federation of Anglers and Hunters

Canadian Wildlife Foundation

University of Waterloo

Royal Ontario Museum

Carleton University

**Funding for the printing of the *Atlas of the Mammals of Ontario*
was provided by the Ontario Heritage Foundation.**

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by Jon (Sandy) Dobbyn

with contributions from Judith Eger and Nancy Wilson



Canadian Cataloguing in Publication Data

Dobbyn, Jon Sandy, 1966-

Atlas of the mammals of Ontario

Includes bibliographical references and index.

ISBN 1-896059-02-3

1. Mammals - Ontario - Geographical distribution
- Maps. 2. Mammals - Ontario - Geographical distribution.
I. Federation of Ontario
Naturalists. II. Title.

QL721.5.05D63 1994 599.09713'022'3 C94-900351-4

Published by:

Federation of Ontario Naturalists

355 Lesmill Road, Don Mills, Ontario, Canada

M3B 2W8

(416)444-8419 Fax: (416)444-9866

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Proceeds from the sale of this book go to support further volunteer conservation efforts.

Printed in Canada by D.W. Friesen
Altona, Manitoba Canada.

cover photo: Red Fox: Michael W.P. Runtz

Foreword



Eastern Chipmunk: Ivan Foster

The presence of a balanced, functioning mammal fauna in an area is an indicator of the general health of that environment. Monitoring mammal populations, particularly in habitats sensitive to human activities, is an important part of taking the environmental pulse. The *Atlas of the Mammals of Ontario* serves as a baseline in this regard, as did the maps published by R.L. Peterson earlier (1966, *The Mammals of Eastern Canada*). These documents summarize our knowledge of the distribution of mammals at specific periods in time.

The geographic distribution of a species is a major aspect of its natural history, and the knowledge of the geographic distribution of all species within a region provides the basis for faunal analyses or studies of biological diversity. The *Atlas of the Mammals of Ontario* is a compilation of distributional data, both historical and recent, for all wild mammals found in the province.

The distributional ranges of different species vary greatly, from those that are restricted to a relatively small area, such as the Eastern Mole, to those that encompass the entire province, such as the Red Fox. The reasons for this are not always clear. In some cases ranges may be limited by geographic barriers, but more importantly, the distribution and abundance of an individual species are governed by environmental factors that influence its chance to survive and reproduce. These factors may be grouped into four major categories: weather/climate, food, other animals and disease-causing organisms, and places in which to live. These major environmental components may act on their own, or, and this is probably more often the case, they may interact.

An example of a single environmental component being involved is provided by the evidence that the occurrence of prolonged periods of cold weather in winter is the factor that limits the northern distribution of the Virginia Opossum. The opossum's spread into the north temperate regions of North America is a relatively recent phenomenon and it is, therefore, not surprising that the species has not fully adapted to harsh winters.

To illustrate the more complex situation of a number of components interacting, one could consider the history of the distributions of the White-tailed Deer and the Caribou. Habitat changes produced by humans favoured the northward extension of the White-tailed Deer's range. With the deer came a parasitic meningeal nematode which, harmless enough in its normal host, proved to be deadly for the Caribou. The parasite, combined with extensive logging of old growth Boreal Forest on which the Caribou depends, played a major role in eliminating the Caribou from most of its southern range. Logging of the old growth forest favoured the expansion of Moose populations. Wolf numbers increased along with the Moose, resulting in higher predation rates on the more vulnerable Caribou.

These few examples serve to illustrate that a thorough knowledge of a species' requirements and an understanding of how the major environmental components interact are needed to explain the distribution and abundance of a species. Unfortunately, only a few species have been adequately studied and there remains much to be learned about the distribution and abundance of Ontario's mammals. One thing is certain, in the category "other animals", humans loom large as a factor in the distribution and abundance of all other

species. Humans are the most abundant large mammals in the province and their impact on the global environment is, as we all know, significant and pervasive. The effects of the general environmental degradation of air, water, and soil and the significant loss or fragmentation of habitats are most noticeable in southern Ontario where human population densities are greatest. Although many wild mammals were affected negatively, several have benefited from the human-made changes or have adapted to them in time. Some, such as Gray Squirrels and Raccoons, have even become urbanites.

In northern Ontario with nearly 90% of the land and only 10% of the human population, the situation may seem less acute, but major problems exist here as well. Most of these problems are caused by extractive industries and logging. Of particular concern at present, is the massive destruction of old growth boreal forests by clearcutting, which will have serious consequences for the distribution and abundance of species such as Caribou and Marten. It is clear that improving the environment and restoring healthy ecosystems requires intensive management of our own species.

Biodiversity has now become a household word, like ecology before it. Most people think of biodiversity simply as the number of species living in a particular area. However, there are other aspects of biological diversity that one has to take into consideration when comparing different areas,

such as the relative abundances of species in a community, or seasonal changes in the number of species present. Another aspect of biological diversity is the adaptive radiation in a group. In this respect, mammals display greater diversity than other vertebrates, having adapted to all climates, and to life in the water, on the land, in the soil, in the trees, and in the air. For those interested in assessing the biodiversity of an area, the Mammal Atlas provides the basic information on the number of species present.

Not only are mammals an important part of the overall biological diversity of the province, but many are also keystone species in their ecological communities. For example, herbivorous mammals, such as voles, Snowshoe Hares, deer, and Moose, are important links in the food chains of terrestrial communities, whereas the larger carnivorous mammals function as top predators. There are also more subtle, but equally essential, interactions between mammals and plants that sustain communities, such as that between the Gray Squirrel and its food plants. Not only is this species an agent of seed dispersal for nut-bearing trees, but it also spreads the trees' mycorrhizal symbionts, by eating the fruiting bodies of the fungi and passing the spores, unharmed, in its droppings.

The Mammal Atlas will be a welcome and useful reference for all those interested in Ontario mammals and is a basis for further work on their distribution.

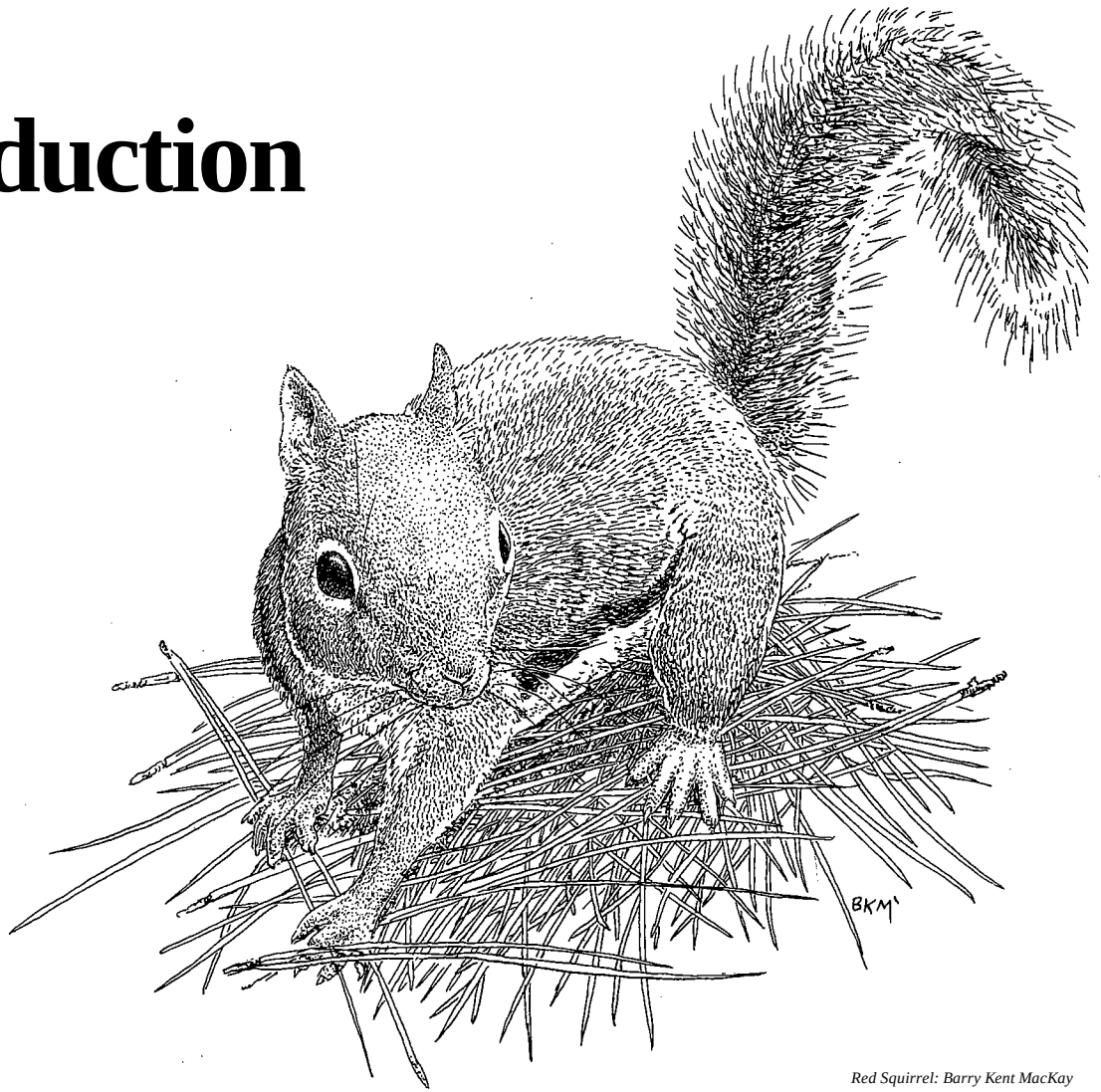
C.G. van Zyll de Jong

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Introduction



Red Squirrel: Barry Kent MacKay

Naturalists, biologists, environmental consultants and planners are but a few of the many people who will find this book useful. By mapping the presence of Ontario's 86 wild mammal species, the *Atlas of the Mammals of Ontario* (Mammal Atlas) will provide: a benchmark for future studies, an aid in determining conservation priorities, an information source for status reports on rare or vulnerable species, and a resource for environmental impact assessments.

The Mammal Atlas makes use of information collected from institutions and volunteers to document a provincial range for each wild mammal in Ontario. As such, the Mammal Atlas is a much more accurate record of Ontario's mammals than can be found in a field guide. Maps in field guides tend to be large-scale, sometimes including entire countries or even continents in an attempt to map the entire range of a species. The Mammal Atlas focuses on Ontario, mapping actual mammal

specimen records, sightings, and telltale evidence. Mammal Atlas species accounts also outline factors known to affect local distribution, including habitat preferences, land-use practices and climate.

The maps in the Mammal Atlas illustrate what is currently known about the distribution of Ontario mammals. However, the maps are not comprehensive. Volunteers sometimes had difficulties finding and identifying smaller species. In some remote areas, no surveying was done at all. Consequently, some of the maps show sufficient data to indicate specific mammal distribution while others indicate further study is needed to provide a more accurate distribution assessment. For most species, the Mammal Atlas maps are the best available representation of their Ontario range. It is hoped this book will stimulate new studies that might further improve our knowledge of mammal distribution in Ontario.

Guide to the Mammal Atlas

The *Atlas of the Mammals of Ontario* includes two range maps and a species account for every wild mammal found in the province. The larger range map (that of either southern or northern Ontario) subdivides the province into 10X10-km squares while the smaller all-Ontario map subdivides the province into 100X100-km blocks. Symbols are plotted in the centre of squares and blocks when mammals are found to exist within their borders. Symbols include: circles (representing pre-1900 records), triangles (representing records from 1900 to 1969), and squares (representing records from 1970 to 1993). If mammals have been observed over two or three time periods, the symbol for the most recent time period is used.

The range of a species can be determined by looking at the configuration of the symbol-containing squares. The furthest group of symbols in any direction is a good indication of the extent of a particular species' range. Unfortunately, for a few species, insufficient Mammal Atlas data can create a false impression of distribution. However, when inadequate data misrepresent a mammal's range, the commonly accepted range is noted in the species account.

Occasionally, open symbols (for instance, perimeters of squares) are placed on the maps. Open symbols indicate that a mammal record can't be pinpointed to a single square. Usually, imprecise record locations stem from having to adjust Ontario Ministry of Natural Resources fur harvest trapline data to the 10X10-km square system. In such instances, records are assigned to the square that is most likely the origin of the record. If data aren't sufficient to ascertain one likely square of origin, the record is plotted as an open symbol in two,

three, or a maximum of four squares.

Mammal Atlas species accounts make use of standard geographic regions to facilitate range discussion (Figure 1).

For research or planning purposes, more specific Mammal Atlas information can be obtained by contacting the Federation of Ontario Naturalists.

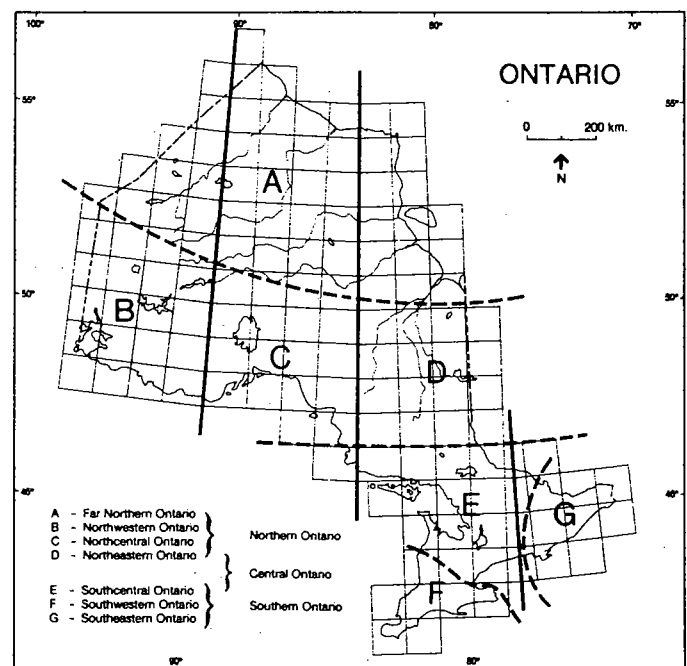


Figure 1: Standard geographic regions in Ontario

Atlas History



Long-tailed Weasel: Linda Shaw

Atlassing of flora and fauna originated in Britain with the *Atlas of the British Flora*, published in 1962. The British atlas was the first comprehensive document to use the 10X10-km square as the basis for surveying and mapping species. It laid the foundation for other atlas projects including the 1976 *Atlas of the Breeding Birds in Britain and Ireland*. The British breeding bird atlas project was an overwhelming success, generating over 285 000 records from over 10 000 contributors (Sharrock 1976). Similar atlases have since been produced in most European countries, in Africa, Australia and several states and provinces in North America.

In 1981, the Federation of Ontario Naturalists and the Long Point Bird Observatory initiated the Ontario Breeding Bird Atlas. Five years of field work was conducted by 1 351 volunteers who contributed over 400 000 records (Cadman *et al.* 1987). The *Atlas of the Breeding Birds of Ontario*, published in 1987, quickly became the authority on the distribution of breeding birds in the province.

By 1989, with Ontario atlas projects already surveying reptiles and amphibians, butterflies, and rare vascular plants, the Ontario Ministry of Natural Resources and Ontario conservation organizations decided it was time to create a mammal atlas. The *Atlas of the Mammals of Ontario* was launched in January of 1990.

Originally, the Mammal Atlas was to be a five-year survey of Ontario's mammals similar to the *Atlas of the Breeding Birds of Ontario*. However, after one year of field surveys, it became apparent that a comprehensive volunteer-based Mammal Atlas would not be feasible because of low volunteer interest and difficulties in locating and

distinguishing some mammals. Fortunately, a wealth of information on mammal distribution exists in Ontario from sources such as the Ontario Ministry of Natural Resources, the Royal Ontario Museum, the Canadian Museum of Nature, and various universities. It was therefore determined that the Mammal Atlas would rely primarily on existing institutional data supplemented by volunteer records.

The Mammal Atlas is similar to the *Provisional Atlas of the Mammals of the British Isles*, which is an ongoing project to map mammal distribution in Britain. The British atlas is a compilation of both volunteer and institutional data mapped using the 10X10-km square system (Arnold 1978).

Although the Mammal Atlas was administered by the Federation of Ontario Naturalists, most of the project's goals and policies were developed by the Atlas Management Committee. The committee included representatives from the Federation of Ontario Naturalists and sponsor organizations, as well as professional biologists.

A second committee, the Atlas of the Mammals of Ontario Technical Committee, included professional mammalogists from Ontario universities, the Royal Ontario Museum, Ontario Hydro, and the Ontario Ministry of Natural Resources. The technical committee provided methodological advice, reviewed mammal records, and assisted in the production of instructional materials.

Committee members were all volunteers. Their experience, knowledge and advice were crucial to the project's success. See the acknowledgements for a complete list of committee members.

Methods



Meadow Vole: Linda Shaw

Methods used to collect and process data for the Mammal Atlas were suggested by the Atlas of the Mammals of Ontario Technical Committee and developed by atlas staff. For more detailed information on Mammal Atlas methods, contact the Federation of Ontario Naturalists for copies of the Atlas of the Mammals of Ontario Participant's Manual numbers 1 and 2.

Mammal Atlas data were obtained from institutions and volunteers. Data-contributing organizations included the Ontario Ministry of Natural Resources, the Royal Ontario Museum, the Canadian Museum of Nature and several universities (see the Acknowledgements for a complete list). Volunteer data came from interested naturalists, hunters, and researchers.

General Data Collection

Species

Data were collected on all wild mammals including indigenous species, non-indigenous (released) species that have developed a sustainable population, and any escaped mammals thought to be reproducing in the wild. For a complete species list, consult the table of contents, or the species index at the back of the book. Common and scientific names used in the Mammal Atlas were decided upon by the nomenclature sub-committee of the Atlas of the Mammals of Ontario Technical Committee.

Location

To ensure geographic accuracy, mammal locations were recorded using the Universal Transverse

Mercator Grid (UTM) coordinate system. The 10X10-km square, a unit of the UTM grid, was chosen as the basic unit for Mammal Atlas surveying.

Instructions for determining the UTM of a location are provided in the right margin of all topographic maps under the heading "ONE THOUSAND METRE UNIVERSAL TRANSVERSE MERCATOR GRID". Figure 2 shows the UTM zones and 100X100-km blocks of Ontario and indicates how the blocks are further subdivided into 10X10-km squares. Figures 3 and 4 illustrate, respectively, northern and southern Ontario, including larger cities, towns, and lakes. UTM grid lines plotted over Figures 3 and 4 will help readers determine the location of specific squares on the species maps.

Whenever possible, records from volunteers and institutions were assigned a UTM coordinate to within a 100X100-m site. However, when data were not sufficient to allow such precision, records were assigned to a 10X10-km square in southern Ontario or a 100X100-km block in northern Ontario.

Date

The dates of most mammal observations were recorded to the day. However, sometimes dates were accepted precise to the month, year, or "ten-year period" (for instance, 1980-1989).

For common mammals, only one record per square per ten-year period was required. But for less common species, called "Provincial Priority Species" (as denoted by a + in the species index), all available records were collected.

Evidence Codes

A voucher specimen or photograph provides the best evidence of a mammal observation. However, many species are rarely seen in the wild. Mammals do often leave telltale signs of their presence, though, including tracks, scat, and homes. The Mammal Atlas made use of such evidence to document mammal presence. A series of evidence codes was developed and grouped into three categories based on the nature of evidence.

I. Voucher specimen or photograph

- VS Voucher Specimen - skin and skull, skeleton, or other distinctive part collected, or whole animal pickled or frozen and placed in a collection or museum
- PH Photograph clearly showing distinguishing characteristics

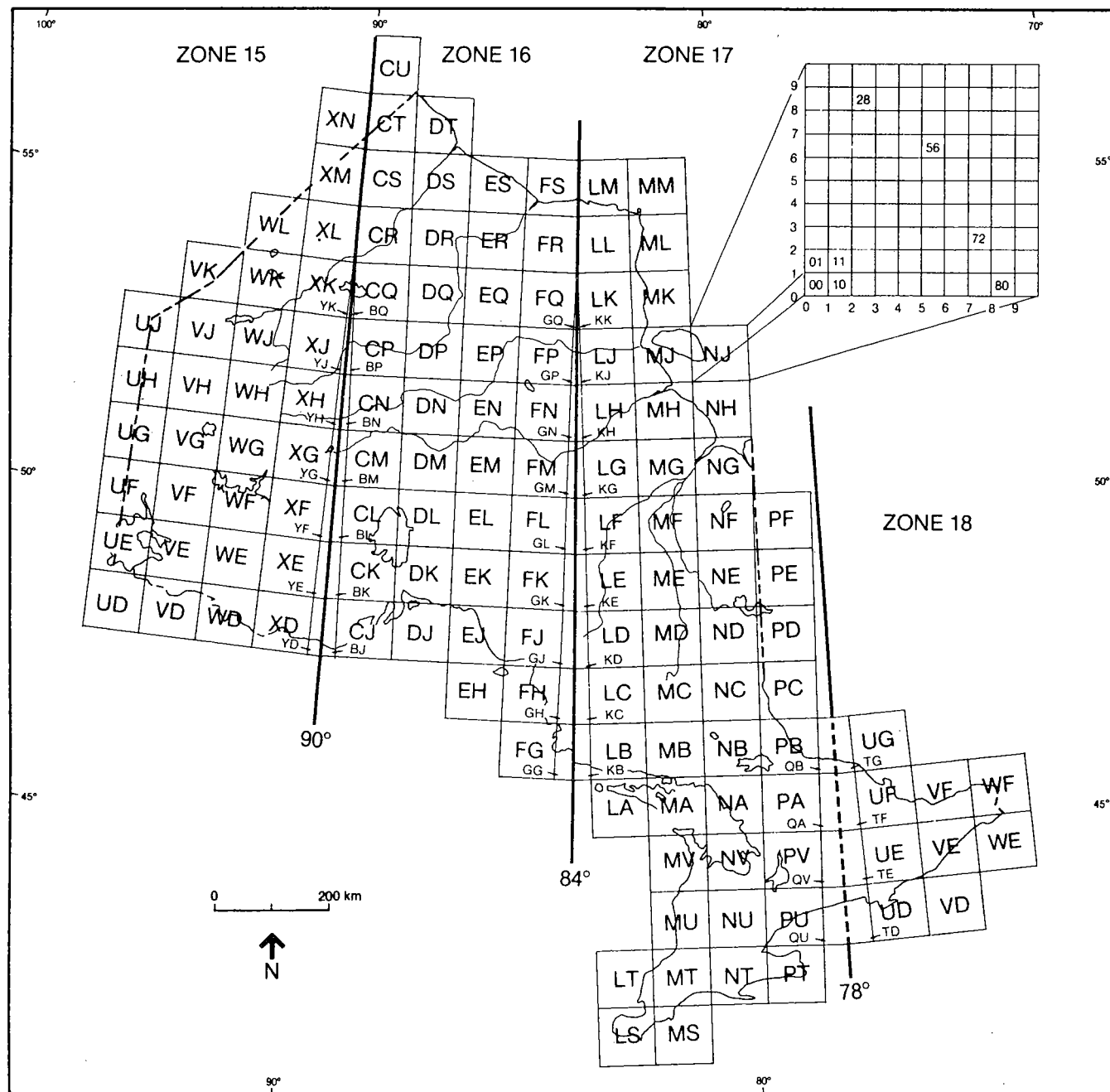


Figure 2: UTM zones, blocks, and squares in Ontario

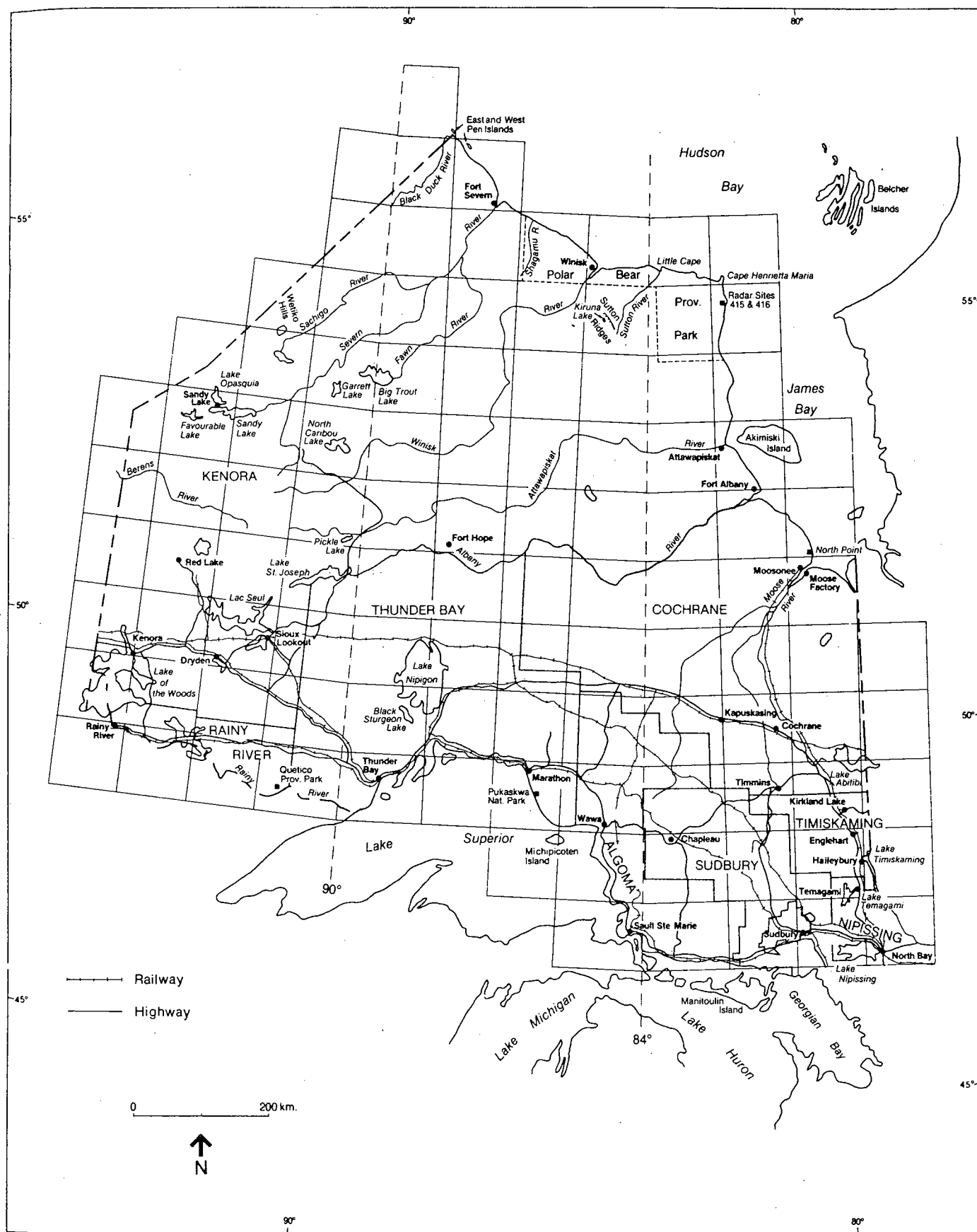


Figure 3: Districts, urban centres, and other localities in northern Ontario

2. Actual observation in whole or part but not retained or photographed

OB Observed live mammal
 TR Trapped, netted, or hand-captured mammal
 CA Carcass of mammal seen and identified
 BO Bones, especially skulls, antlers or teeth
 RE Remains in scat or raptor pellet
 HA Hair
 QU Quills
 DP Other distinctive part found

3. Distinctive signs observed

DA Dam (e.g., Beaver)
 DE Den (e.g., Black Bear)
 BU Burrow (e.g., Woodchuck)
 HO House (e.g., Muskrat)
 NE Nest (e.g., Gray Squirrel)
 FC Food cache (e.g., Red Squirrel)
 OD Odour (e.g., Striped Skunk)
 PD Plant damage (e.g., Porcupine chewing)
 RT Radio-tracking (for use by scientists)
 SC Scat (e.g., White-tailed Deer)
 TK Tracks (e.g., Virginia Opossum)
 VO Vocalization (e.g., Gray Wolf)

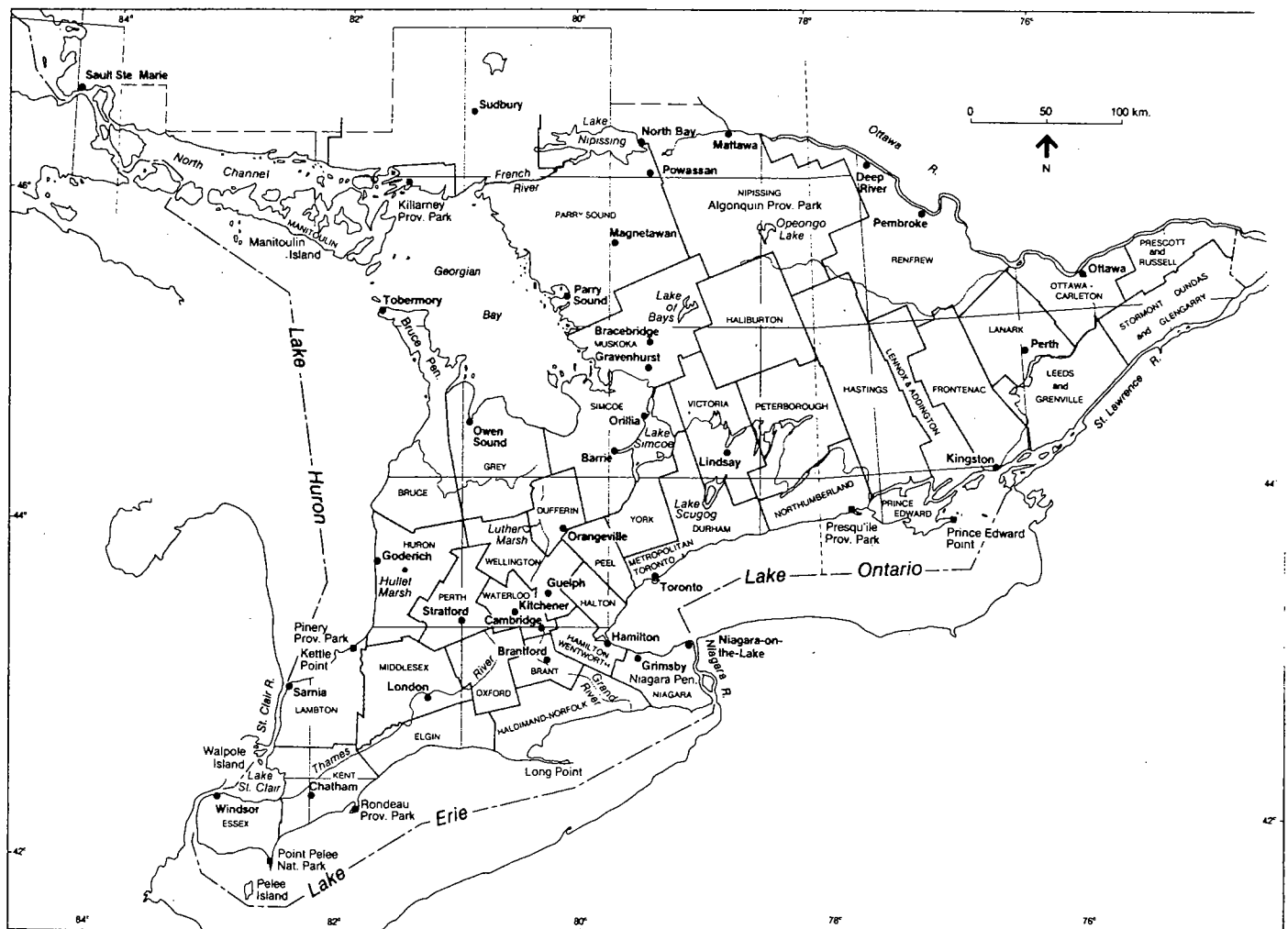


Figure 4: Counties, Regional Municipalities, Districts, urban centres, and other localities in southern Ontario

Volunteer Data Collection

Two main data forms were used by volunteers: the Data Report Form for submitting personal historical data and casual observations, and the Square Survey Form for surveying a particular 10X10-km square. Volunteer surveys were conducted during 1992 and 1993.

Volunteers who submitted a record of a difficult-to-identify or Provincial Priority Species (as denoted by * and +, respectively, in the species index) were also asked to forward detailed documentation on an Unusual Species Report Form. On these forms, the volunteers provided information stating: the time of the observation; the distance between mammal and observer; distinctive features of the mammal; and a detailed explanation of what characteristics led the volunteer to believe the record to be of a particular species and not any other similar species. The Unusual Species Report Forms were reviewed by the Atlas of the Mammals of Ontario Technical Committee. Acceptable records were incorporated into the data base.

Regions and Regional Coordinators

The coordination of hundreds of volunteers surveying an area the size of Ontario couldn't be handled from one central office. Volunteers required survey information, encouragement, and a steady supply of data forms. To best assist volunteers, Ontario was divided into a series of regions, each with a volunteer Regional Coordinator. Southern Ontario was broken into 40 regions and northern Ontario was divided into 10 regions. Regional Coordinators played an important role in directing the compilation of local historical records and in coordinating field data collection. See the Acknowledgements for a complete list of volunteers who acted as Regional Coordinators during the Mammal Atlas.

Special Volunteer Survey Techniques

Surveying by passive observation alone was not sufficient to obtain data on all species. Two special survey techniques were adopted by the Mammal Atlas: live-trapping and the use of bat detectors.

1. Live-trapping

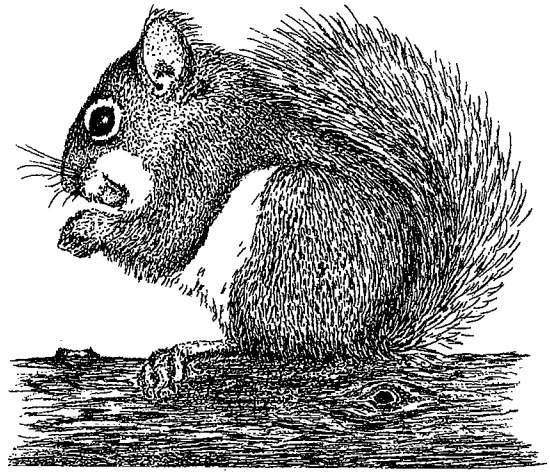
A pilot program of live small mammal trapping was conducted to assess trapping effectiveness in the determination of small mammal distribution. Trapping was conducted in eight regions throughout Ontario (Essex, Niagara, Bruce, Lanark/South Renfrew, Ottawa-Carleton, Manitoulin, Nipissing, and Chapleau). Sherman-type live traps captured mammals ranging in size from shrews to flying squirrels and weasels. The pilot project met with varying degrees of success. Some volunteers did not continue trapping long enough to obtain the skill and knowledge necessary to obtain high capture rates. In other cases, volunteers contributed useful information on some difficult-to-find mammals.

2. Bat Detectors

Bats were the most challenging group of mammals to survey. Fortunately, bat detectors can be used to identify certain bats based on characteristics of their echolocation calls. Bat detectors are small, transistor radio-sized electronic devices equipped with an ultrasonic microphone. The detector converts bat calls into a pulse which is heard through the bat detector speaker. Different species of bats are heard at different frequencies and some produce distinctive patterns in their calls which can be distinguished by a trained listener.

Volunteers borrowed bat detectors in exchange for any data collected. Some groups and individuals even purchased bat detectors. Volunteers who had been trained to use bat detectors could positively identify Eastern Red Bats and Hoary Bats. Identification of Big Brown Bats was also possible, although sometimes they can be hard to distinguish from Silver-haired Bats. Bats of the genus *Myotis* could be identified but distinguishing between the Eastern Small-footed, Northern Long-eared, and Little Brown bats was impossible with basic bat detectors. With increased experience, identifying the Eastern Pipistrelle was also possible.

Atlas Results



Red Squirrel: Ivan Foster

The Mammal Atlas sought to collect institutional information on mammal distribution in Ontario and supplement it with a volunteer survey program. As such, the Mammal Atlas was quite successful. For most species, Mammal Atlas range maps provide an excellent indication of overall range within the province and many also provide a decent indication of local distribution.

Twenty-one institutions and 444 volunteers contributed data to the Mammal Atlas. In all, 164 697 records were contributed, 137 106 from institutions and 27 591 from volunteers. Table 1 outlines the number of records obtained per species.

Mammal Atlas maps should be interpreted carefully. The number of mammal records does not always correlate with the actual abundance of a species.

Vastly different numbers of historical data were available for different species. The largest single source of data for the Mammal Atlas was the Ontario Ministry of Natural Resources. The OMNR contributed records on big game and furbearers and a few less common species such as Caribou. The OMNR does not keep significant quantities of data on other species. Consequently, big game and furbearers can misleadingly appear to be more common than other species.

Some species were particularly difficult to survey because of their small size, behaviour, secretive nature, or more obscure distinguishing characteristics. Fewer records were obtained for such species, even though they could actually be quite common. Examples of difficult-to-survey mammals include: shrews and voles (very small and

live within the leaf litter or grass layer); Gray Wolves (very secretive); flying squirrels and bats (nocturnal).

Some specific regions exist where Mammal Atlas data require careful interpretation. On Mammal Atlas maps, for example, Algonquin Provincial Park mistakenly appears to be devoid of some mammals. Because there exists only a localized harvest of furbearers or big game mammals from the park, data were generated almost exclusively from volunteers. Unfortunately, Algonquin has a large area and very few resident atlasers. A shortage of volunteers affected data accumulation in sparsely-populated areas of northern Ontario as well. Infrequent northern records of Woodchuck and Porcupine (species for which no harvest records are kept), for example, reflect a lack of volunteers in the north, not necessarily fewer mammals.

Figure 5 illustrates the number of species obtained for each 100X100-km block in Ontario (5A) and each 10X10-km square in southern Ontario (5B). The average number of species obtained per square in southern Ontario was 14.7 (maximum 46), whereas the average number of species per block for the province was 26.6 (maximum 61).

Although 444 volunteers contributed data to the Mammal Atlas, the number falls short of the 1 351 who contributed to the *Atlas of the Breeding Birds of Ontario*. The difference in volunteer support for the two atlases can likely be attributed to the higher number of birders in the province, and difficulties in locating and identifying mammals.

A comprehensive all-biota inventory in Hamilton suggested that more survey time results in a higher

number of species being found per 10X10-km square. So, to increase the number of species found, future studies might consider longer, more

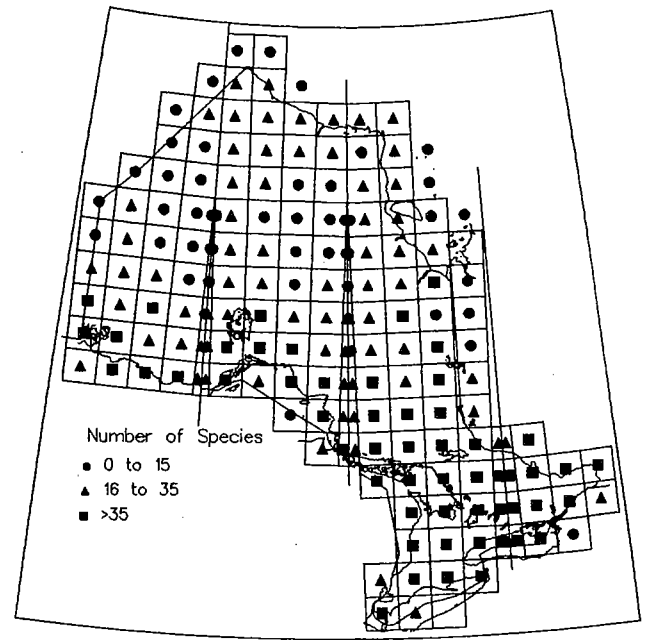
localized surveys and/or surveys of fewer species. A more focused study would also ease coordination problems and help maintain volunteer involvement.

Table 1: *The number of records per species*

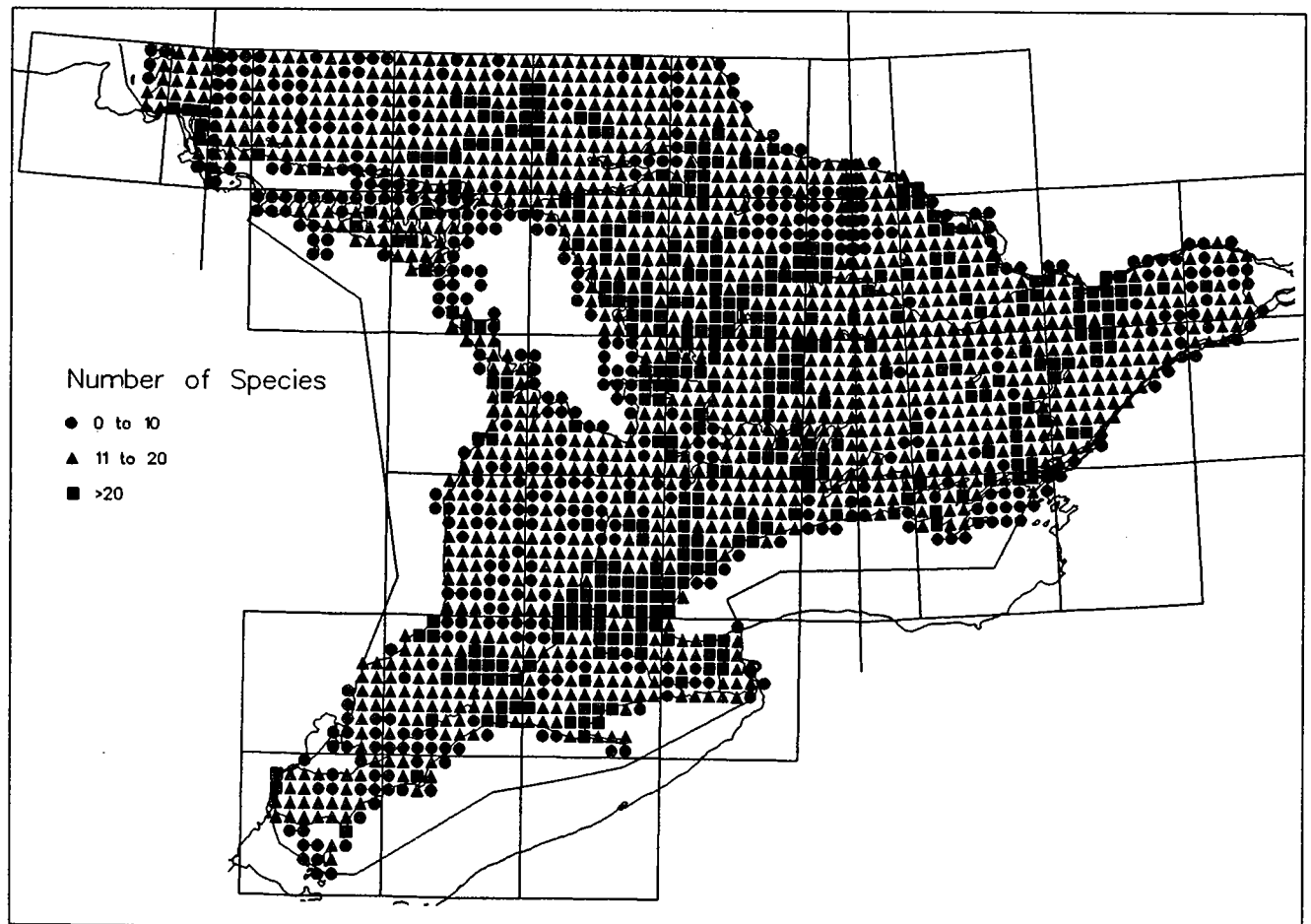
Virginia Opossum	940	Muskrat	3803
Black-backed Shrew	192	Northern Bog Lemming	23
Common Shrew	1901	Southern Bog Lemming	288
Smoky Shrew	525	Norway Rat	370
Pygmy Shrew	254	Black Rat	4
Water Shrew	317	House Mouse	361
Northern Short-tailed Shrew	1890	Meadow Jumping Mouse	985
Least Shrew	2	Woodland Jumping Mouse	697
Hairy-tailed Mole	269	Porcupine	1202
Eastern Mole	52	Coypu	8
Star-nosed Mole	556	Beluga	73
Eastern Small-footed Bat	141	Narwhal	1
Little Brown Bat	1793	Minke Whale	1
Northern Long-eared Bat	248	Coyote	1941
Silver-haired Bat	135	Gray Wolf	3564
Eastern Pipistrelle	91	Arctic Fox	65
Big Brown Bat	1878	Red Fox	7058
Eastern Red Bat .	264	Gray Fox	23
Hoary Bat	167	Black Bear	4129
Evening Bat	1	Polar Bear	4575
Eastern Cottontail	1133	Raccoon	6661
Snowshoe Hare	1464	Marten	1868
Arctic Hare	1	Fisher	1635
European Hare	356	Ermine	492
White-tailed Jackrabbit	3	Long-tailed Weasel	325
Least Chipmunk	558	Domestic Ferret	145
Eastern Chipmunk	2696	Least Weasel	9
Woodchuck	2053	Mink	7342
Franklin's Ground Squirrel	16	Wolverine	52
Gray Squirrel	1653	Badger	18
Gray Squirrel Black Phase	866	Striped Skunk	3889
Gray Squirrel Gray Phase	430	River Otter	2369
Fox Squirrel	56	Cougar	678
Red Squirrel	4056	Canada Lynx	1149
Northern Flying Squirrel	373	Bobcat	177
Southern Flying Squirrel	163	Walrus	51
Beaver	3885	Ringed Seal	18
White-footed Mouse	2489	Bearded Seal	17
Deer Mouse	3170	Harbor Seal	1
Southern Red-backed Vole	1772	Wapiti	83
Heath Vole	107	White-tailed Deer	28373
Rock Vole	273	Moose	43846
Meadow Vole	2669	Caribou	2522
Woodland Vole	43	Bison	1

Figure 5: Number of species recorded in (A) each block in all of Ontario, and (B) each square in southern Ontario

(A)



(B)



Features Affecting Mammal Distribution

Mammal range is influenced by many factors, including: climate, land-use patterns, physiographic regions, and forest types. Two of these factors, physiographic regions and forest types, are particularly helpful in understanding mammal distribution.

Physiographic Regions

There are three physiographic regions within Ontario: the Hudson Bay Lowland, the Canadian Shield, and areas to the south and east of the Canadian Shield in southern Ontario (Figure 6). The following descriptions of the physiographic regions have been summarized from Cadman *et al.* (1987).

Hudson Bay Lowland

The Hudson Bay Lowland is found within 150 to 300 km of the shorelines of James and Hudson bays, immediately northeast of the Canadian Shield. The area is underlain with sedimentary bedrock and characterized by flat, poorly-drained lands with numerous small, shallow lakes and ponds. Most of the Hudson Bay Lowland is covered by the Hudson Bay Lowland Forest.

Canadian Shield

The Canadian Shield is the largest physiographic region in Ontario, extending from the Hudson Bay Lowland to southern Ontario. The southern extent of the shield is called the Frontenac Axis, which crosses the St. Lawrence River northeast of Kingston. The Canadian Shield is underlain with igneous and metamorphic bedrock and covered by a

thin layer of relatively infertile soil and thousands of lakes. The primary forest regions of the shield are the Boreal Forest and the Great Lakes-St. Lawrence Forest. Significant Canadian Shield land features include the Little and Great Clay Belts which extend, respectively, from Haileybury to Englehart, and from Timmins to north of Cochrane and west of Kapuskasing. The clay belts are formed by the former bed of Lake Ojibway-Barlow, and are characterized by deep, fertile soils capable of supporting agriculture.

South and East of the Shield

The areas to the south and east of the Canadian Shield in southern Ontario are underlain with sedimentary rock and covered with deeper, more fertile soils. Relatively flat topography and rich soils make the areas south and east of the shield the province's most suitable region for agriculture. Significant land features in this region include the Niagara Escarpment and the Oak Ridges Moraine. The Niagara Escarpment extends from Niagara Falls to the tip of the Bruce Peninsula and across Manitoulin Island, and is characterized by large cliffs and heavily-wooded forests. The Oak Ridges Moraine extends westward from Presqu'île Provincial Park to the Niagara Escarpment near Orangeville. The moraine features deep rolling hills with well-drained soil and large tracts of forest.

Forest Regions

Five main forest regions are found within Ontario: the Tundra, the Hudson Bay Lowland Forest, the Boreal Forest, the Great-Lakes-St. Lawrence Forest, and the Carolinian Forest (Figure 6).

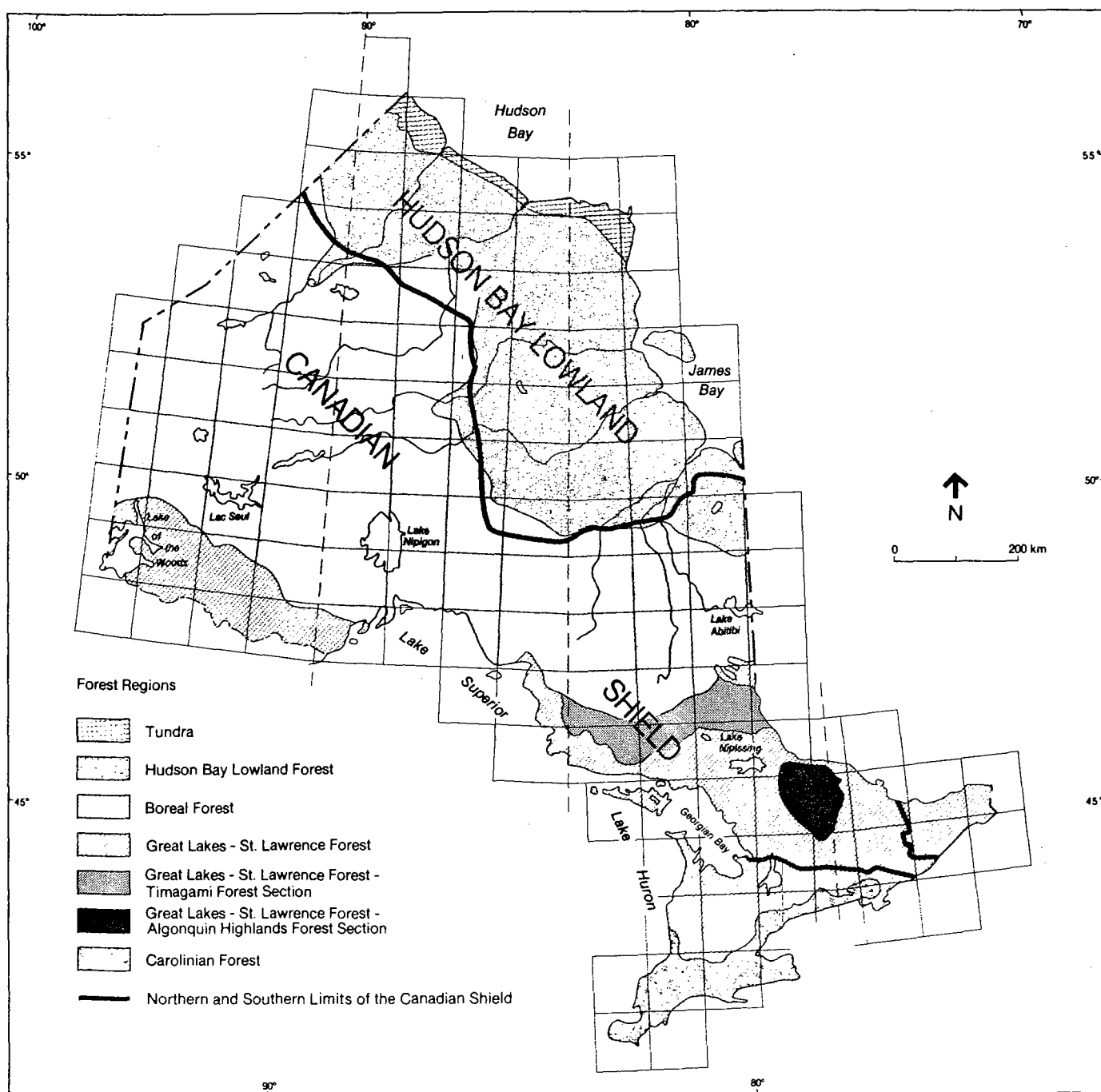


Figure 6: Physiographic and forest regions, and selected forest sections of Ontario

The following descriptions of the forest regions have been summarized from Rowe (1972).

Tundra

The Tundra, characterized by permafrost, is a narrow strip of land along the shore of Hudson and northern James bays. Features include dry uplands with lichens and heath plants, low-lying fens with grasses and sedges, and uplifted beach ridges with numerous ponds and lakes. Dwarf willows and birches occur in sheltered areas. Stunted spruces grow singly or in patches along riverbanks and occur with increasing frequency inland toward the transition with the Hudson Bay Lowland Forest at the tree line.

Hudson Bay Lowland Forest

The Hudson Bay Lowland Forest extends inland from the Tundra. It stretches south to the northern edge of the Canadian Shield. The Hudson Bay Lowland Forest is characterized by flat topography and poor drainage, numerous open fens and bogs, and treed fens and bogs of black spruce and tamarack. Ground cover consists of lichen in dry areas and sphagnum in wet areas. Forests of white spruce, balsam fir, trembling aspen, balsam poplar, and white birch are all common in well-drained areas. The southern parts of the Hudson Bay Lowland Forest are heavily forested, whereas the northwestern sections are dominated by lakes and wetlands.

Boreal Forest

The Boreal Forest is the largest forest region in Ontario. It is underlain by the Canadian Shield. The region is dominated by thousands of lakes and coniferous forests of black spruce, white spruce, balsam fir, jack pine, and tamarack with occasional white birch, trembling aspen and balsam poplar. Towards the southern extent of the Boreal Forest, the forest becomes transitional, exhibiting characteristics of both the Boreal and Great Lakes-St. Lawrence Forest regions.

Great Lakes-St. Lawrence Forest

The Great Lakes-St. Lawrence Forest is the primary forest region of southern Ontario. It is characterized by a mixture of coniferous and deciduous trees including sugar maple, yellow birch, eastern hemlock, white and red pine, red maple, basswood, white elm, white cedar, beech, red oak, and white ash.

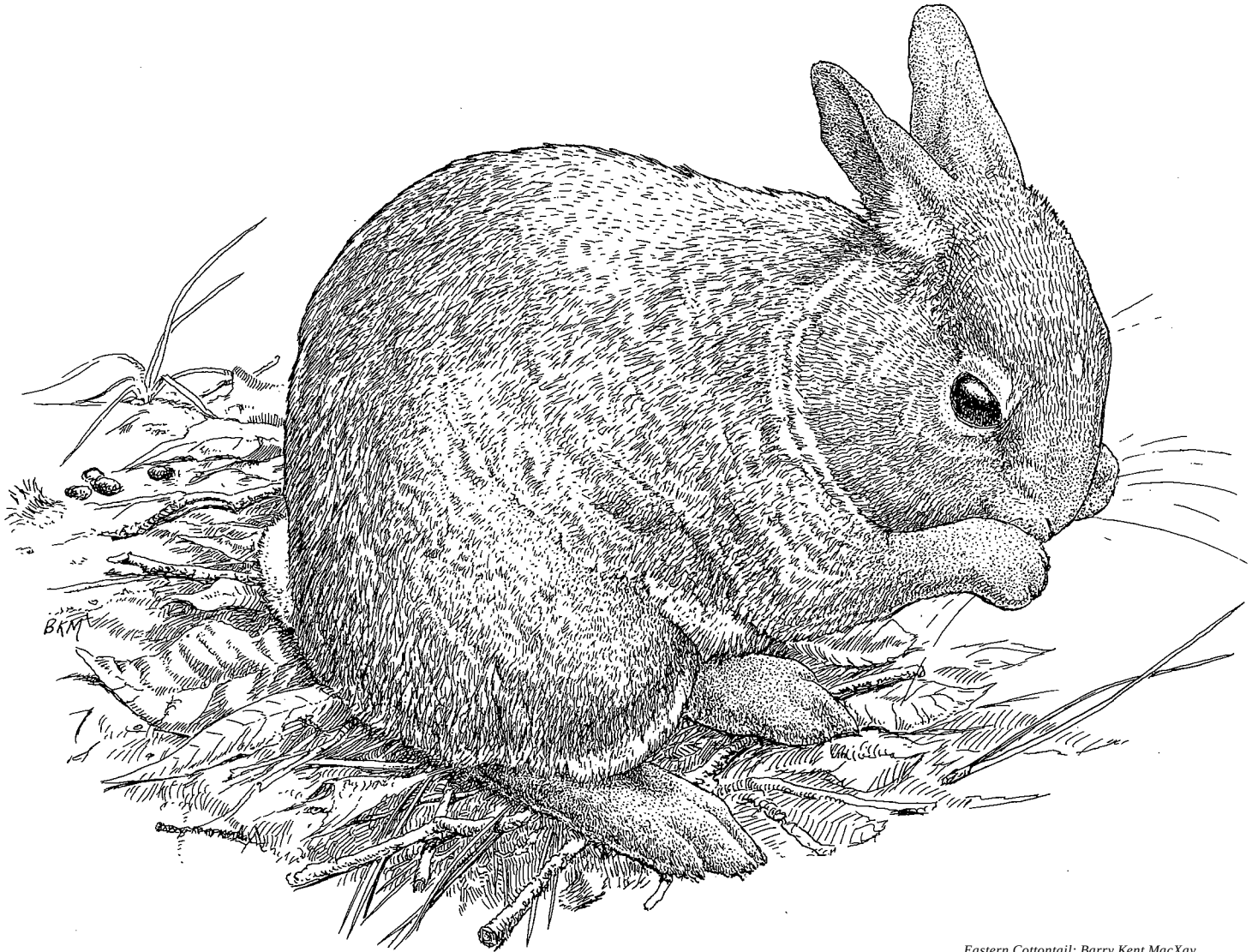
The northern portion of the Great Lakes-St. Lawrence Forest overlies the Canadian Shield while the southern and eastern portions are located over sedimentary rock. Most of the Great Lakes-St. Lawrence Forest region that is not located on the Canadian Shield has been cleared for agriculture, leaving only small pockets of forest cover.

The Great Lakes-St. Lawrence Forest region is divided into several forest sections, including the Timagami Forest and the Algonquin Highlands Forest sections. The Timagami Forest section is the transition area between the Boreal and Great Lakes-St. Lawrence Forest regions and features a high proportion of Boreal tree species. The Algonquin Highlands forest section, which is almost entirely contained within Algonquin Provincial Park, also contains a large proportion of Boreal tree species.

Carolinian Forest

The Carolinian or Eastern Deciduous Forest is restricted to the southern part of the province along lakes Erie and Ontario. Typical of eastern US forests, the Carolinian Forest is dominated by broad-leaved trees such as beech, sugar maple, basswood, red maple, black walnut, sycamore, swamp white oak, shagbark hickory, butternut, butternut hickory, rock elm, blue beech, and red, white, and bur oak. The Carolinian Forest also features a number of typically southern species such as tulip tree, black cherry; Kentucky coffee-tree, and sassafras. This forest region has been highly modified by settlement and agriculture. Consequently, few large woodlots remain, especially in southwestern Ontario.

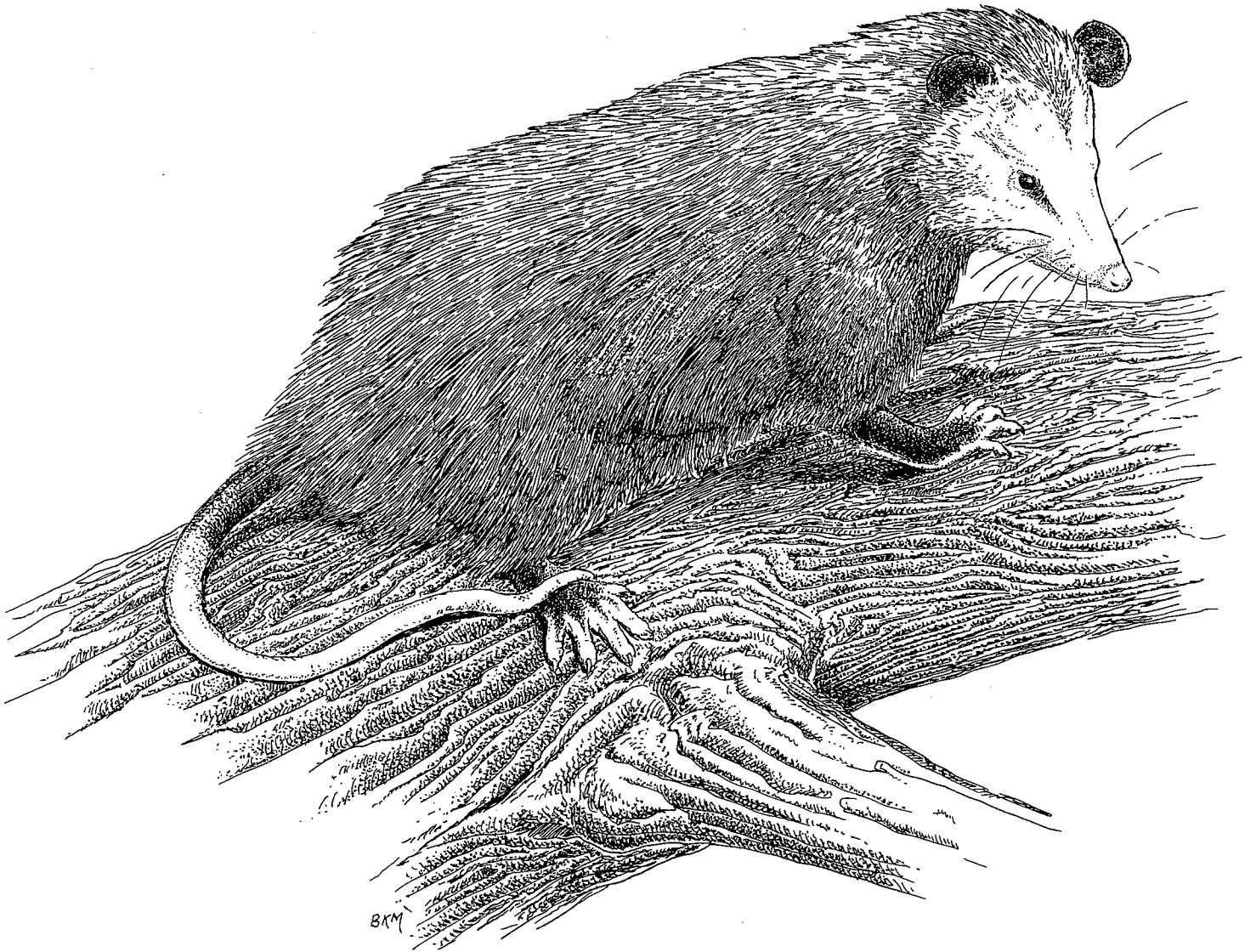
Species Accounts



Eastern Cottontail: Barry Kent MacKay

Opossums

Didelphimorphia



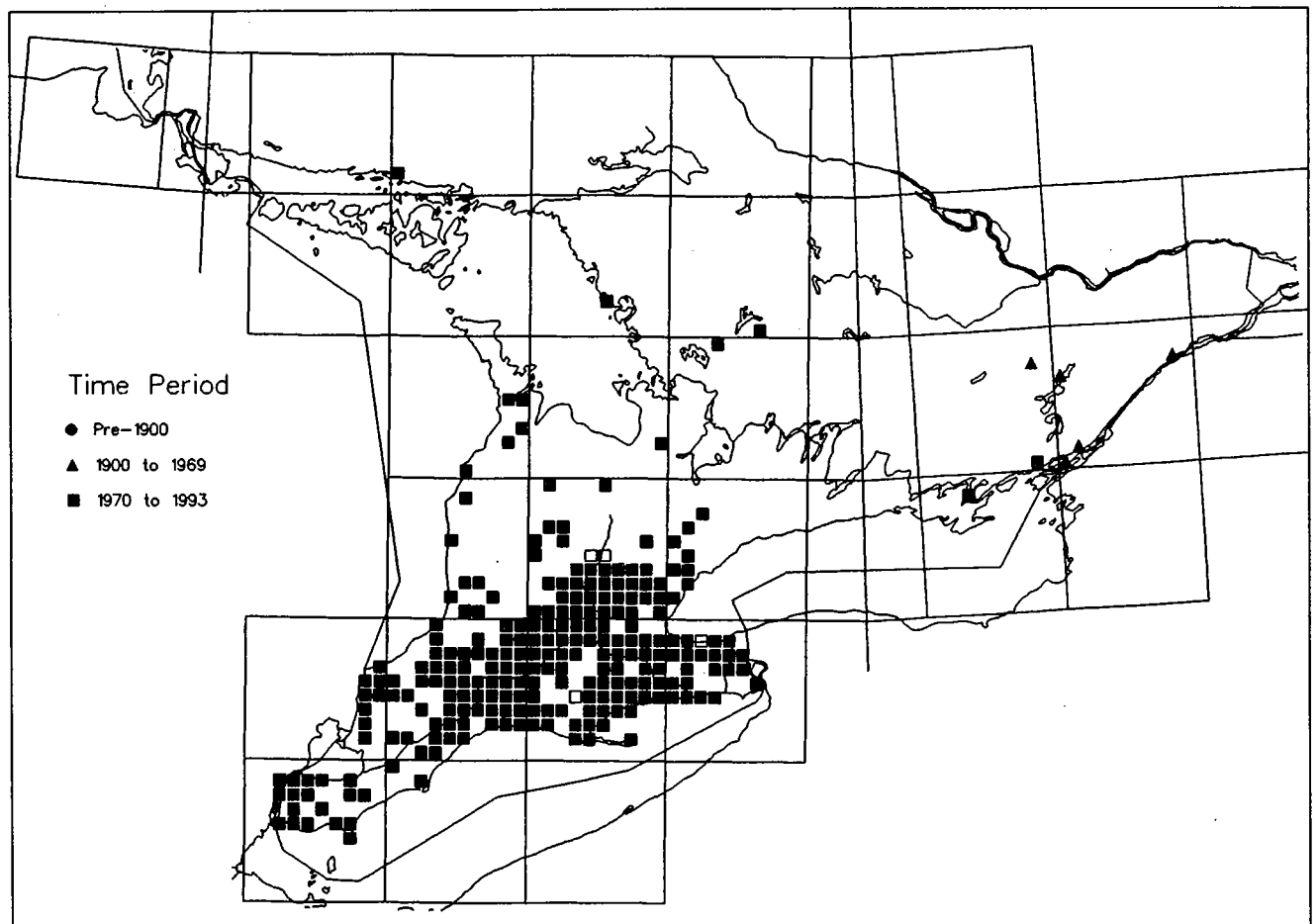
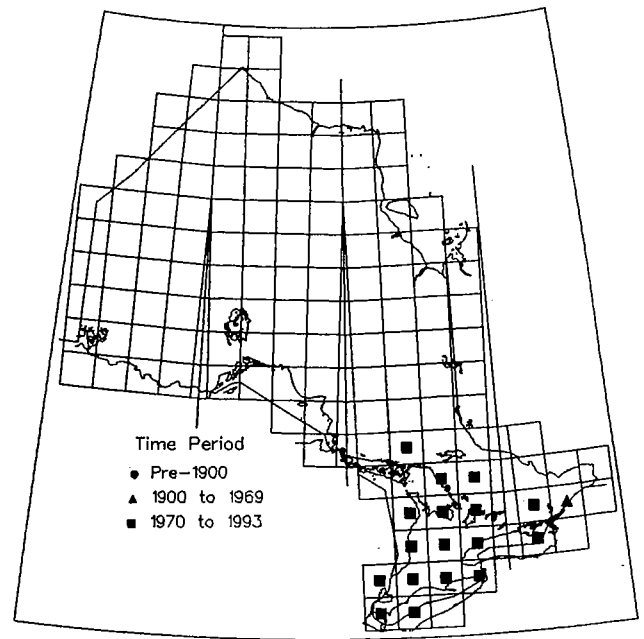
Virginia Opossum: Barry Kent MacKay

Virginia Opossum

Didelphis virginiana

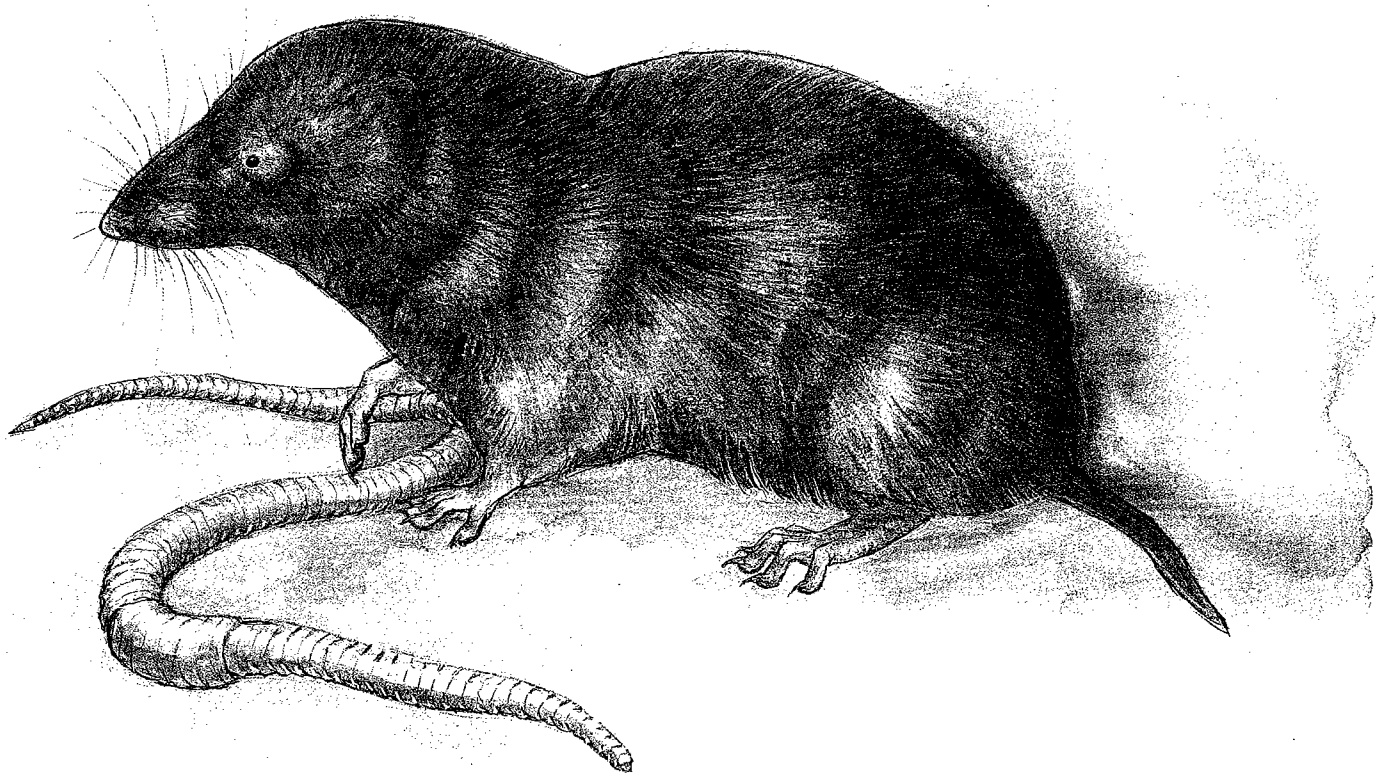
The Virginia Opossum is North America's only marsupial ranging north of Mexico, and is found through the eastern half of the US into Ontario. In Ontario, the opossum's range depends on the climate: mild winters allow them to move northward; severe winters would likely cause a reduction of their range. Although the Virginia Opossum has been sighted as far north as Massey, it is most common throughout agricultural southern Ontario in a band along Lake Erie from Windsor to St. Catharines and north to Waterloo and Guelph.

Records of Virginia Opossums from areas north of Barrie are not considered representative of the species' true range. Instead, these records may represent opossums that have been accidentally transported around Ontario on trucks. Such opossums likely don't survive the winter.



Shrews and Moles

Insectivora

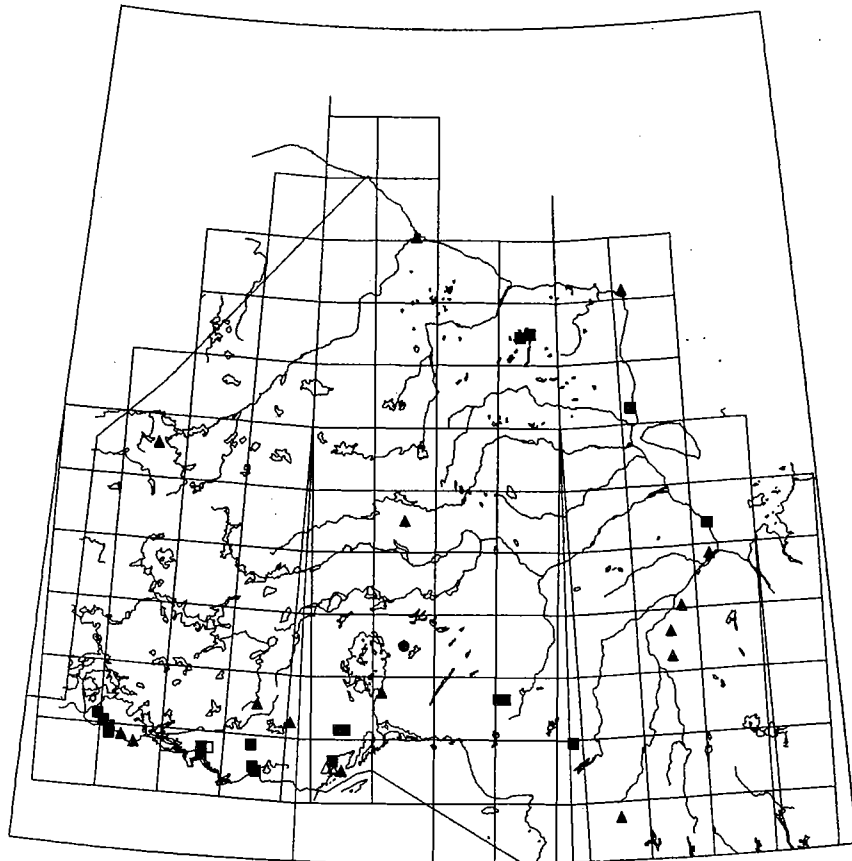
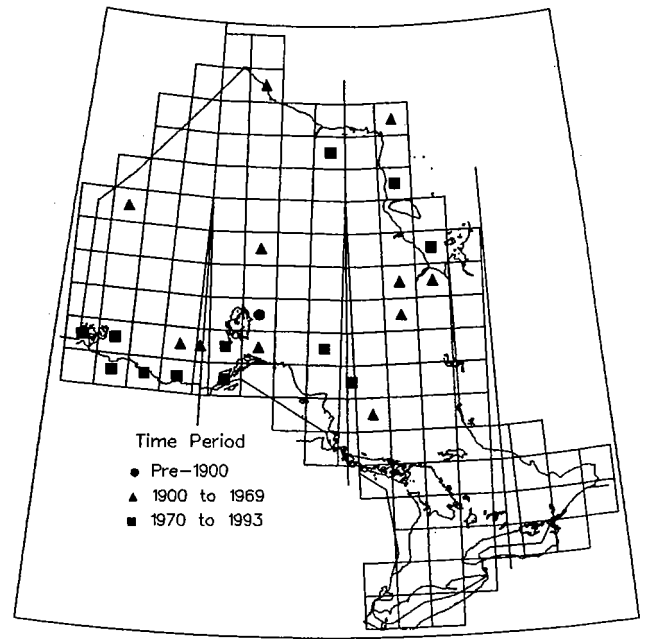


Northern Short-tailed Shrew: Linda Shaw

Black-backed Shrew

Sorex arcticus

This species ranges across Canada, from the Maritimes to the Yukon, and into Alaska (Banfield 1974). Within Ontario, the Black-backed Shrew is found in the Boreal Forest and north to the Tundra. Despite limited observations (perhaps due to difficulties in surveying small mammals) the Black-backed Shrew is likely present throughout northern Ontario.

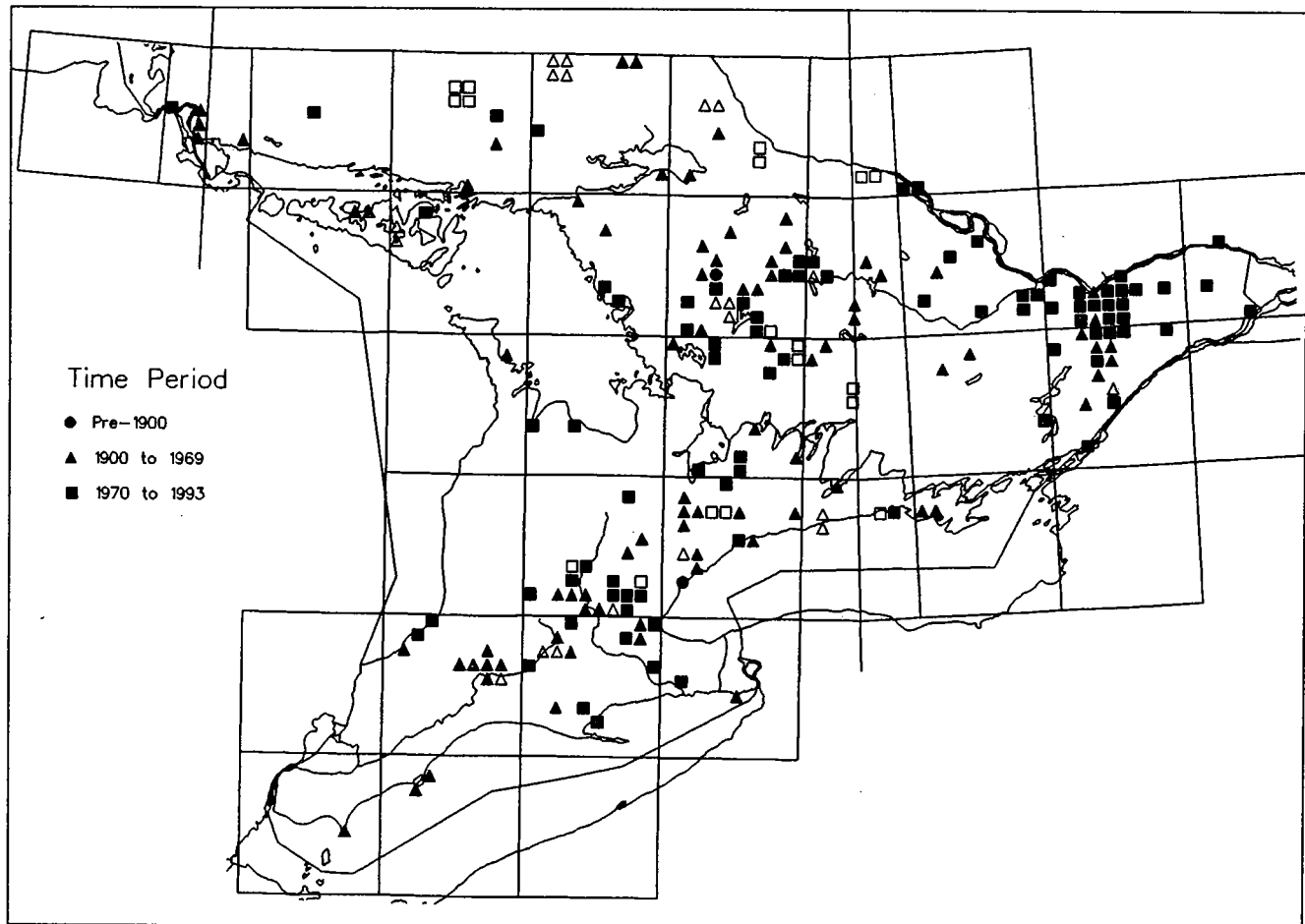
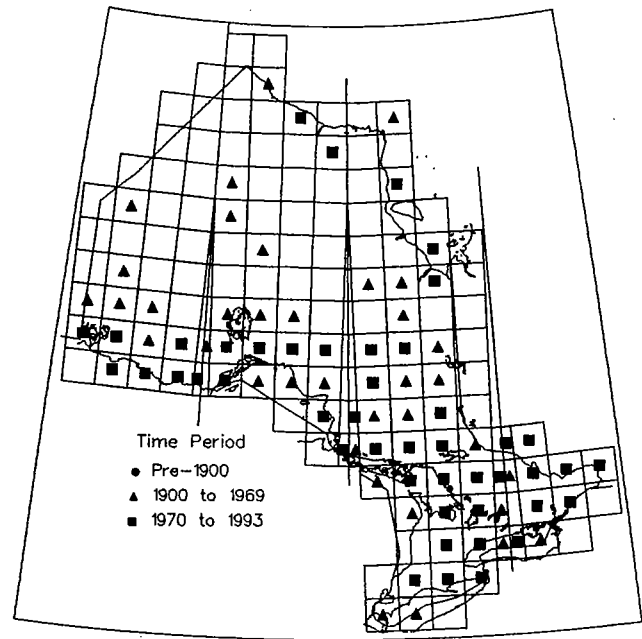


Common Shrew

Sorex cinereus

The Common Shrew is the most widely distributed shrew in Ontario and Canada. In North America, this shrew is found throughout the northern and western US and most of Canada except on the Ungava Peninsula and the islands of the Arctic Archipelago. The Common Shrew is found throughout Ontario.

As with most long-tailed shrews, identification is based on examination of the teeth. Because experience is usually necessary to make a positive identification, fewer records have been obtained for this species than would be expected for such a common mammal.



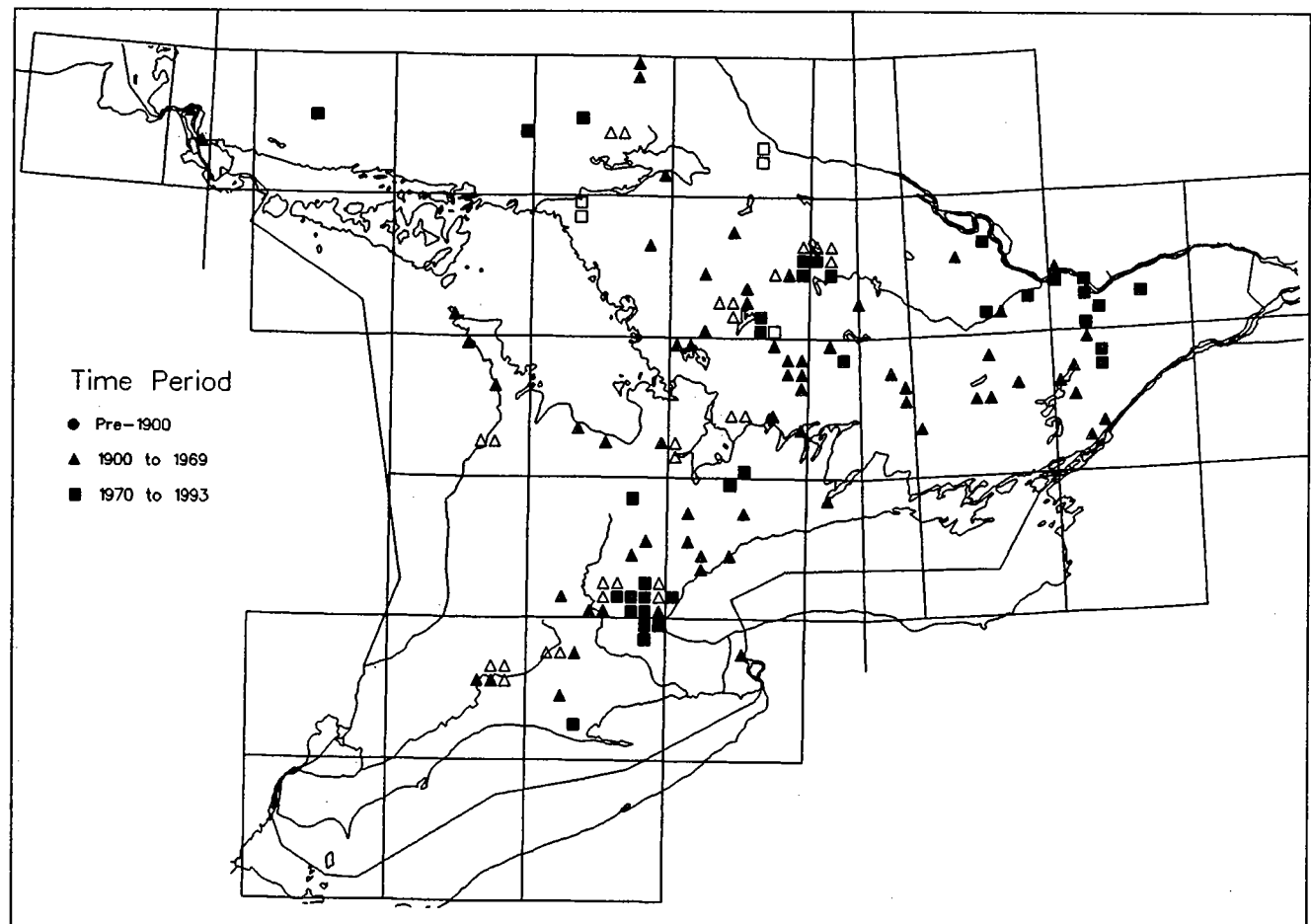
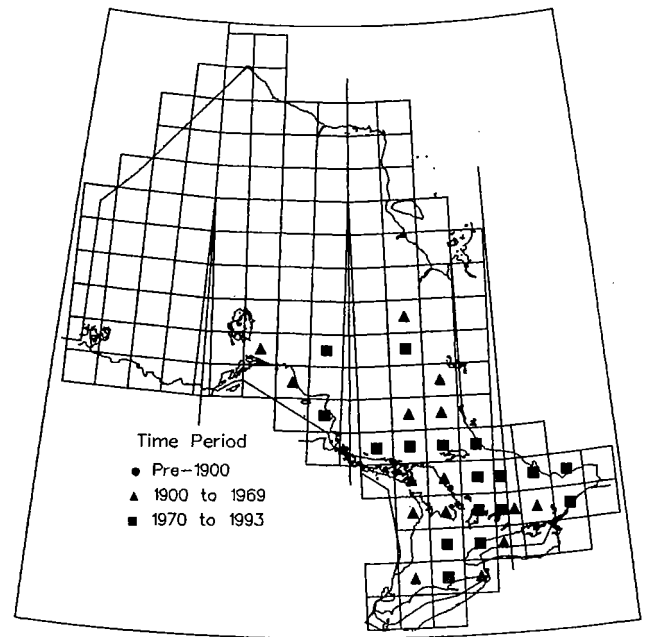
Smoky Shrew

Sorex fumeus

The Smoky Shrew is another of the long-tailed shrews in Ontario. It is slightly larger and darker than the Common Shrew.

Geographically, the Smoky Shrew is restricted to the northeastern US, the Maritimes, and parts of Ontario and Quebec. In Ontario, it ranges north from London into northeastern Ontario and west along the shore of Lake Superior to Thunder Bay.

Existing data do not include any records for Smoky Shrews in the extreme southwestern parts of Ontario (Essex, Lambton, Elgin, and Haldimand counties). The shrew's absence from these areas may be the result of the loss of suitable forest habitat caused by settlement and agriculture (van Zyll de Jong 1983).



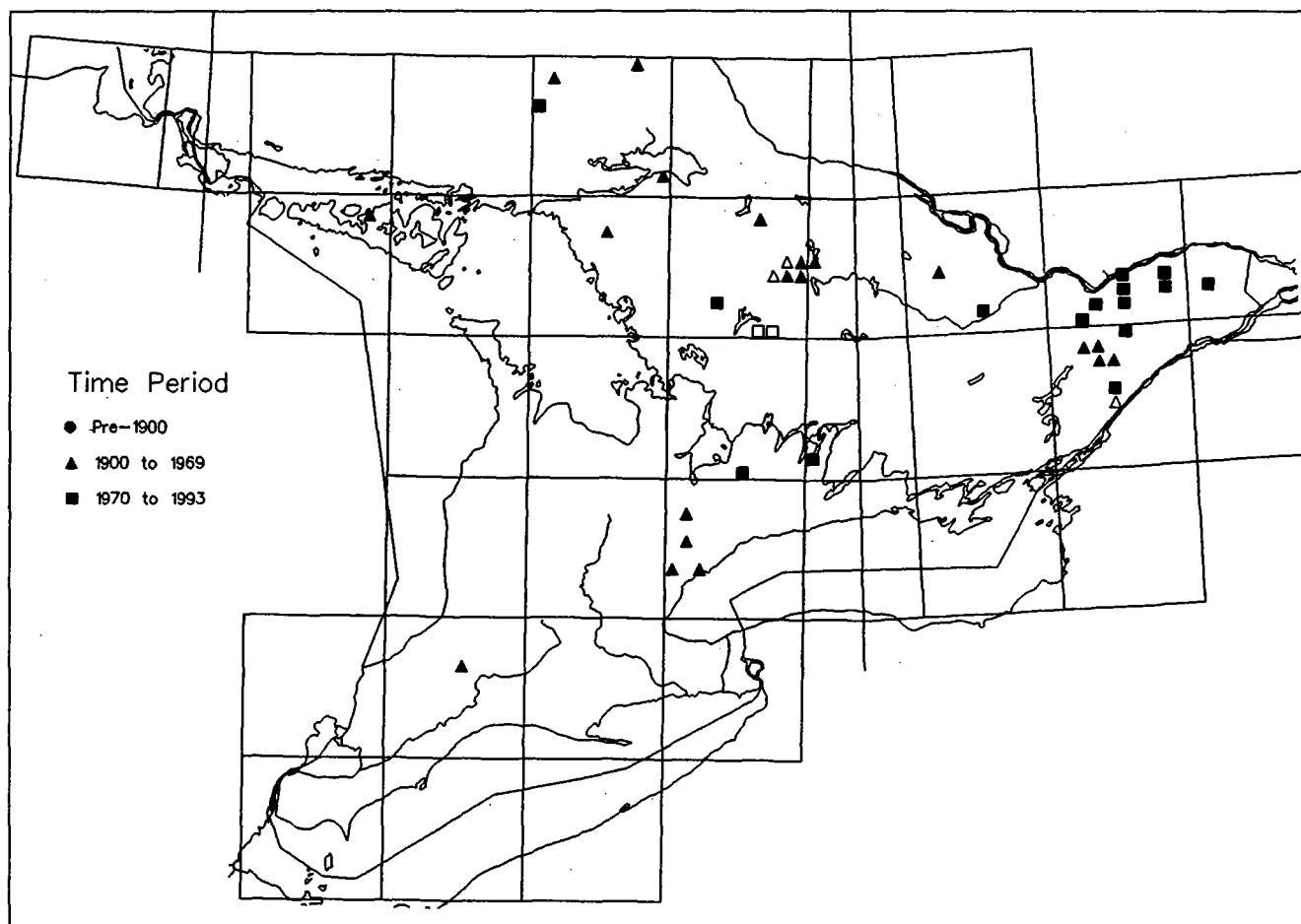
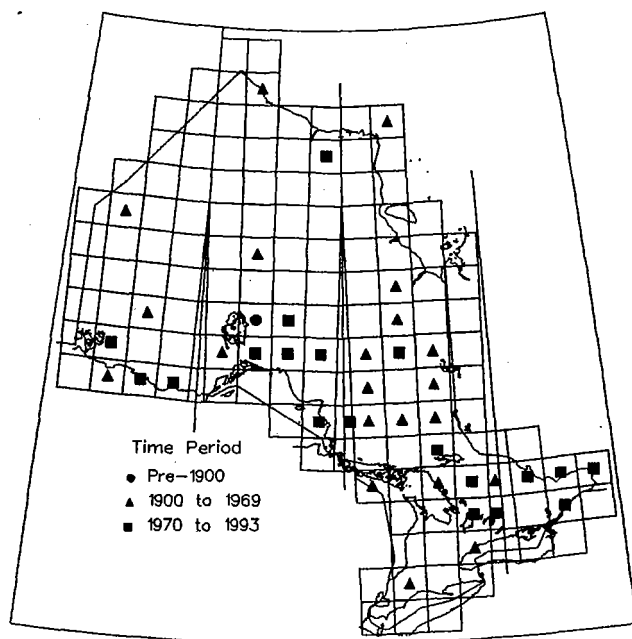
Pygmy Shrew

Sorex hoyi

The Pygmy Shrew ranges throughout Canada (south of the Tundra) and the northern US. In Ontario it has been recorded from the southcentral region of the province north to Hudson Bay. Two records from as far south as Coldstream in southwestern Ontario were documented in 1915 and 1917.

Although the Pygmy Shrew ranges throughout Ontario, fewer records have been obtained for this species than for other species of *Sorex*. The low incidence of Pygmy Shrew records coincides with normally low population levels that have been observed for this species (van Zyll de Jong 1983).

The Pygmy Shrew is the smallest shrew in Ontario, but can still be comparable in size to a small Common Shrew. Examination of the teeth is required for a positive identification.

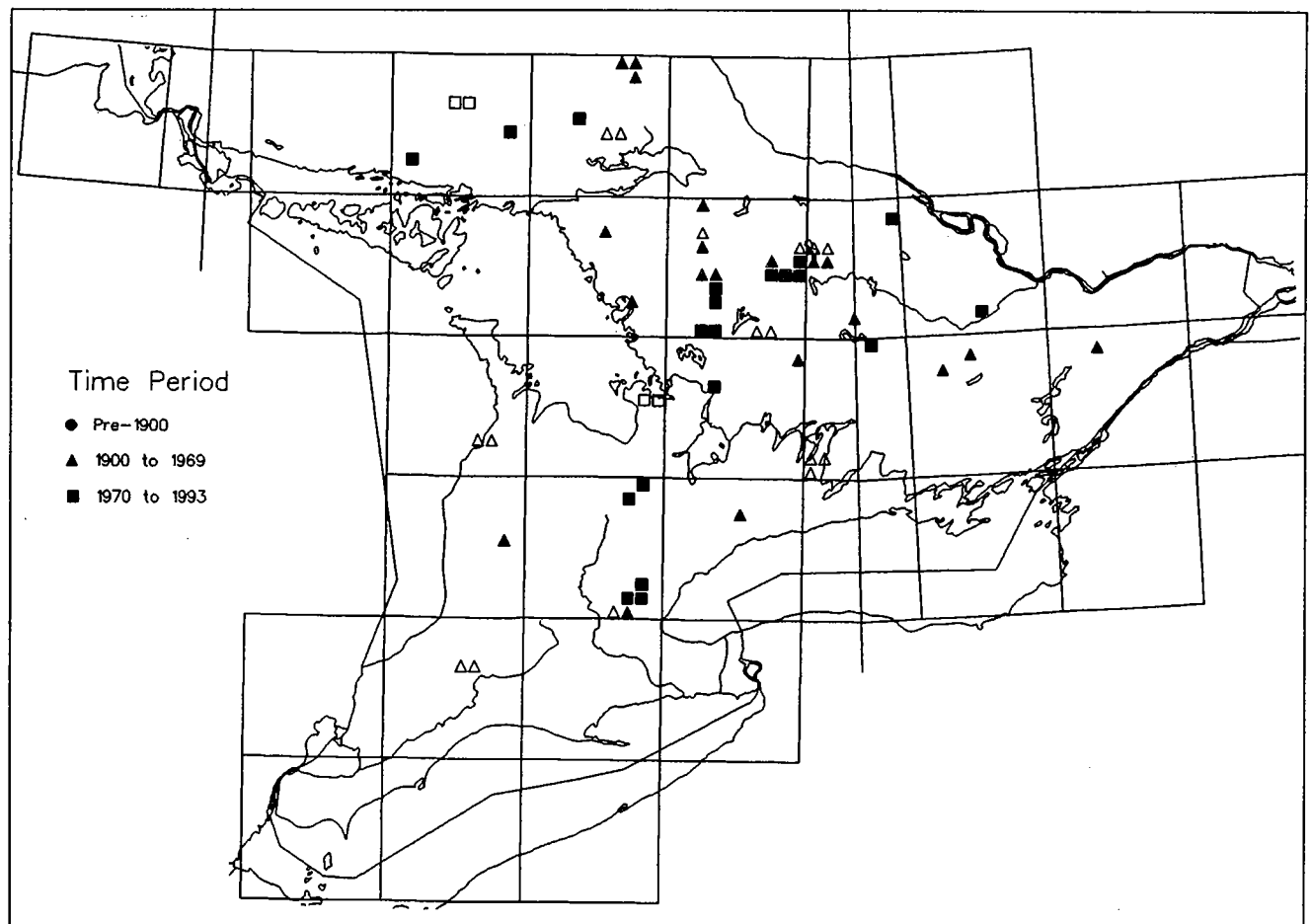
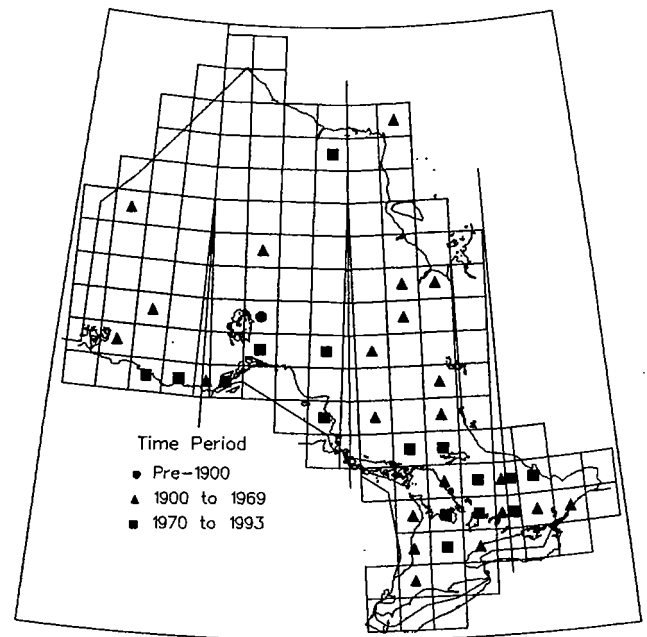


Water Shrew

Sorex palustris

The Water Shrew is found in northern and montane American states and throughout Canada except in tundra or prairie regions. In Ontario, it is found from the southcentral region north to Hudson Bay. The Water Shrew has been found at only one location in southwestern Ontario: Coldstream (1925). Its scarcity in southwestern Ontario is likely due to the region's lack of adequate forest cover and associated aquatic systems.

The Water Shrew is one of the few long-tailed shrews that can be positively identified solely by external characteristics. It is large (twice the size of a Common Shrew) and has a distinct fringe of stiff hairs along the outer and inner margins of the feet and toes; the longest hairs may exceed one millimetre (van Zyll de Jong 1983).



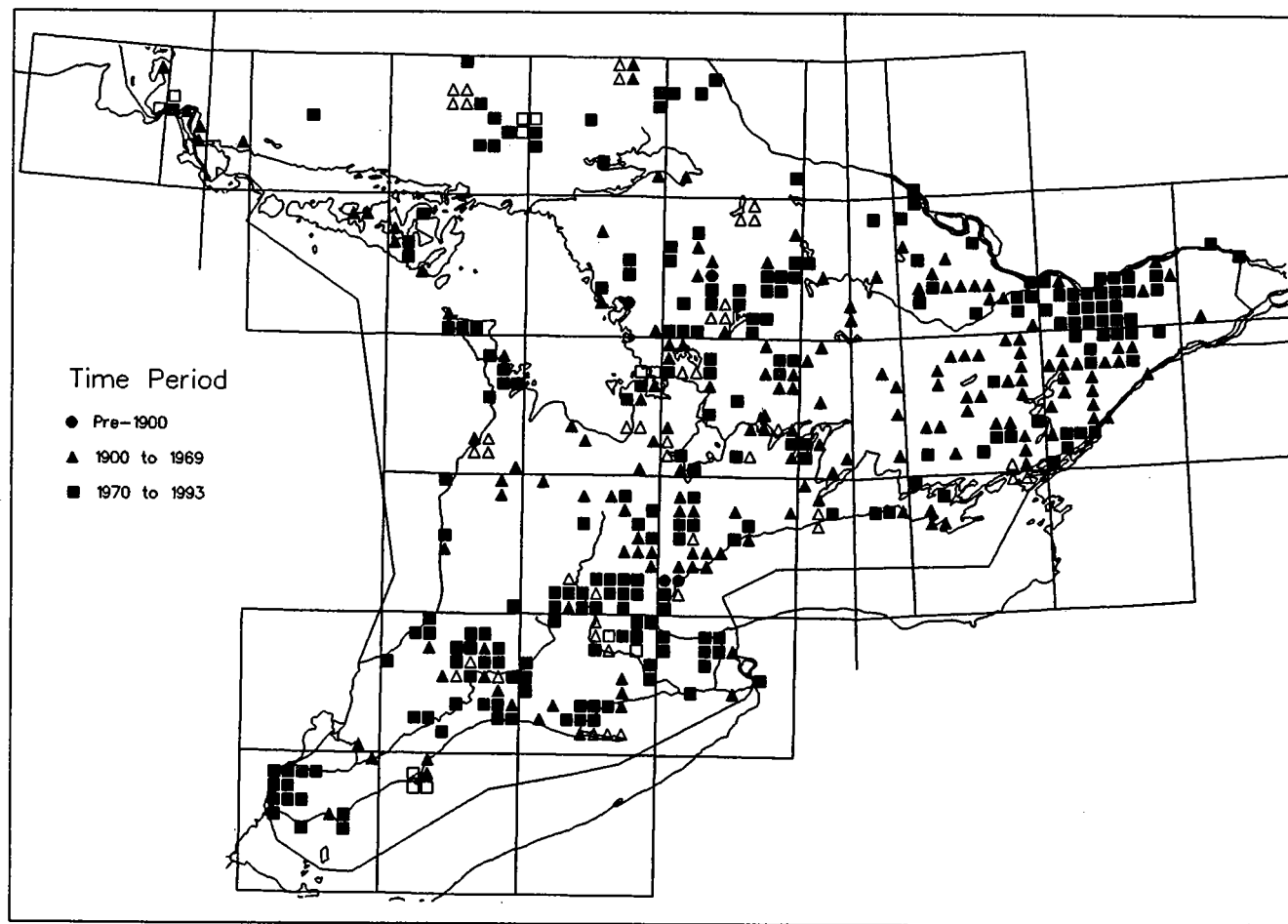
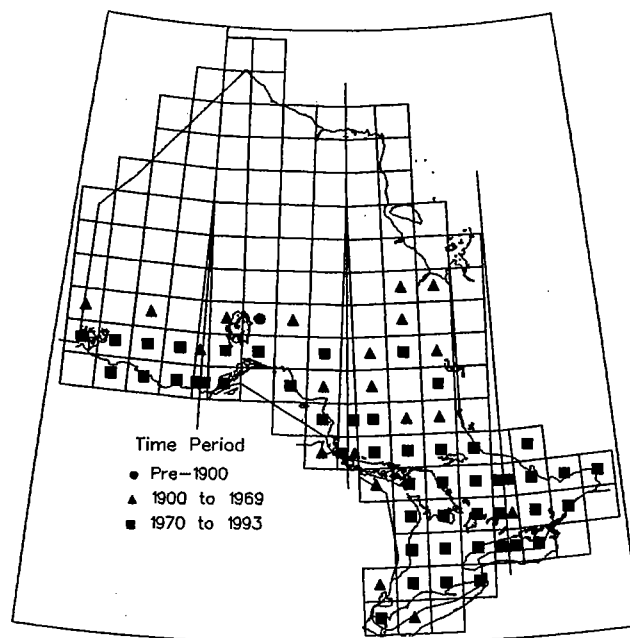
Northern Short-tailed Shrew

Blarina brevicauda

The Northern Short-tailed Shrew is well-known to most naturalists. As the largest of the Ontario shrews, it is characterised by a large body, reduced eyes and ears, short dark fur, and a very short tail. It is more common than the Least Shrew, the other short-tailed shrew found in Ontario, which has been recorded only at Long Point.

The Northern Short-tailed Shrew ranges throughout the eastern US and southern Canada from the Maritimes to Saskatchewan. In Ontario, it is found throughout southern and northeastern regions and as far north as Lake Nipigon in northcentral and northwestern Ontario.

Because of its large size and short tail, the Northern Short-tailed Shrew is readily identified. Large numbers of these shrews appear in museum collections and many have been caught in mouse traps or by house cats. Consequently Northern Short-tailed Shrew records are plentiful.

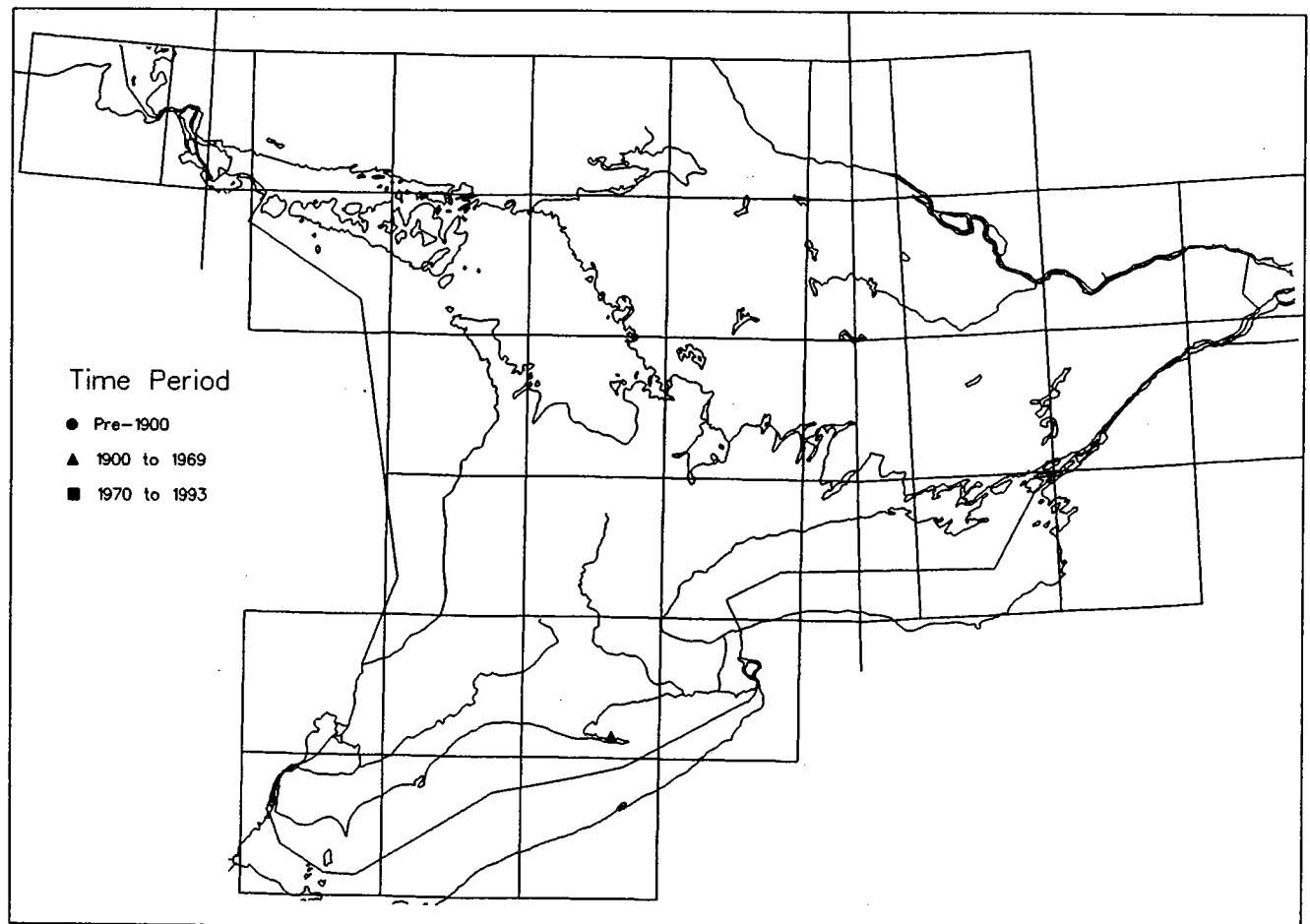
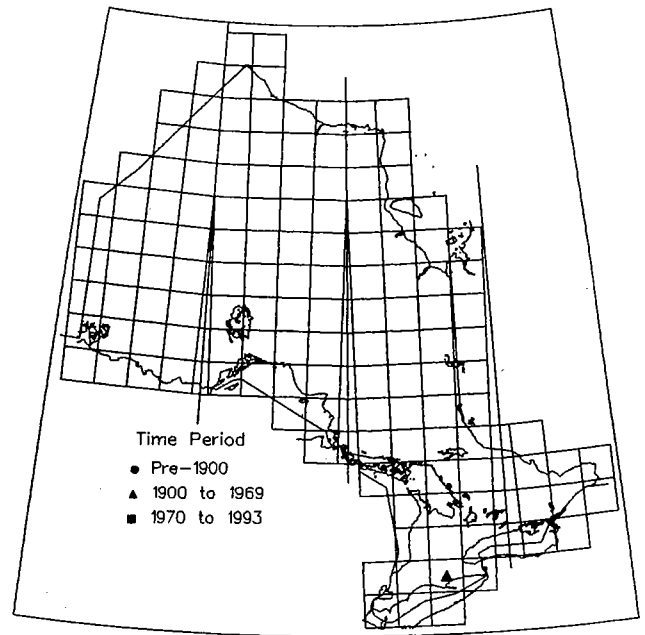


Least Shrew

Cryptotis parva

The Least Shrew has the most limited distribution of all shrews in Ontario. In fact, it has been found at only one Canadian location: Long Point (on the north shore of Lake Erie). Specimens have been collected from this location on two occasions, once in 1927 and the other in 1958. Least Shrews range throughout the eastern half of the US and into Mexico.

Although the only records for this species are from Long Point, it is possible that the Least Shrew could be found along the Lake Erie shore in areas of open, grassy dunes. Difficulty in trapping and a shortage of its preferred habitat in Ontario have resulted in a lack of records for the Least Shrew (Peterson 1966, van Zyll de Jong 1983).

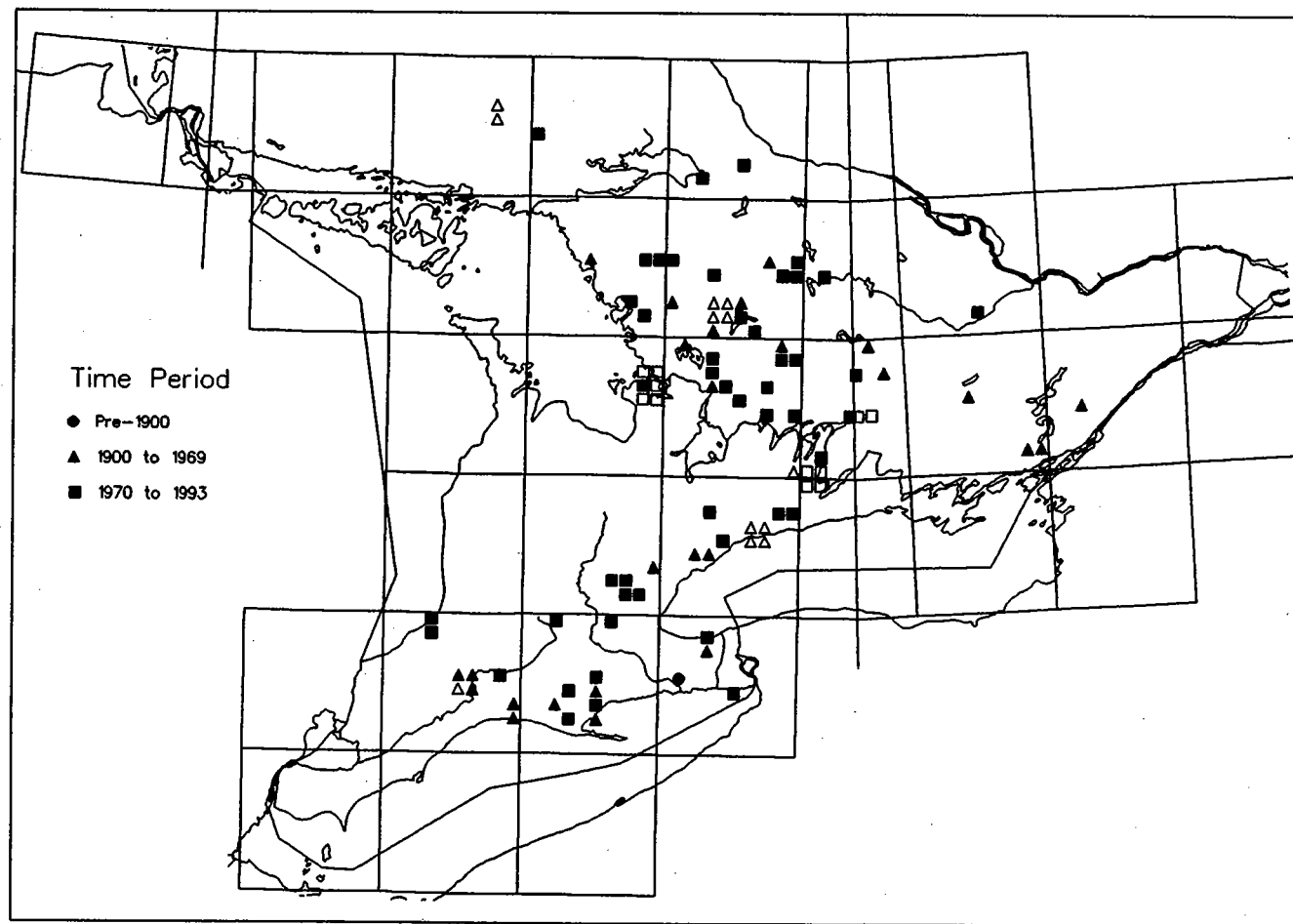
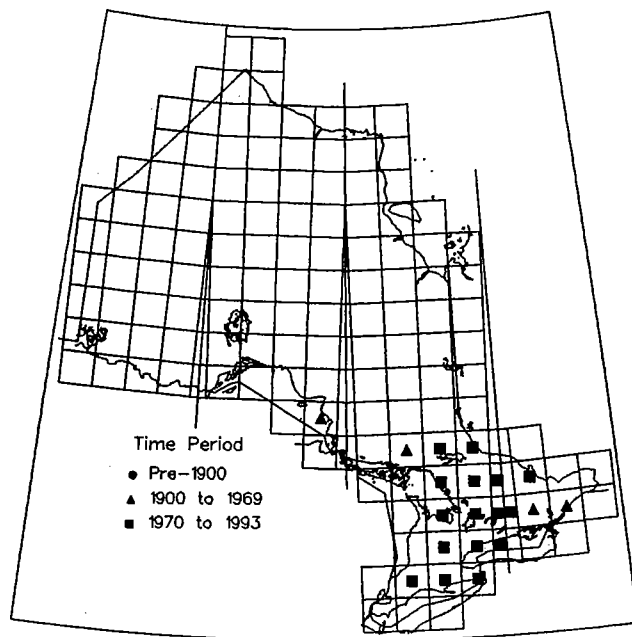


Hairy-tailed Mole

Parascalops breweri

The Hairy-tailed Mole's distribution in North America is limited to the northeastern US, southern Ontario and southern Quebec. In Ontario, it is found from London to Pancake Bay, just north of Sault Ste. Marie. Generally it is found in areas with sufficient depths of well-drained soil (van Zyll de Jong 1983).

The Hairy-tailed Mole can be readily distinguished from the other two moles in Ontario by its short, hairy tail and lack of protuberances from the snout. It spends most of its time in an extensive system of tunnels that it digs just below the surface of the ground (van Zyll de Jong 1983), and as a result, few are seen.

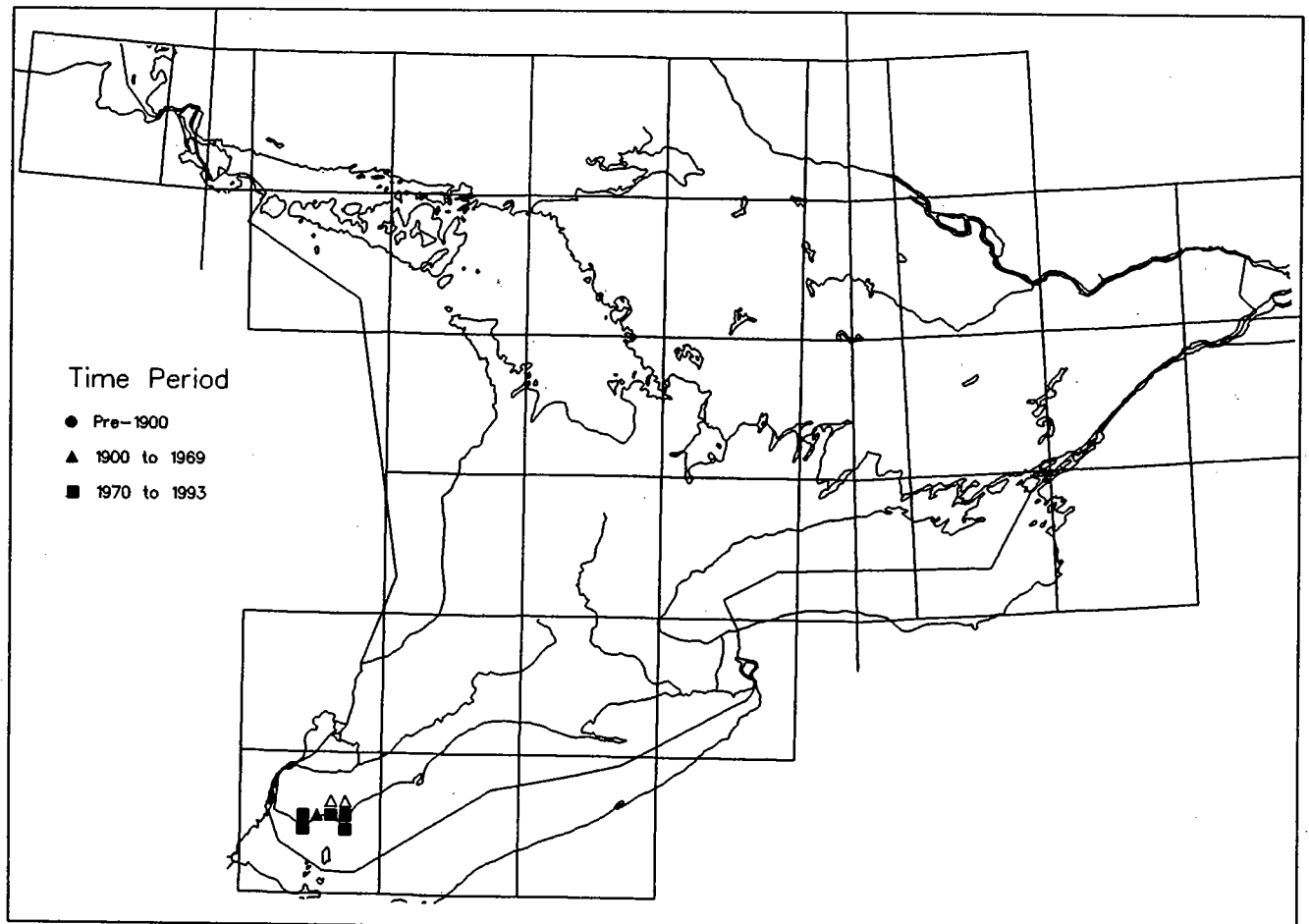
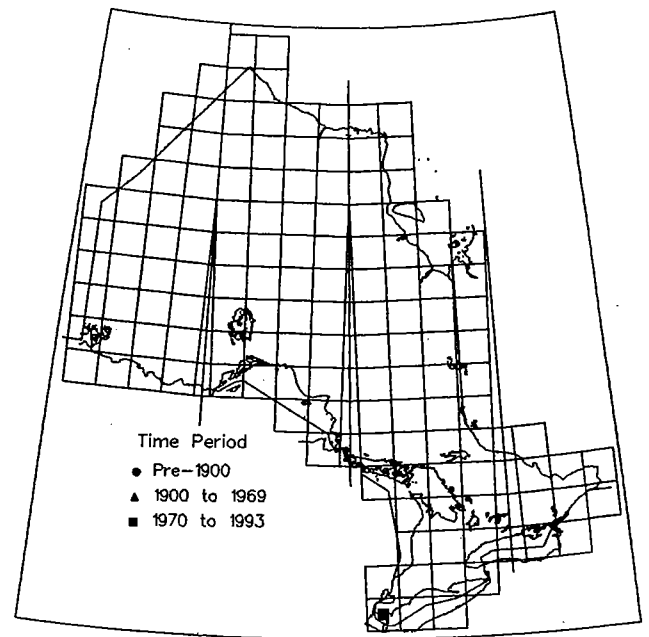


Eastern Mole

Scalopus aquaticus

The Eastern Mole is the largest of the Ontario moles, but has the most limited range within the province. A southern species, it is found throughout the eastern US. In Ontario, the Eastern Mole is mainly restricted to Essex County from Windsor to Point Pelee, although a specimen was reported to have been collected near Strathroy prior to 1911 (Saunders 1932).

The Eastern Mole prefers areas of sandy or sandy-loam soils in which it digs extensive burrow systems, often as deep as 60 cm (Peterson 1966, van Zyll de Jong 1983). It rarely emerges from the ground and is usually detected only by protruding ridges of earth which indicate the presence of tunnels (Peterson 1966). The Eastern Mole's specific soil requirements and limited range have prompted the Ontario Ministry of Natural Resources to designate the Eastern Mole a rare species.

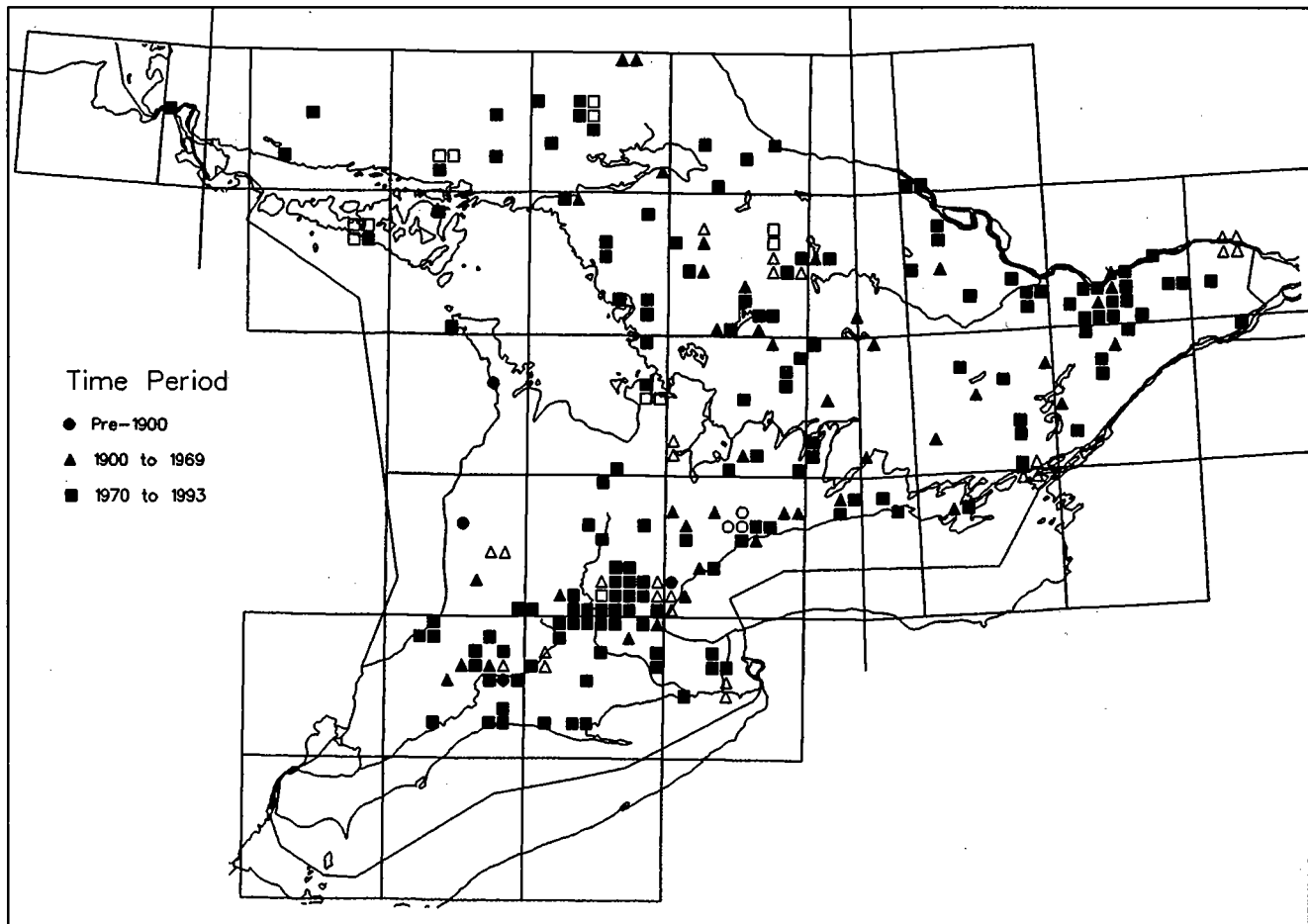
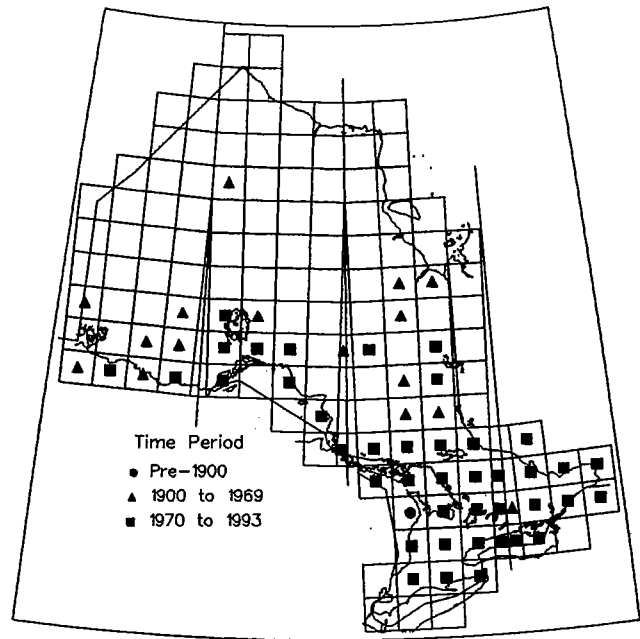


Star-nosed Mole

Condylura cristata

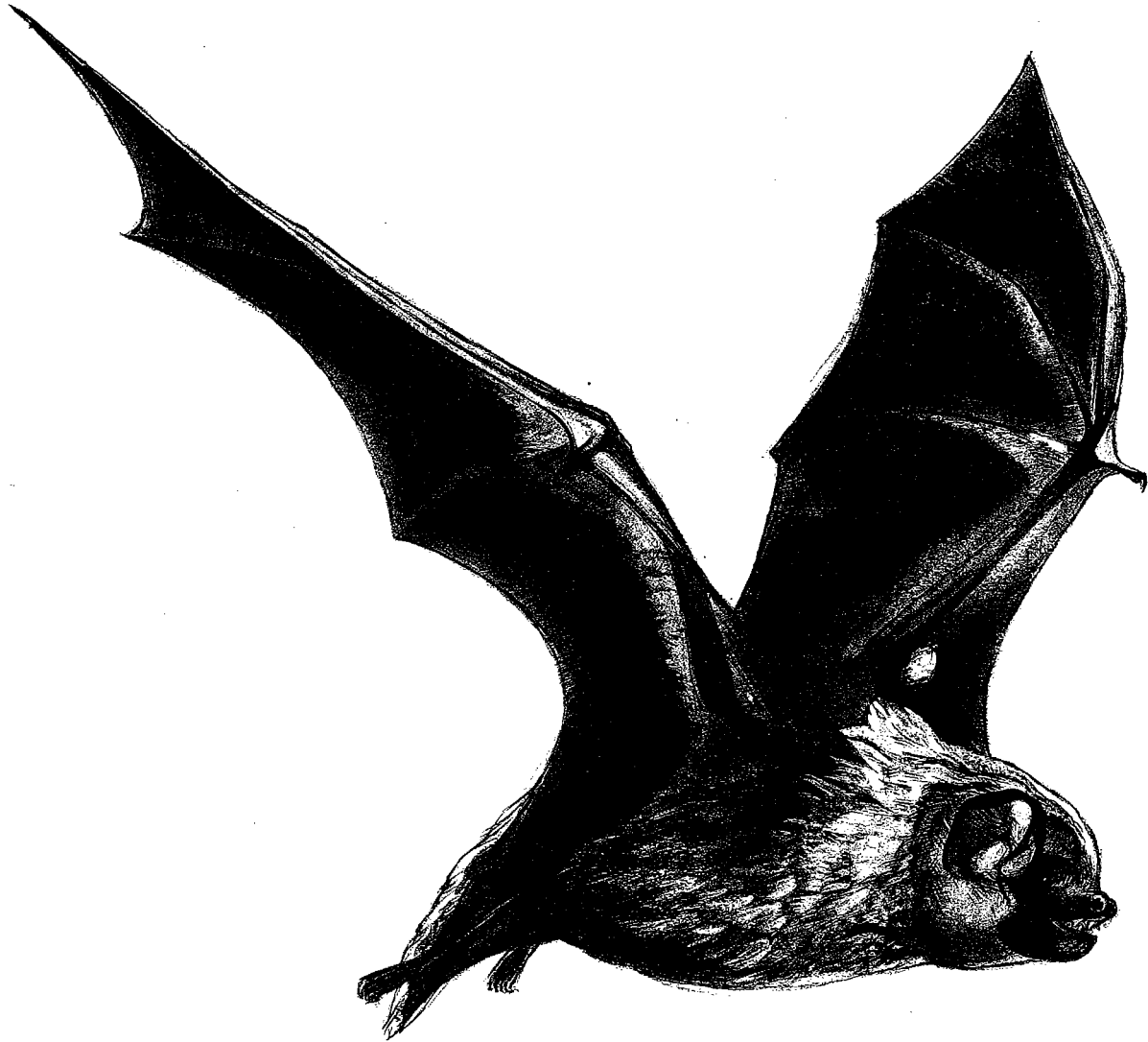
Fleshy appendages protruding from the Star-nosed Mole's snout allow for easy identification. Geographically, the mole is found in the northeastern US, the Maritimes, and most of Ontario and Quebec. In Ontario, it is found throughout the province, as far north as Moosonee and Lake Nipigon. However, one record from Big Trout Lake suggests that Star-nosed Moles range much further north than Mammal Atlas data indicate. The lack of volunteers in the north may explain the limited number of observations from these areas.

The Star-nosed Mole spends less time in burrows and more time atop the ground than other Ontario moles. Preferred habitats include marshes, shorelines, and wet fields. The characteristic star-like snout organ consists of 22 tactile appendages which are used to locate prey in soft soils and in the sediments at the bottom of lakes, streams, and rivers (van Zyll de Jong 1983).



Bats

Chiroptera



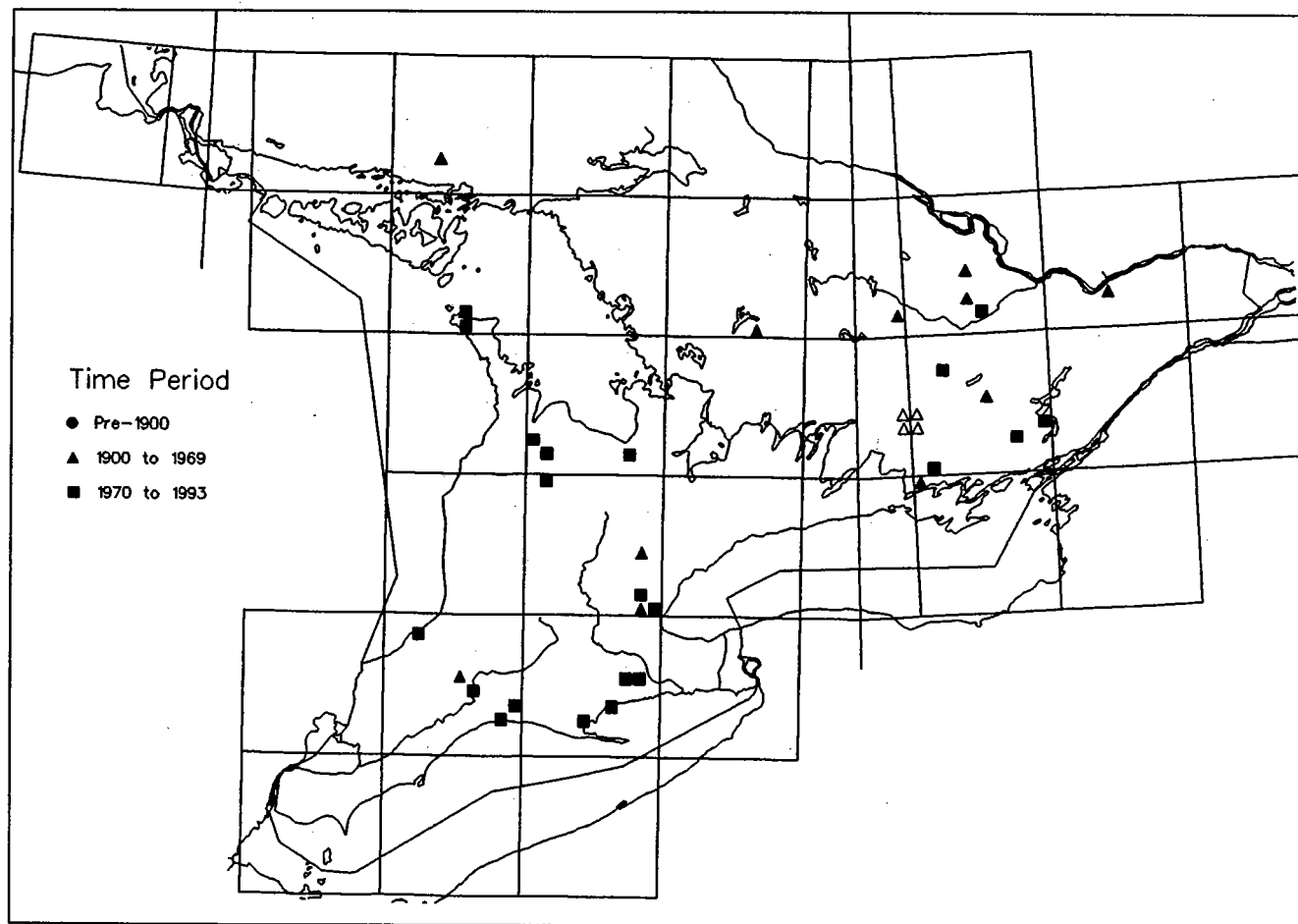
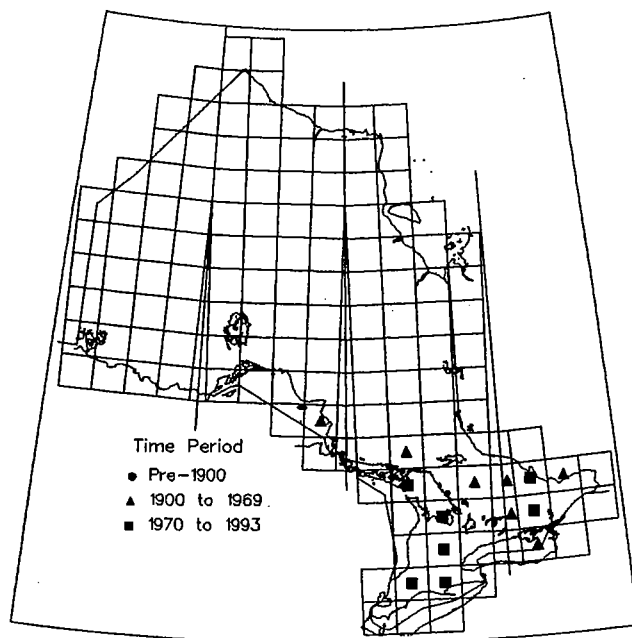
Hoary Bat: Linda Shaw

Eastern Small-footed Bat

Myotis leibii

The Eastern Small-footed Bat is the smallest bat in Ontario. It also has one of the smallest overall distributions (Peterson 1966). Geographically it is limited to the northeastern US, southern Ontario and a very small portion of southwestern Quebec. In Ontario, the Eastern Small-footed Bat has been reported almost exclusively in the southern part of the province and most commonly from areas south of the north shore of Georgian Bay. The most northern record for this species is from Agawa Bay on Lake Superior (Peterson 1966).

Most of the Ontario data for this species were provided by museums and researchers who observed bats at hibernation sites. Identification of this bat is based on forearm and hind foot lengths; the forearm measures less than 34 mm and the hind foot less than 9 mm. On a bat detector tuned to 40 kHz, the Eastern Small-footed Bat produces "ticking" pulses similar to those produced by other *Myotis* species.

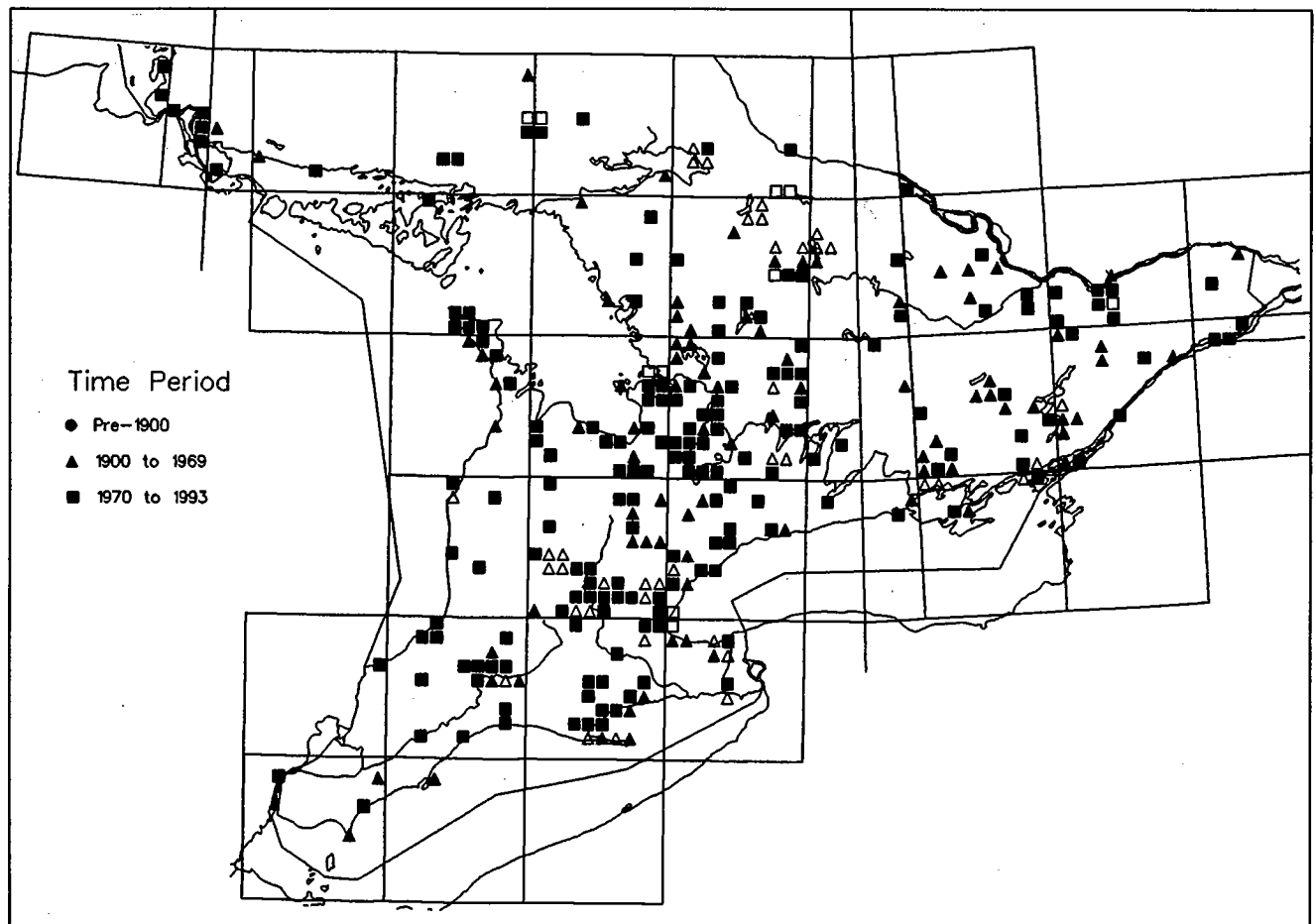
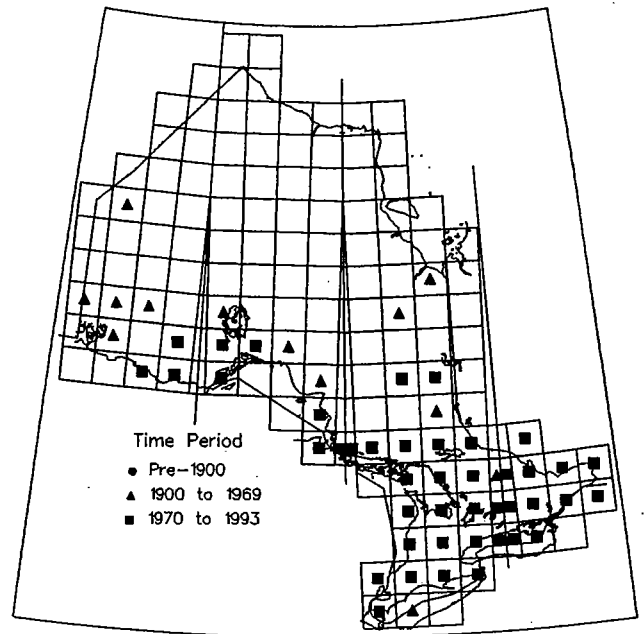


Little Brown Bat

Myotis lucifuga

The Little Brown Bat is the most common bat in Ontario (van Zyll de Jong 1985). It is found throughout the US and Canada, north to the tree line. In Ontario, there are records for the Little Brown Bat north to Favourable Lake and Moose Factory.

Little Brown Bats are a part of the difficult-to-identify *Myotis* complex. The complex comprises three species which are not easily distinguishable using a bat detector because they all produce a similar “ticking” noise on a detector tuned to 40 kHz. Identification must be based on morphological characteristics. Consequently, despite the abundance of this bat in Ontario, difficulties in identification meant few records were contributed by volunteers. Most records were obtained from museums and researchers who have conducted bat surveys in Ontario. Little Brown Bats and Big Brown Bats are the only two species in Ontario that regularly make use of buildings for their maternity colonies.

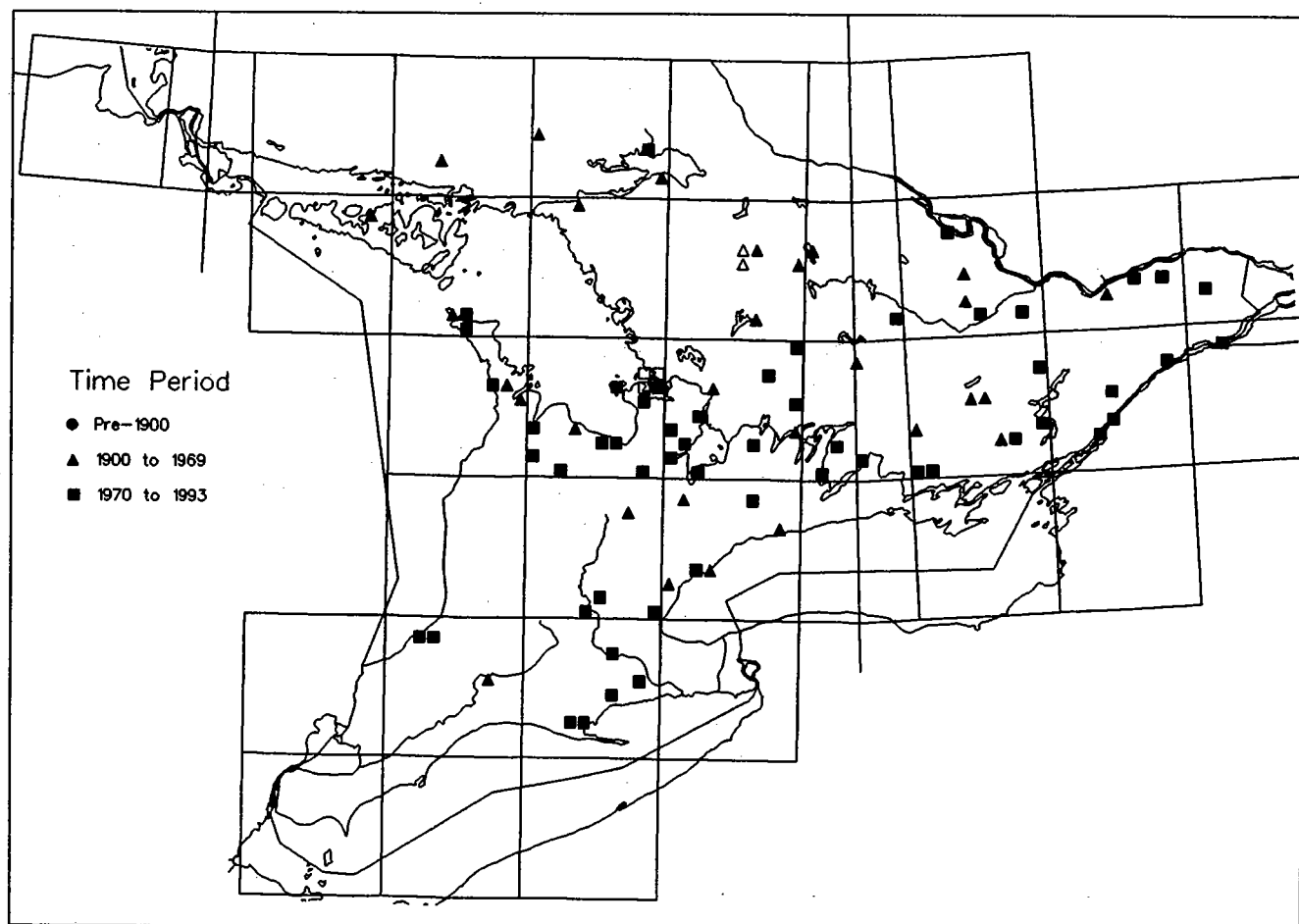
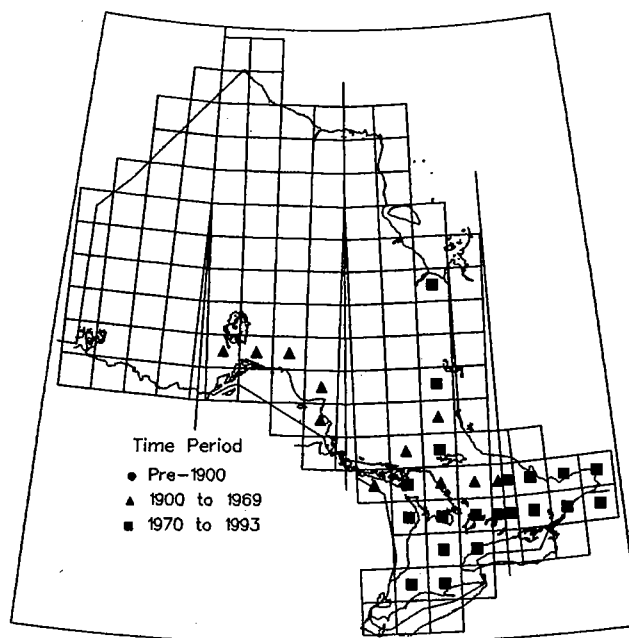


Northern Long-eared Bat

Myotis septentrionalis

The Northern Long-eared Bat was once considered to be the same species as Keen's Long-eared Bat (*Myotis keenii*). They were separated by range and morphological differences. The Northern Long-eared Bat is found throughout eastern North America and west into British Columbia, whereas Keen's Long-eared Bat is found only on the west coast (van Zyll de Jong 1985). In Ontario, there are records of the Northern Long-eared Bat throughout the southern part of the province and along the north shores of lakes Huron and Superior. There are also occasional records from further north, including one from Moosonee.

As with other bats from the genus *Myotis*, identification is based on morphological characteristics. Identification to species cannot be made using a bat detector as the "ticking" pulses produced on a detector tuned to 40 kHz are similar to those produced by other *Myotis* species.

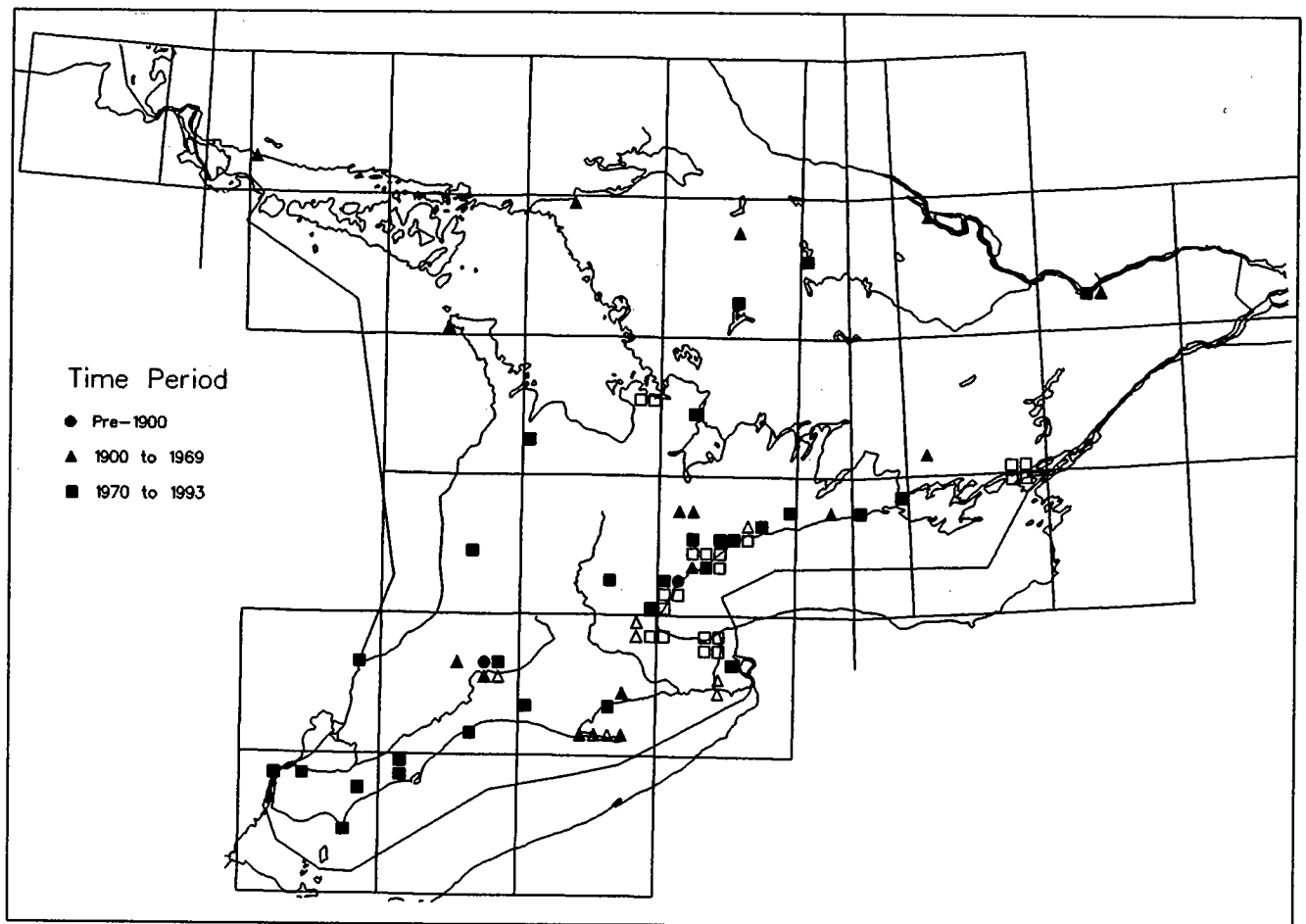
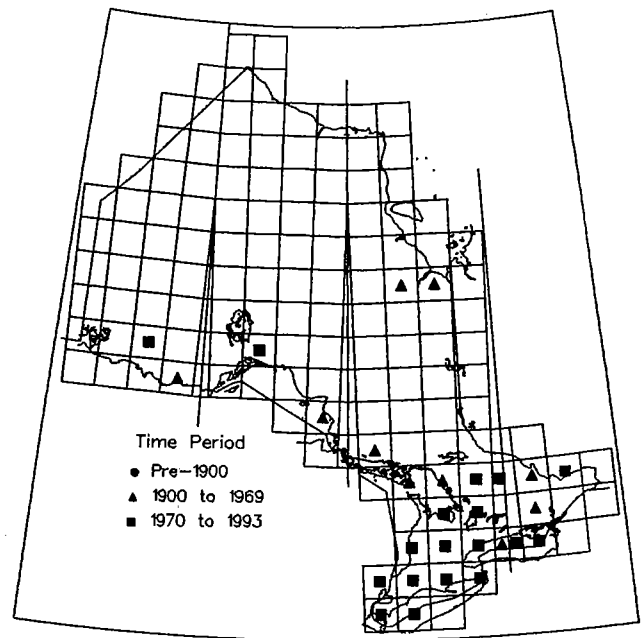


Silver-haired Bat

Lasionycteris noctivagans

The Silver-haired Bat is not well-documented in Ontario. The accepted range for this bat includes most of the US, southern Canada as far north as James Bay and northern British Columbia. In Ontario, there are several dozen southern records but only a few in the north. Mammal Atlas records indicate that this species can be found at least as far north as Nipigon in the west and James Bay in the east.

Although Silver-haired Bats are relatively easy to identify “in hand”, they are not often seen. They form small maternity colonies, often in hollow trees, and don’t generally make use of buildings or caves (van Zyll de Jong 1985). As well, they are not easily surveyed using bat detectors because they are heard at the same frequency as Big Brown Bats (30 kHz). Distinguishing between Silver-haired and Big Brown bats with a detector is based on the slightly faster pulse rate and more “chirp”-like sound of the Silver-haired Bat.

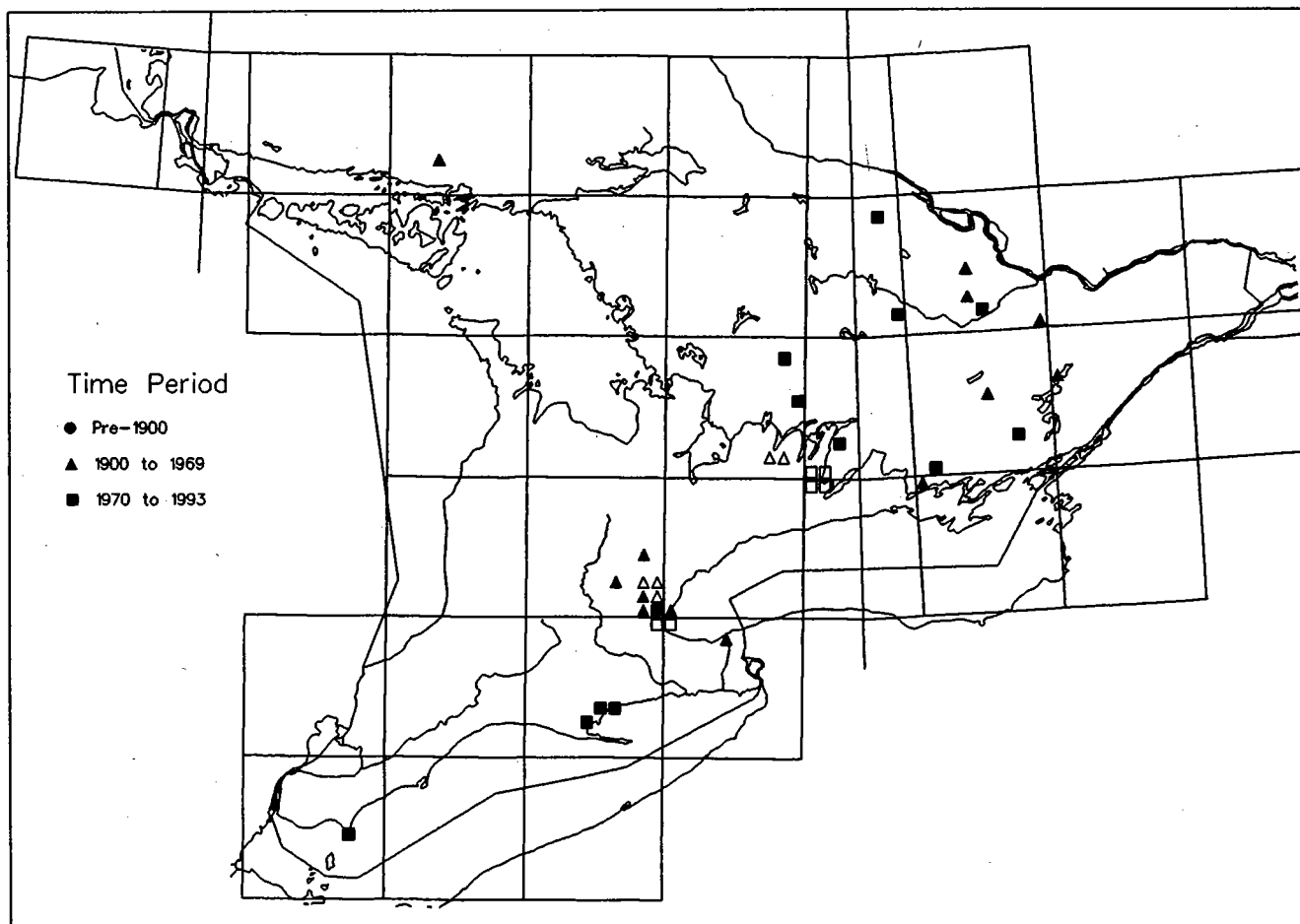
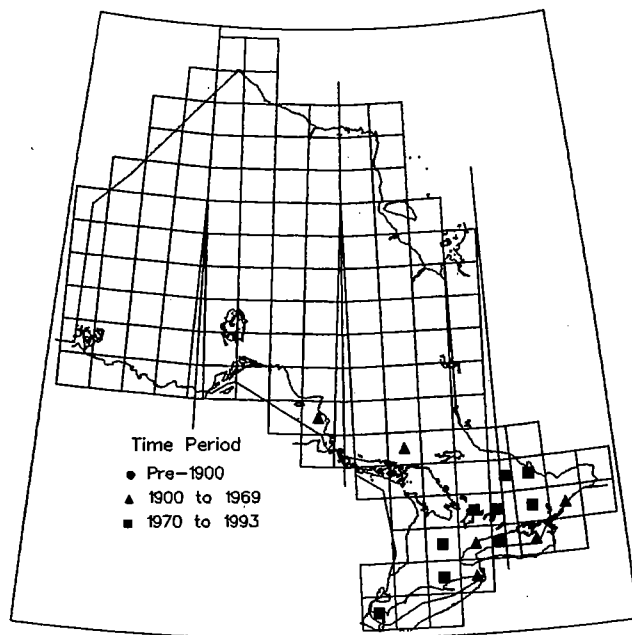


Eastern Pipistrelle

Pipistrellus subflavus

The Eastern Pipistrelle has the southernmost distribution of any bat in Ontario. In North America, it ranges throughout the eastern half of the US, north to the Great Lakes and the St. Lawrence River. In Ontario, the Eastern Pipistrelle is most commonly found along the north shores of lakes Ontario and Erie, and from Kingston to Renfrew in the southeast. The northernmost records for this species were documented at hibernation sites near Espanola and Alona Bay. Southern Ontario is at the northern edge of the Eastern Pipistrelle's North American range, which may explain why there are fewer records for it than for other species of bats (van Zyll de Jong 1985).

The Eastern Pipistrelle is difficult to distinguish, but can be identified by its uniform coloration and by the presence of tricoloured fur on the bats' back. Identification can also be made using a bat detector by looking for two frequency peaks, one at 40 kHz and the other at 20 kHz (MacDonald *et al.* 1994).

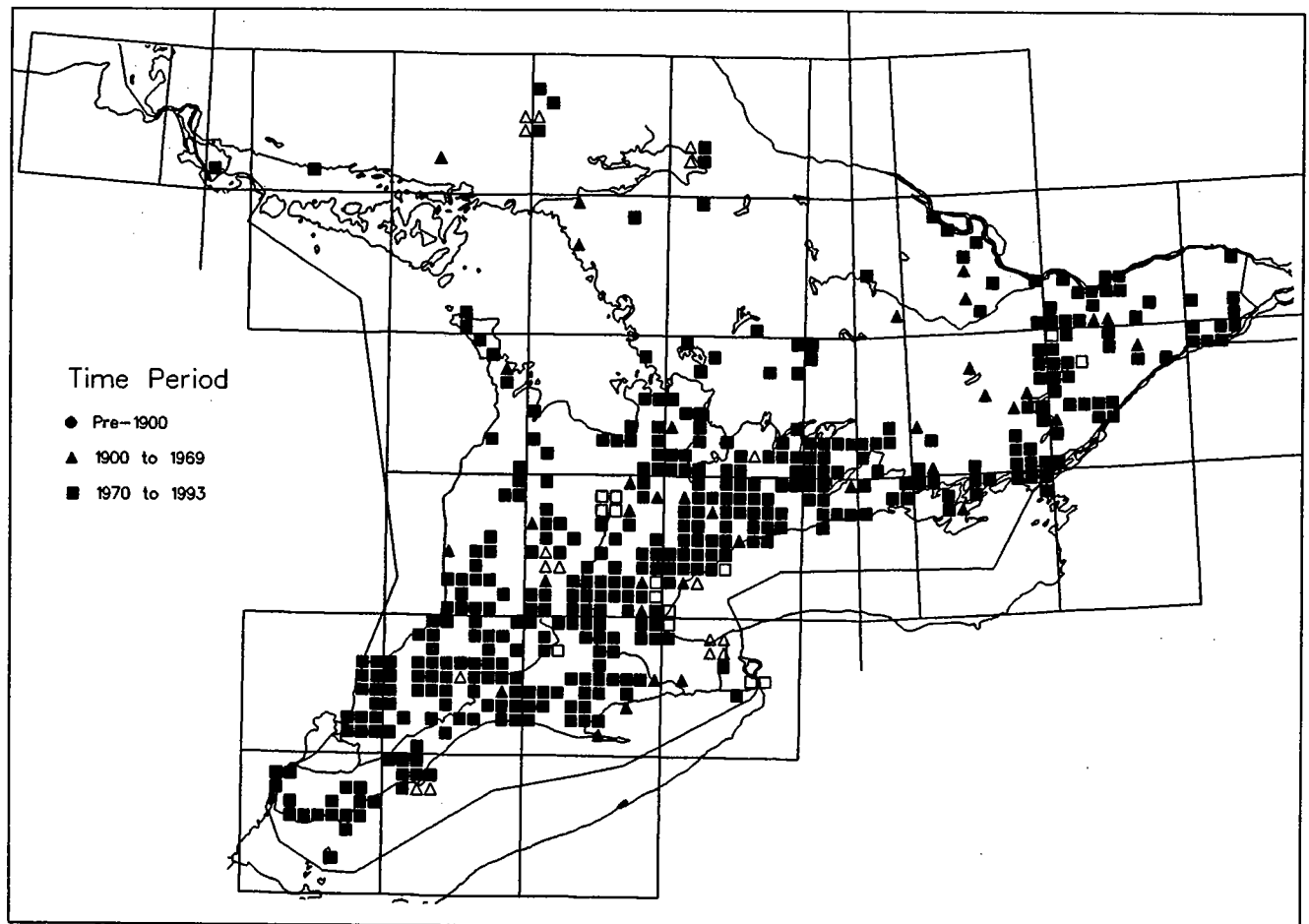
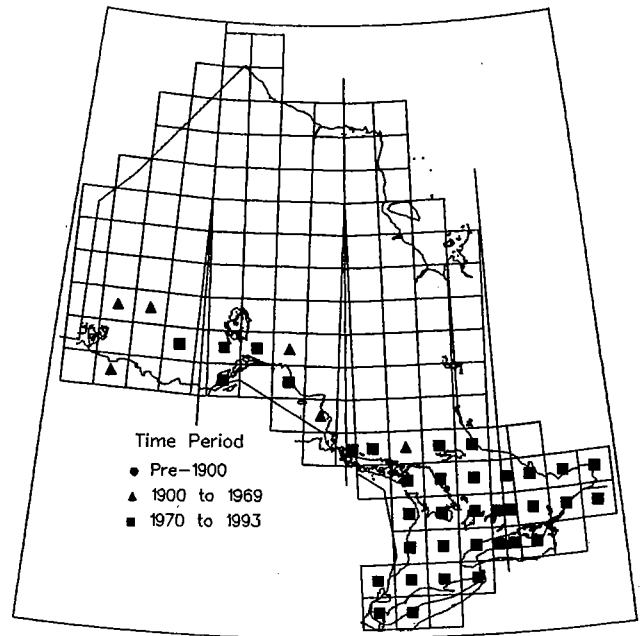


Big Brown Bat

Eptesicus fuscus

The Big Brown Bat ranges throughout the US, western Canadian provinces, and southern areas of eastern and central Canada. In Ontario, the Big Brown Bat is found throughout the southern part of the province, along the Lake Superior shoreline, and west to the Ontario-Manitoba border.

The Big Brown Bat is a familiar species of semi-open forests, agricultural areas, and even urban centres (van Zyll de Jong 1985). Because of their size, Big Brown Bats are relatively easy to identify. Brown pelage; a short, broad, blunt tragus; and a forearm length over 40 mm will distinguish Big Brown Bats from other species. It is also possible to identify this species using a bat detector tuned to 30 kHz, although Big Brown Bats can be confused with Silver-haired Bats. Distinguishing these species using a detector is based on the faster pulse rate and more “chirp”-like sound produced by the Silver-haired Bat.



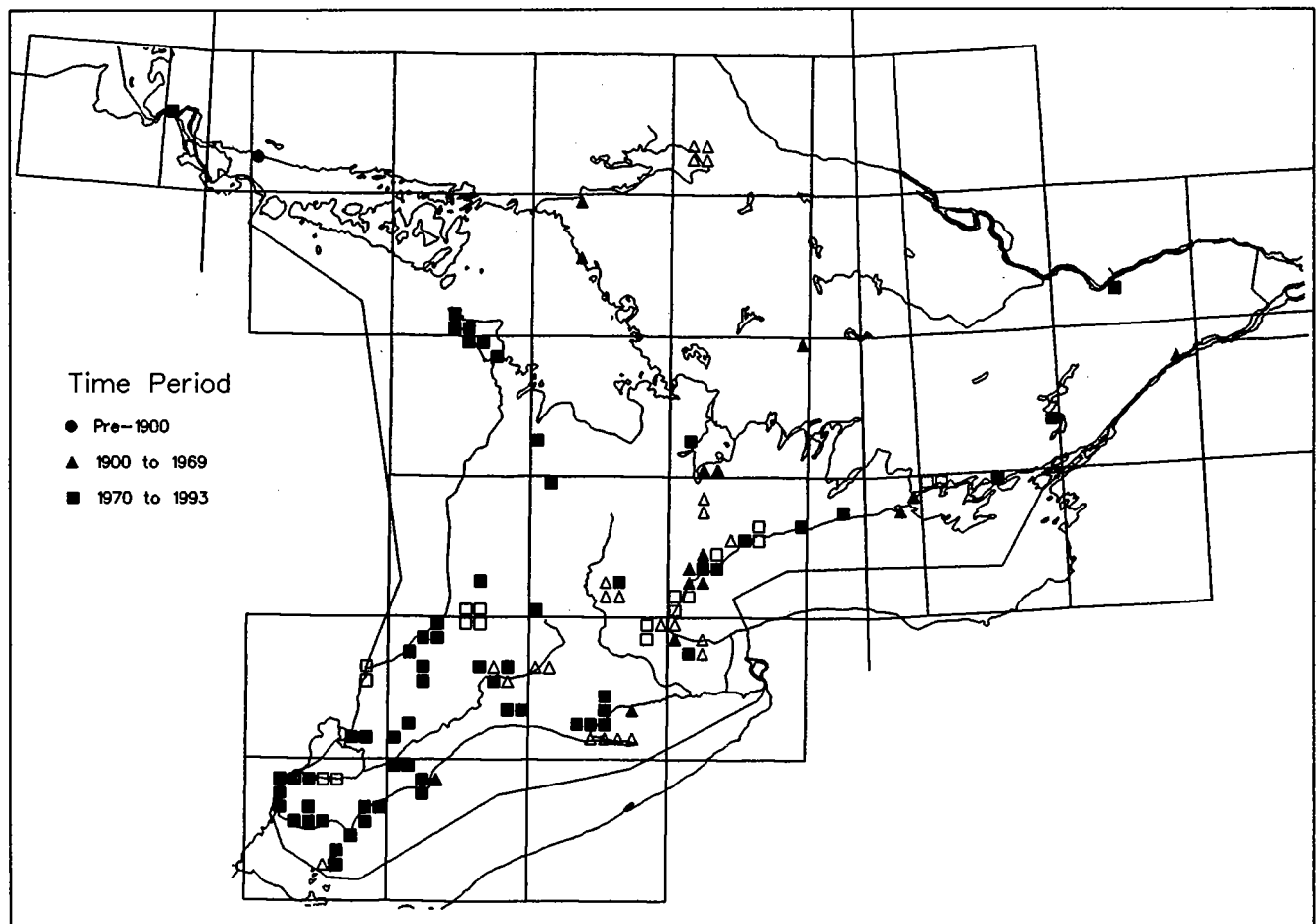
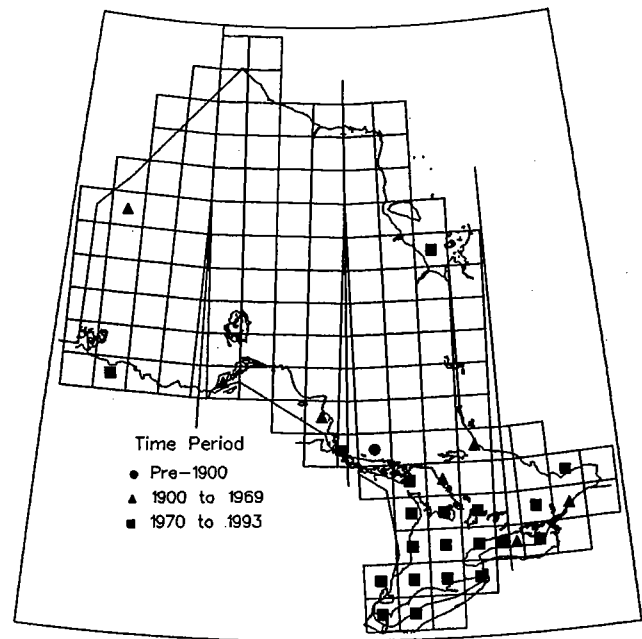
Eastern Red Bat

Lasiurus borealis

The Eastern Red Bat is a mid-sized, reddish-brown bat that roosts exclusively in the terminal foliage of trees and migrates south each year prior to hibernation (van Zyll de Jong 1985).

The Eastern Red Bat ranges throughout eastern North America south to South America. In Ontario, the Eastern Red Bat is found throughout the province north to James Bay, but is most common in the lower Great Lakes region.

Red Bats can be identified using a bat detector tuned to 40 kHz, at which frequency they generate a heavy, raindrop-like pulse in contrast to the metallic “ticking” pulses produced by bats of the *Myotis* complex.



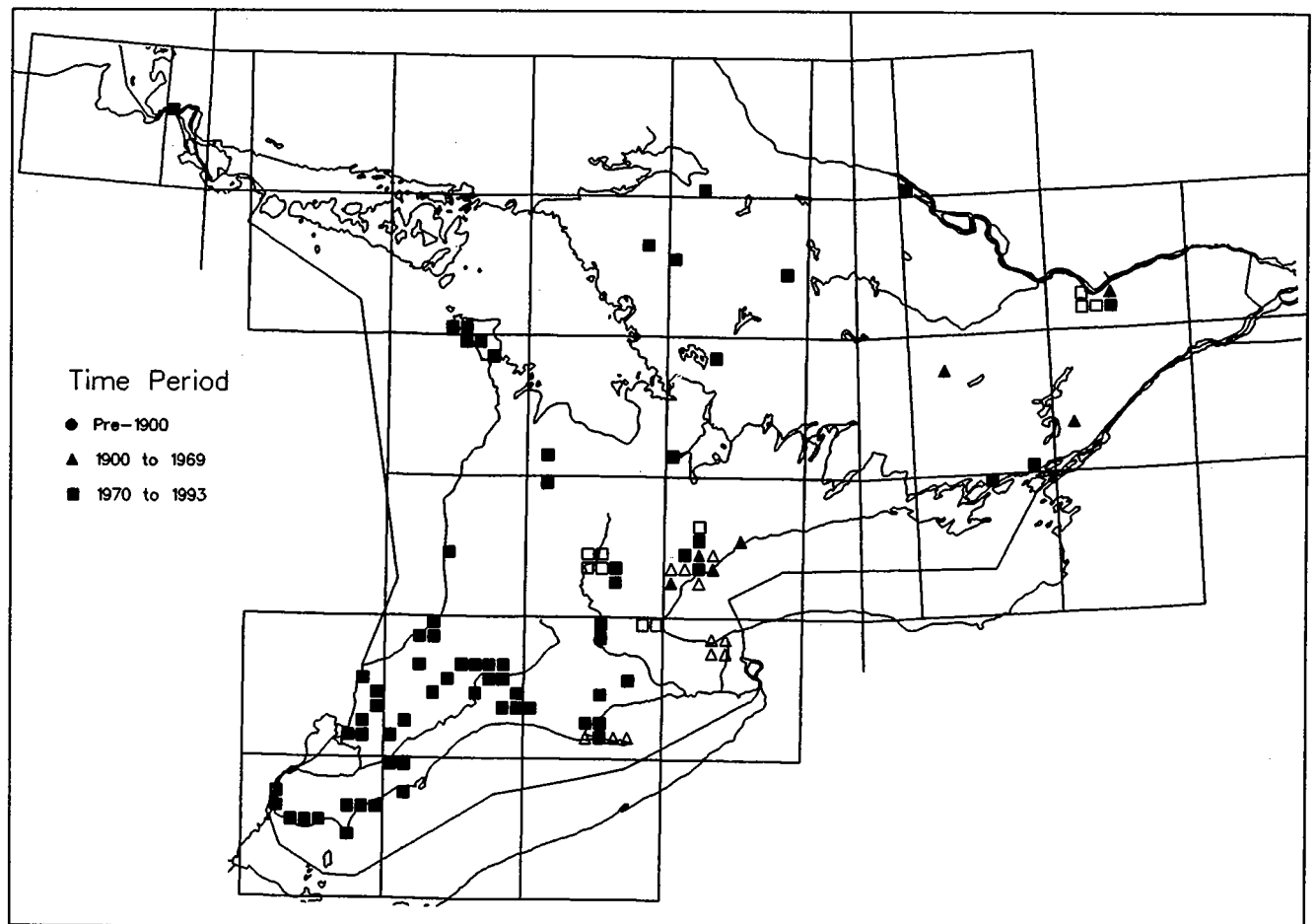
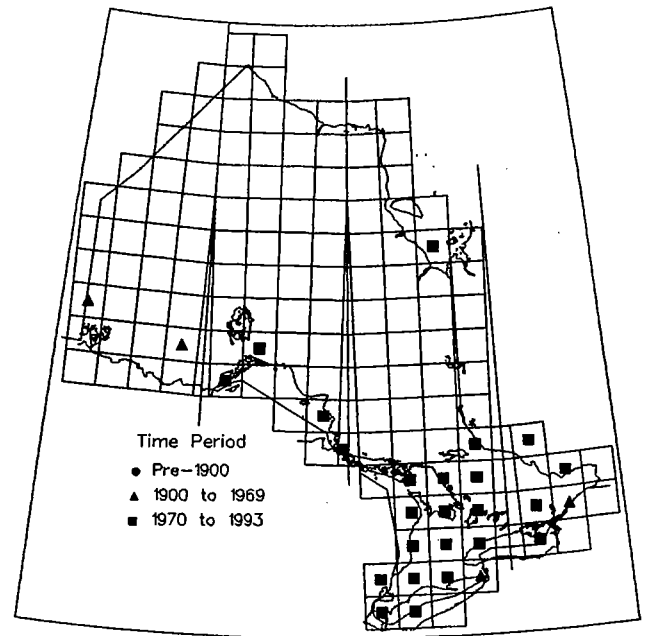
Hoary Bat

Lasiurus cinereus

The Hoary Bat is the largest bat in Ontario. It is a solitary mammal and roosts in the terminal foliage of trees (van Zyll de Jong 1985). It is distributed across the US, as well as through parts of Alberta, Saskatchewan, and southeastern Canada. In Ontario, the Hoary Bat can be found as far north as James Bay in the east and Lake of the Woods in the west.

The echolocation calls of the Hoary Bat are unique and easily distinguishable from other species with the help of a bat detector tuned to 20 kHz. At this frequency, Hoary Bats produce strong, heavy beats on the detector's speaker, allowing volunteers to compile accurate and useful data on the distribution of this mammal.

Hoary Bats are one of three Ontario species of bats (including the Eastern Red and Silver-haired bats) that migrate south to the US each winter prior to hibernation.

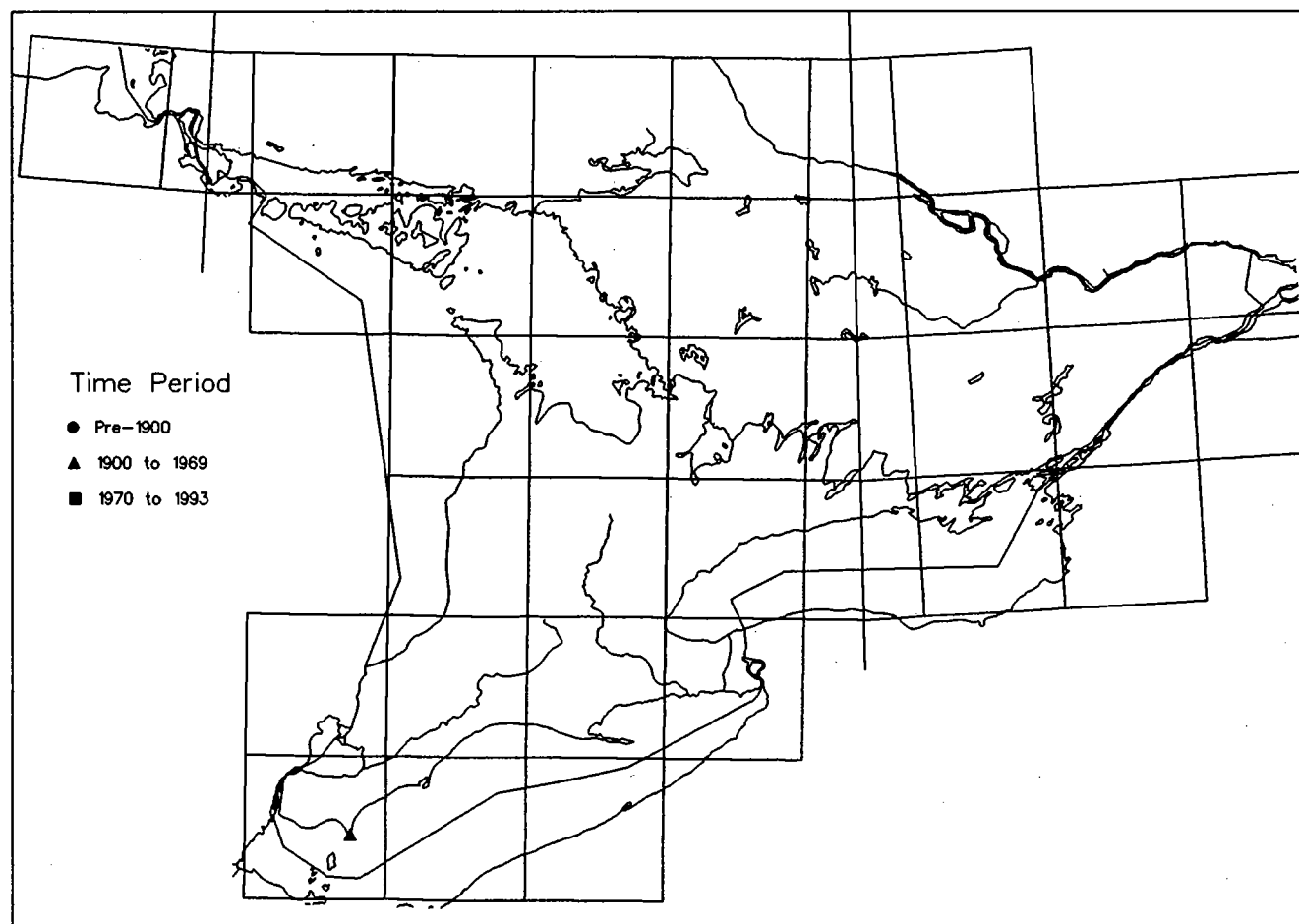
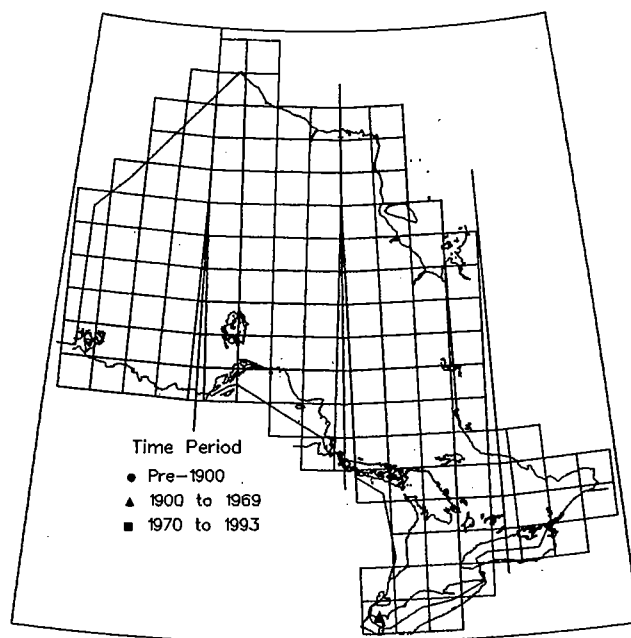


Evening Bat

Nycticeius humeralis

The Evening Bat is not considered a resident species of Ontario. It is included in the list of mammals for the province because one specimen was collected in Ontario at Point Pelee in May 1911.

The Evening Bat is a southern bat, occupying most of the eastern portion of the US north to Michigan. Because the northern populations of Evening Bats are migratory (van Zyll de Jong 1985), it is likely that the Point Pelee specimen was collected after the bat overshot its migratory destination.



Rabbits and Hares

Lagomorpha



Snowshoe Hare: Barry Kent MacKay

Eastern Cottontail

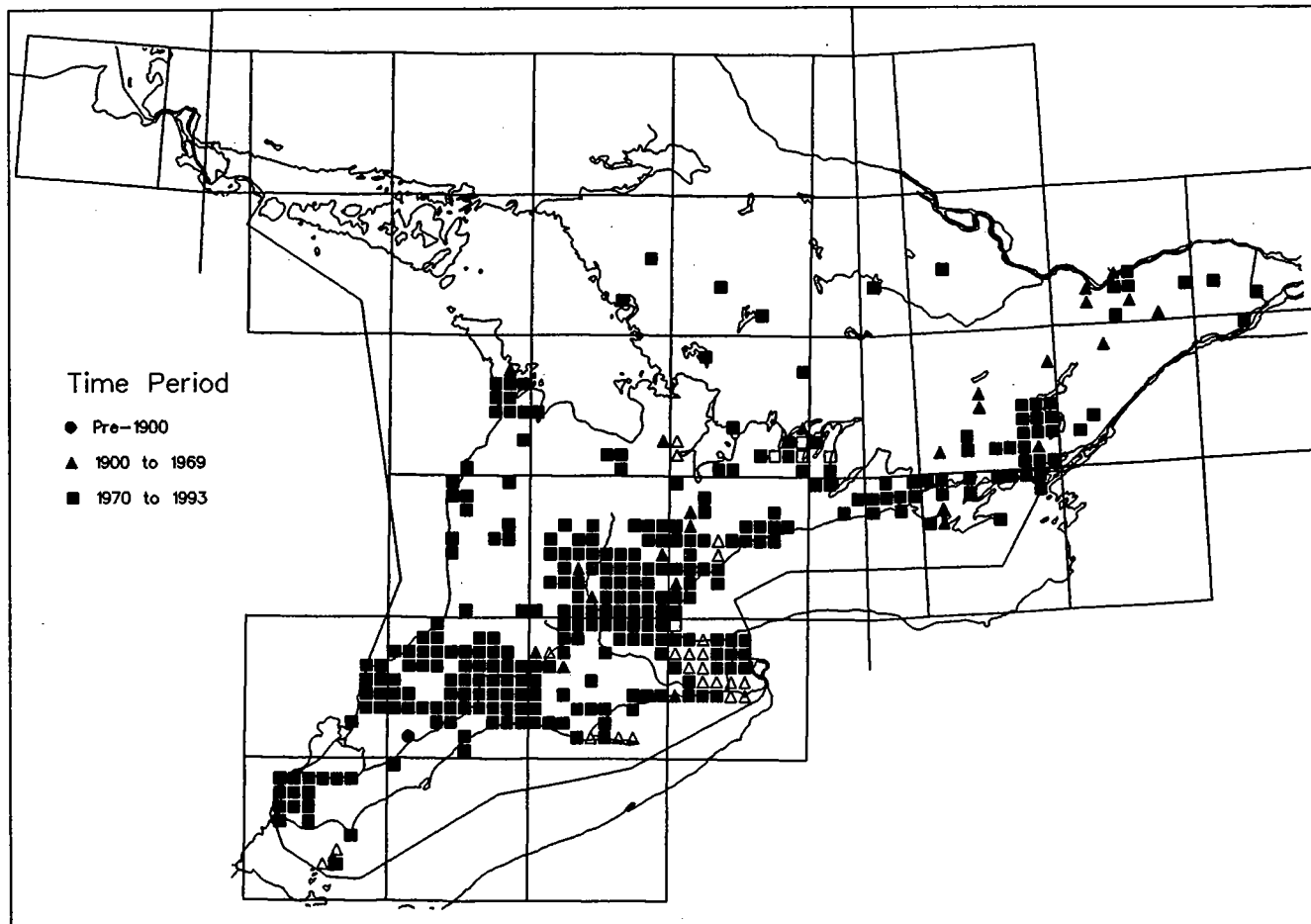
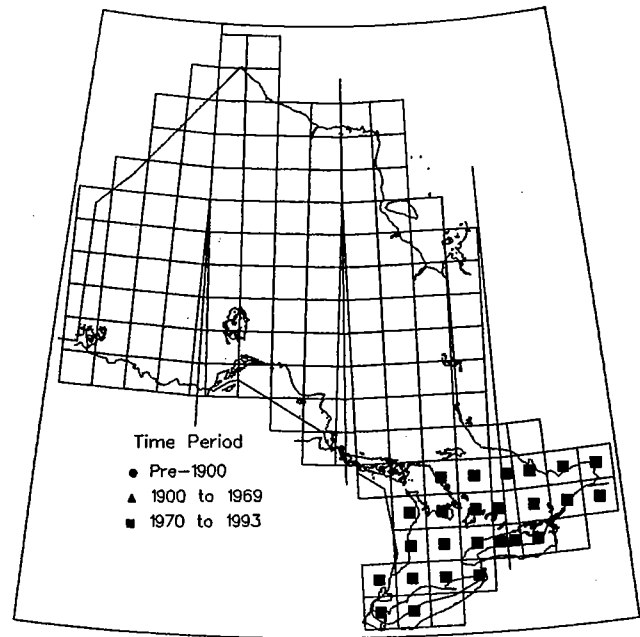
Sylvilagus floridanus

The smallest of the Ontario lagomorphs, the Eastern Cottontail is common in southern Ontario and as far north as the Magnetawan River. Across Canada, the Eastern Cottontail ranges as far north as southern Saskatchewan, Manitoba, and southwestern Quebec. In the US, the species is found throughout the eastern half of the continent, from the Great Lakes south to Mexico.

The Eastern Cottontail was absent from southern Canada at the time of European settlement, entering Canada about 1860 (Stewart 1982). Eastern Cottontails were common near London by 1875 and had expanded north to Ottawa by 1931.

The Eastern Cottontail is found in woodlands and open areas adjacent to cover.

.. Judith Eger



Snowshoe Hare

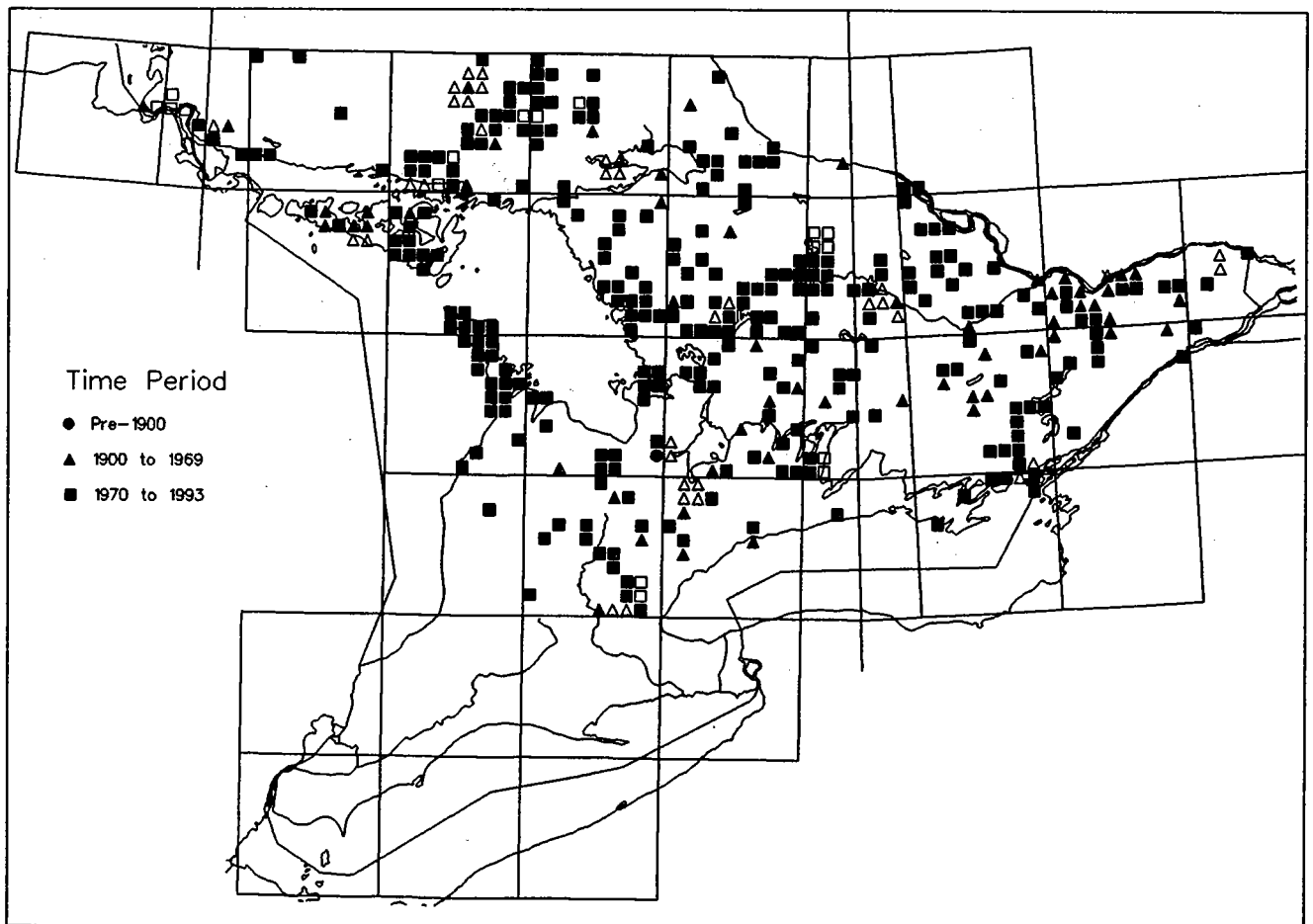
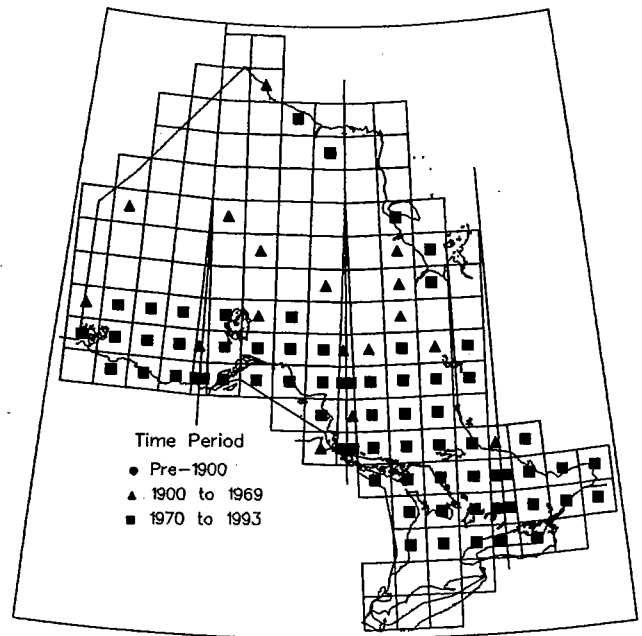
Lepus americanus

The Snowshoe or Varying Hare is widespread across Canada south of the tree line. Within Ontario, it has been recorded from southcentral Ontario north to Hudson and James bays. The Snowshoe Hare is a resident of the Boreal Forest but in the southern part of its range, is found in cedar and spruce swamps.

A prolific breeder, Snowshoe Hare populations are subject to regular cycles of abundance and scarcity peaking every nine or ten years.

The common name, Snowshoe Hare, refers to this animals large, well-furred hind feet, which are a useful adaptation for the deep snow of the boreal forest. The species is equally well-known as the varying hare, a reference to its change in colour from brownish in summer to white in winter.

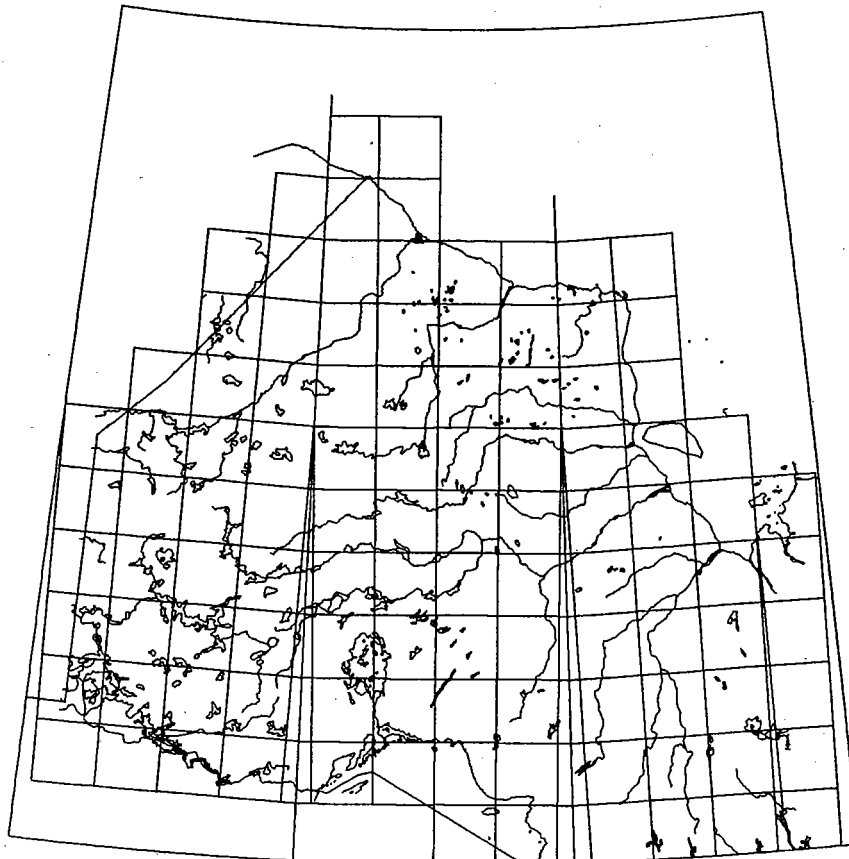
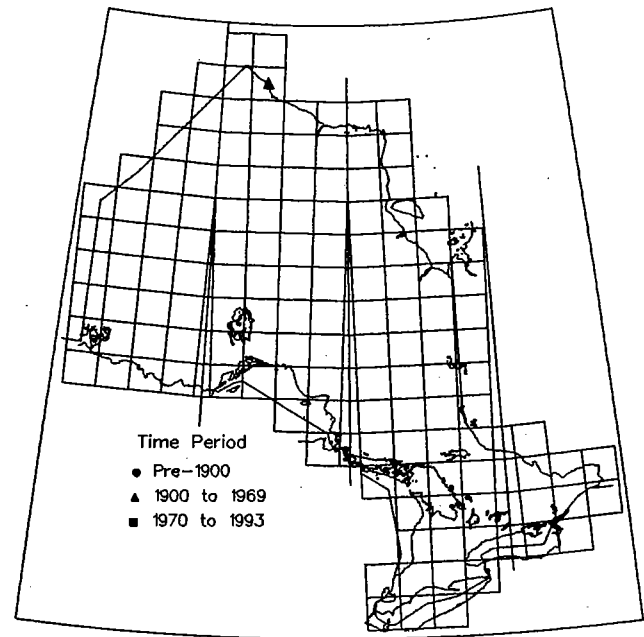
.. Judith Eger



Arctic Hare

Lepus arcticus

Only one Ontario record exists for Arctic Hare. Consequently, the 1966 Fort Severn record should be considered accidental. The normal range for this Tundra species stretches north from the Great Whale River through the Ungava Peninsula, coastal Labrador and Newfoundland. Arctic Hares are also found from Churchill, north along Hudson Bay, and throughout the Canadian Arctic (Hall and Kelson 1959, Peterson 1966).



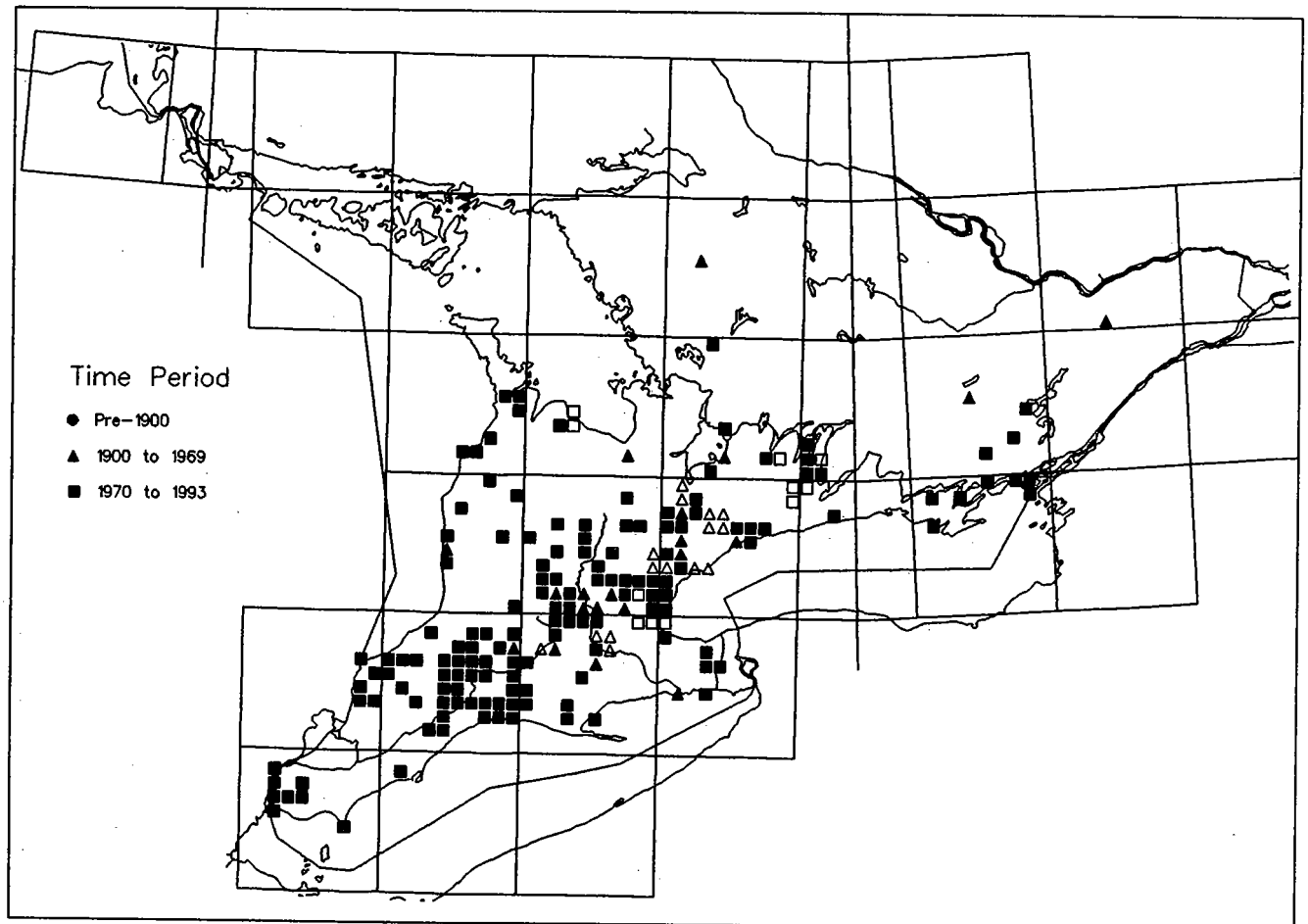
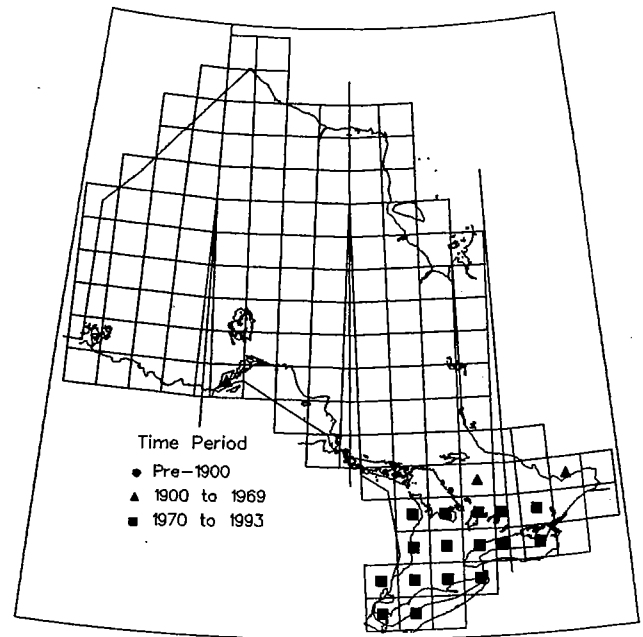
European Hare

Lepus europaeus

The European Hare is the largest of the Ontario hares and rabbits. Native to Europe, the species was introduced to Ontario from a stock of nine animals brought from Germany to Brantford in 1912. The species was well adapted to the new environment and spread throughout southern Ontario as far east as Gananoque by the 1950s and north to Ottawa by 1961 (Dean and de Vos, 1965).

The European Hare is most common in the southwestern part of the province where there is an abundance of its preferred habitat: open fields bordered by woodlots or fence rows. It is a popular small game species.

.. Judith Eger



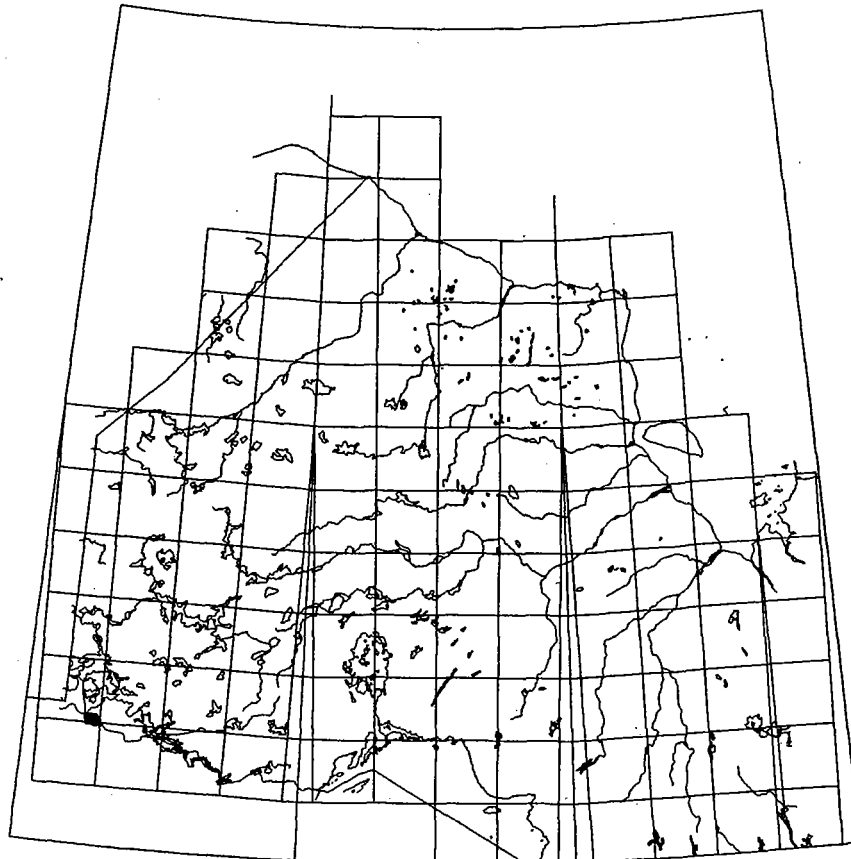
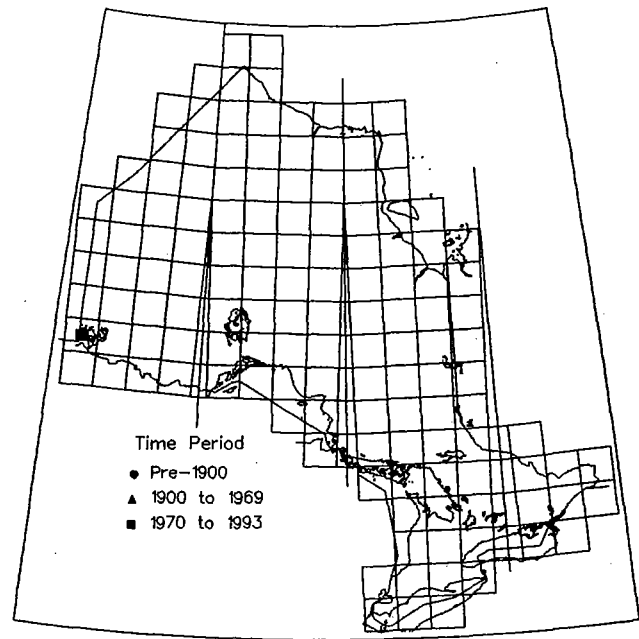
White-tailed Jackrabbit

Lepus townsendii

The White-tailed Jackrabbit is a species of the plains in the midwestern US, southern Alberta, Saskatchewan, and Manitoba. There are three records of the species in northwestern Ontario, two from Rainy River and one from Sleeman (a few kilometres east of Rainy River).

The White-tailed Jackrabbit probably entered Ontario from Manitoba or Minnesota as the species extended its range north and east of the true prairie as a consequence of the land being cleared for agriculture (Jones and Bimey 1988, Peterson 1966). The species has been widely introduced and has become established in areas with appropriate habitat in Wisconsin, excluding the counties bordering the Great Lakes. These introductions are not likely to have affected the expansion of the White-tailed Jackrabbit into northwestern Ontario.

.. Judith Eger



Rodents

Rodentia



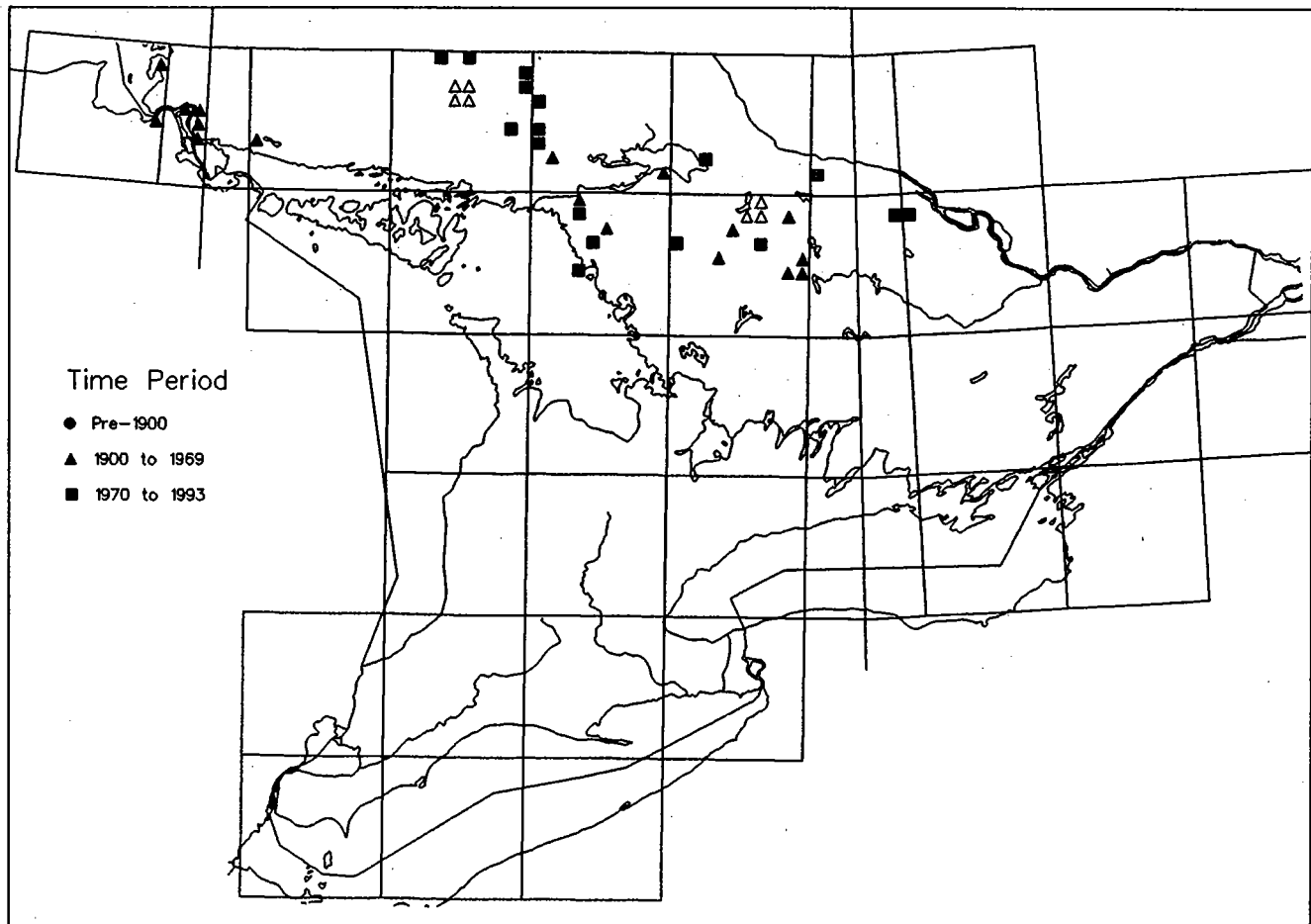
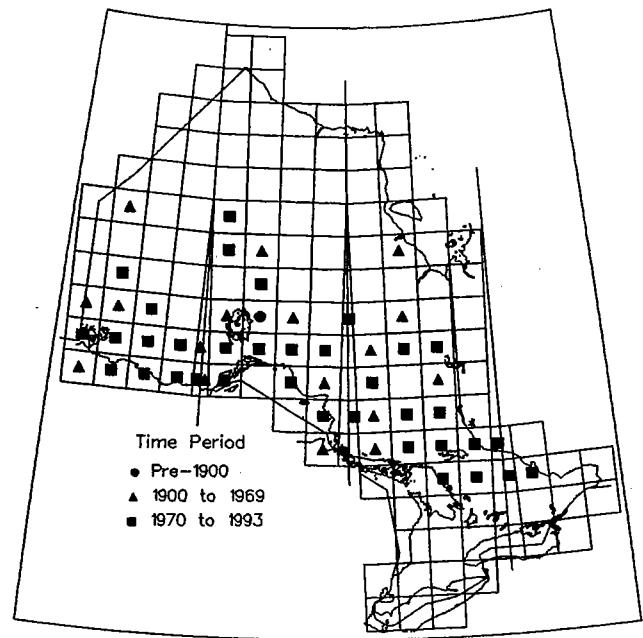
Porcupine: Linda Shaw

Least Chipmunk

Tamias minimus

The Least Chipmunk ranges from western North America into central Canada and the northern Great Lakes states. In Ontario, the species occupies most of the north (except for coastal regions). It is also found as far south as Algonquin Provincial Park and the Magnetawan River in central Ontario where it prefers coniferous habitat. Although the Least Chipmunk is considered to be expanding its range southward (Peterson 1966), its most southern record remains in Algonquin Provincial Park where it was first documented in the late 1940s.

.. Judith Eger

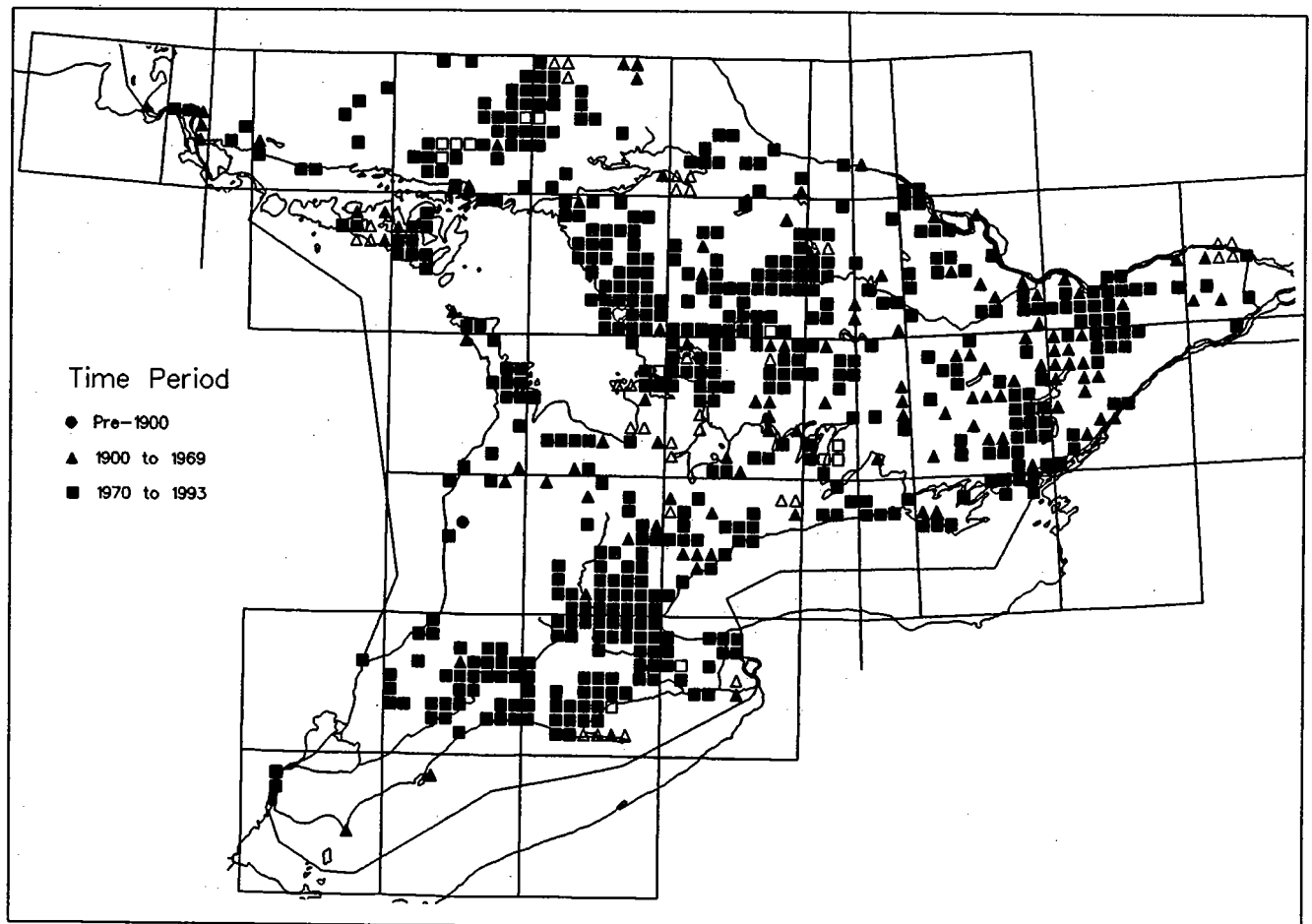
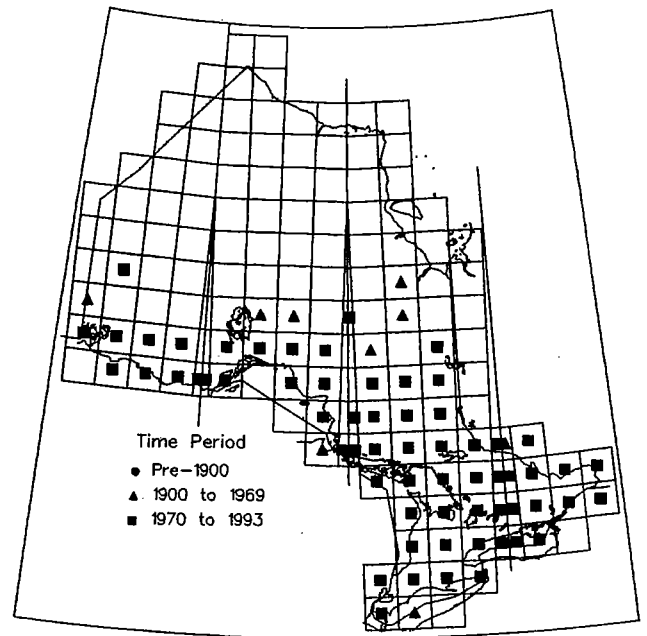


Eastern Chipmunk

Tamias striatus

The Eastern Chipmunk inhabits deciduous hardwood forests of eastern North America, from southeastern Canada to Georgia and Louisiana. In Ontario the species is common from the south to approximately 50° latitude in the north, at which point records are scarce. Mature beech-maple forests support maximum numbers of these chipmunks, although the species prefers open situations and evergreen-deciduous forest edges (Baker 1983).

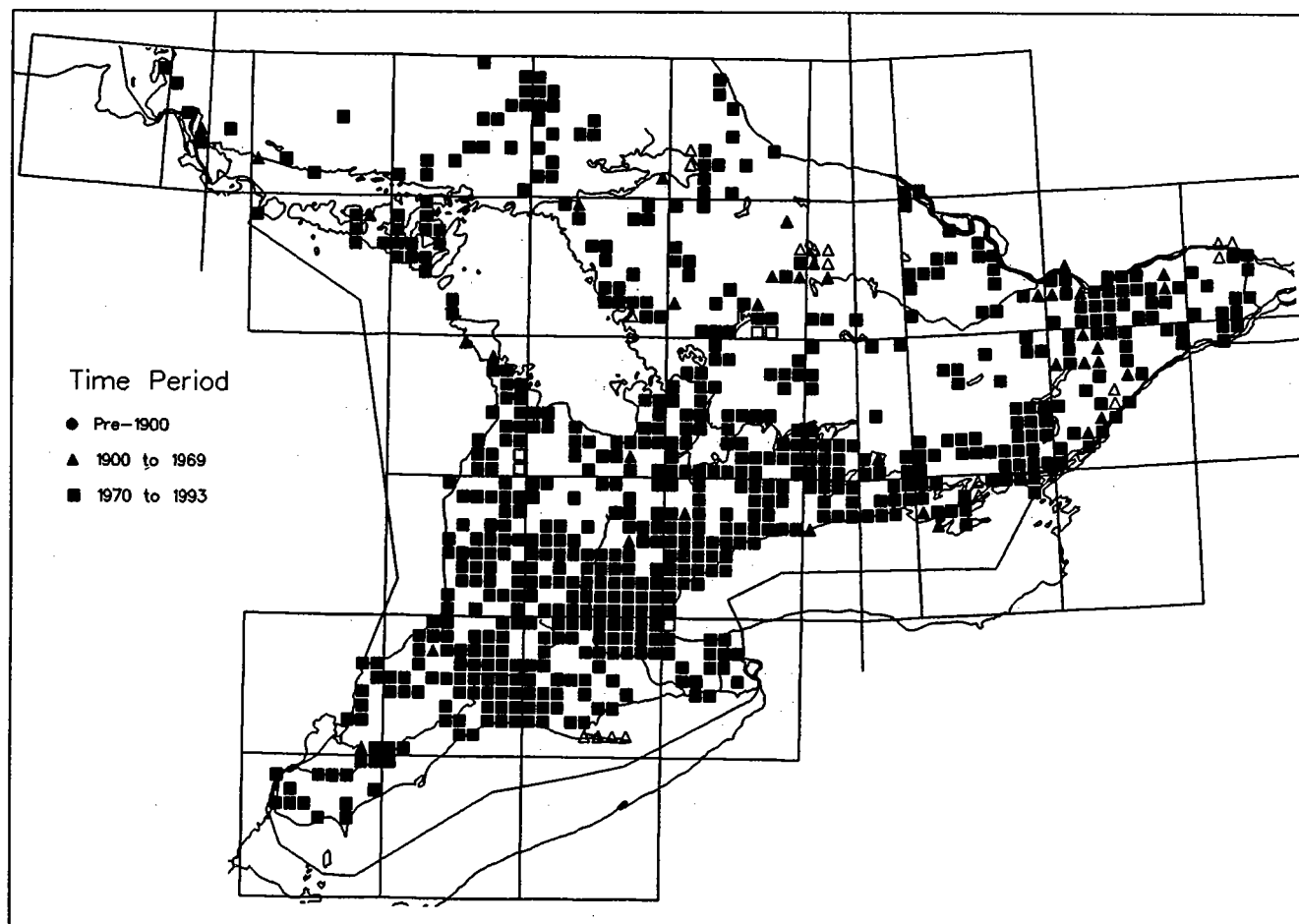
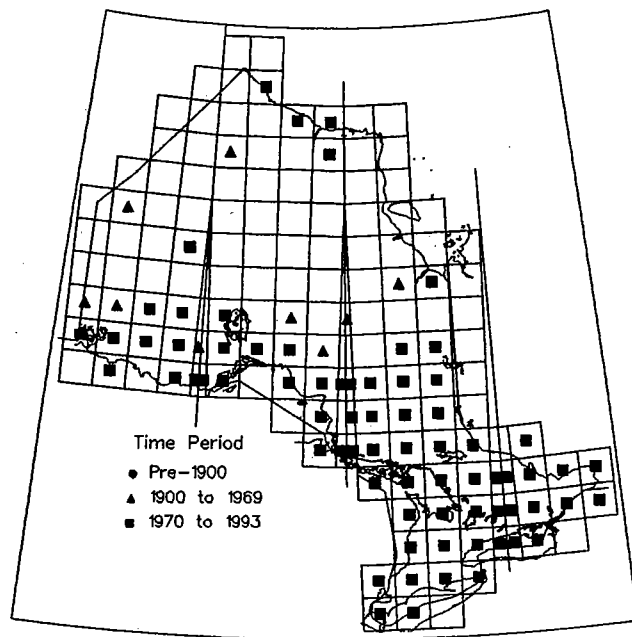
.. Judith Eger



Woodchuck

Marmota monax

The common Woodchuck or Groundhog is the largest member of the squirrel family in Ontario. It ranges throughout the eastern US and all of the Canadian provinces except Newfoundland. In Ontario, the Woodchuck can be found everywhere, except for parts of the Tundra along James and Hudson bays. Woodchucks favour agricultural areas, small woodlots, and open forests but where these are absent, Woodchucks will live in larger, more dense forests.

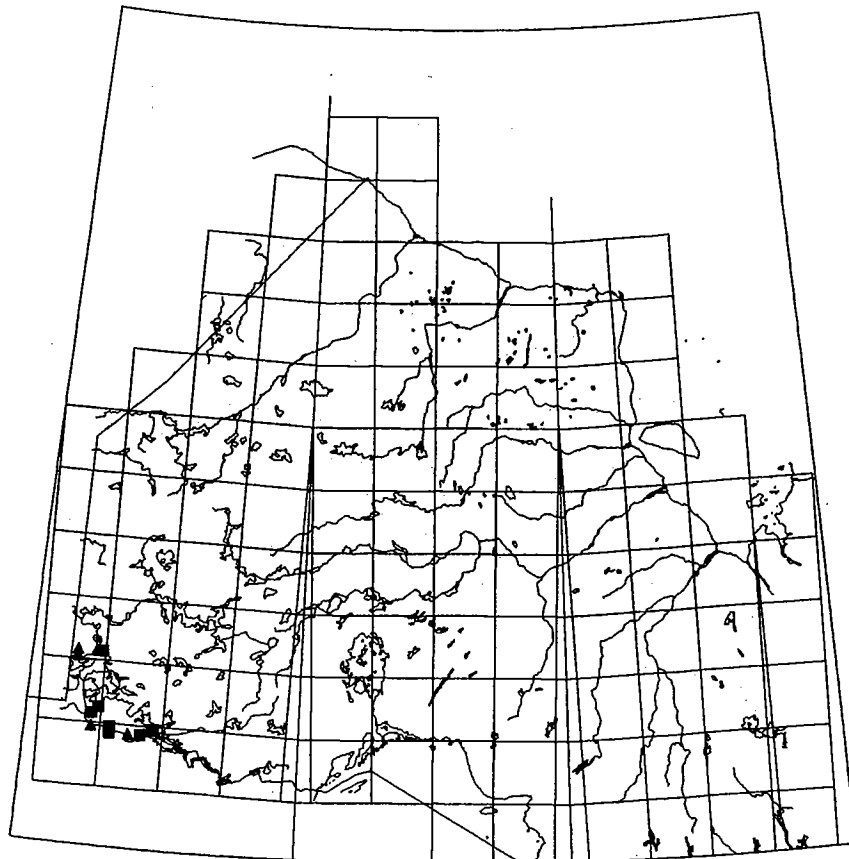
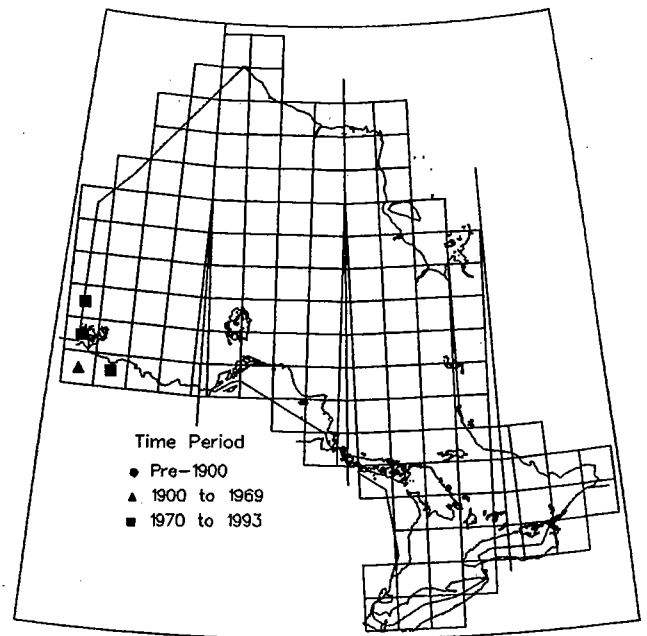


Franklin's Ground Squirrel

Spermophilus franklinii

The Ontario population of Franklin's Ground Squirrels represents a fringe population at the eastern extent of their range. Franklin's Ground Squirrels are generally prairie mammals, ranging through the American prairies from Indiana to Kansas and north into southern Manitoba and central Saskatchewan. Forest clearing in the southern parts of northwestern Ontario allowed Franklin's Ground Squirrels to move into the province. This ground squirrel can now be found in the Fort Francis, Kenora, and Rainy River areas.

Although this squirrel was able to move into the Rainy River area, it is unlikely that it will spread much further. Areas north and east of its present Ontario range are primarily forested, with insufficient soil depths for this burrowing, hibernating mammal.



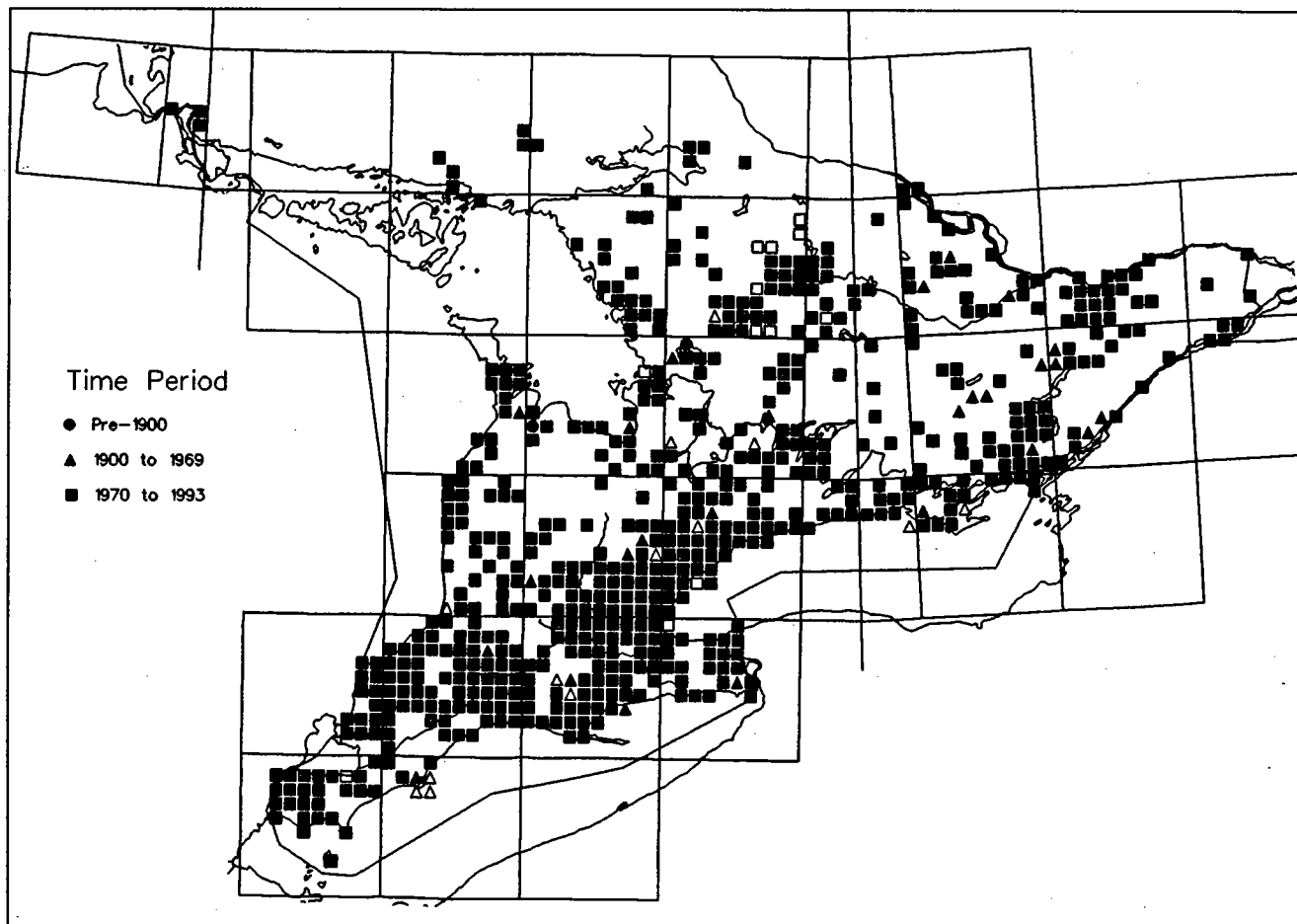
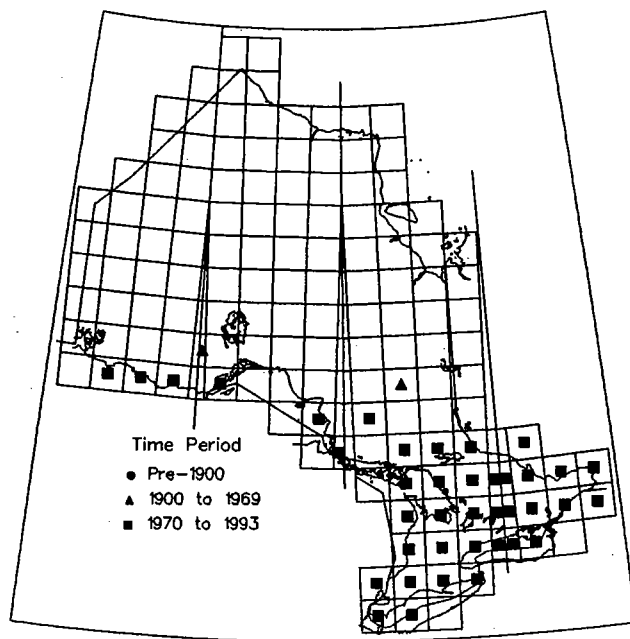
Gray Squirrel

Sciurus carolinensis

The Gray Squirrel is one of the most common mammals in Ontario urban centres. The species has two colour phases: gray and black. For specific information concerning each colour phase, see their respective accounts.

The Gray Squirrel inhabits the eastern broad-leaved deciduous forests of southern Canada and the US. The Gray Squirrel was formerly rare in northern regions such as Algonquin Provincial Park (Peterson 1957), but has since become more common. In Ontario, the species is now common as far north as Parry Sound with occasional records to lake Nipissing. A single specimen from Gogama district was collected in 1948. However, this record is likely beyond the normal range of the species. Gray Squirrels are also found in the Rainy River area, and along the Ontario-Minnesota border in northwestern Ontario. Further northern expansion of the Gray Squirrel's range will be limited by the distribution of deciduous forest.

.. Judith Eger



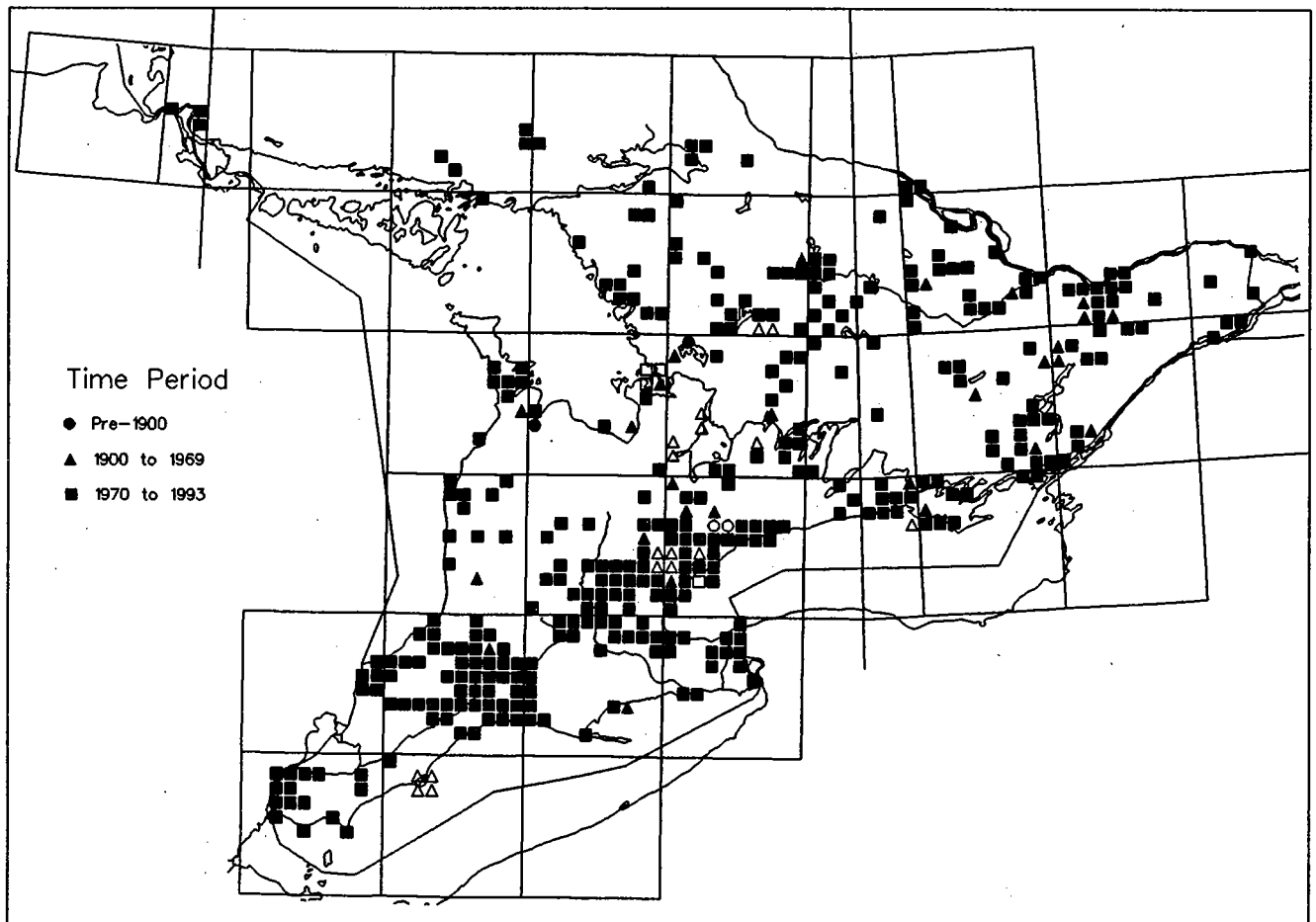
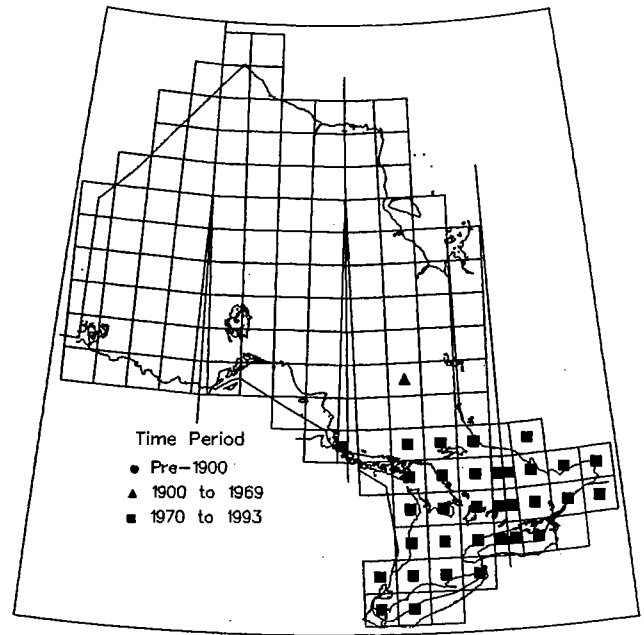
Gray Squirrel Black Phase

Sciurus carolinensis

The black phase of the Gray Squirrel is more common in central Ontario than the gray phase. Throughout the entire range of the Gray Squirrel, melanistic squirrels (including the black colour phase) live primarily where there is snow in winter. Experimental work at the University of Guelph indicated that black-phase animals exhibited lower energy expenditure during winter than gray morphs (Innes and Lavigne 1979). Therefore, the more efficient thermoregulation of the black phase may be more advantageous in colder areas.

Black-phase animals have been found as far west as Sault Ste. Marie and as far north as Gogama District, although the latter record is clearly an isolated one.

.. Judith Eger

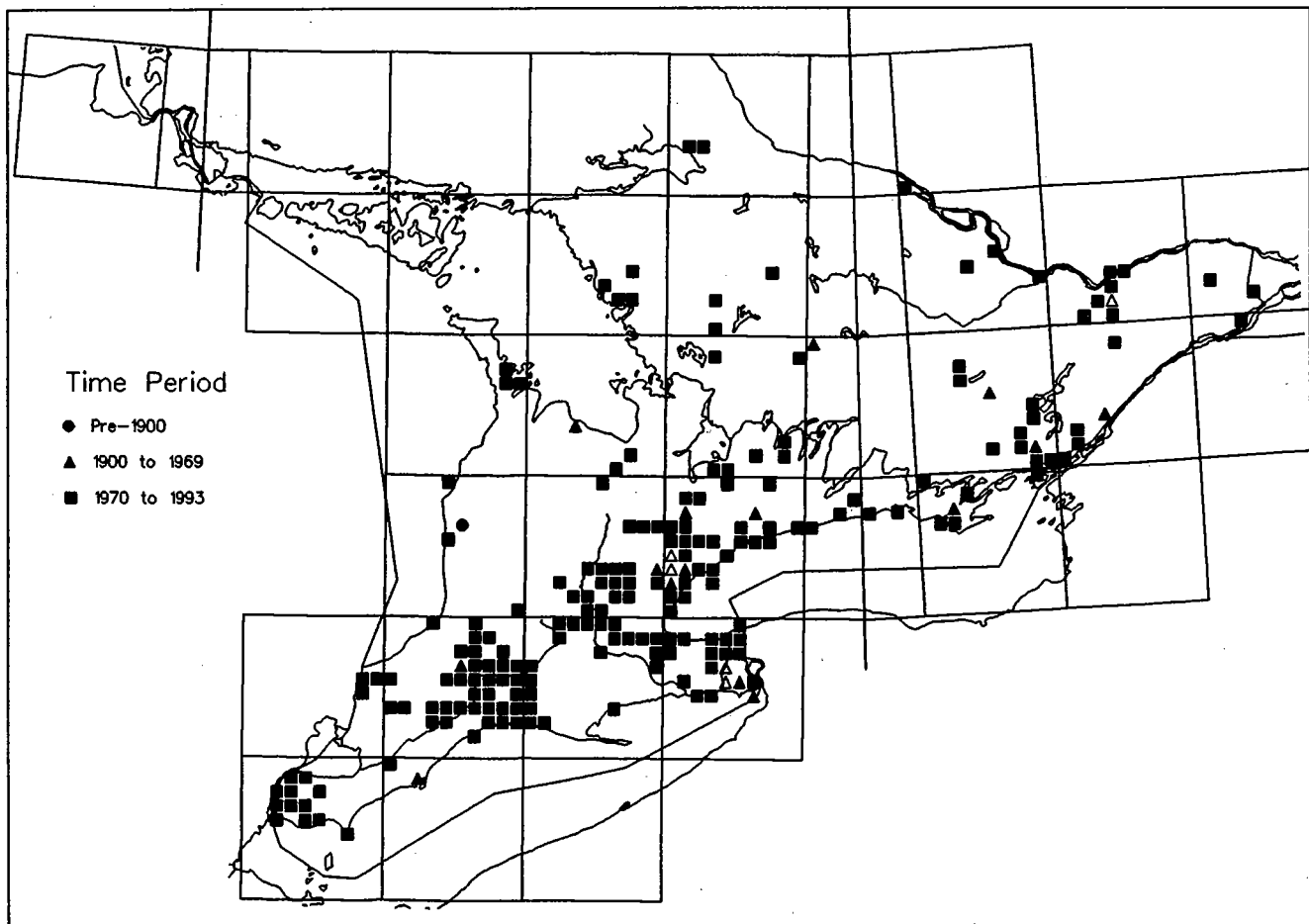
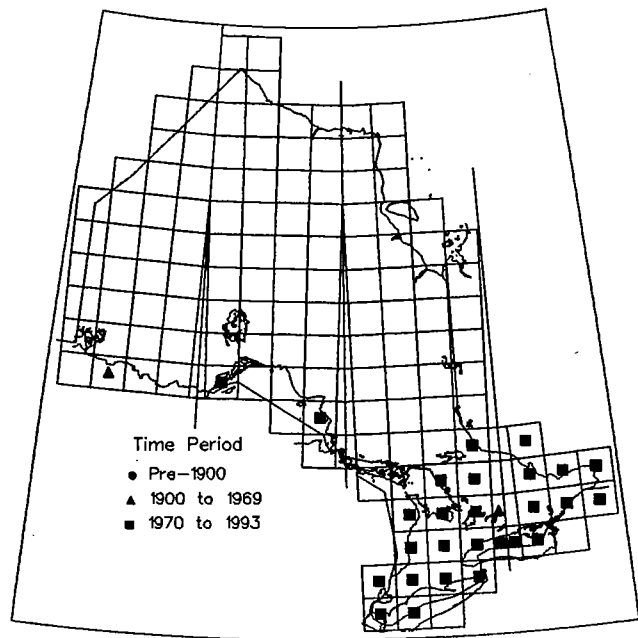


Gray Squirrel Gray Phase

Sciurus carolinensis

The gray colour phase from which the species derives its common name is most common in the southern parts of Gray Squirrel range. In Ontario the gray-phase and black-phase animals have a similar distribution, although there are fewer records of the gray phase, especially in central Ontario. Squirrels that have been identified to colour in northwestern Ontario have been gray-phase individuals, as are the Gray Squirrels from northern Minnesota.

.. Judith Eger

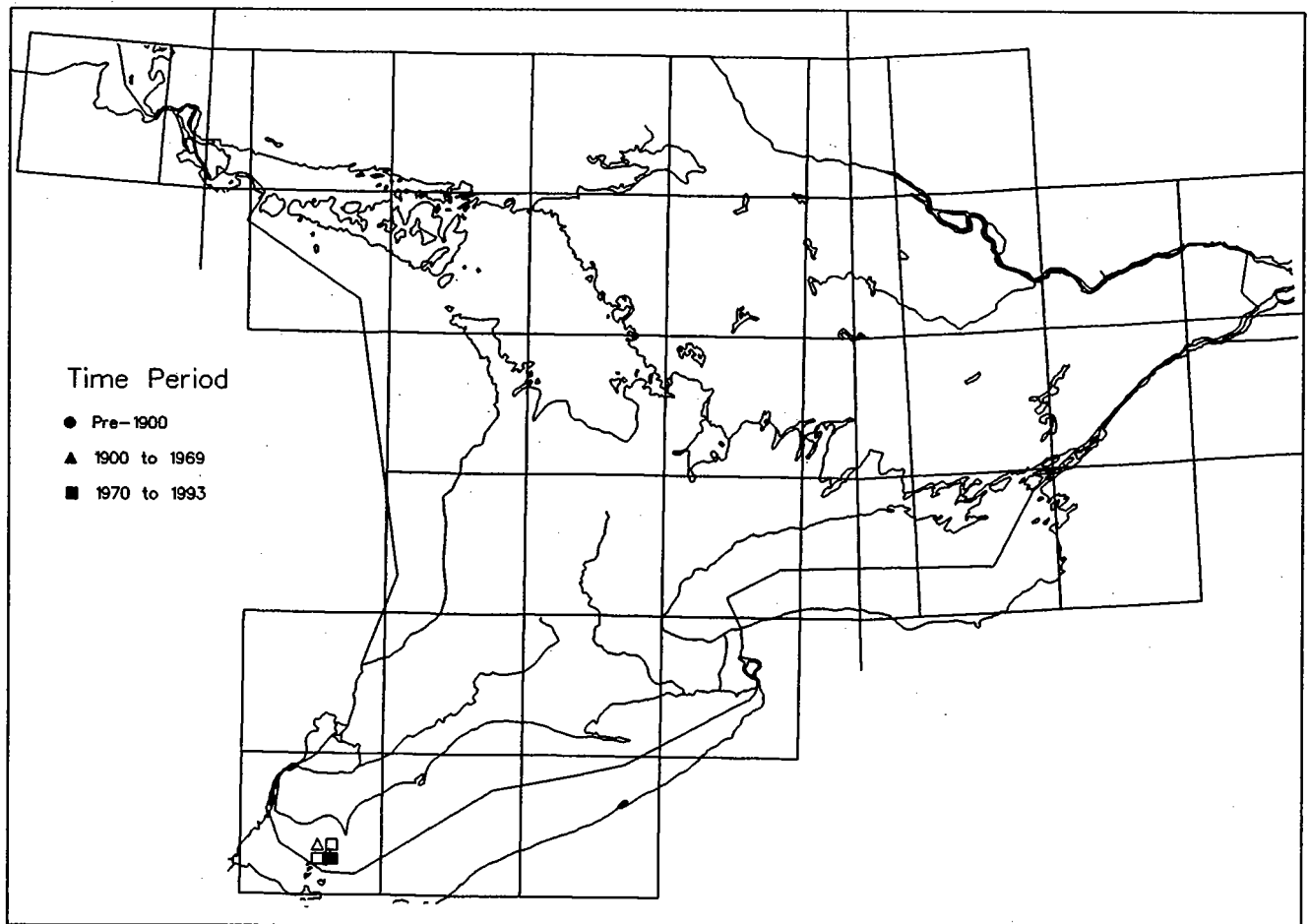
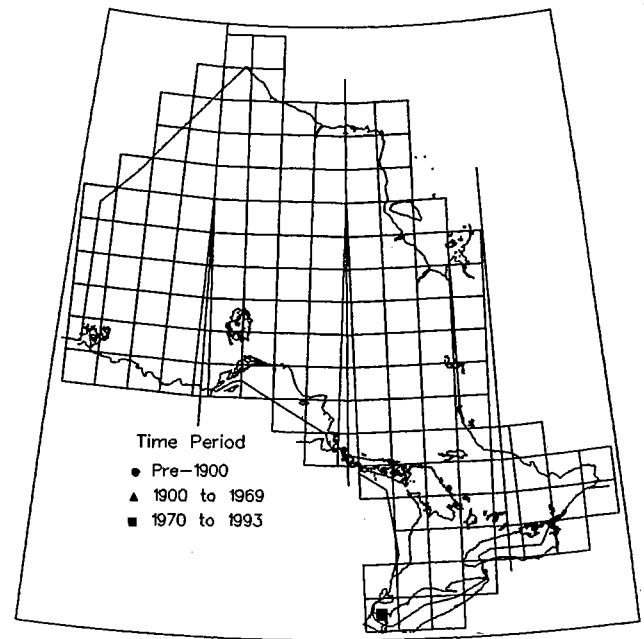


Fox Squirrel

Sciurus niger

The Fox Squirrel is the largest tree squirrel living in the province. However, it is not native to Ontario. It was introduced from Ohio to Pelee Island and parts of the Ontario mainland (Peterson 1966). The mainland introductions were not successful, though, and currently Pelee Island is the only location in Ontario where the Fox Squirrel can be found. In the US, Fox Squirrels are found in the eastern states as far north as Lake Erie.

The Fox Squirrel thrives in agricultural areas interspersed with small woodlots. It was originally associated with the southern oak and hickory forests of the US, but has spread north with settlement and agricultural development.



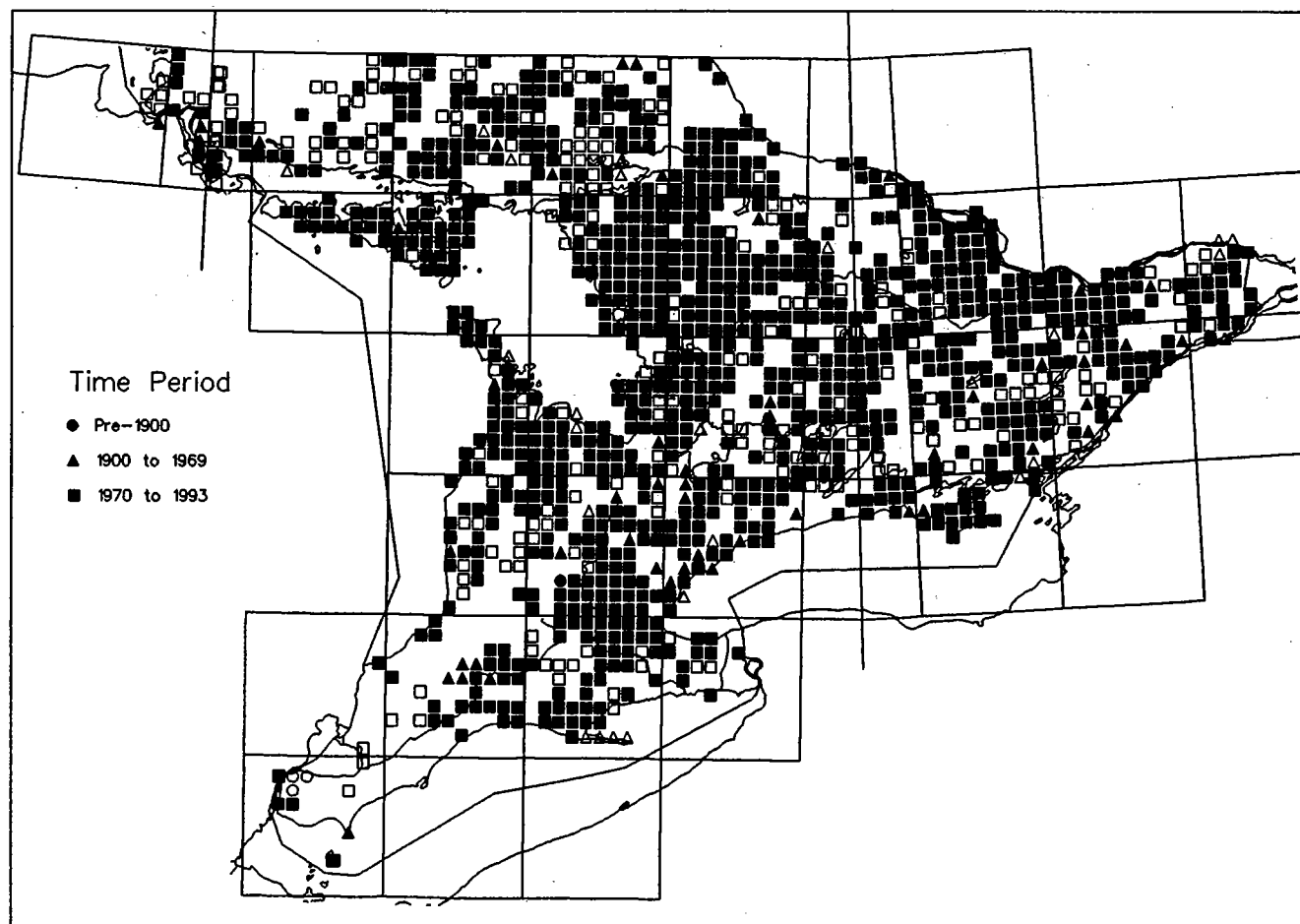
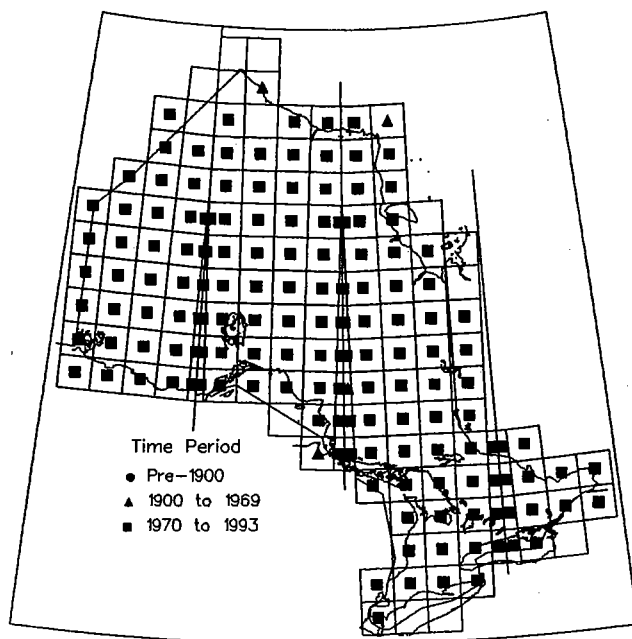
Red Squirrel

Tamiasciurus hudsonicus

The Red Squirrel is found in the Boreal and montane forests of North America. Within Canada, it is found below the tree line, but is absent from the prairies. In Ontario, the Red Squirrel can be found throughout the province, although records become scarce in southwestern Ontario where spruce and pine are not as prevalent.

Although Red Squirrels have not been seriously exploited for their fur, ample data do exist to provide a detailed distribution map for the species. The Red Squirrel is easily identified by direct observation, tracks, and vocalizations.

.. Judith Eger



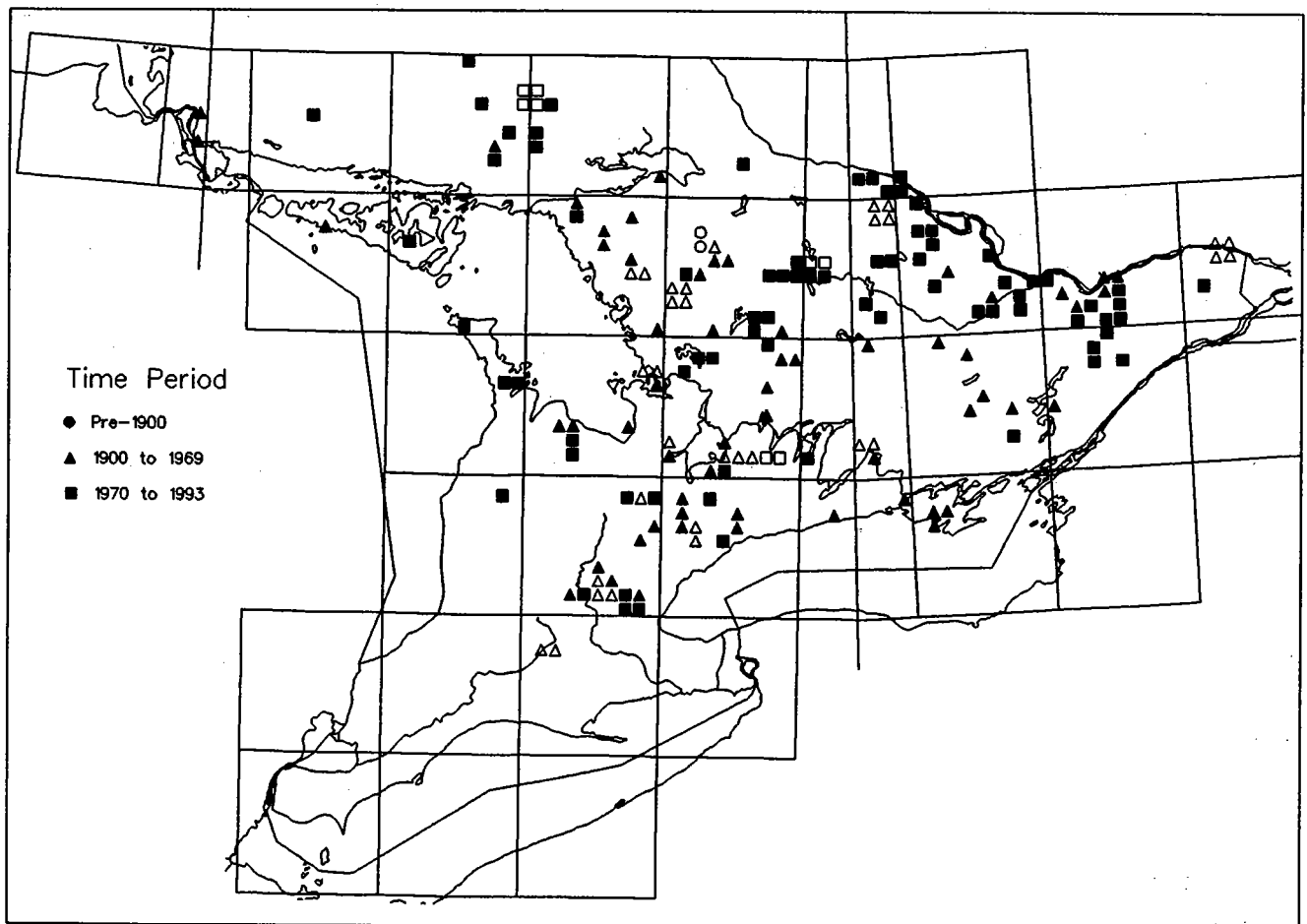
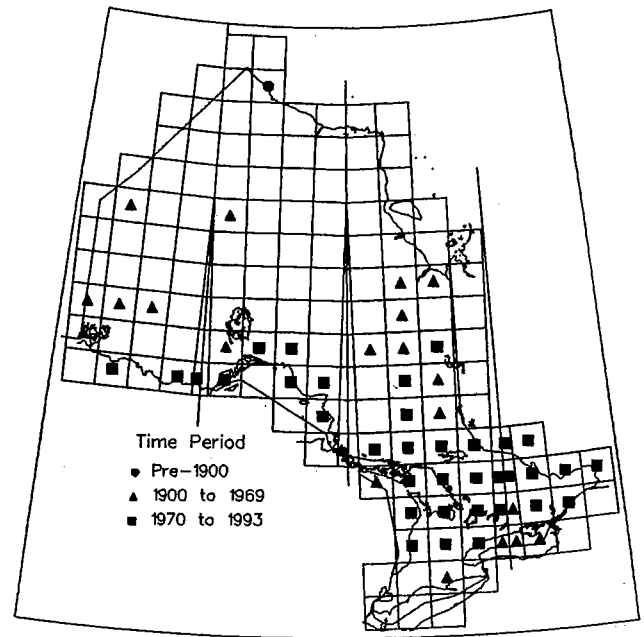
Northern Flying Squirrel

Glaucomys sabrinus

The Northern Flying Squirrel is larger than the Southern Flying Squirrel, and shows subtle colour differences. In North America, the Northern Flying Squirrel is found in Boreal and evergreen forests from the tree line in Canada and Alaska, south to the montane forests of California, Colorado, North Carolina and Tennessee. In Ontario, the Northern Flying Squirrel is found from southern Ontario, to the tree line.

Whereas the range of this animal overlaps that of the Southern Flying Squirrel (both are occasionally found in the same woodlot), they are generally distinguishable by habitat preference. The Northern Flying Squirrel prefers mixed or coniferous forests, while the Southern Flying Squirrel favours mature hardwood forests.

.. Judith Eger



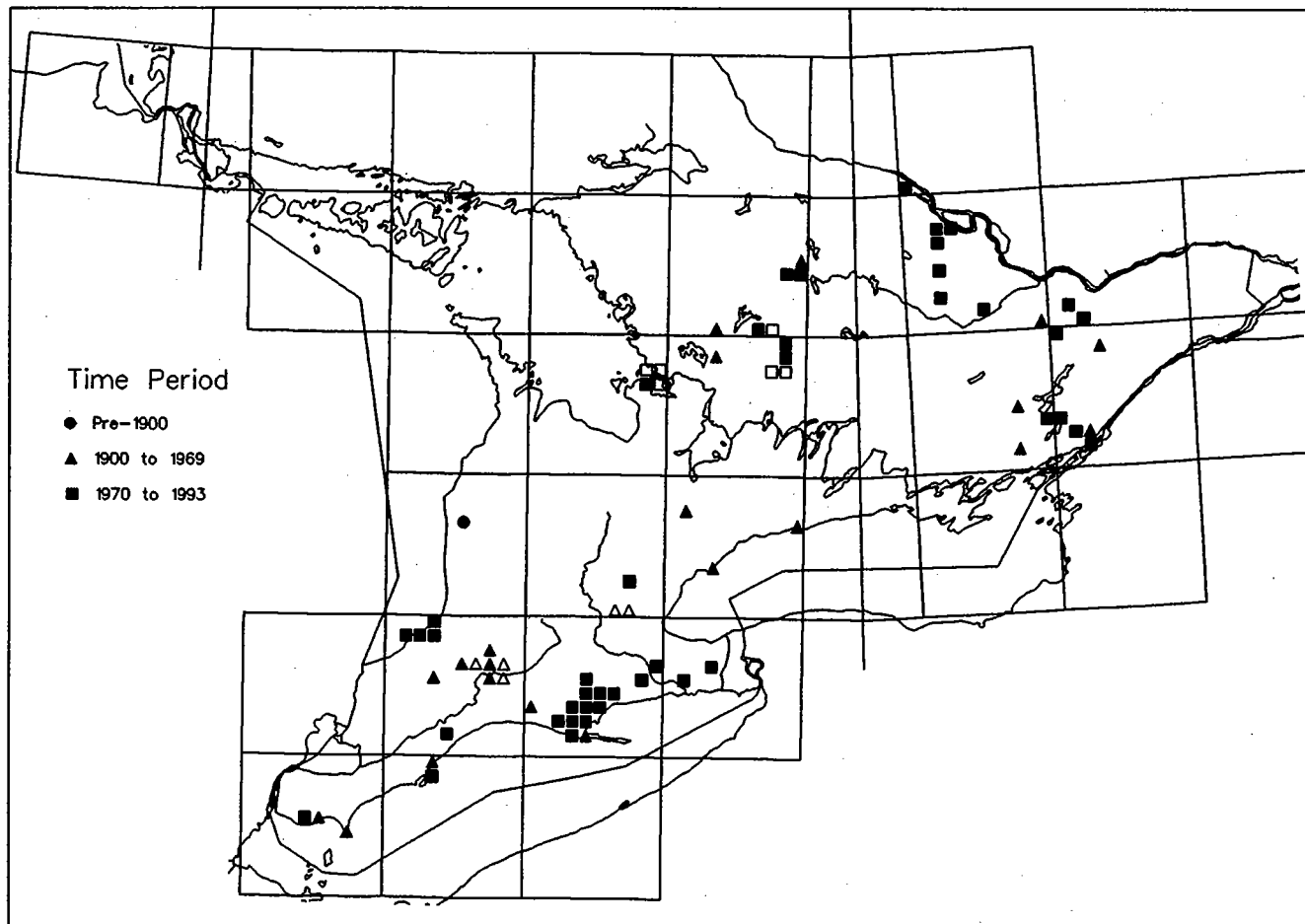
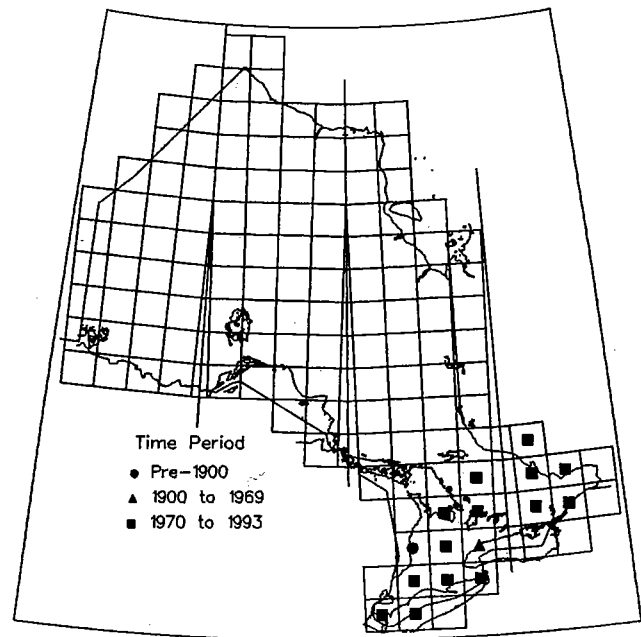
Southern Flying Squirrel

Glaucomys volans

The Southern Flying Squirrel occupies the deciduous forests of eastern North America. Within Ontario, this species is most commonly found in the Carolinian Forest north of Lake Erie, but can also occasionally be found throughout the rest of southern Ontario, north to Deep River and Parry Sound District.

Although the Southern Flying Squirrel has been recorded in a number of locations throughout southern Ontario, it is found only in areas with mature hardwood forests (particularly maple, beech, or oak). This close association with the disappearing Carolinian Forest region has prompted the Ontario Ministry of Natural Resources to designate the Southern Flying Squirrel a rare species.

.. Judith Eger

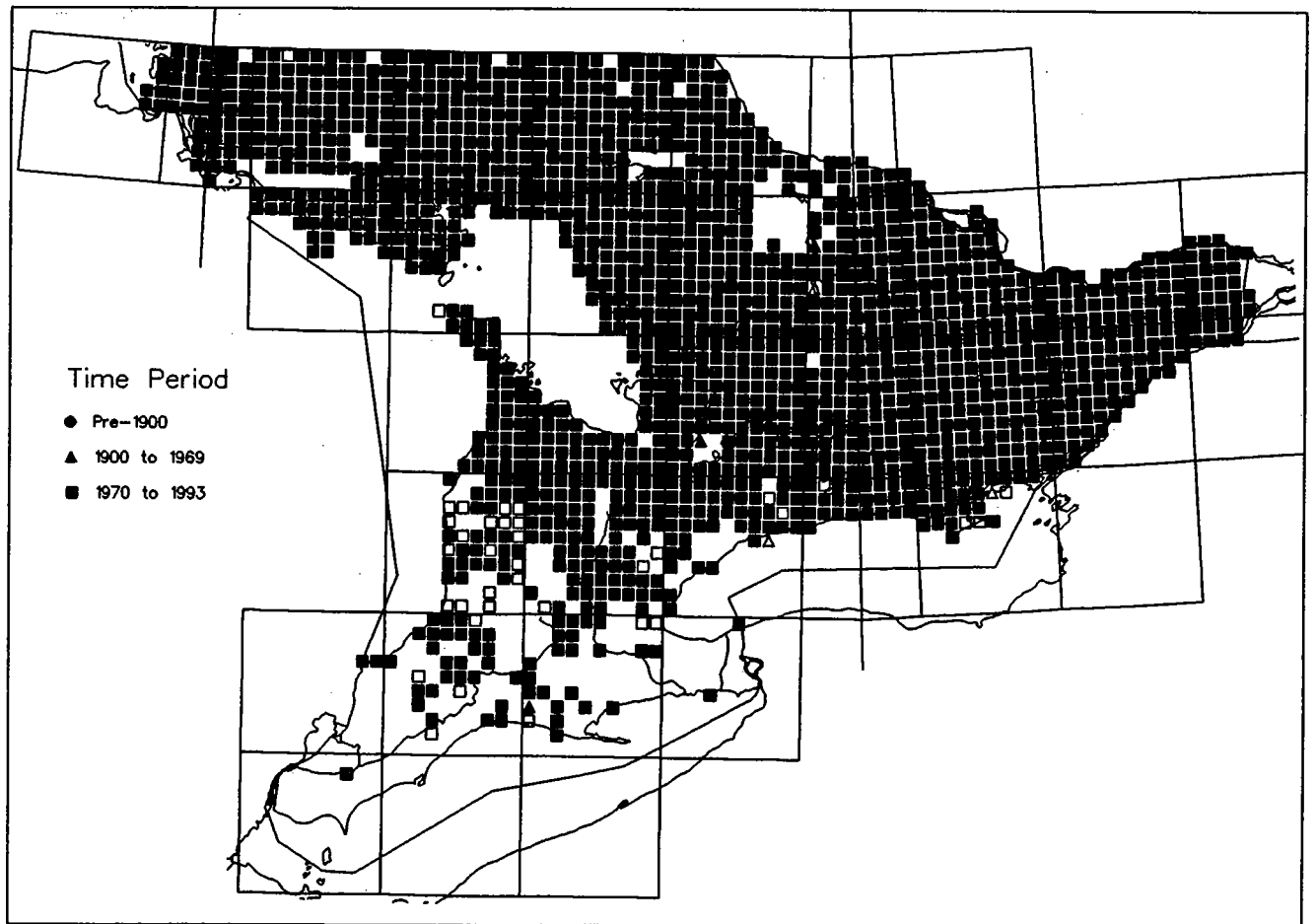
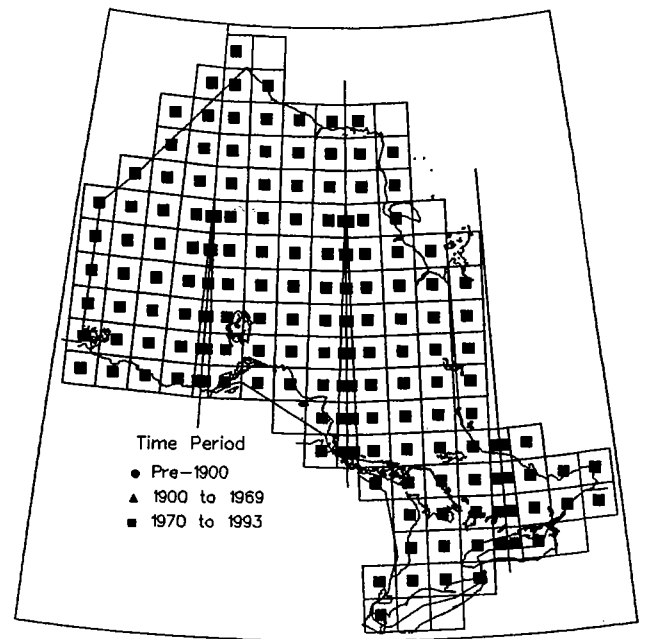


Beaver

Castor canadensis

Canada's official animal is common throughout most of Canada and the US. Within Ontario, Beavers are found in all parts of the province with the exception of southwestern Ontario, where only a few are found because of a lack of suitable water habitat.

Historically, Beavers ranged throughout Ontario before the fur trade caused severe population depletion. Comprehensive fur management programs which began in 1911 have resulted in a dramatic recovery of this species in Ontario. The recovery of Beavers has not met with widespread approval; excessive dam-building can interrupt agriculture through flooding and by impeding drainage and irrigation ditches. Beaver dams may also inhibit fish migration. Conversely, dams create excellent habitat for ducks and many species of mammals, birds, reptiles, and amphibians.

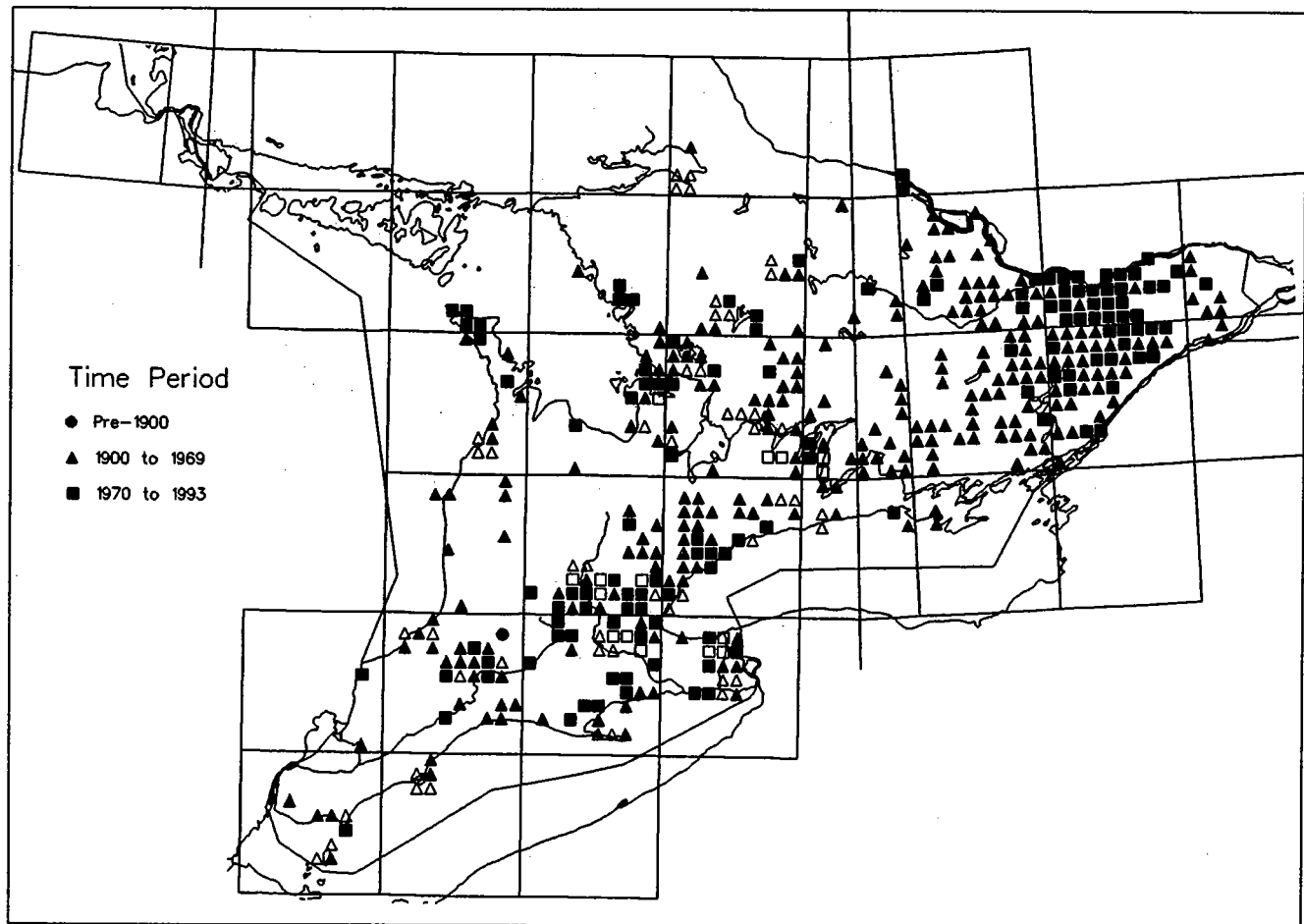
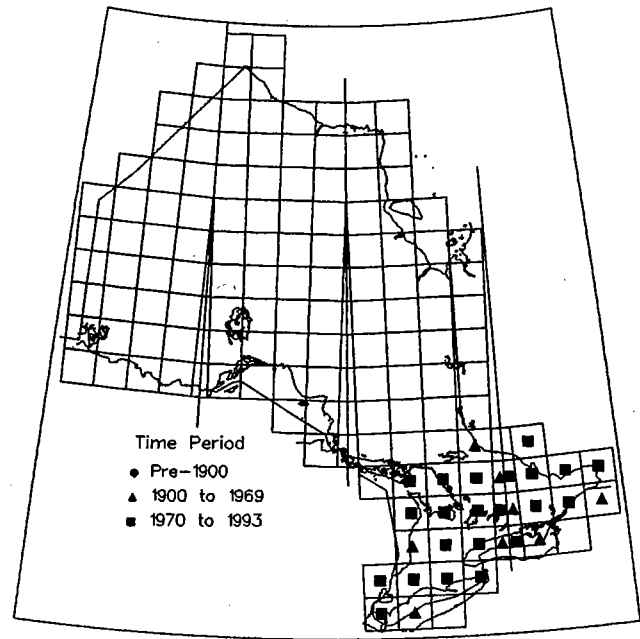


White-footed Mouse

Peromyscus leucopus

The White-footed Mouse is a close relative of the common Deer Mouse. It ranges throughout the eastern and central US and southern parts of Ontario, Quebec, and Nova Scotia. In Ontario, the White-footed Mouse is found from the southern portions of the province north to North Bay.

White-footed and Deer mice are often mistakenly thought of as being one-in-the-same (and are referred to as "White-footed Deer Mice"). Identification is difficult, but the two species are distinguishable. Identification is based upon several characteristics including tail and ear lengths, pelage colour, and pencil hair length. For detailed information on these characteristics, consult Burt (1957) or Peterson (1966).

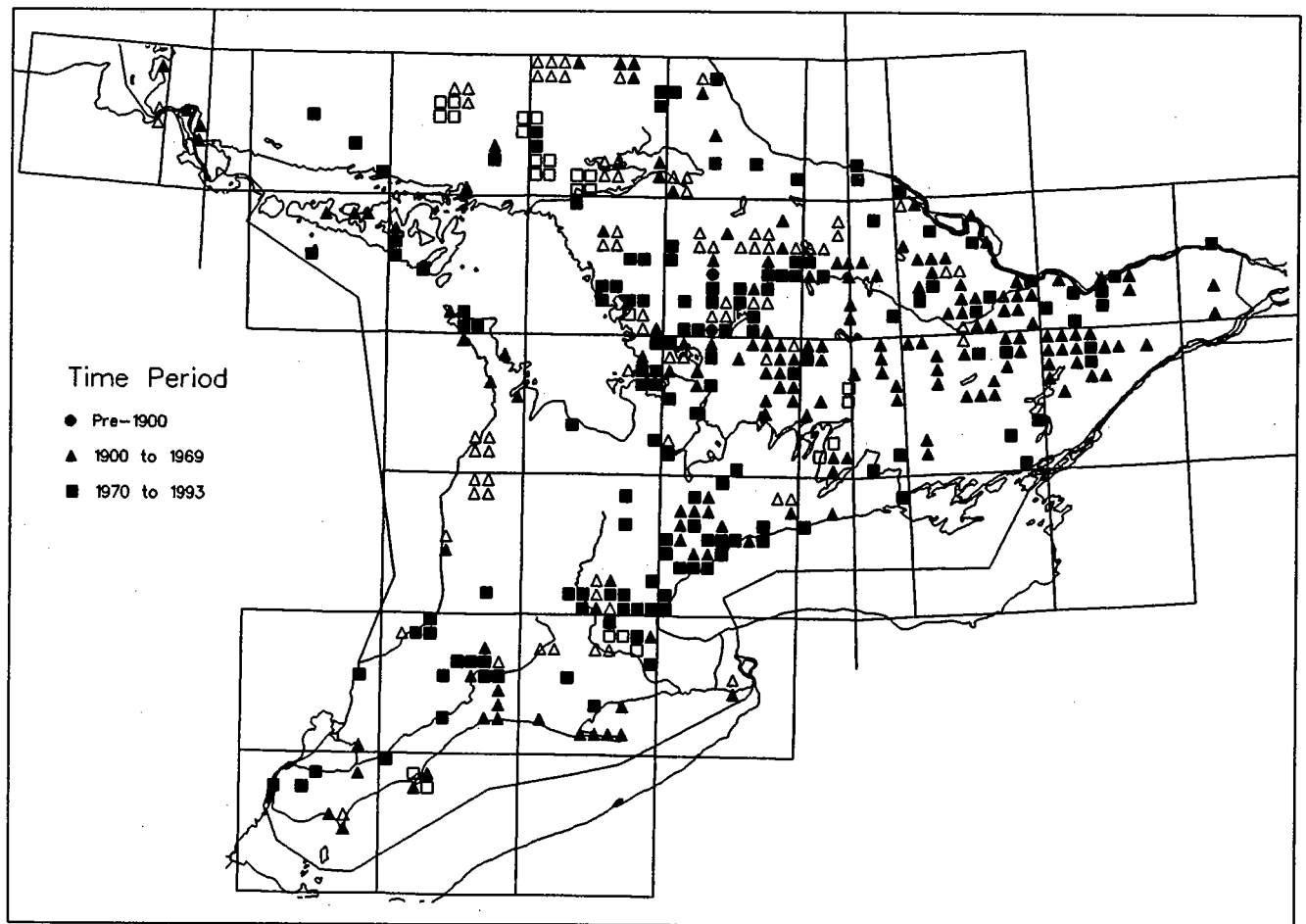
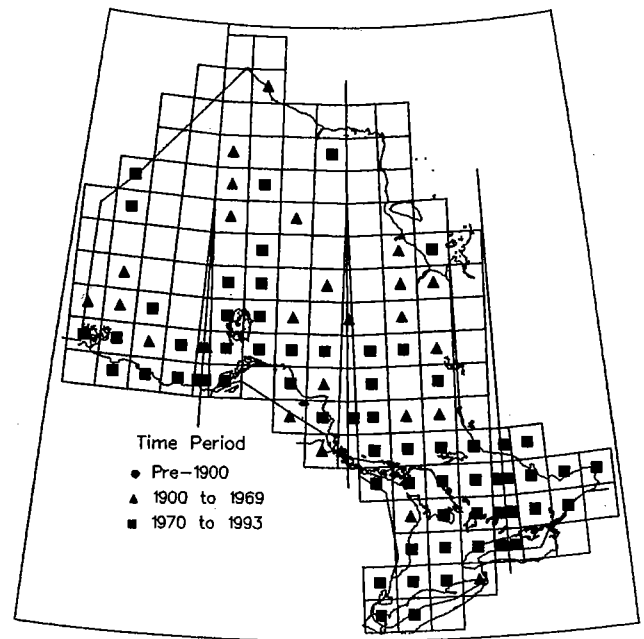


Deer Mouse

Peromyscus maniculatus

The Deer Mouse is one of the most wide-ranging small rodents in North America. It is found throughout the US (except in the south-east) and Canada (south of the Tundra). In Ontario, it can be found in all parts of the province except the Cape Henrietta Maria region at the junction of James and Hudson bays (Peterson 1966).

There are several distinct races of Deer Mice in North America, three of which can be found in Ontario (*P. m. bairdii*, *P. m. maniculatus*, and *P. m. gracilis*) (Peterson 1966). Each of the three races has adapted to a different habitat type and this adaptation has contributed to the successful colonization of a wide geographic area.

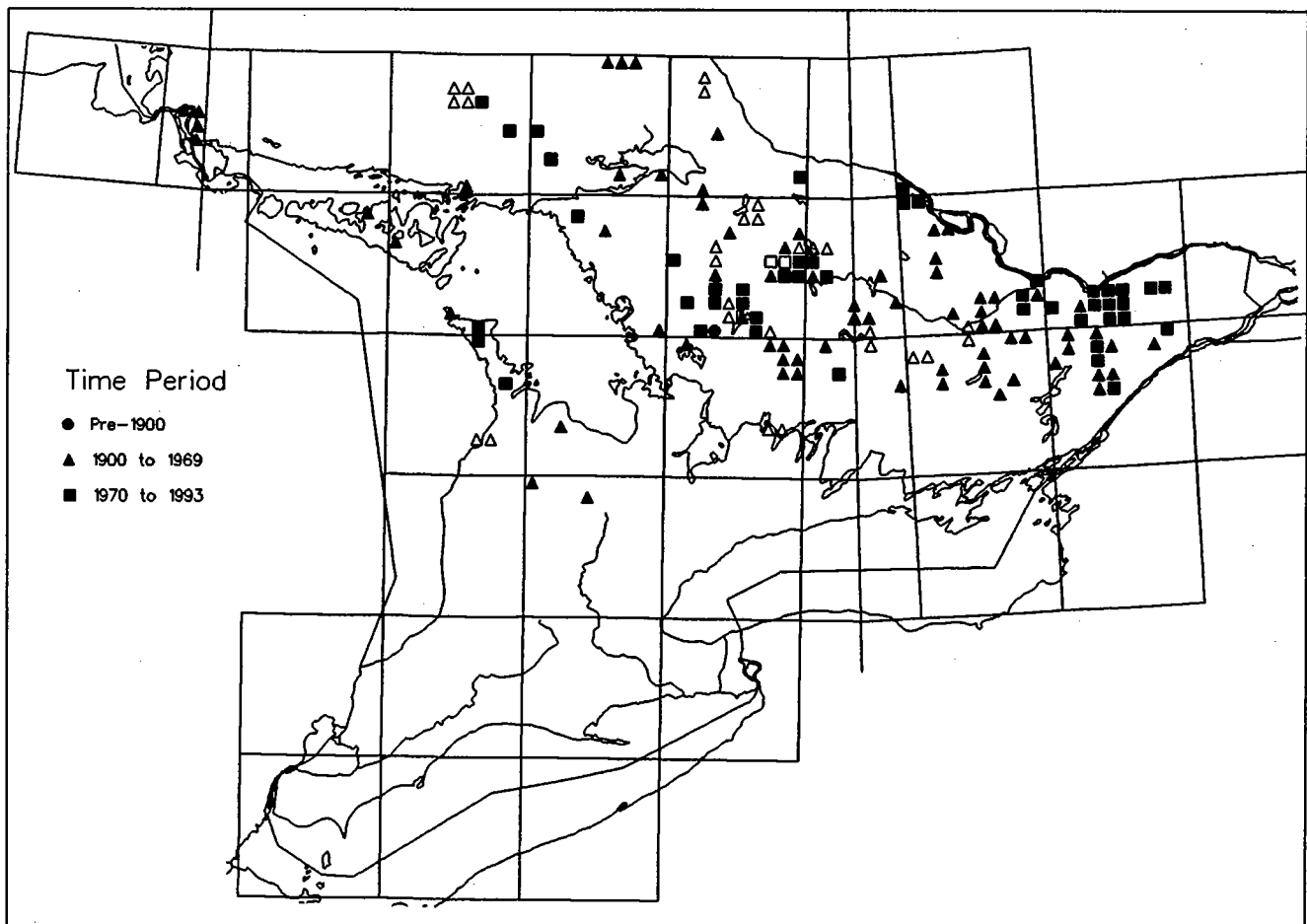
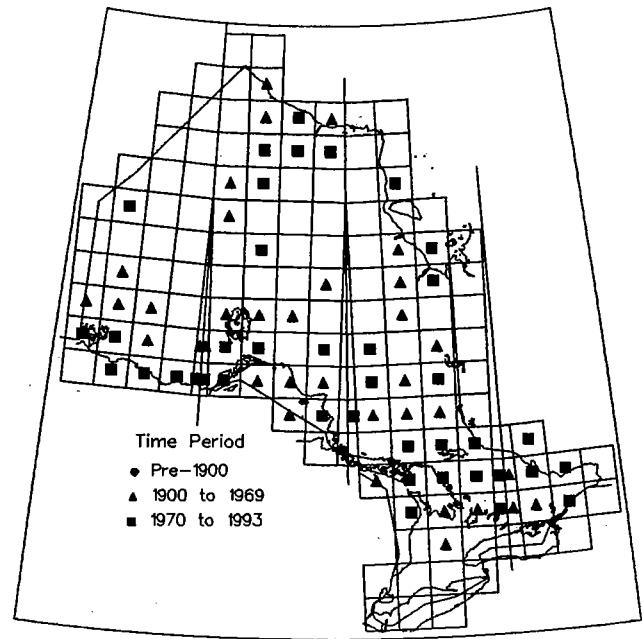


Southern Red-backed Vole

Clethrionomys gapperi

The Southern Red-backed Vole is a familiar occupant of northern US and Canadian forests. In Ontario, it is found from Grey and Bruce counties north to Hudson Bay (except in the Cape Henrietta Maria area) (Peterson 1966).

The Southern Red-backed Vole is readily distinguished from other members of the vole family by a distinct dorsal band that extends from its forehead to rump and varies in colour from yellowish-brown to reddish or even blackish (Peterson 1966). The Southern Red-backed Vole occupies both deciduous and coniferous forests, particularly in damp or swampy areas with deep litter.

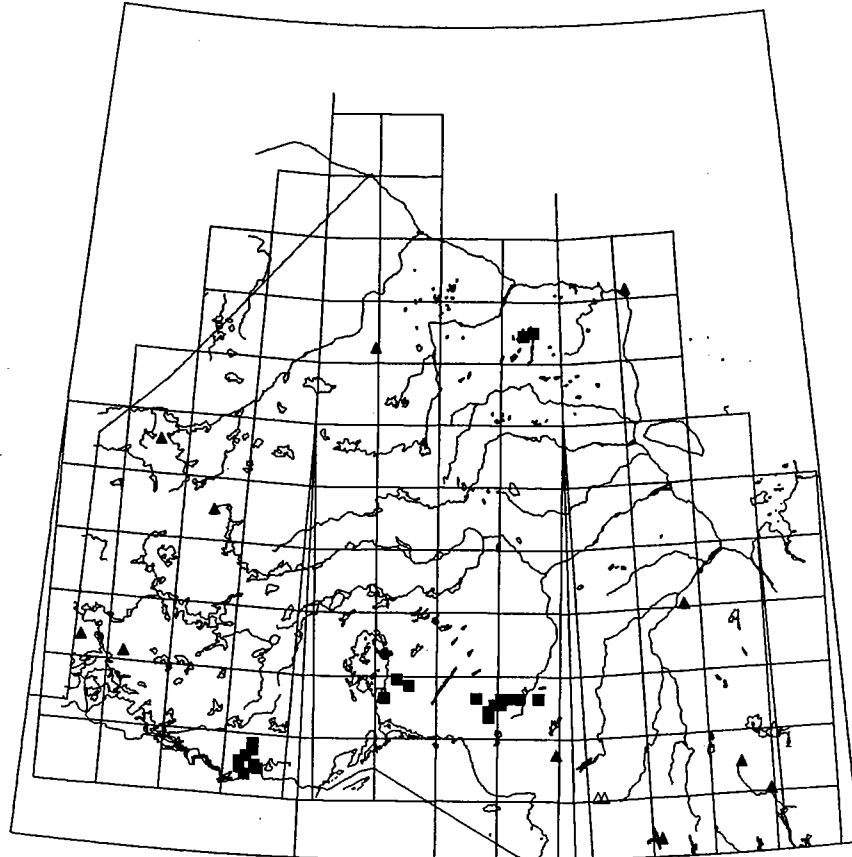
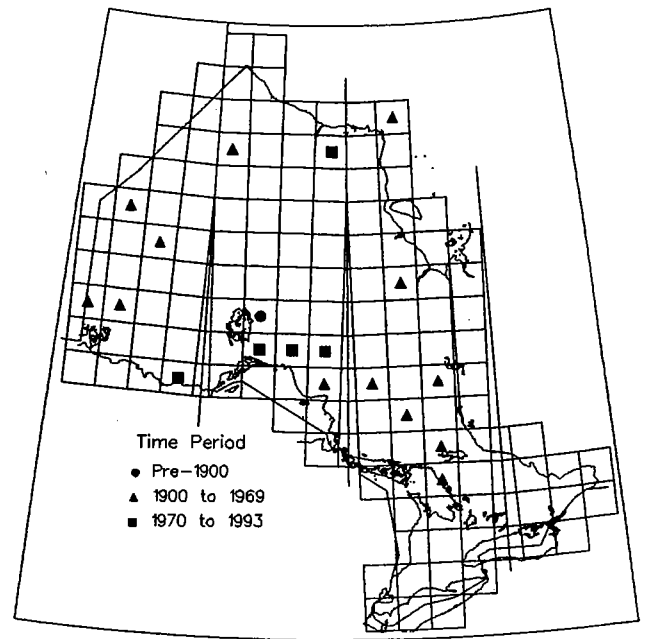


Heath Vole

Phenacomys intermedius

The Heath Vole is found across central and southern Canada except in parts of southern Ontario, Saskatchewan, and Alberta. In Ontario, it has been found north of a line extending from the French River to Lake Nipissing and the Ottawa River.

The Heath Vole has not been well-documented and only a few reliable records exist. Sometimes, the Heath Vole is mistaken for the Rock Vole. However, there are distinguishing features: the Heath Vole's tail is 45 mm or shorter, while the Rock Vole's tail is longer than 45 mm; the Heath Vole has a yellow colouring around its nose while the colouring around the Rock Vole's nose is more yellow-red (Burt 1957, Peterson 1966).

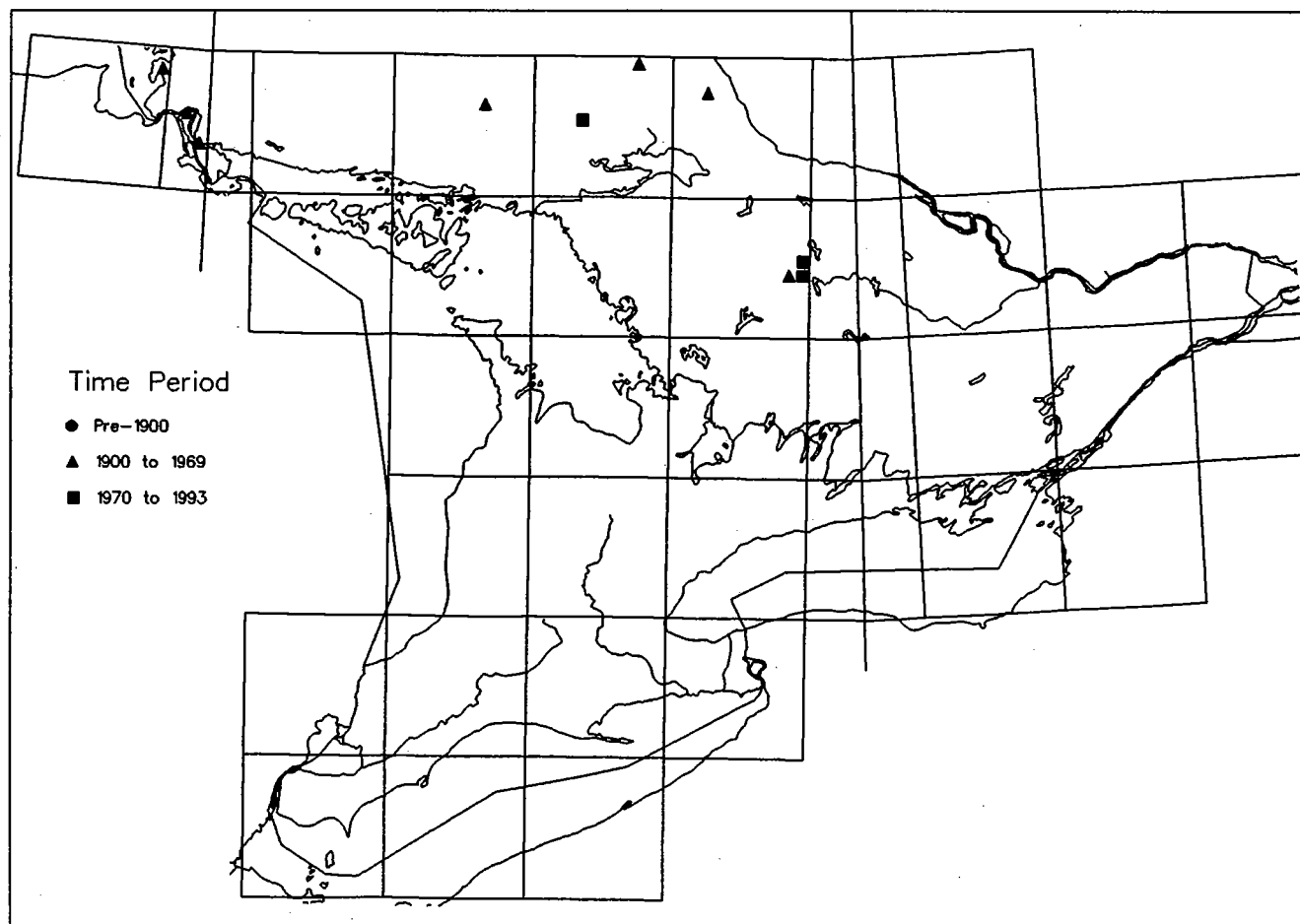
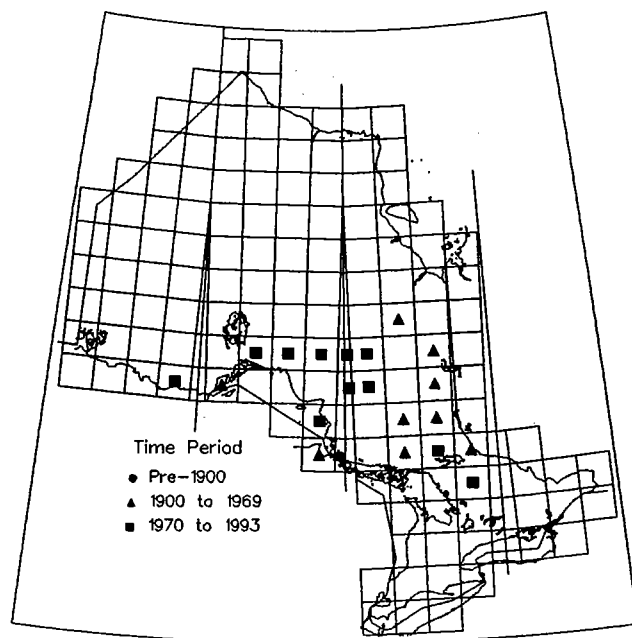


Rock Vole

Microtus chrotorrhinus

The Rock Vole is restricted to a small area of eastern North America. It is found in parts of Ontario, southern Quebec, the Maritimes, and a small area of the eastern US. In Ontario, it ranges throughout northeastern and northcentral regions, from as far west as Quetico Provincial Park and as far south as Algonquin Provincial Park.

The Rock Vole is similar in appearance to the Heath Vole. However, colouring around the nose of the Rock Vole tends to be reddish in contrast to the yellow hue around the nose of the Heath Vole. The tail of the Rock Vole is longer than that of the Heath Vole, usually exceeding 45 mm. The species has been found in association with rock outcrops, talus slopes, and other rocky areas (Peterson 1966).

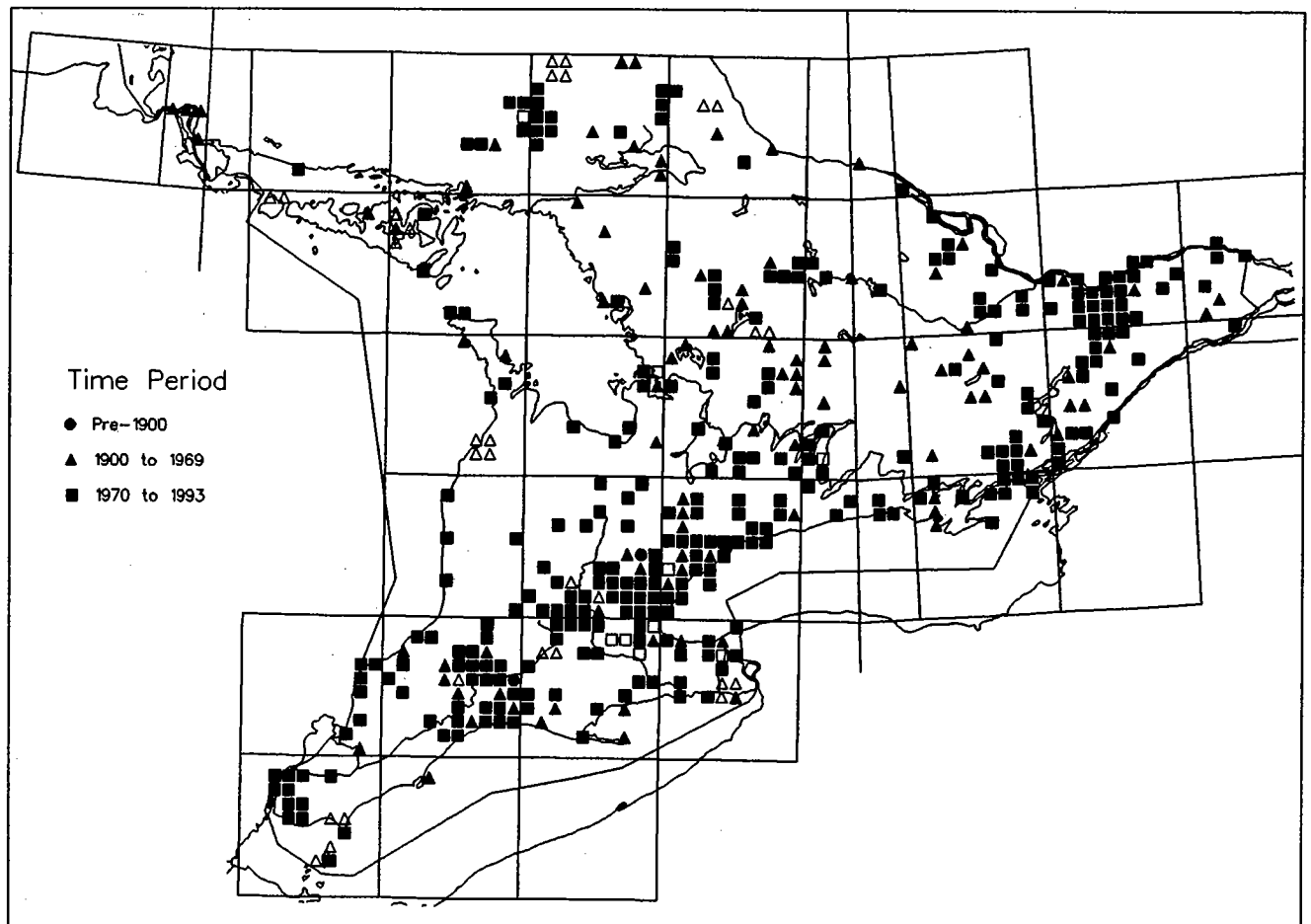
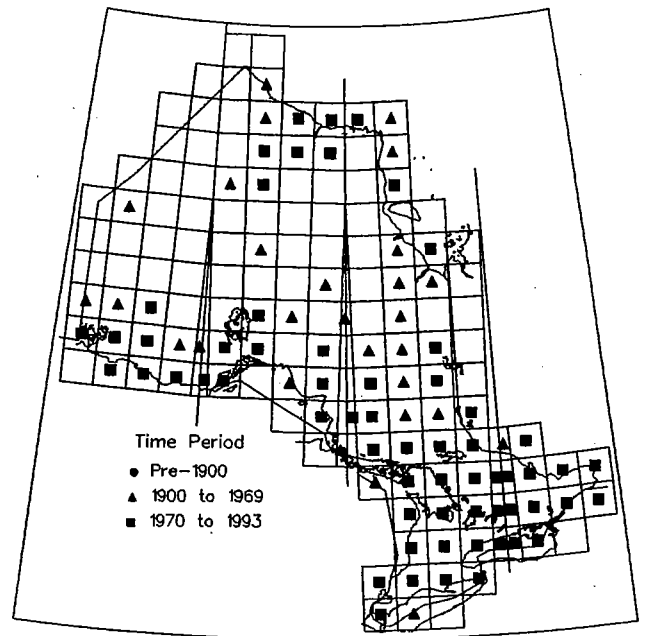


Meadow Vole

Microtus pennsylvanicus

With the possible exception of the Muskrat, the Meadow Vole is the most common and widespread member of the vole family. It is found throughout the northern US and Canada to the Tundra. In Ontario, the Meadow Vole can be found in all parts of the province from Pelee Island in Lake Erie to the Hudson Bay coast.

The Meadow Vole is an important food source for a variety of predators including hawks, owls, Red Foxes, weasels, and Coyotes. Preferred habitats include wet or dry open areas such as meadows, marshes, and open forests, but Meadow Voles can be found in other habitats when population levels are high. Meadow Voles have tails longer than 37 mm and uniformly dark brown or grayish pelage (Peterson 1966).

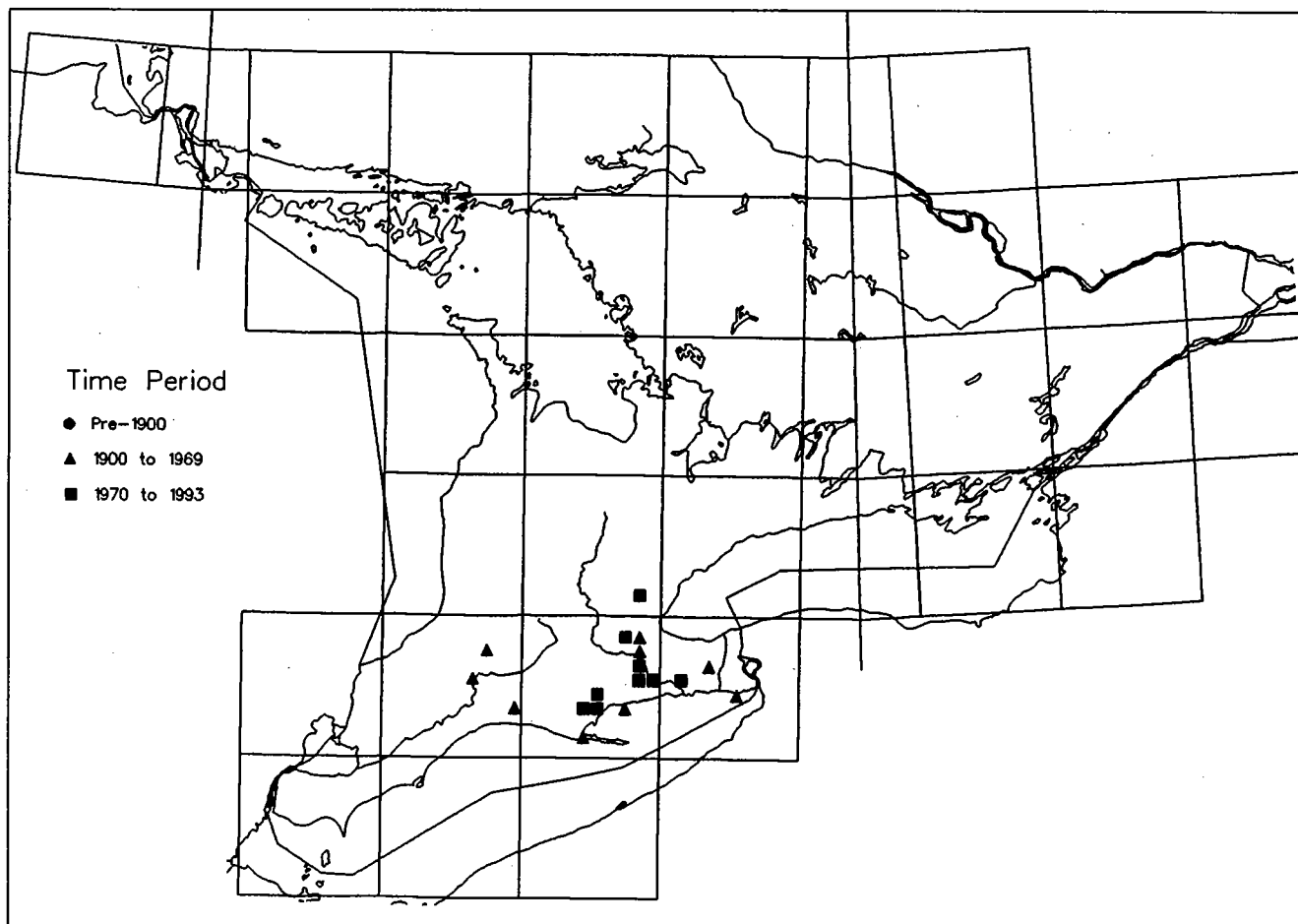
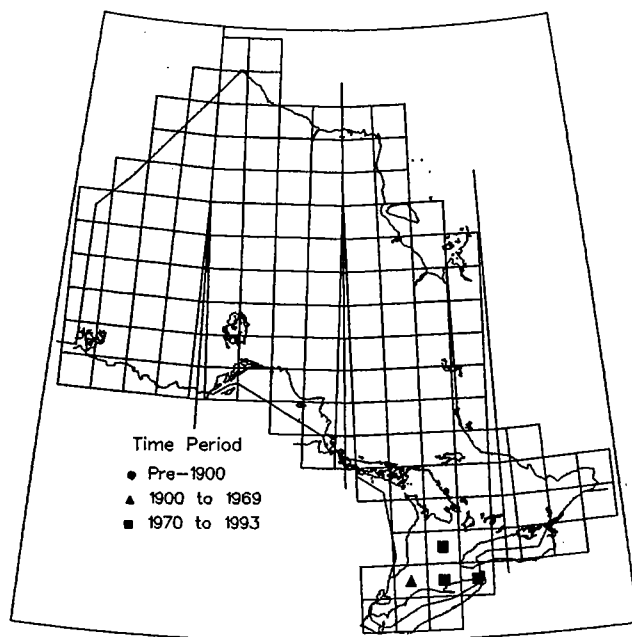


Woodland Vole

Pitymys pinetorum

The Woodland or Pine Vole is a southern species with a restricted Canadian range. Its North American range covers the eastern half of the US, and southwestern Ontario. Within Ontario, this vole is restricted to the area along the north shore of Lake Erie from London to Crawford Lake (near Campbellville).

The distribution of the Woodland Vole appears to be closely related to the mature deciduous forests along Lake Erie where there is loose sandy soil and deep humus suitable for burrowing. In Ontario, the Woodland Vole's preferred habitat is most common within the Carolinian Forest and the future of the Woodland Vole depends on the preservation of this rapidly-disappearing forest type. Although the Woodland Vole has not yet been given official status within Ontario, it should be carefully monitored because of its close association with the disappearing Carolinian Forest.



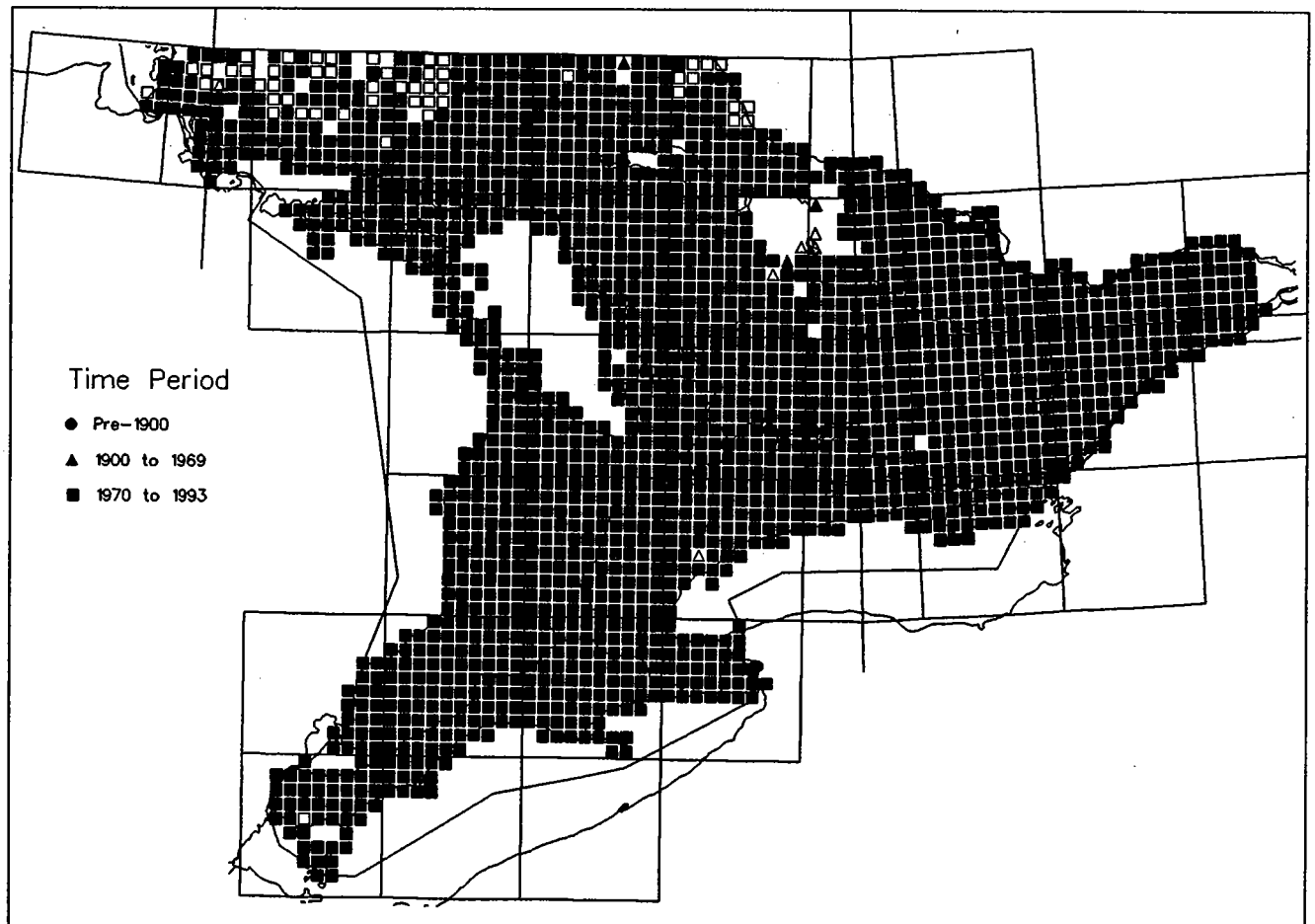
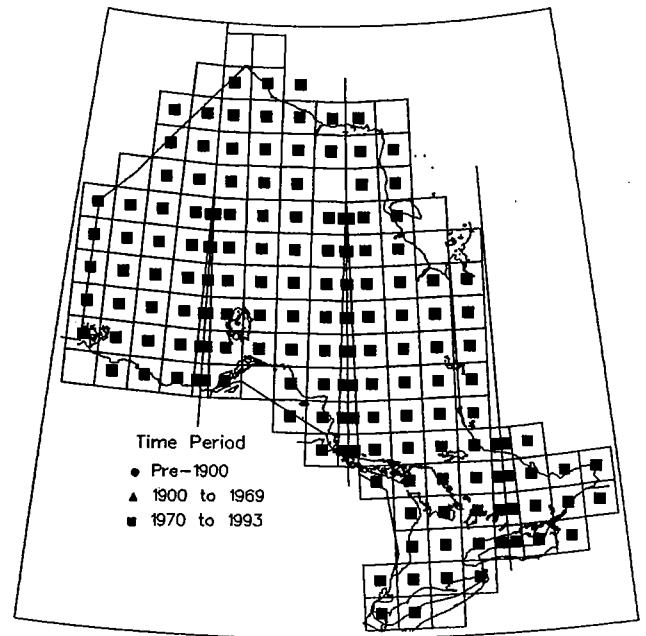
Muskrat

Ondatra zibethicus

The Muskrat is the largest and most aquatic member of the vole family. It resides in marshes, shallow lakes, and slow-flowing streams and rivers where there is abundant vegetation and the water does not freeze to the bottom.

Geographically, the Muskrat ranges across North America except in Tundra regions and the dry southwestern US. In Ontario, Muskrats are common throughout the province. Just as other furbearers are harvested in large numbers every year, so also are Muskrats, providing abundant data on their distribution.

Although the Mammal Atlas map shows Algonquin Provincial Park to be almost devoid of Muskrats, they **do** live in the park. Because trapping is restricted in the park, provincial fur harvest records don't show Muskrat distribution within the park region. Volunteers were able to document some Algonquin park Muskrats, but were not able to provide data for all of the over 100 squares.



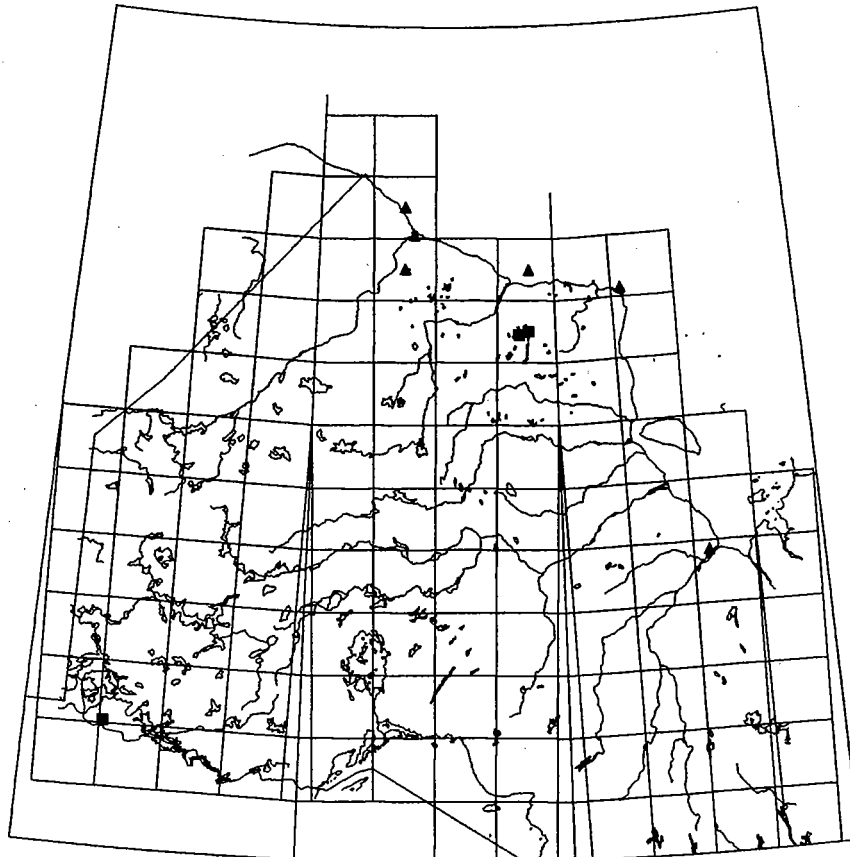
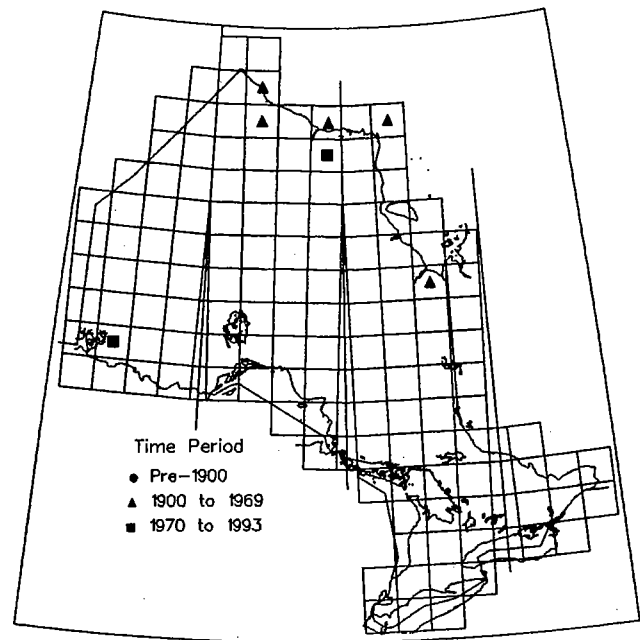
Northern Bog Lemming

Synaptomys borealis

Although rare, the Northern Bog Lemming has a large range: from Alaska to Labrador across the southern edge of the Tundra, south to Washington, northern Minnesota, the Gaspé New Brunswick, Maine, and New Hampshire. Its distribution within Ontario is largely unknown. A few Ontario records exist from the James and Hudson Bay lowlands, and the Rainy River area. The disjunct distribution in Ontario may be misleading, however. It seems likely that the range of the Northern Bog Lemming is continuous between Rainy River and the Hudson and James Bay lowlands.

The Northern Bog Lemming is found in association with cool sphagnum bogs, but has also been found in moist black spruce-horsetail forest, dry black spruce-lichen woodland, hemlock-beech forest, subalpine meadows, alpine tundra, weedy bluegrass fields, and dry hills of sagebrush (Wrigley 1986).

.. Judith Eger

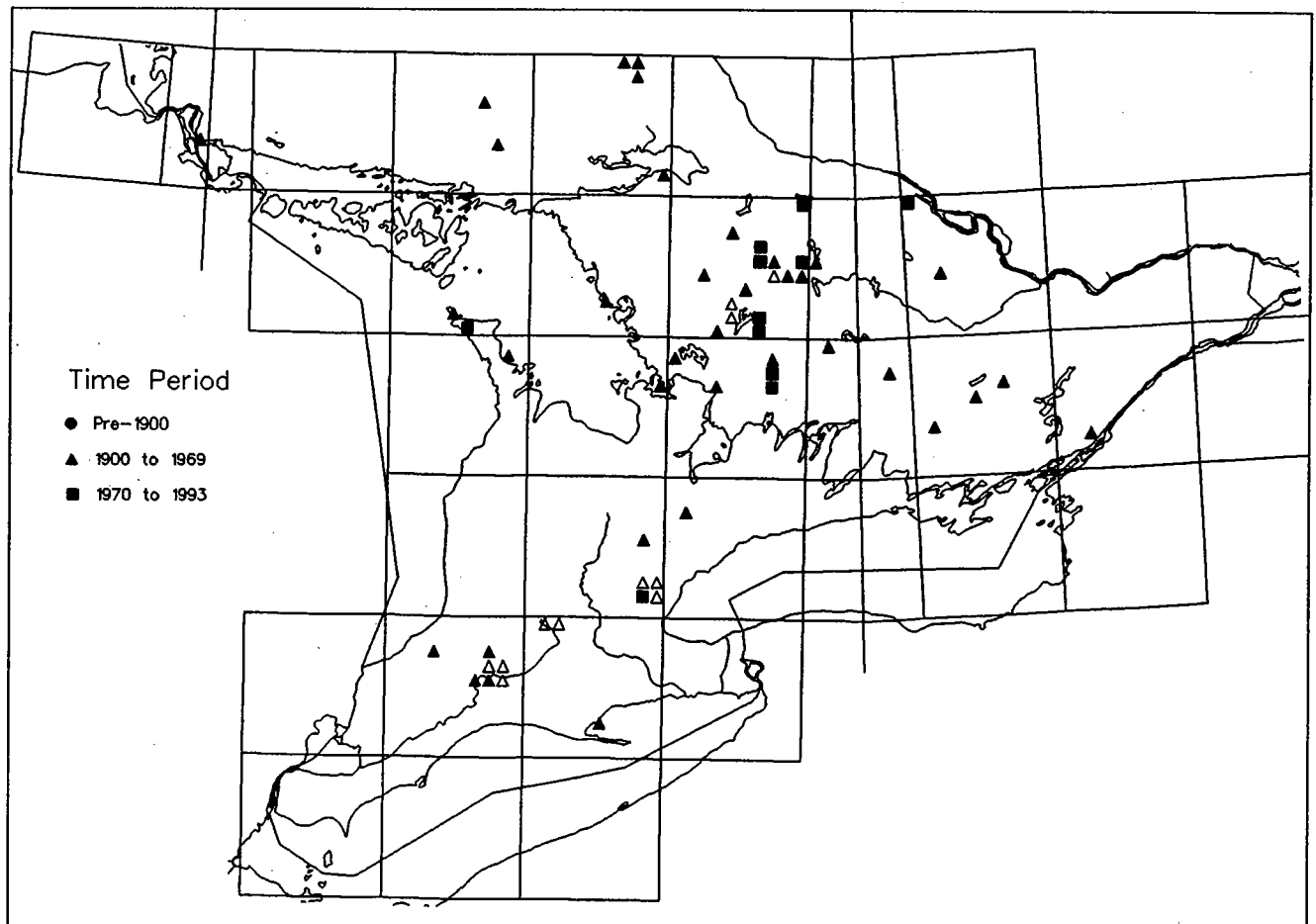
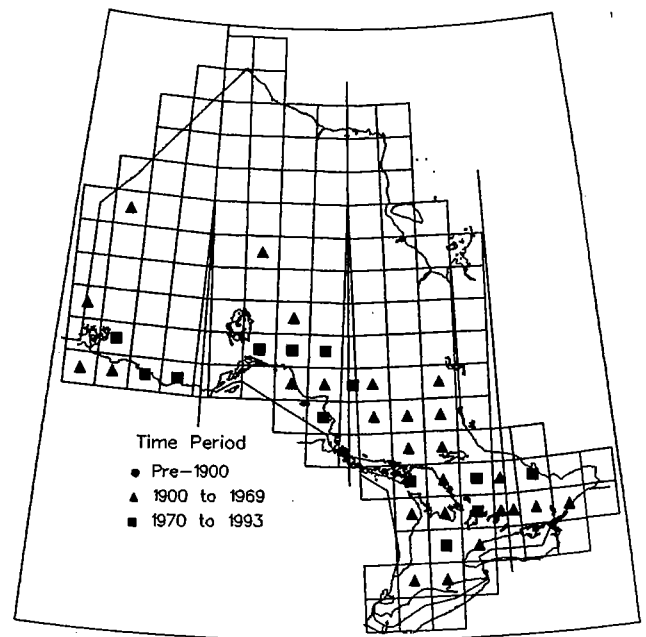


Southern Bog Lemming

Synaptomys cooperi

The Southern Bog Lemming is an uncommon species but has a fairly extensive range. It can be found throughout eastern Canada and the northeastern US. In Ontario, the species has been recorded as far north as Favourable Lake, but is more common in southern regions. The Southern Bog Lemming is a relative of the Northern Bog Lemming and the two species are found sympatrically in Rainy River and possibly north to Favourable Lake. Contrary to its name, the Southern Bog Lemming doesn't only inhabit bogs and other damp areas, but also dry and well-drained uplands covered with grass or forests (Baker 1983).

Naturalists can confuse this lemming with a small Meadow Vole. However, the two can be distinguished by tooth characteristics and tail length. The Southern Bog Lemming has shallow grooves in its upper incisors and a tail less than 25 mm. Distinguishing between the Southern and Northern Bog Lemming can also be difficult, and requires examination of the incisors and cheek teeth. .. Judith Eger

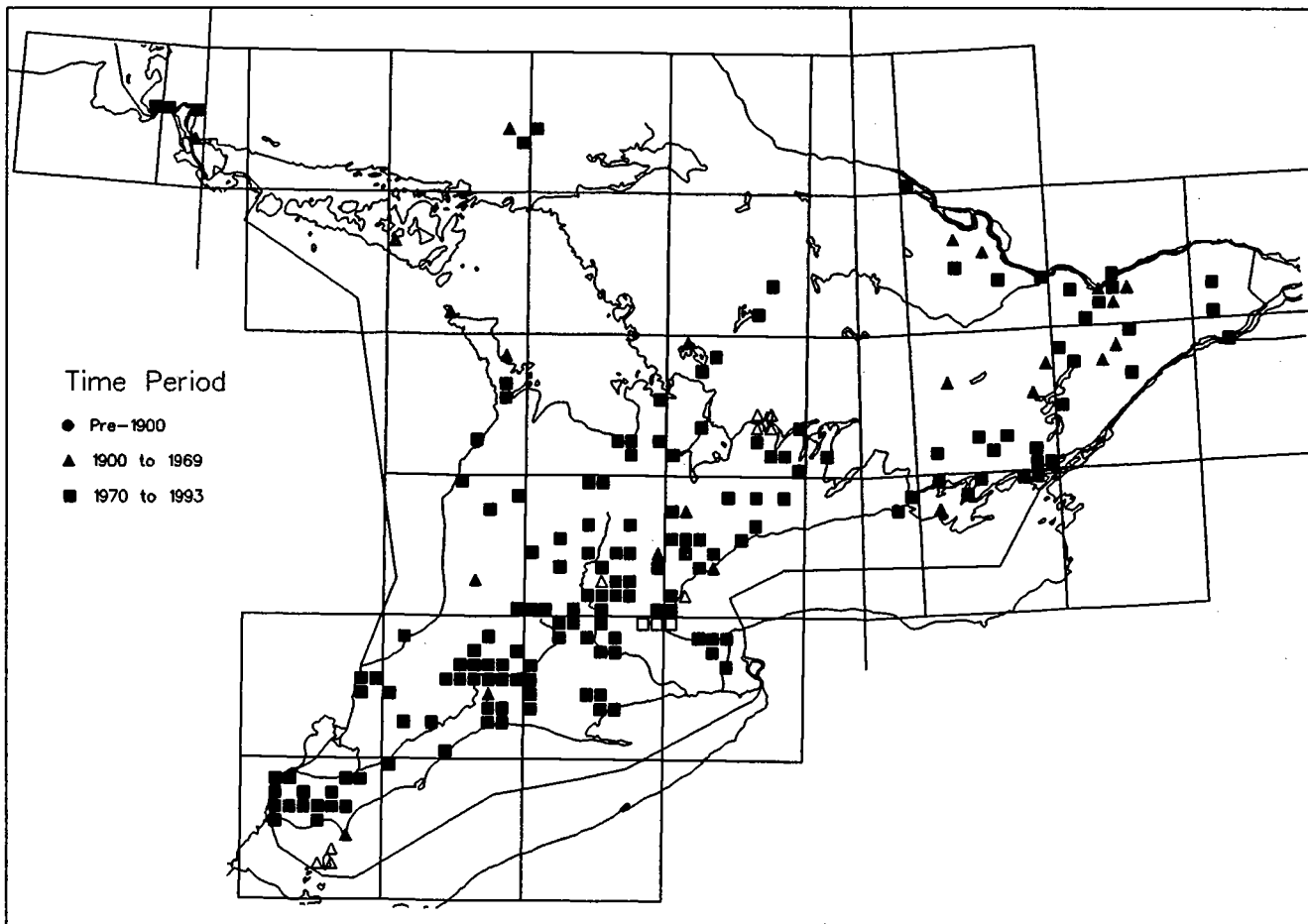
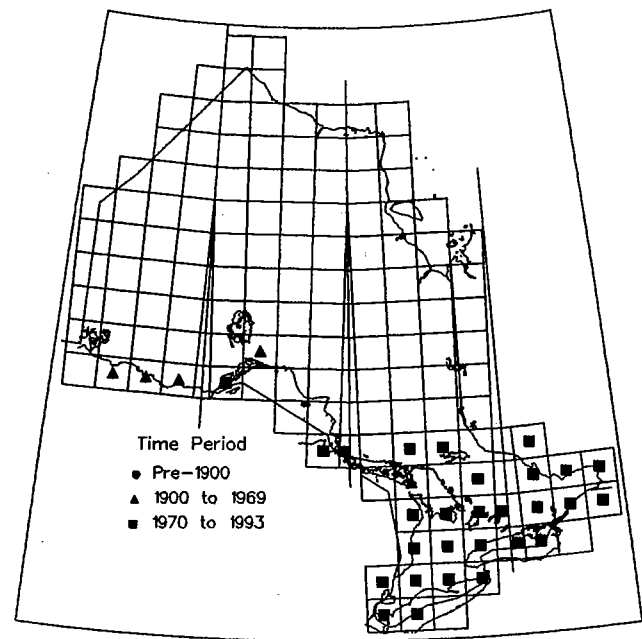


Norway Rat

Rattus norvegicus

The Norway Rat is a large, Old World rat that was inadvertently introduced to North America from Europe. Its distribution coincides with human settlement; permanent populations of the Norway Rat rarely develop in the absence of people (Peterson 1966). Since the settlement of North America by Europeans, the Norway Rat has expanded its range to include all of the US and Mexico, as well as the populated areas of southern Canada. In Ontario, the Norway Rat can be found north to the limit of the railroad.

The Norway Rat often inhabits buildings for shelter and food. To many people, it is a costly pest, damaging food stores, buildings, and furnishings (Peterson 1966).

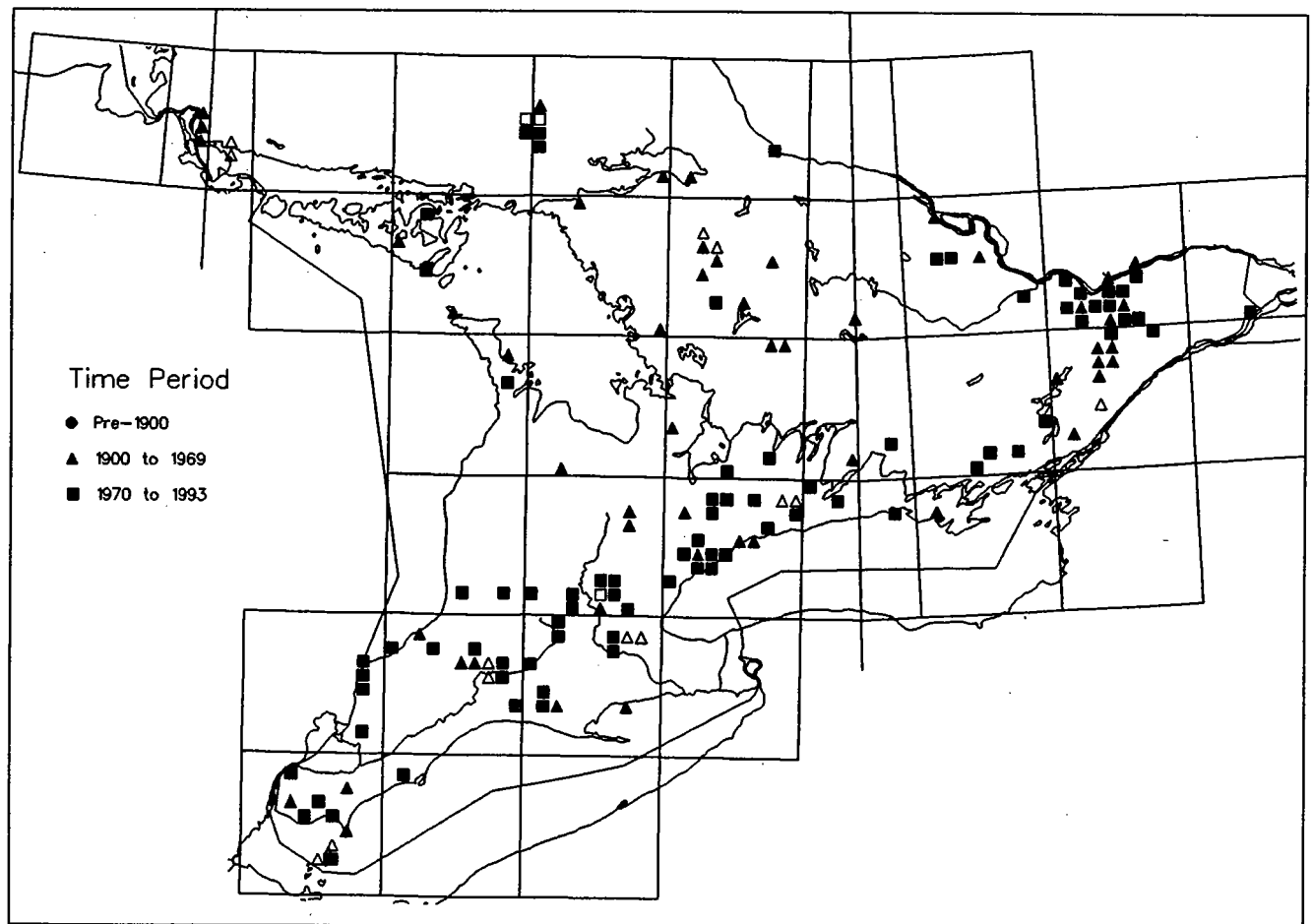
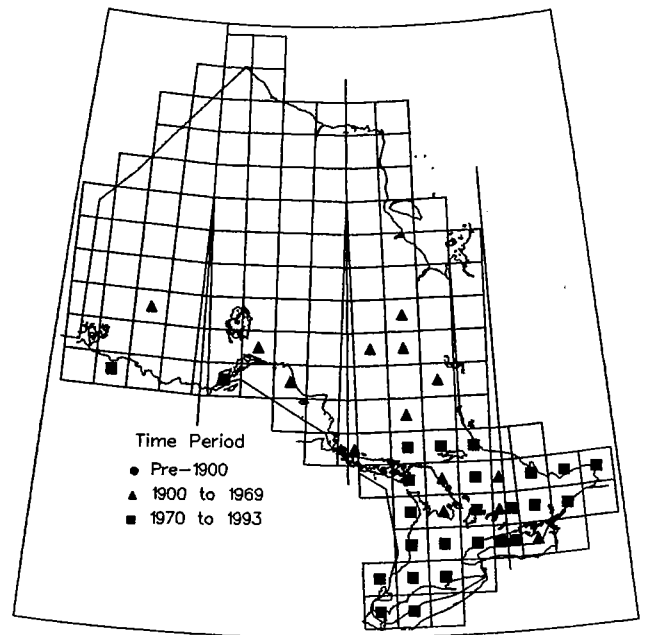


House Mouse

Mus musculus

The House Mouse is the smallest of the Old World rats and mice that were introduced into Canada. It now inhabits all of the continental US and populated areas of southern Canada. In Ontario, House Mouse distribution is similar to that of the Norway Rat, being found in close association with human settlement as far north as Fraserdale and Sioux Lookout (Peterson 1966).

Although the House Mouse does inhabit buildings, White-footed and Deer mice tend to be the two species most often found in homes and cottages. These two native mice are more common than the House Mouse. Distinguishing features of the House Mouse include small size and gray colouring on its back and underparts.

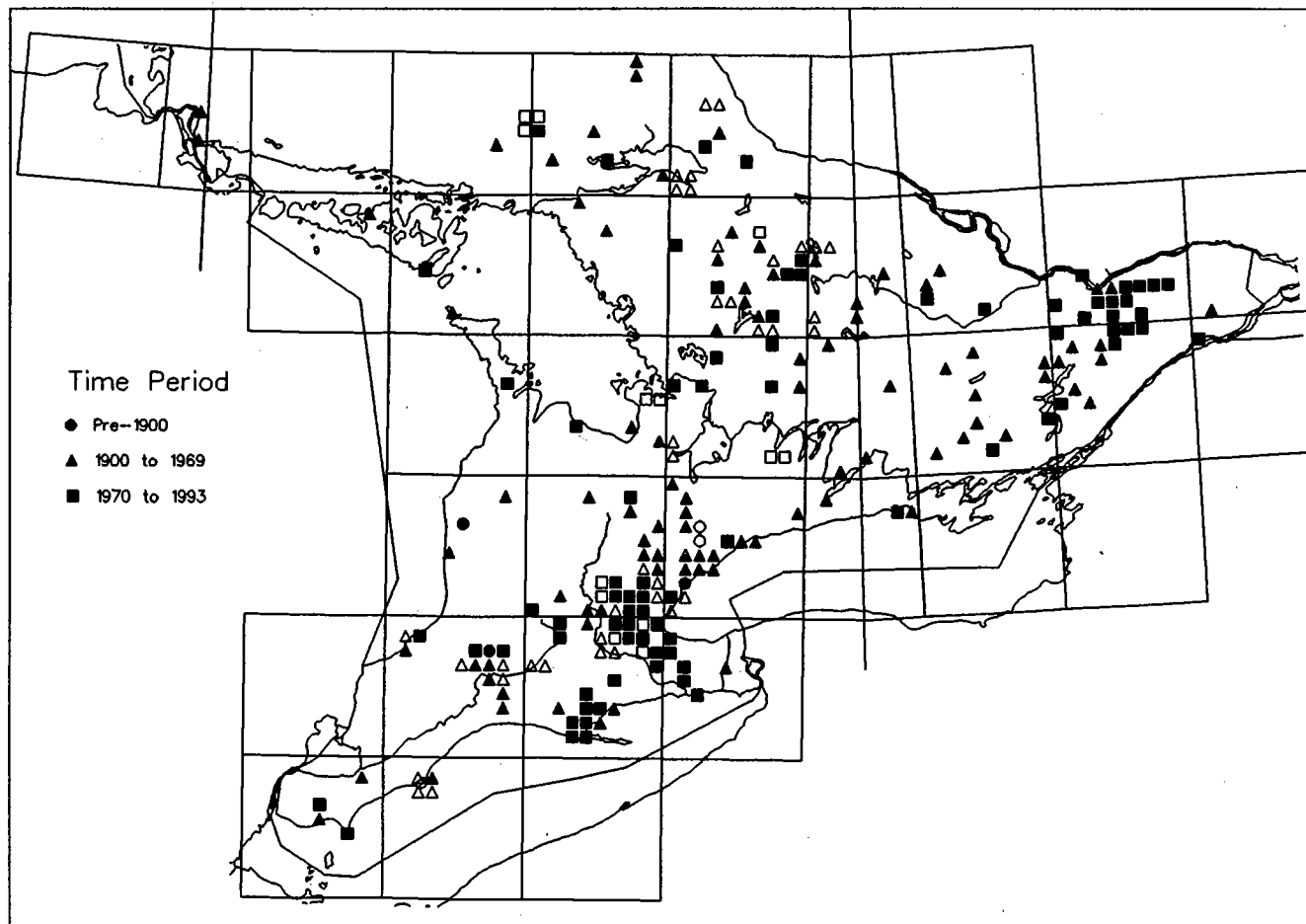
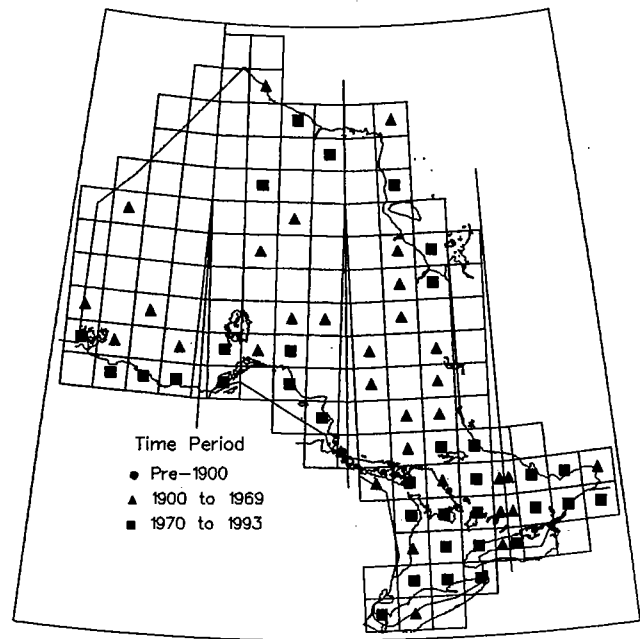


Meadow Jumping Mouse

Zapus hudsonius

The Meadow Jumping Mouse is the most widespread of the four jumping mice found in Canada. It lives throughout the northeastern and central US and eastern and northwestern Canada. In Ontario, the Meadow Jumping Mouse is found from Essex County to the Hudson Bay coast. The presence of this jumping mouse in the Cape Henrietta Maria area (at the junction of James and Hudson bays) is of particular interest because permafrost would make digging hibernation burrows very difficult (Peterson 1966).

Both the Meadow and Woodland Jumping mice are true hibernators. They hibernate from September or October to late April or May. Contrary to its name, the Meadow Jumping Mouse can be found in a variety of open or forested habitats, although it does prefer low, wet meadows (Peterson 1966).

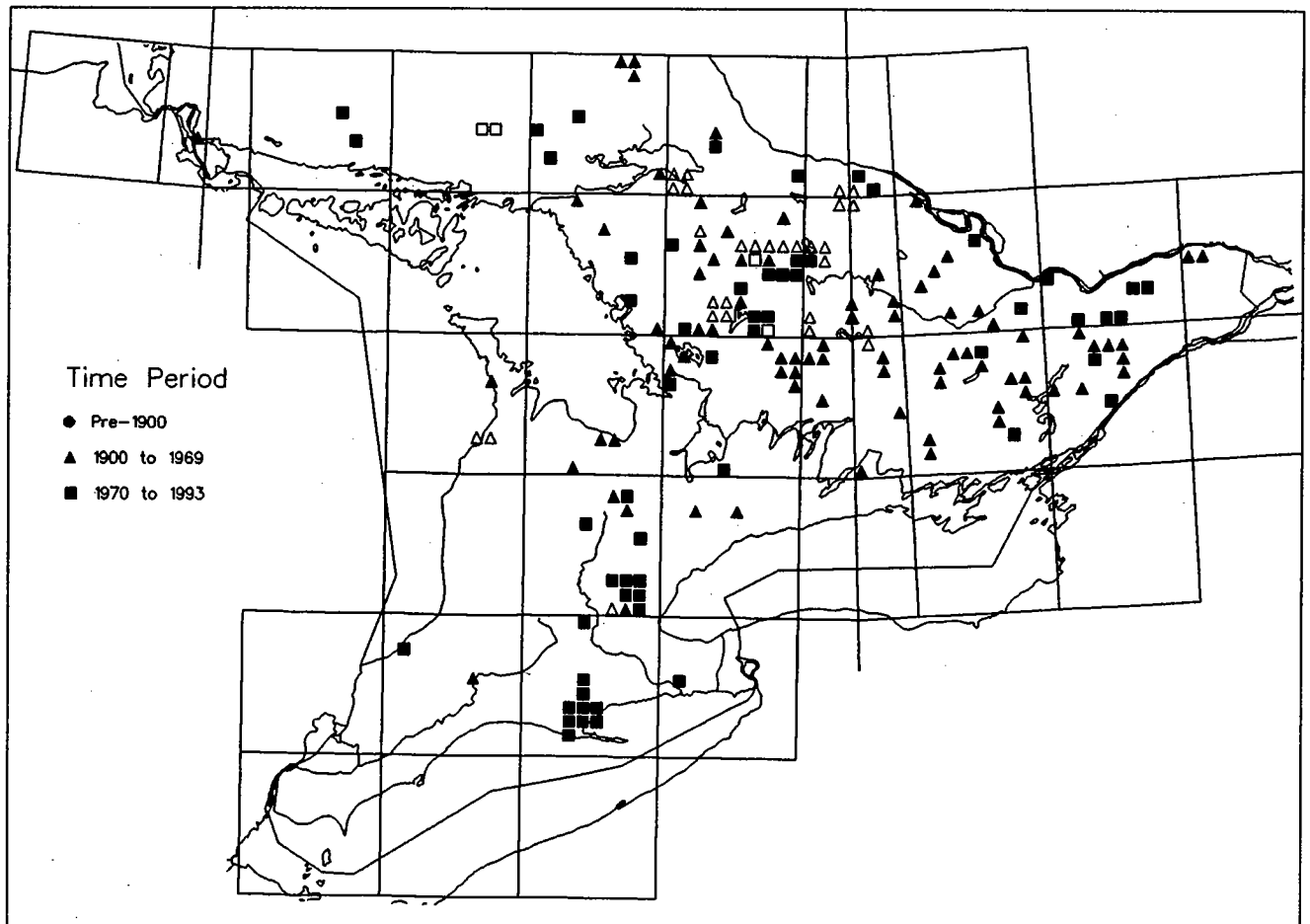
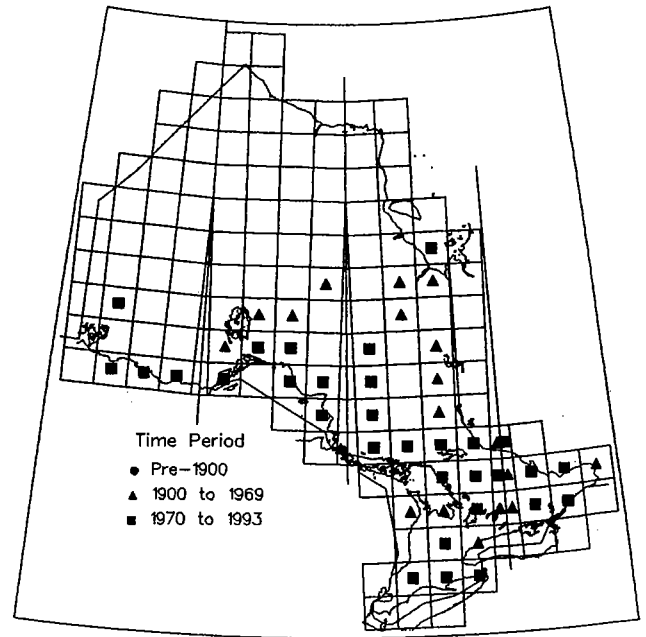


Woodland Jumping Mouse

Napaeozapus insignis

This forest-dwelling mouse can be found in the northeastern US and from the Ontario-Manitoba border through eastern Canada. In Ontario, the Woodland Jumping Mouse ranges throughout southern Ontario from Lake Erie (near Long Point) to southeastern Ontario, and north to Kenora in the west and Moosonee in the east.

The Woodland Jumping Mouse inhabits dry and moist forested areas, distinguishing it from the Meadow Jumping Mouse which prefers low, wet meadows. These habitat preferences are generally sufficient to distinguish the two species; however, the Meadow Jumping Mouse occasionally ventures into dry forests. Positive identification can be made based on the distinct white tip on the tail of the Woodland Jumping Mouse. As well, the Woodland Jumping Mouse lacks the extra peg-like upper premolar found in the Meadow Jumping Mouse (Peterson 1966).



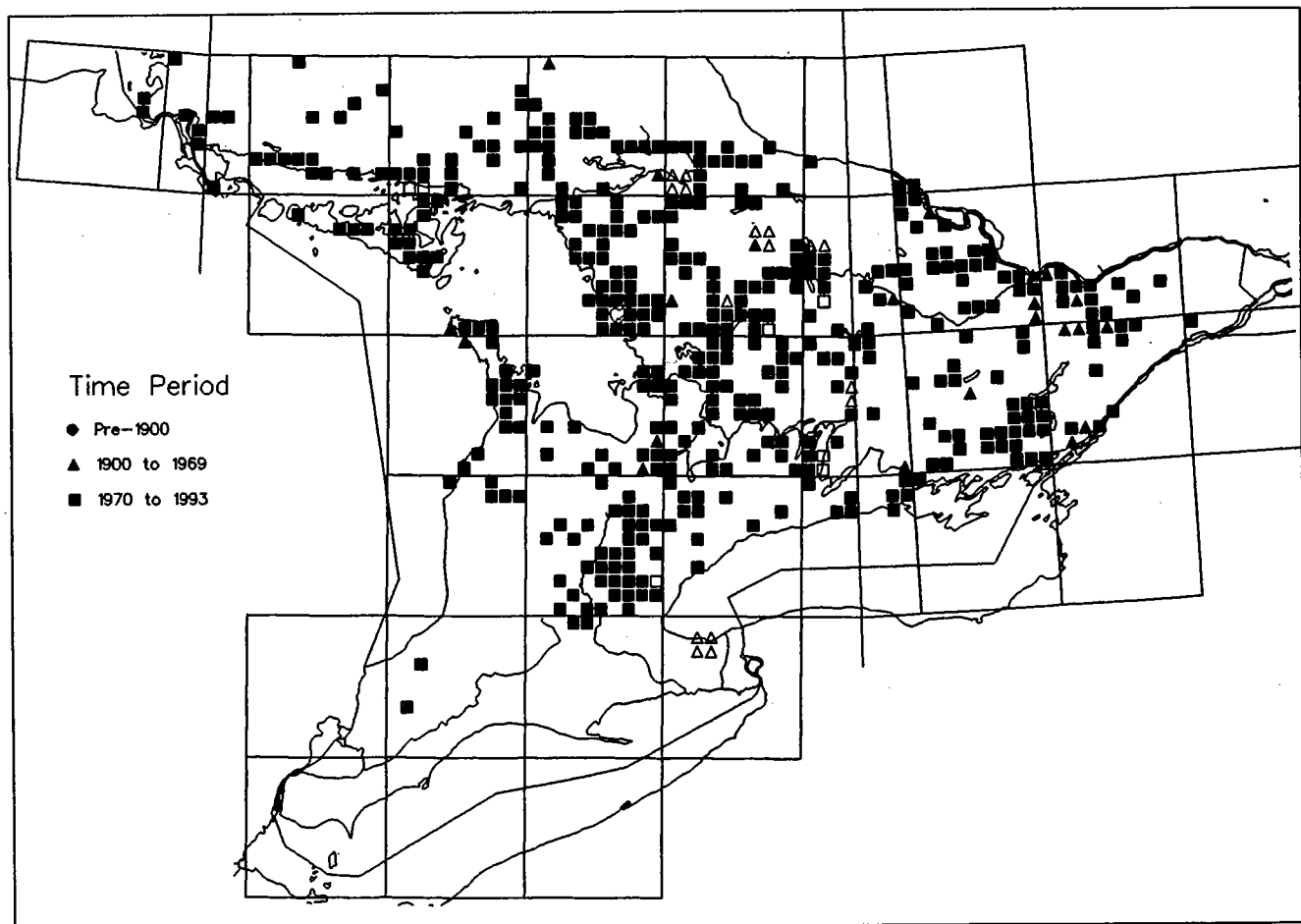
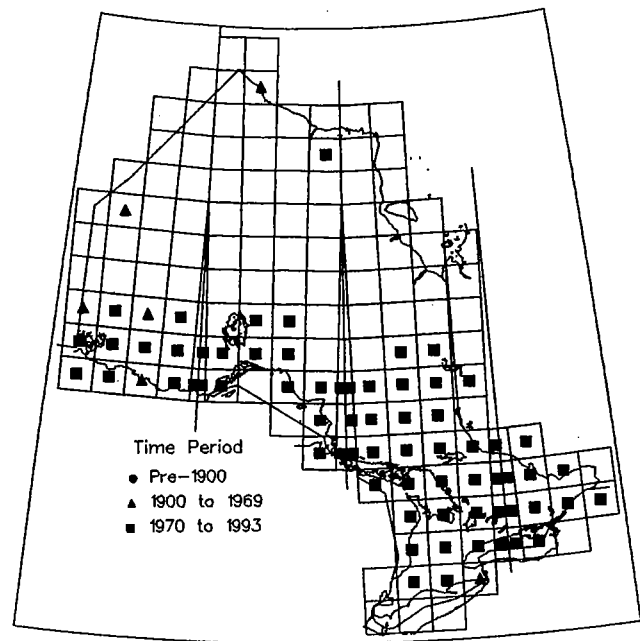
Porcupine

Erethizon dorsatum

Characterized by its thousands of quills, the Porcupine is an easily-identified species found across North America. Porcupines are usually associated with coniferous forests, but do venture into grasslands in wooded riparian areas.

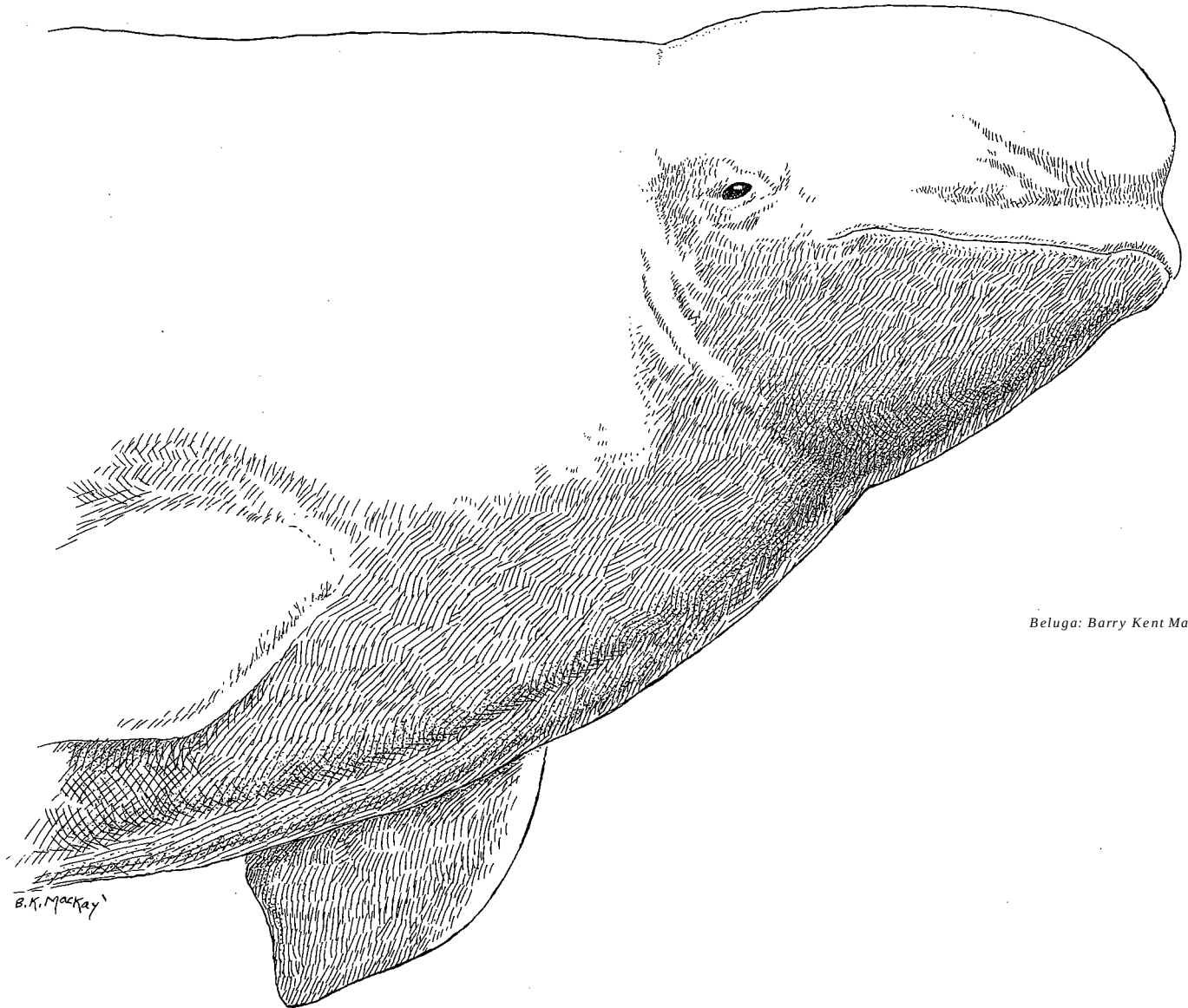
Records of Porcupines in Ontario indicate low numbers in the southwest and north. Small numbers are likely due to a lack of suitable habitat in the southwest, and a lack of observations in the north. The Porcupine seems to have expanded its range south since the 1960s (Peterson 1966), although historically it would have been found in southwestern Ontario.

.. Judith Eger



Whales

Cetacea



Beluga: Barry Kent MacKay

B.K. MacKay

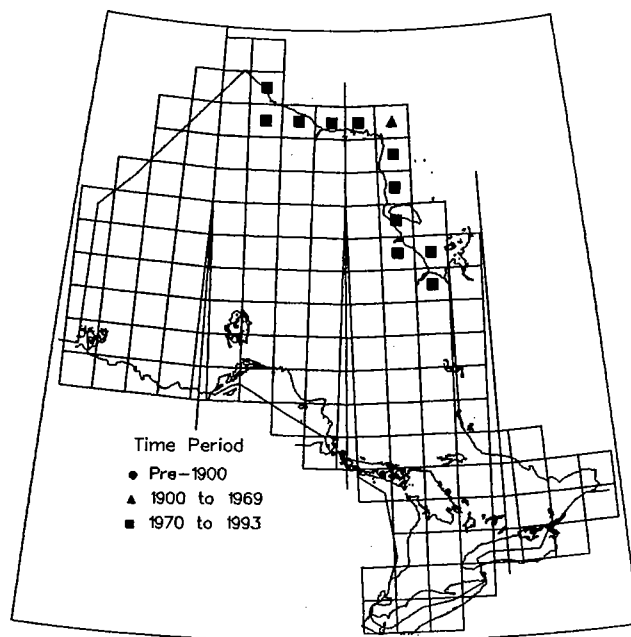
Beluga

Delphinapterus leucas

The Beluga or White Whale has a holarctic distribution, occupying arctic and subarctic waters in North America, with populations as far south as Cook Inlet in the west and the St. Lawrence River in the east. Belugas frequent the Ontario shores of Hudson and James bays in summer months, almost as soon as open water leads are available to permit access from the wintering areas.

Greater numbers of Belugas are present along the Hudson Bay coast, with large aggregations often present at the estuaries of major rivers. The river estuaries are important calving and feeding areas for the Beluga. Recent surveys of the Ontario Hudson Bay population indicate that approximately 2500 Belugas are present from June to late fall (at which point ice has formed sufficiently to encourage migration to wintering areas).

.. Nancy Wilson

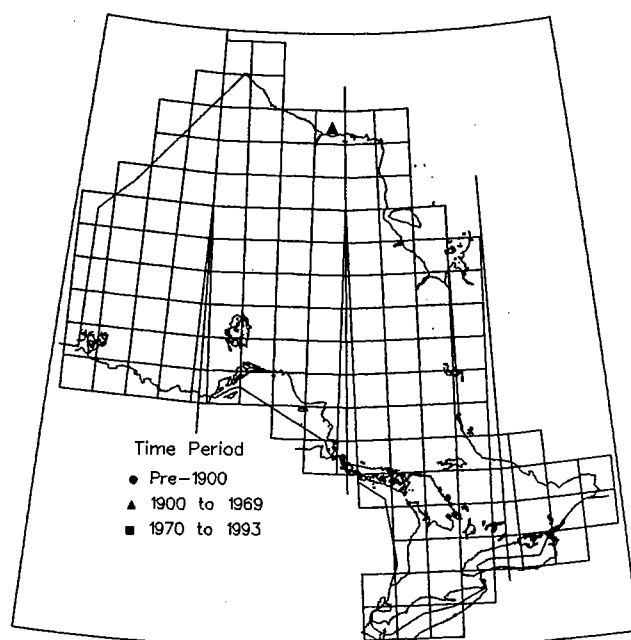


Narwhal

Monodon monoceros

The only record of Narwhal in Ontario is of a specimen found dead on the Hudson Bay shore. The regular range of the Narwhal is restricted to the Atlantic sector of the Arctic Ocean (Banfield 1974) and includes the western Hudson Strait and northern Hudson Bay (Chapman and Feldhamer 1982). It can be expected that individuals may wander out of normal range, but it is not known whether the Ontario record is such an occurrence. In summer, Narwhals prefer deep basins and fjords (Chapman and Feldhamer 1982) which are not found along Ontario's maritime coastline.

.. Nancy Wilson

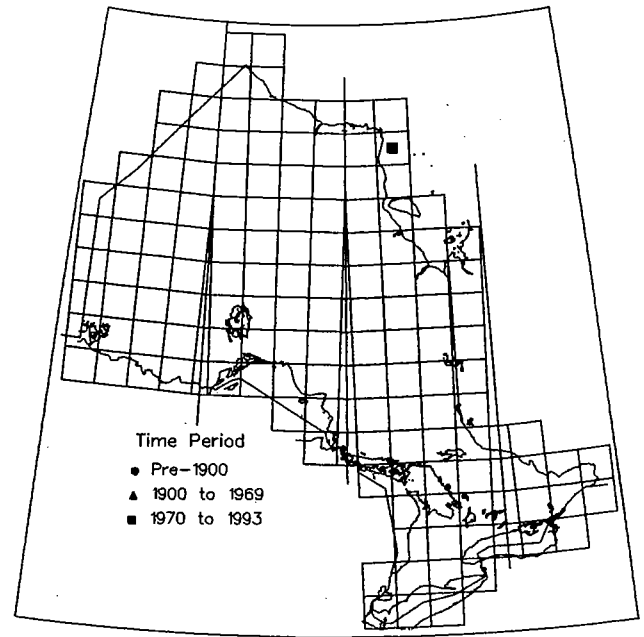


Minke Whale

Balaenoptera acutorostrata

The single record for Minke Whale in Ontario is of a specimen found dead on the northwest shore of James Bay (Abraham and Lim 1990). The record is beyond normal Minke Whale range, which includes the Hudson Strait and Ungava Bay (Chapman and Feldhamer 1982). It is not known whether the Ontario record of this arctic and temperate sea whale represents a live animal that died in James Bay or whether water currents delivered the dead specimen from a great distance. The remains of this whale were placed in the mammalogy collection at the Royal Ontario Museum.

.. Nancy Wilson



Carnivores

Carnivora



Red Fox: Linda Shaw

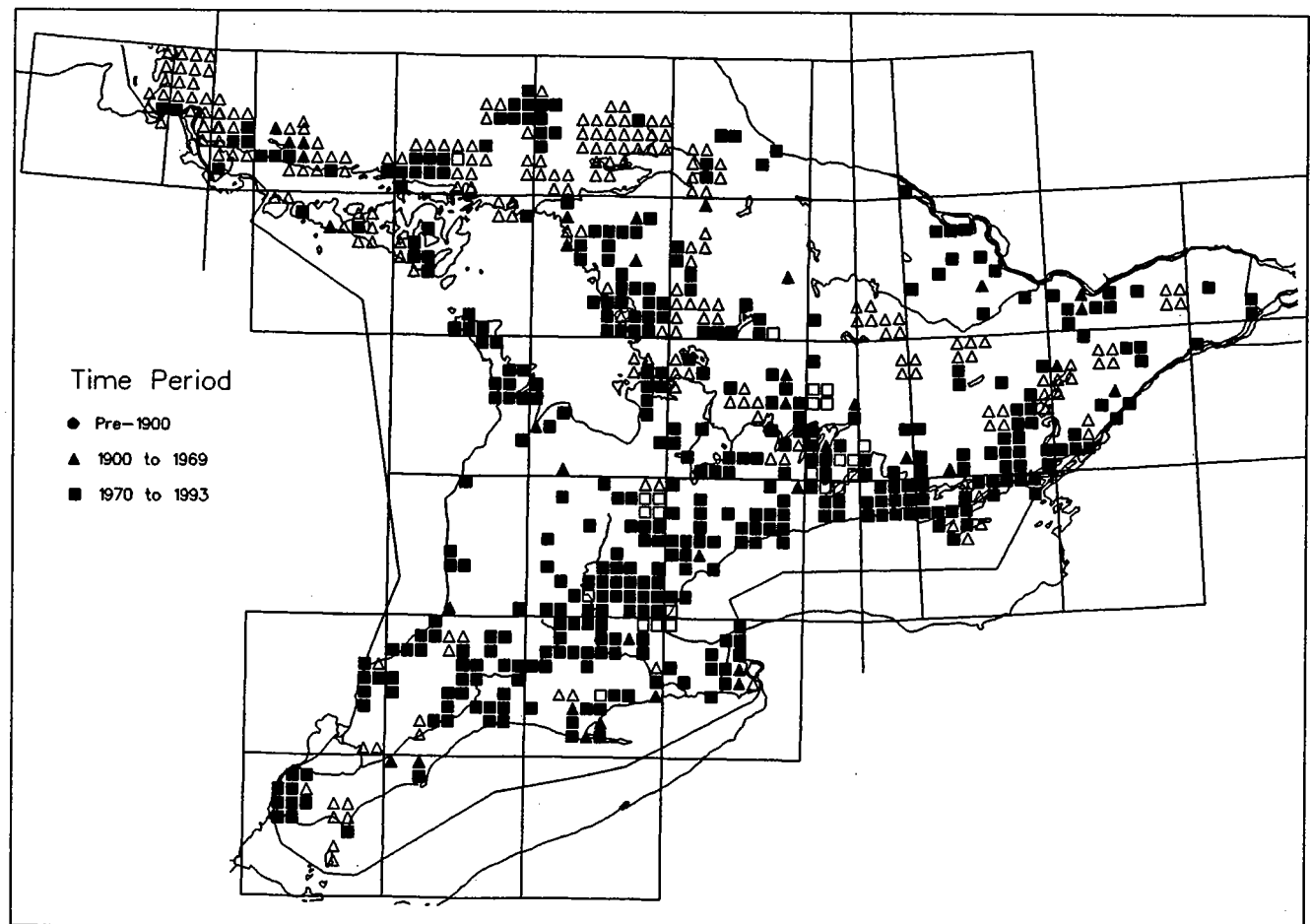
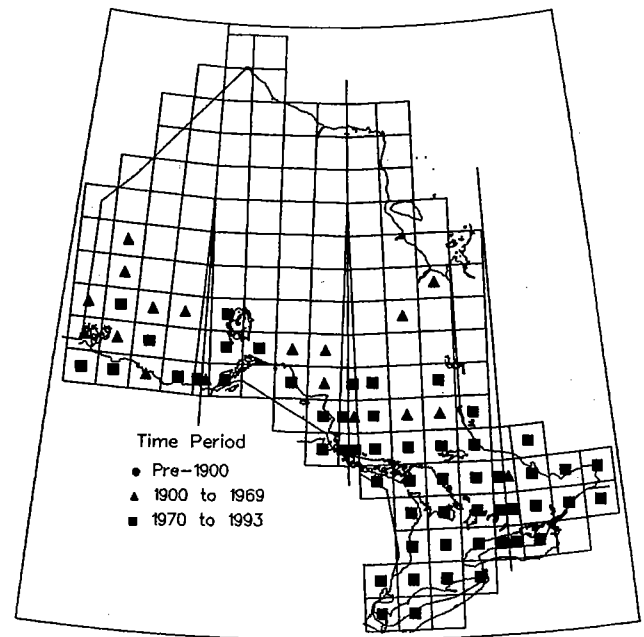
Coyote

Canis latrans

The Coyote is a small relative of the Gray Wolf. While the wolf prefers more heavily forested areas, the Coyote is a common mammal of open woodlands and agricultural areas. The Coyote also fares well near human settlement.

Geographically, the Coyote can be found across Mexico, the US, and most of Canada. It is common throughout Ontario except in the far north. Coyotes are prevalent in the open forests and extensive agricultural regions of southern Ontario.

Prior to 1900, the Ontario range of the Coyote was restricted to the Rainy River area in northwestern Ontario. By 1956, however, it had spread eastward through all of central and southern Ontario (Peterson 1966).

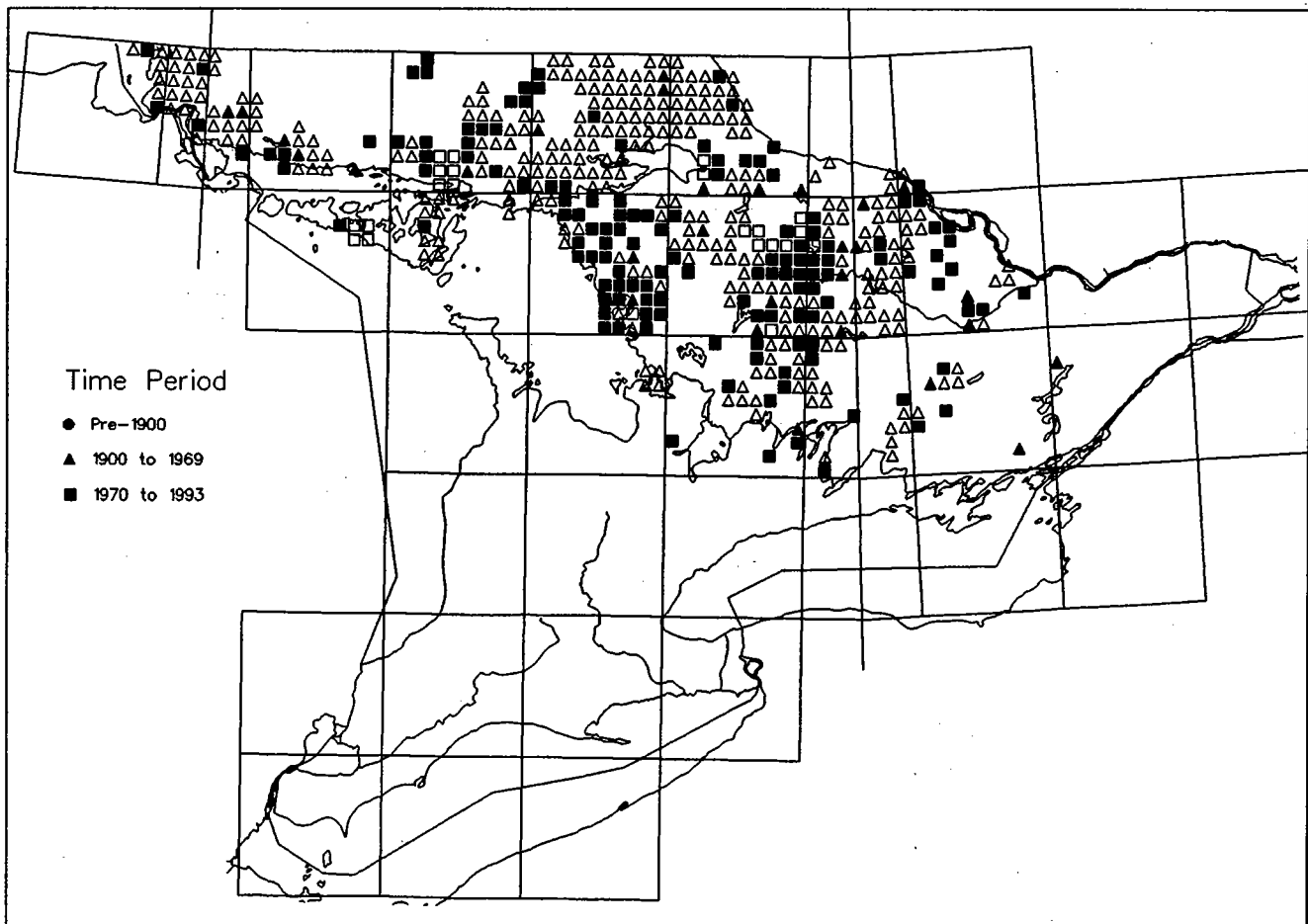
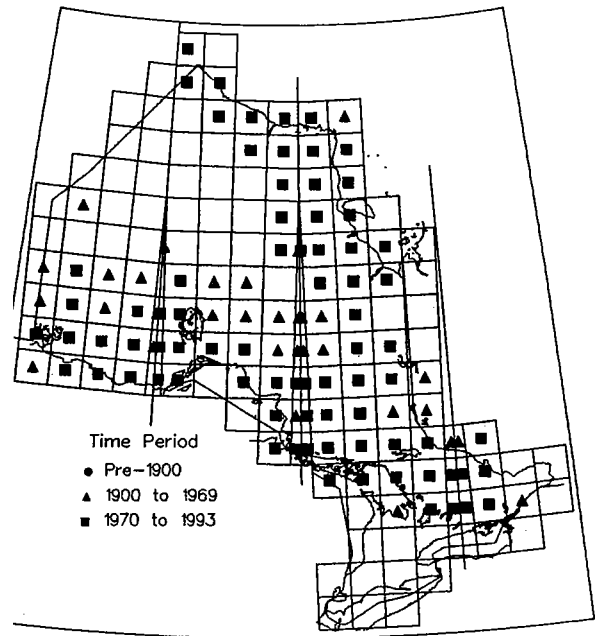


Gray Wolf

Canis lupus

The Gray Wolf is the largest member of the dog family in Ontario and has long been a symbol of the Canadian north. It ranges throughout Canada except on the prairies and in heavily populated areas of the south. In Ontario, the range of the wolf extends from Lake Simcoe to the James and Hudson Bay shorelines, whereas the Coyote dominates areas south of this range and around some northern settlements. The Gray Wolf is the dominant species in Algonquin Provincial Park.

Distribution of Coyotes and Gray Wolves is governed by specific habitat preferences. The Gray Wolf prefers more heavily forested areas whereas the Coyote prefers open woodlands and agricultural areas. The Gray Wolf does not coexist with people as well as the more adaptable Coyote. As a result, the Gray Wolf dominates in northern regions where people are scarce, while the Coyote dominates everywhere else.



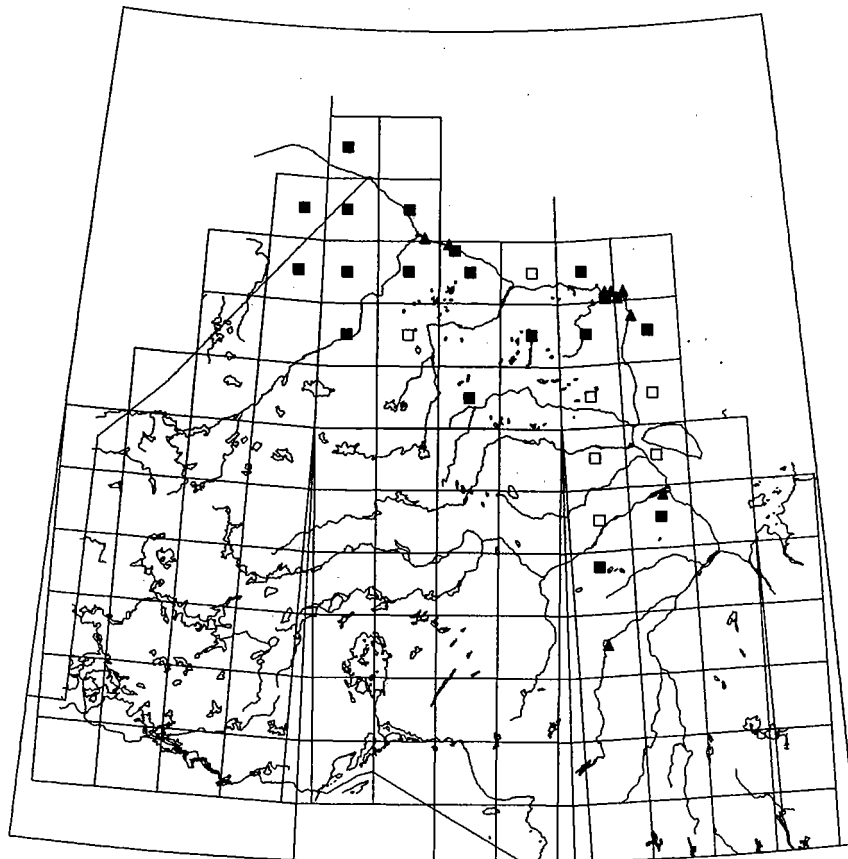
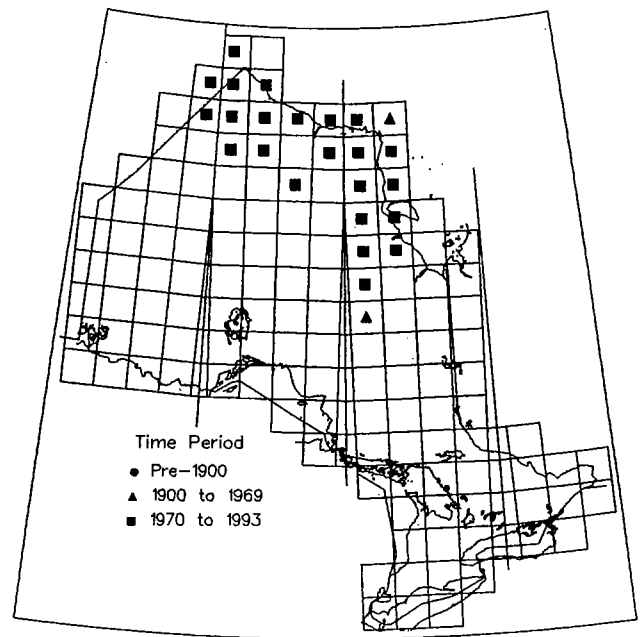
Arctic Fox

Alopex lagopus

The Arctic Fox is a circumpolar inhabitant of the Arctic Tundra Biome. It is frequently found along Ontario's narrow Tundra region adjacent to Hudson Bay. Evidence of the Arctic Fox south of the Tundra is consistent with some winter dispersal records away from the breeding range (Chapman and Feldhamer 1982).

Arctic Fox range and population levels fluctuate with prey abundance, and some movement out of their normal range can be expected in response to low prey populations. However, records of this species venturing long distances inland from the coast likely represent isolated cases of wandering individuals.

.. Nancy Wilson

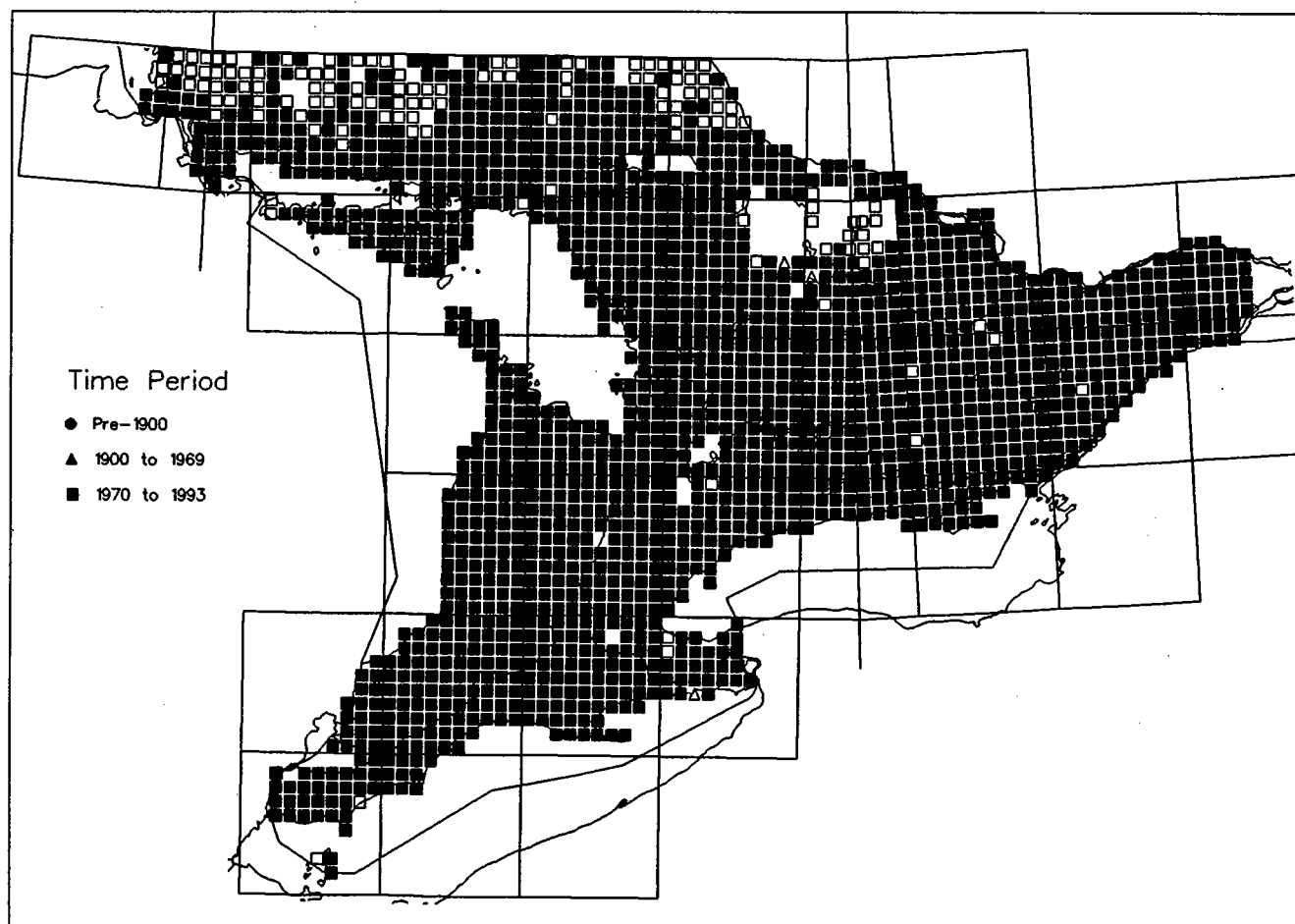
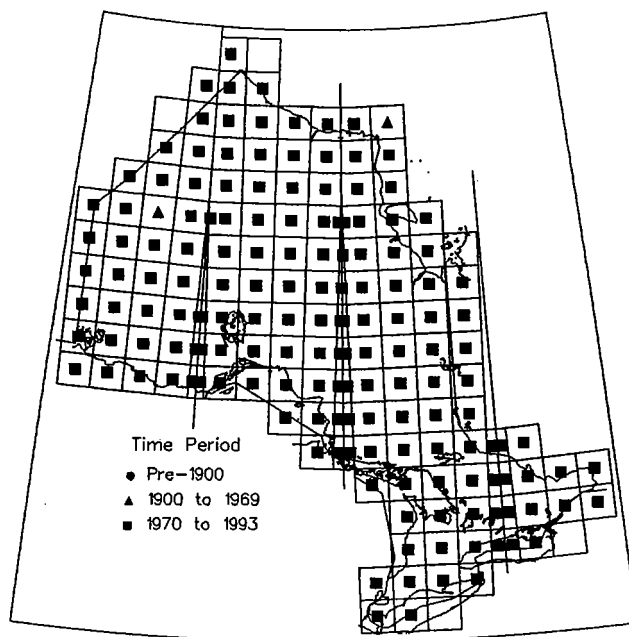


Red Fox

Vulpes vulpes

The Red Fox is one of the most successful carnivores in Ontario. There are records for this highly adaptive mammal in every UTM block, and most squares in Ontario. The Red Fox also ranges throughout North America, except in the southwestern US and Mexico.

Aside from the normal red colour, the Red Fox has two other basic colour morphs: the cross fox and the black or silver fox. The cross fox is more brown than the red morph and has a characteristic dark cross on its back. The black fox is all black with varying numbers of white-tipped guard hairs on its back. When there are a lot of white-tipped hairs, the fox takes on a silvery appearance and is referred to as a silver fox. In all colour morphs, the feet, legs and outside tips of the ears are black, whereas the tip of the tail and much of the underparts are white (Peterson 1966).

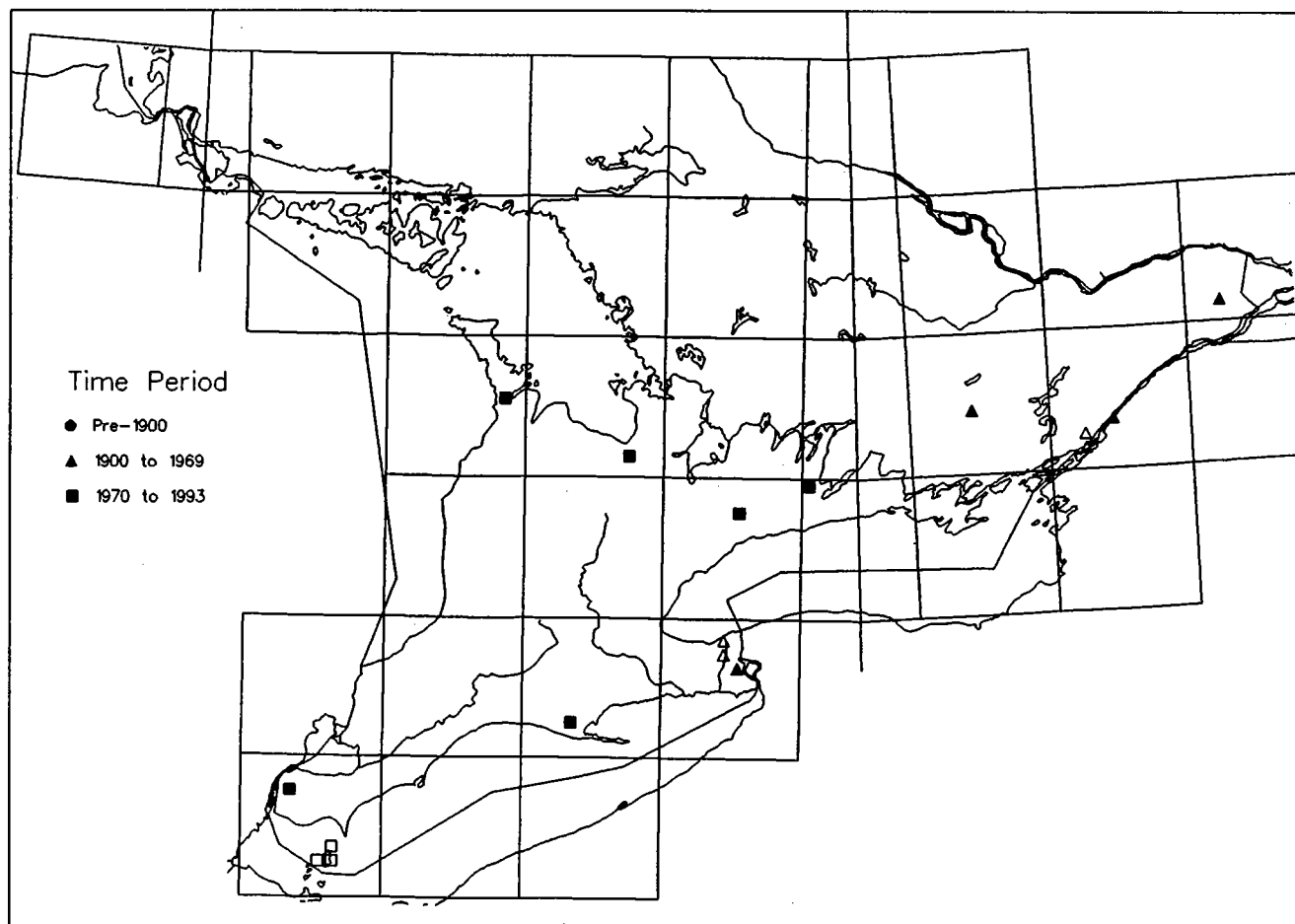
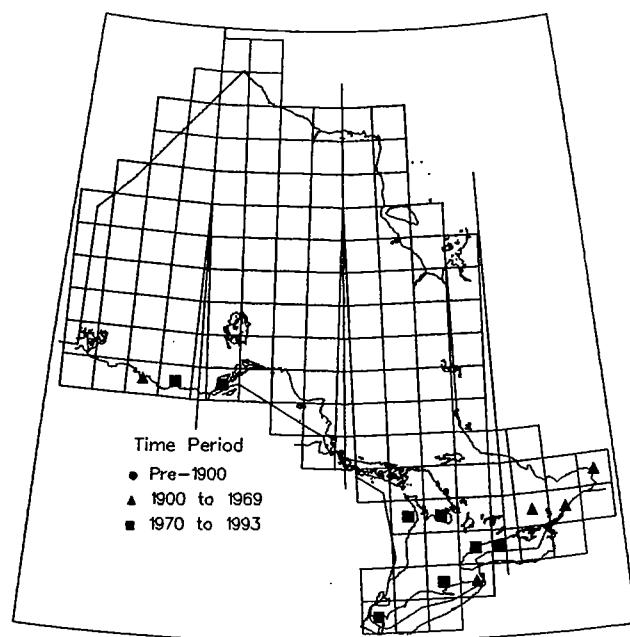


Gray Fox

Urocyon cinereoargenteus

The Gray Fox is a southern mammal which is found across most of the US except in the northwest. Gray Fox range in Canada is marginal. Within Ontario, the Gray Fox is restricted to the south. It ranges north to Georgian Bay and east along the St. Lawrence River. The Gray Fox is also found in the Rainy River area where it has entered Ontario from Minnesota in recent years. There are no records of a Gray Fox having produced a litter in Ontario. Most Ontario Gray Foxes are thought to have come from the US.

The Gray Fox is about the same size as a Red Fox and is often confused with the cross fox morph of the Red Fox. However, the Gray Fox has a distinguishable black-tipped tail (Peterson 1966). The Gray Fox is designated a rare species on the provincial status list.

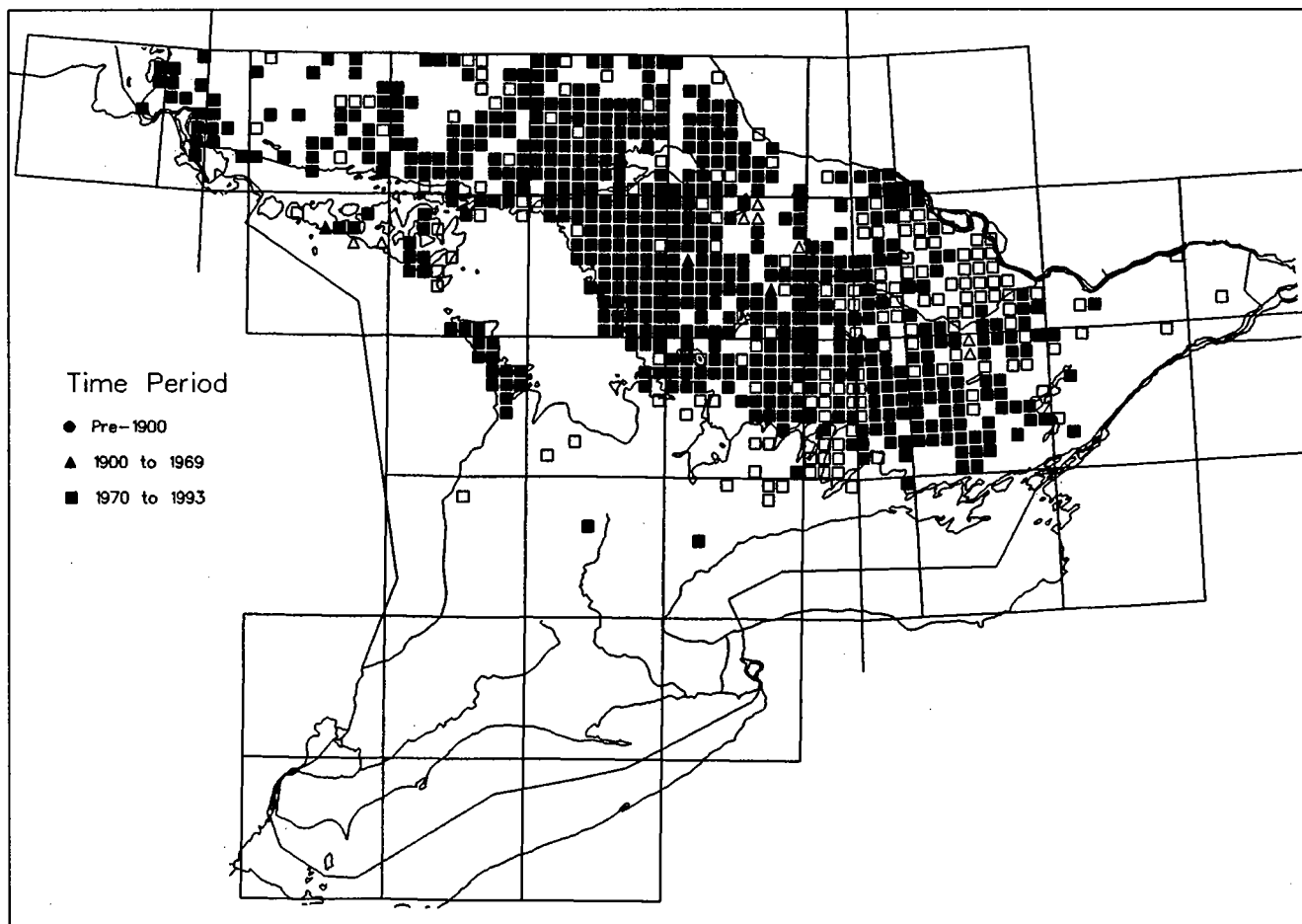
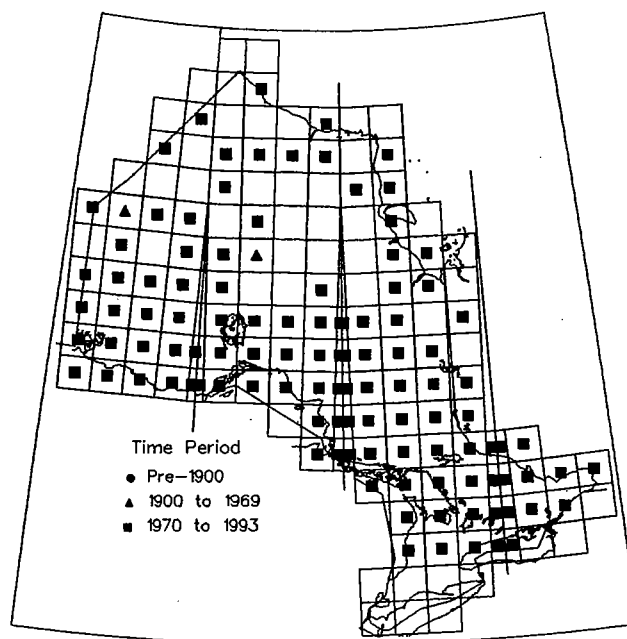


Black Bear

Ursus americanus

The Black Bear is well documented in Ontario Ministry of Natural Resources big game harvest records, providing a detailed distribution map. Historically, the Black Bear has been found throughout the province, right down into southwestern Ontario (Peterson 1966). Currently, however, its range is restricted to the Canadian Shield, northern Ontario, and an isolated population on the Bruce Peninsula. Occasional records have been found further south, such as the one from Luther Marsh in 1978. Likely, records south of normal Black Bear range are examples of unusual dispersal movements.

Black Bears prefer to live in large, undeveloped tracts of forest with clearings and early succession vegetation. As a result, bears are generally not found south of the Canadian Shield where most of the land has been cleared for agriculture and settlement.



Polar Bear

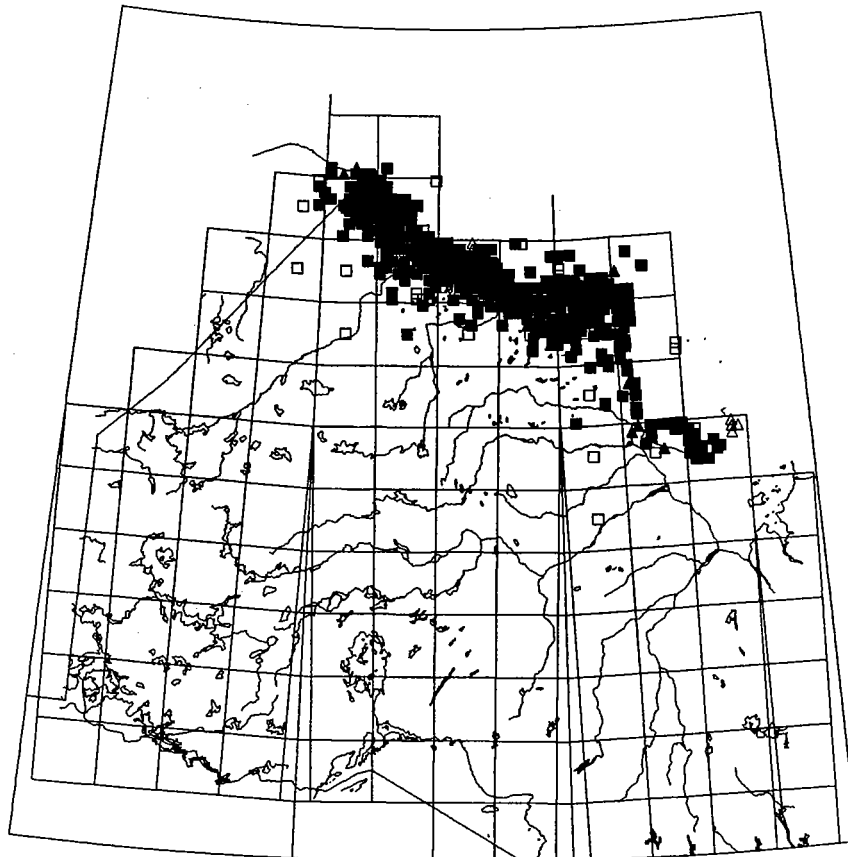
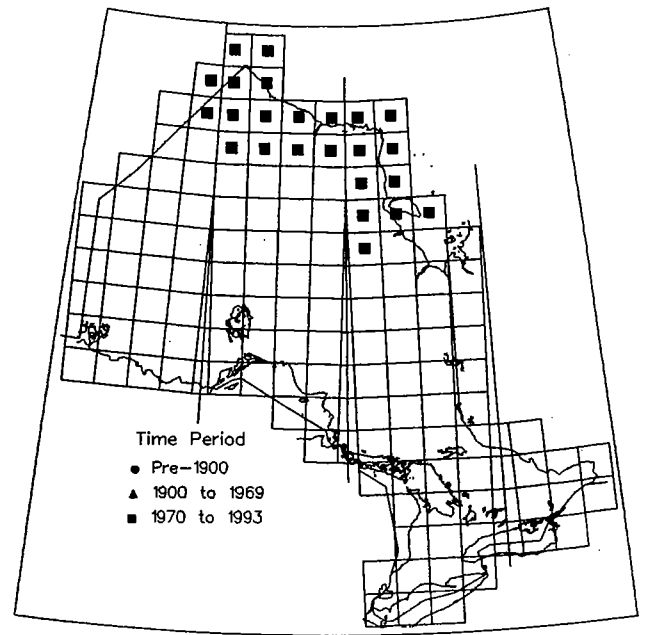
Ursus maritimus

The most southern range of this circumpolar, arctic species is found in Ontario. The Ontario Polar Bears are part of the southern Hudson Bay sub-population (Chapman and Feldhamer 1982).

The Polar Bear lives in close association with sea ice, coming ashore only when the ice has fractured substantially (approximately mid-July) and remaining there until the ice forms again (in the late fall). Pregnant females often travel over 100 km inland to den and give birth in late fall or winter. The southern Hudson Bay sub-population of Polar Bears is the only population that makes dens in the earth; the rest make their dens in snow.

Records south of Akimiski Island represent extralimital movements of these bears.

.. Nancy Wilson.



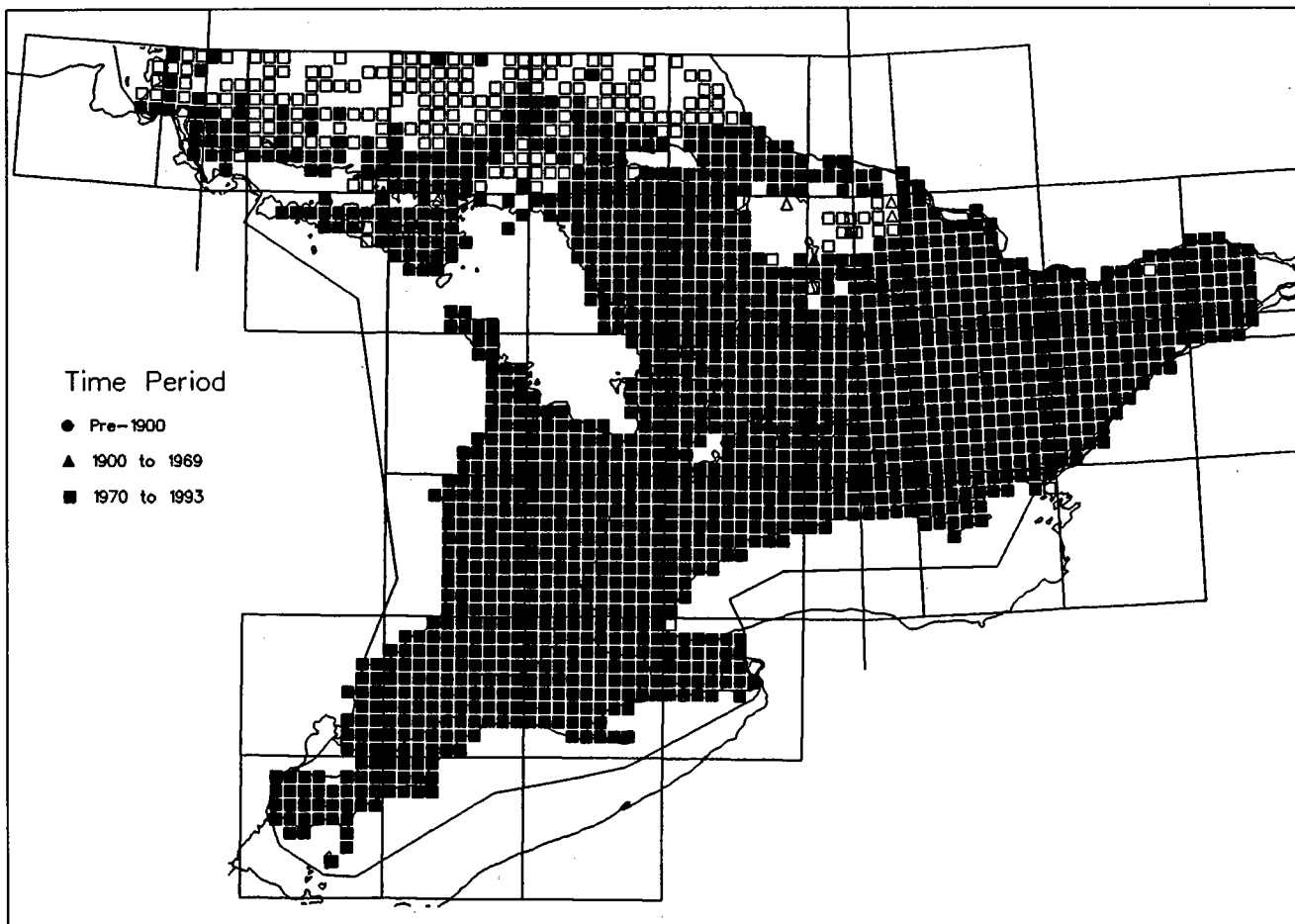
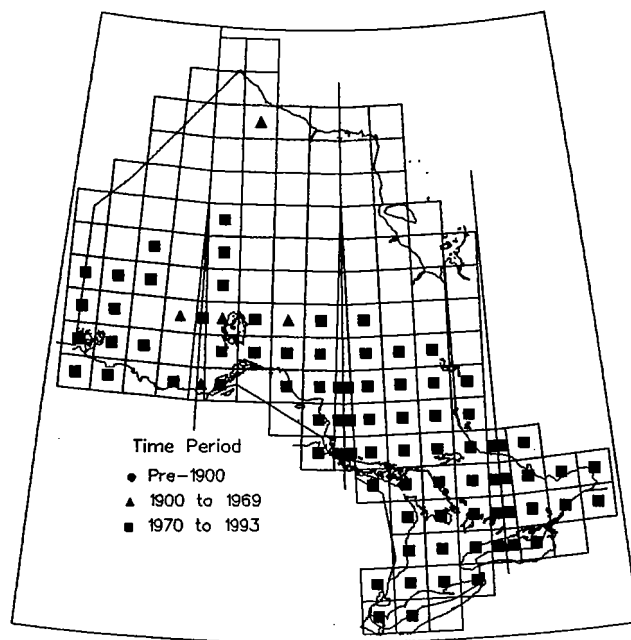
Raccoon

Procyon lotor

Raccoons are familiar to most people, even those living in cities. The masked bandit is common in wooded areas, especially near lakes and streams.

In North America, Raccoons are found throughout most of the US, and parts of southern Canada. Raccoons are common in southern Ontario, but more scarce in far northern areas, likely because of the long winters (Peterson 1966).

An extensive amount of Ontario Ministry of Natural Resources fur harvest data has contributed to a relatively complete map for this species. However, as is the case with the Red Fox and Muskrat, a lack of harvest data from areas such as Algonquin Provincial Park can lead to the misconception that Raccoons are absent from these areas. Raccoons do live throughout the park, and it is more than likely that further surveys in such areas would produce records.



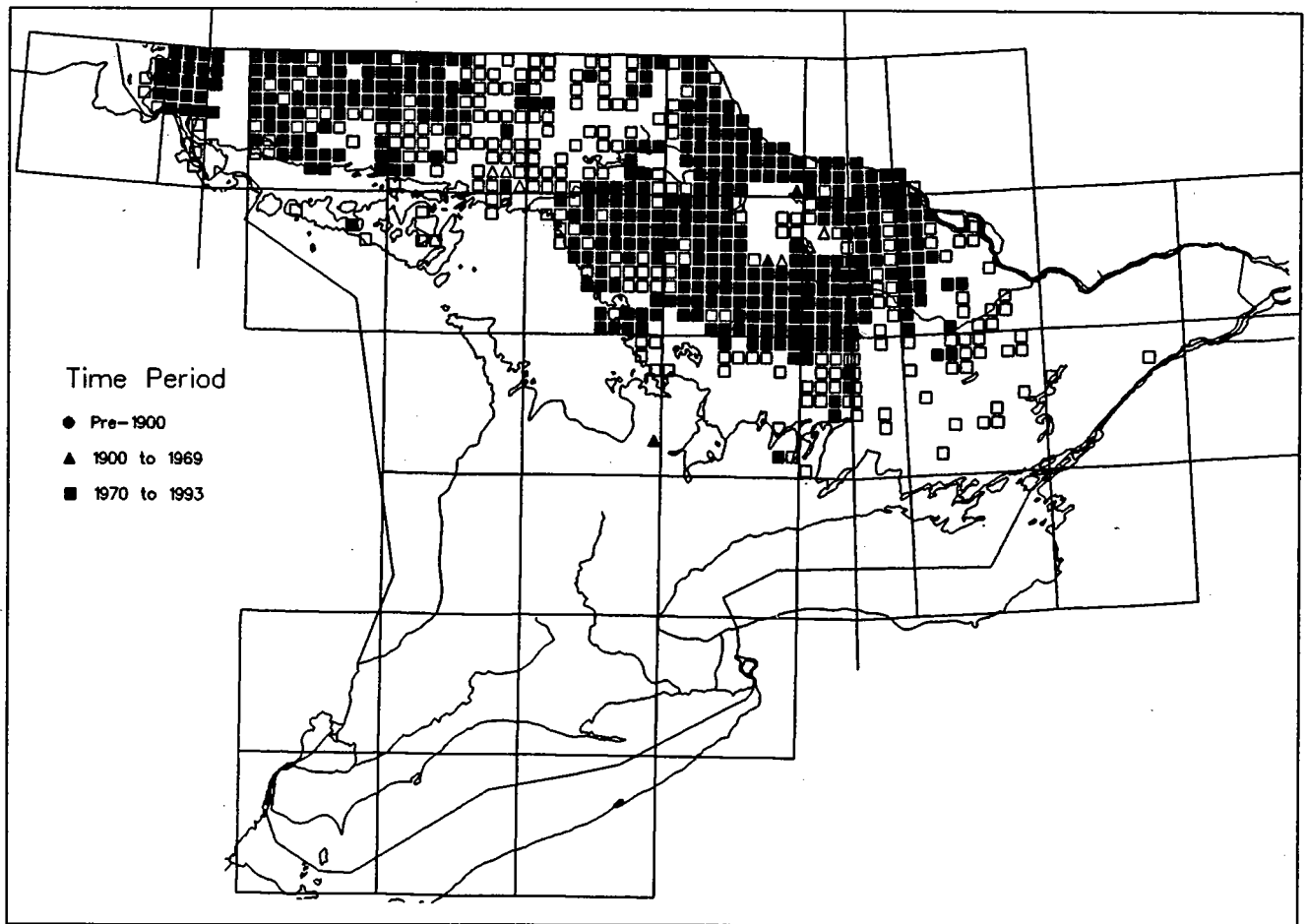
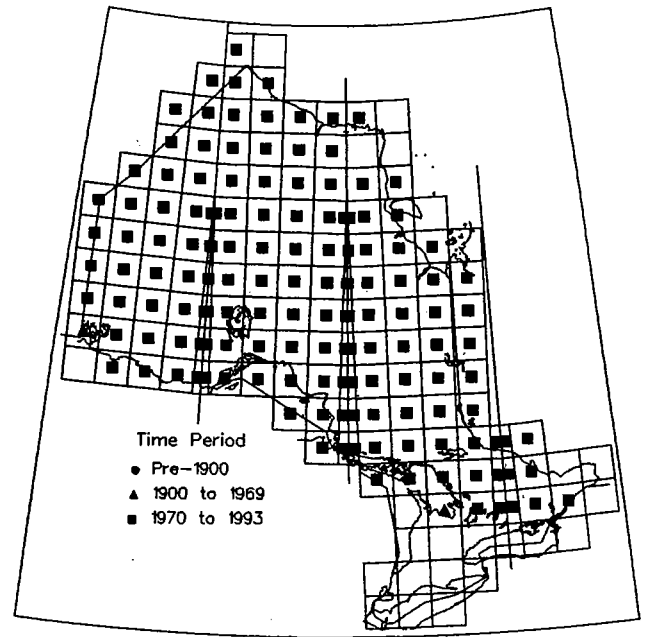
Marten

Martes americana

The Marten is a common mammal of the Boreal Forests of Canada, Alaska, and northwestern US. In Ontario, the Marten can be found from Lake Simcoe in the south and Arnprior in the east north to the tree line.

Although Martens and Fishers share a similar range, they have distinct habitat preferences. Martens prefer mature coniferous forests while Fishers prefer mixed or hardwood early succession forests.

During the late 1800s and early 1900s, Marten populations were significantly reduced by the trapping industry. But Marten populations eventually returned to original levels largely as a result of season closures, quotas, licensing, and a co-operative management program between trappers and the Ontario Ministry of Natural Resources. At the local level, Marten populations fluctuate dramatically in response to small-mammal population cycles.

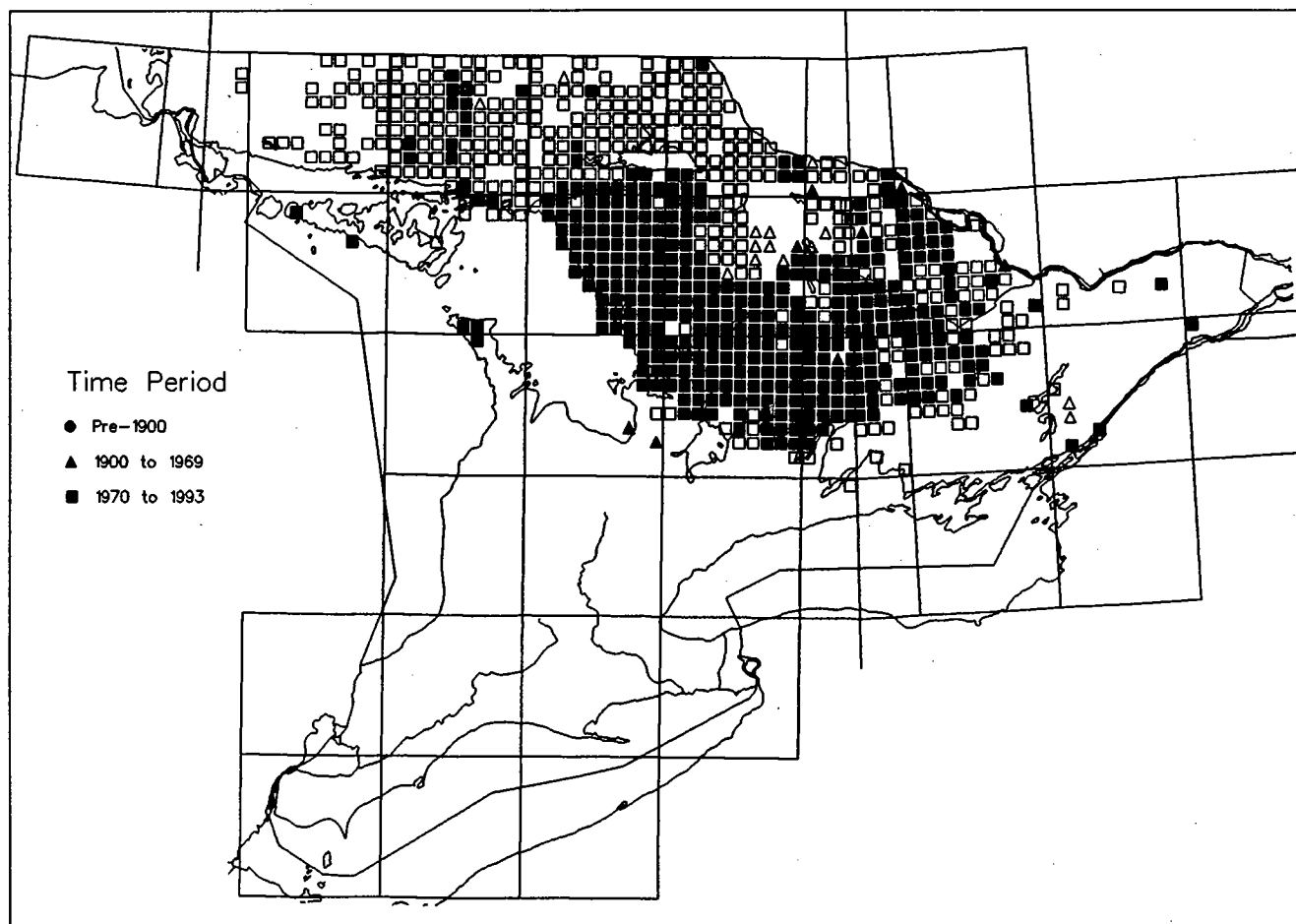
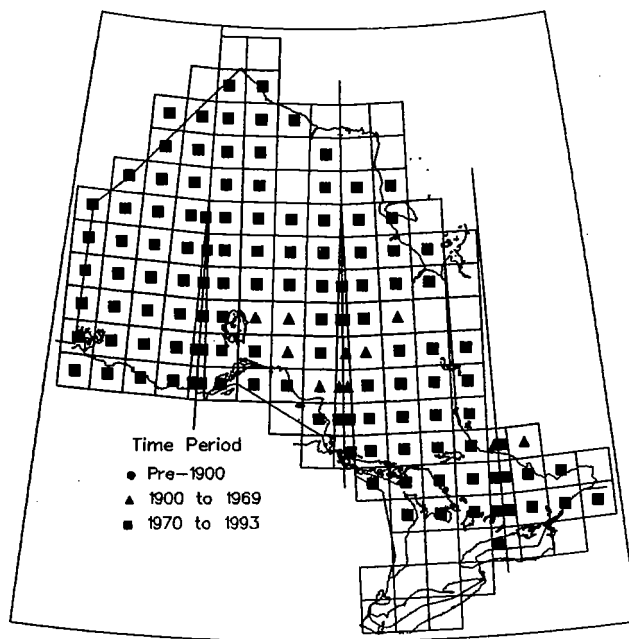


Fisher

Martes pennanti

The Fisher is found throughout Canada and the northern US. In Ontario, Fishers range from Lake Simcoe to the tree line with an isolated population on the Bruce Peninsula. At one time, Fishers may have ranged as far south as southwestern Ontario (Peterson 1966). However, extensive forest clearing led to its disappearance from the southwest. Fishers prefer mixed or hardwood early succession forests whereas the Marten prefers mature coniferous forests.

The Fisher has always been prized for its high-quality pelt. Historically, excessive trapping resulted in a province-wide decline in its numbers. However, a co-operative management plan between trappers and the Ontario Ministry of Natural Resources resulted in the recovery of most of the Fisher's historical range and population levels. Recent Fisher reintroductions in several locations including the Bruce Peninsula, Manitoulin Island, and the Ottawa Valley have helped bring Fishers back to some of the areas from which they had been extirpated.

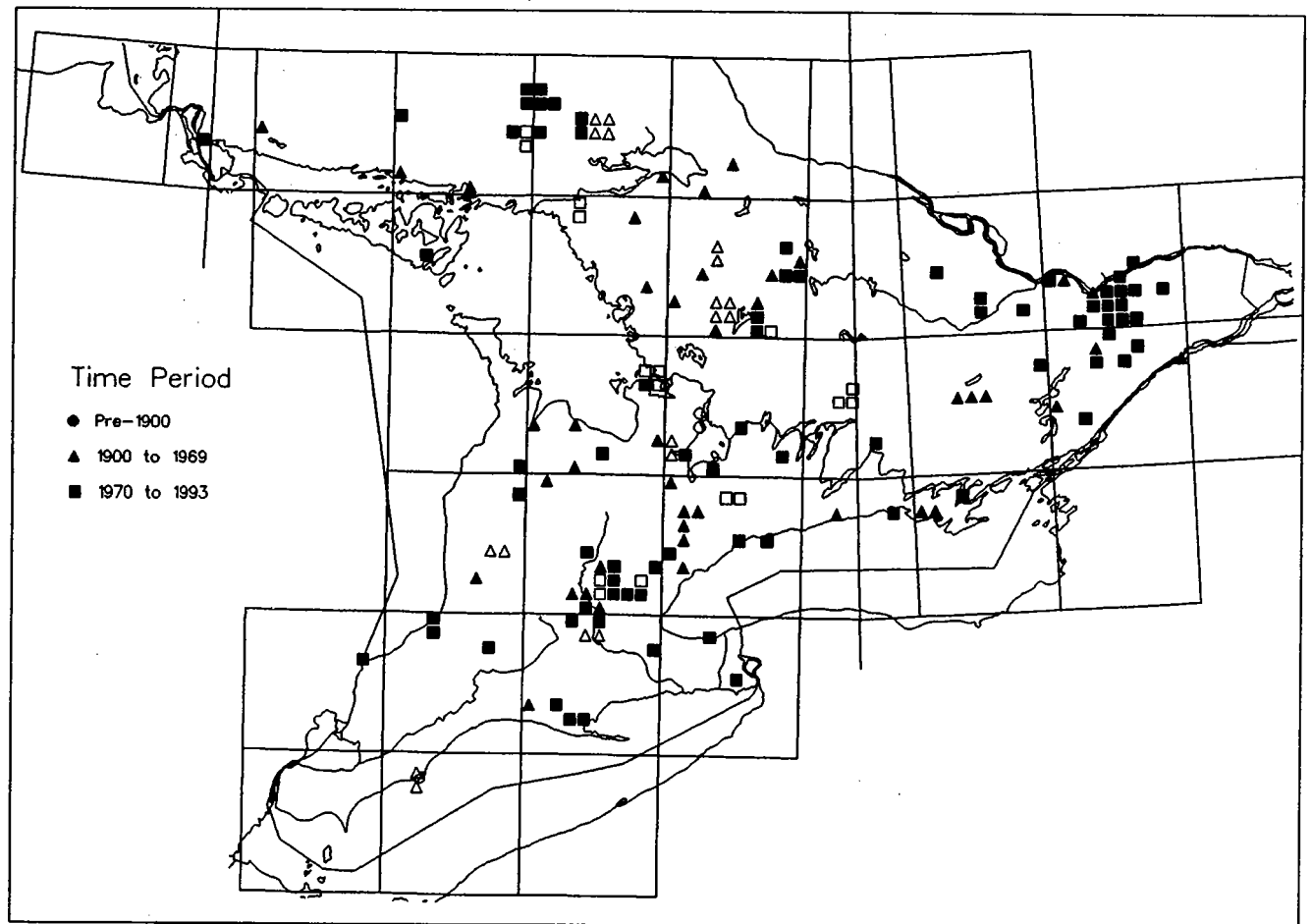
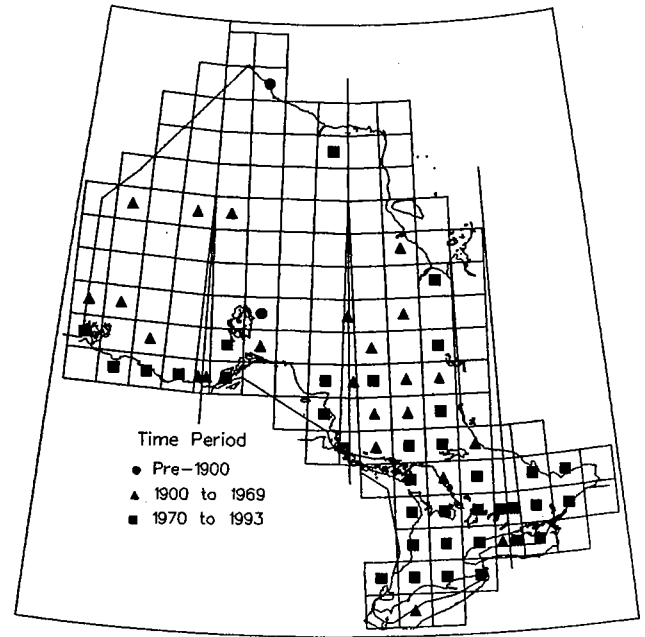


Ermine

Mustela erminea

The Ermine or Short-tailed Weasel is the smaller of two similar-looking weasels. It can be found throughout Canada and the northeastern and western US. In Ontario, the Ermine is found throughout the province.

Data for Ermine are fairly limited because of identification difficulties. Although Long-tailed Weasels are larger than Ermine, sexual dimorphism causes an overlap in size between male Ermine and female Long-tailed Weasels. The best distinguishing method is to determine the sex and then measure the tail vertebrae. Females with tail vertebrae less than 70 mm are Ermine, while those with tail vertebrae greater than or equal to 75 mm are Long-tailed Weasels. Males with tail vertebrae less than or equal to 95 mm are Ermine, whereas males with tail vertebrae greater than 100 mm are Long-tailed Weasels. Specimens that have tail lengths between these values will require examination of other features, such as skull characteristics.

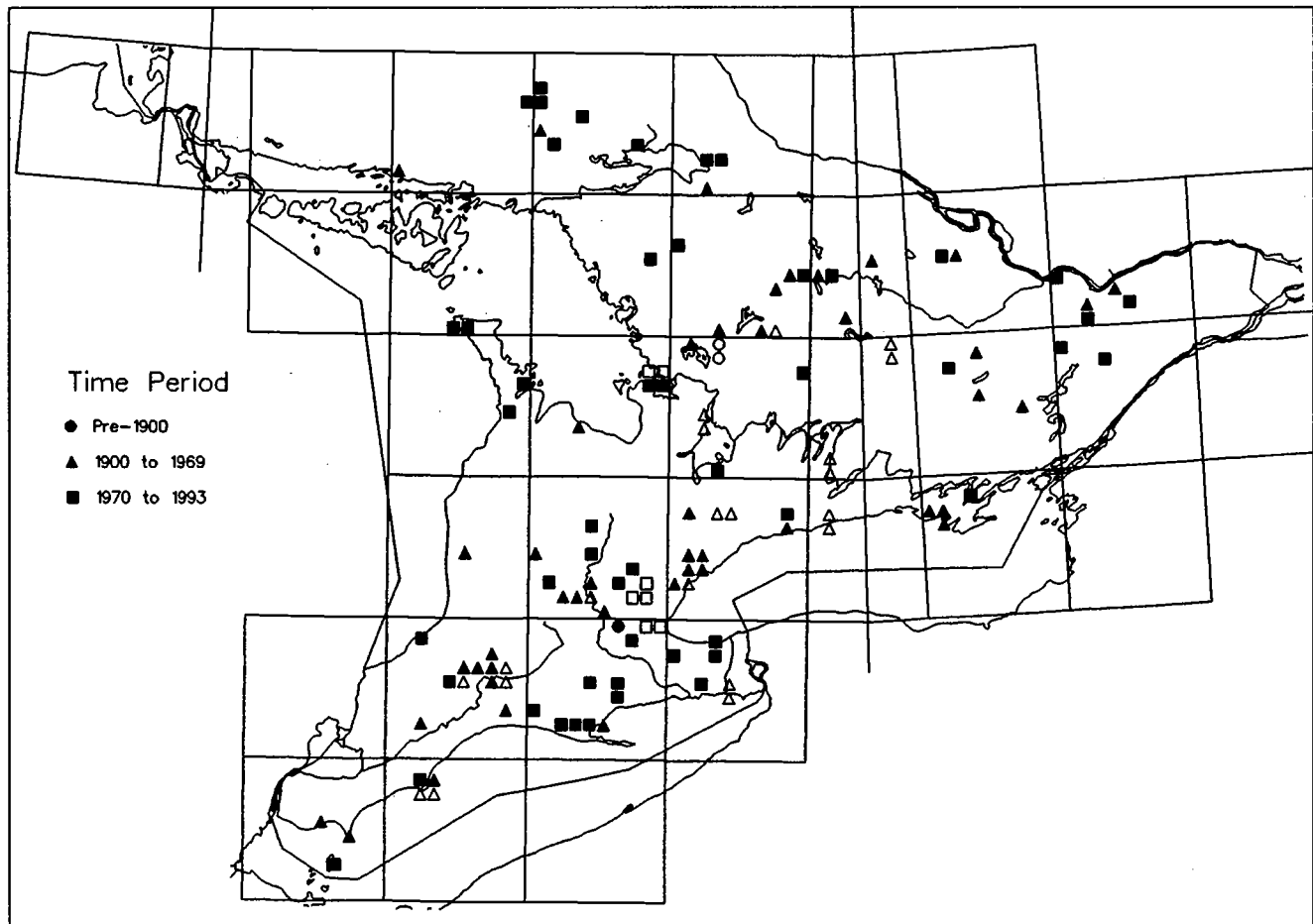
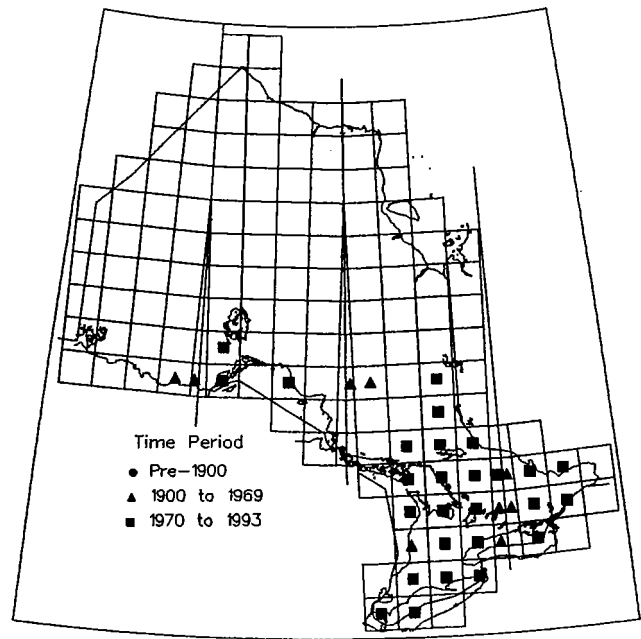


Long-tailed Weasel

Mustela frenata

The Long-tailed Weasel is more southerly distributed than the Ermine. In North America, the Long-tailed Weasel occupies most of the US, Mexico, Canadian Prairies, and southern portions of the remaining provinces. In Ontario, Long-tailed Weasels are found in the southern portion of the province below the north shore of Lake Superior.

In southern Ontario, where the Ermine and the Long-tailed Weasel overlap in distribution, identification can be particularly difficult. Proper identification generally requires that the animal be caught and specific measurements taken. See the Ermine account for specific instructions on how to distinguish between these similar species.

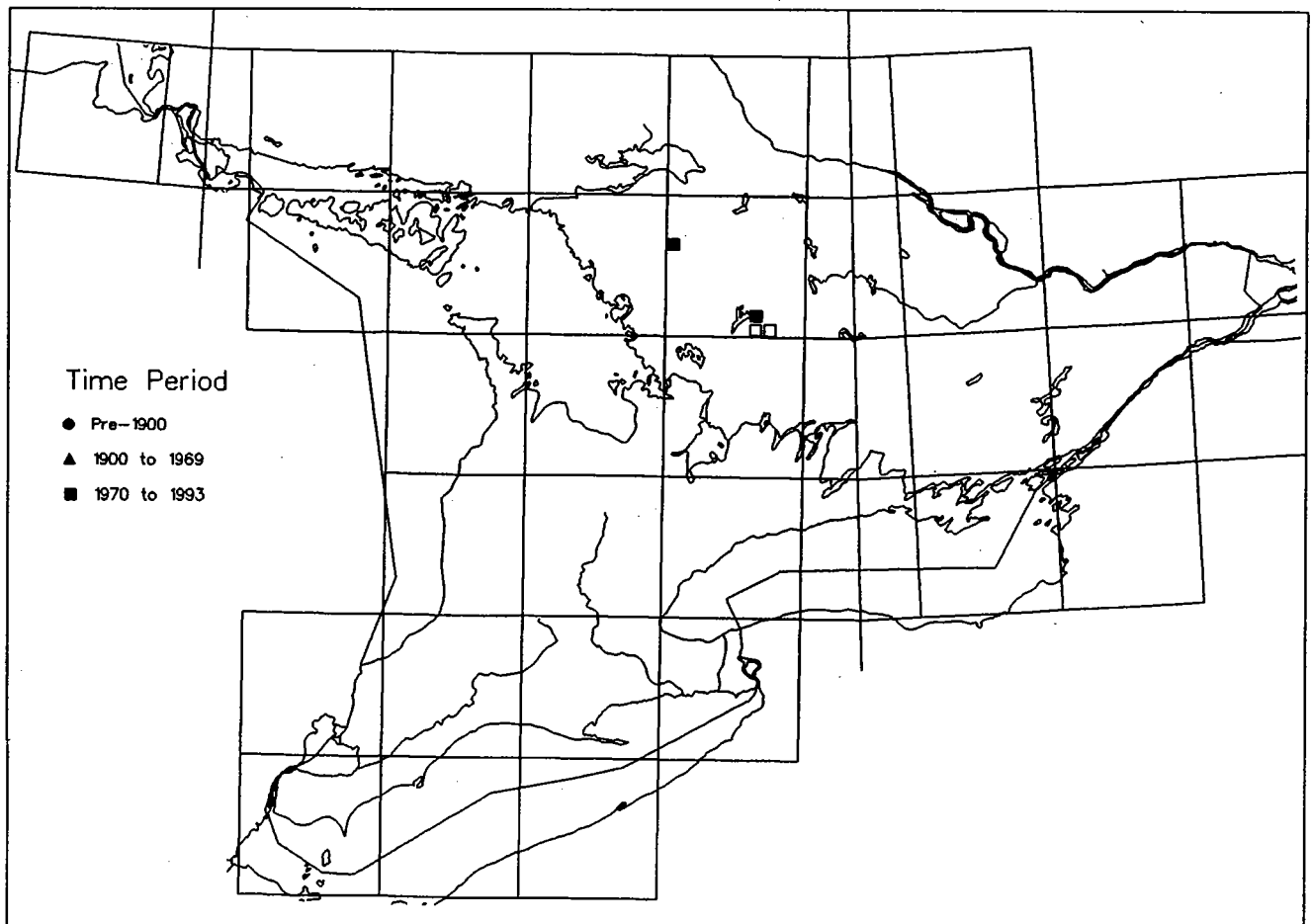
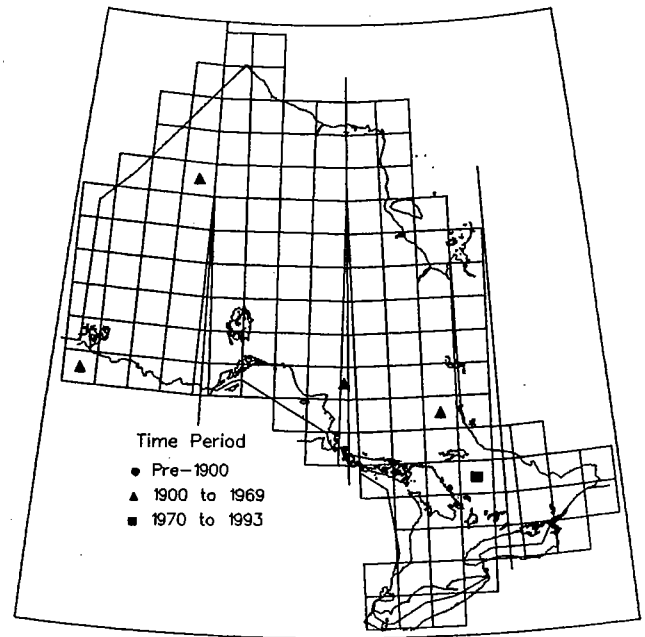


Least Weasel

Mustela nivalis

The Least Weasel is a small, rare relative of the Ermine and Long-tailed Weasel. It can be found from the northern US to Hudson Bay. Peterson (1966) showed the Least Weasel range in Ontario to extend north from the northeast corner of Lake Superior. However, the Mammal Atlas has obtained records for areas much further south, including Dorset and Magnetawan. Insufficient data exist to identify the true range of the Least Weasel in Ontario.

The Least Weasel is often confused with small Ermine, although they are easily distinguished. The Least Weasel is smaller and has a very short tail (less than 38 mm) with no black tip, whereas the Ermine has a tail measuring at least 45 mm with a distinct black tip (Peterson 1966).

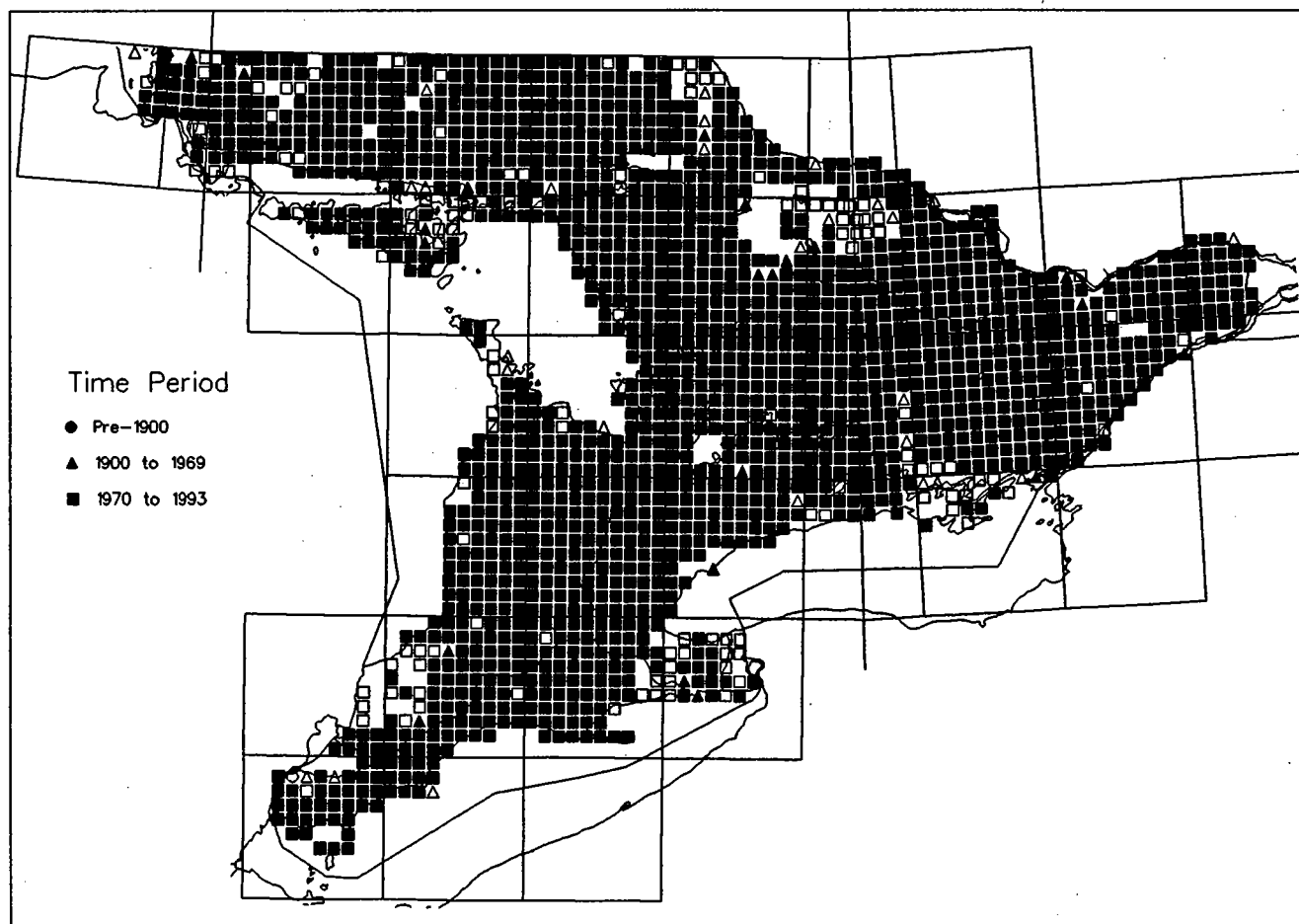
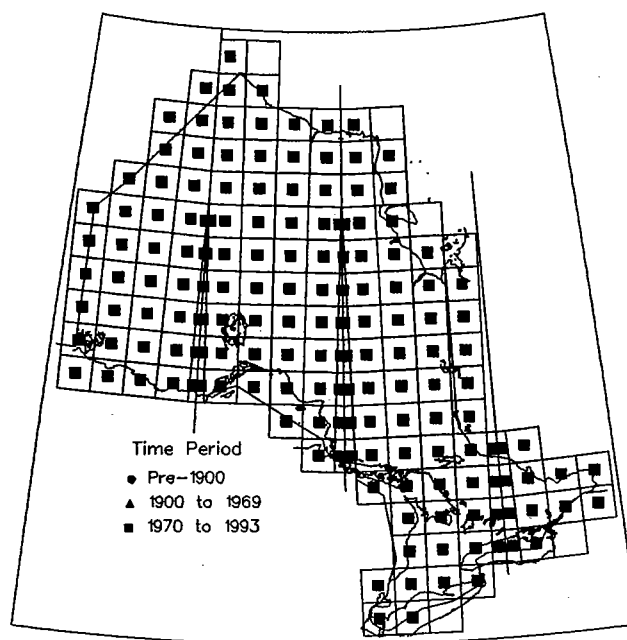


Mink

Mustela vison

The Mink is one of the most commonly seen members of the weasel family. Its appears across most of North America except in the southwestern US and parts of the Arctic. In Ontario, there are records for this highly adaptable mammal in almost every UTM block from Windsor to Hudson Bay. An abundance of Ontario Ministry of Natural Resources fur harvest data on Mink distribution contributed extensively to the formation of this map.

Mink, like River Otter, are adapted to life in aquatic environments (Peterson 1966). They can be found in streams, lakes, and Beaver ponds containing a good supply of fish, frogs and invertebrates.



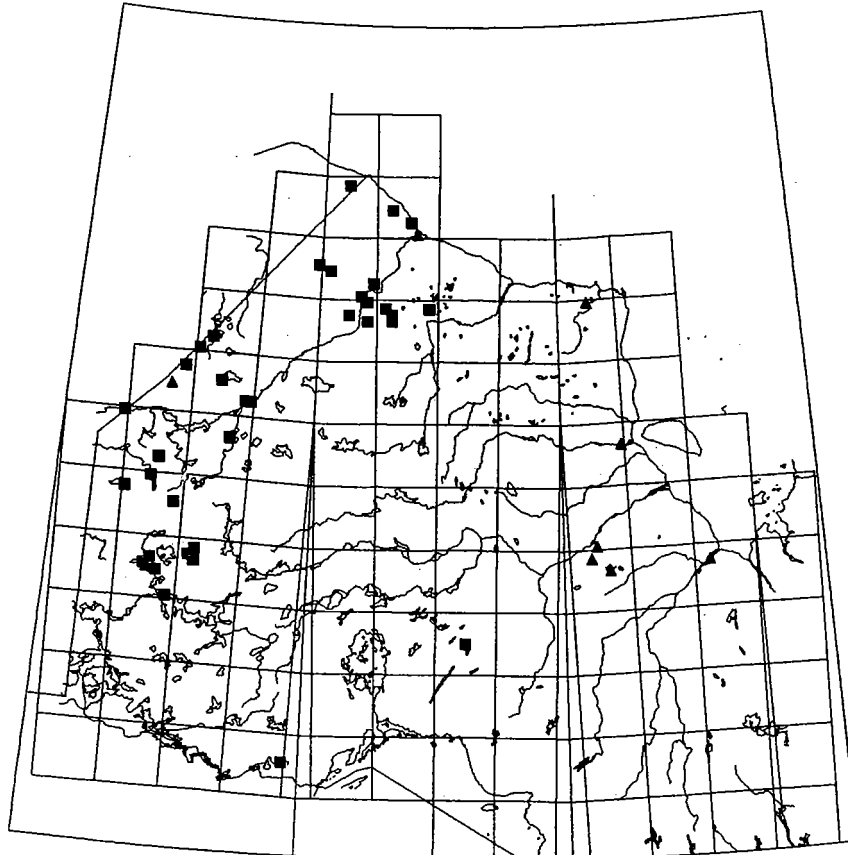
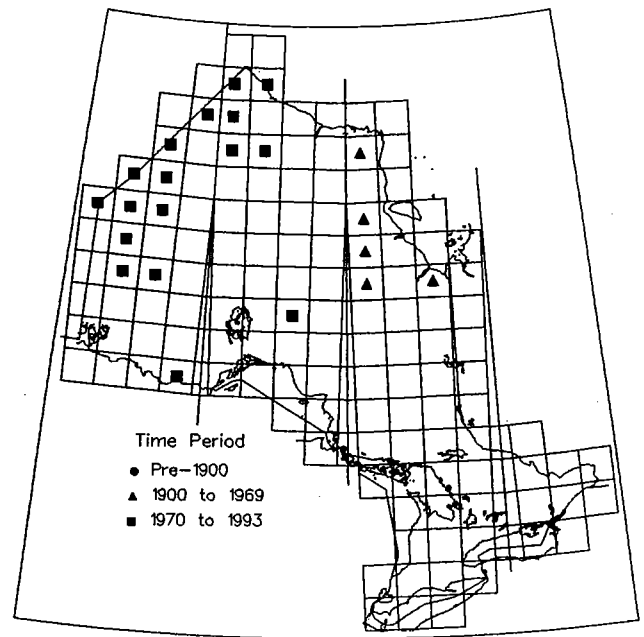
Wolverine

Gulo gulo

Historically, Wolverines were widely distributed across the northern portion of North America but their numbers steadily declined during the early to mid part of the century, resulting in a much smaller range (Hash 1987). Small pockets of Wolverines are found in some of the montane regions of the US, but most live in BC, Alaska, the Northwest Territories, and the northern regions of remaining Canadian provinces. In Ontario, the Wolverine is present in the northwest portion of the Boreal Forest. Although historical trapping notes indicate the past existence of a few local populations of Wolverine in the Moosonee and Sutton Ridge areas, no evidence of such populations exist today.

Wolverine records in the Mammal Atlas are mostly derived from trapped specimens and tracks observed during aerial surveys.

.. Nancy Wilson



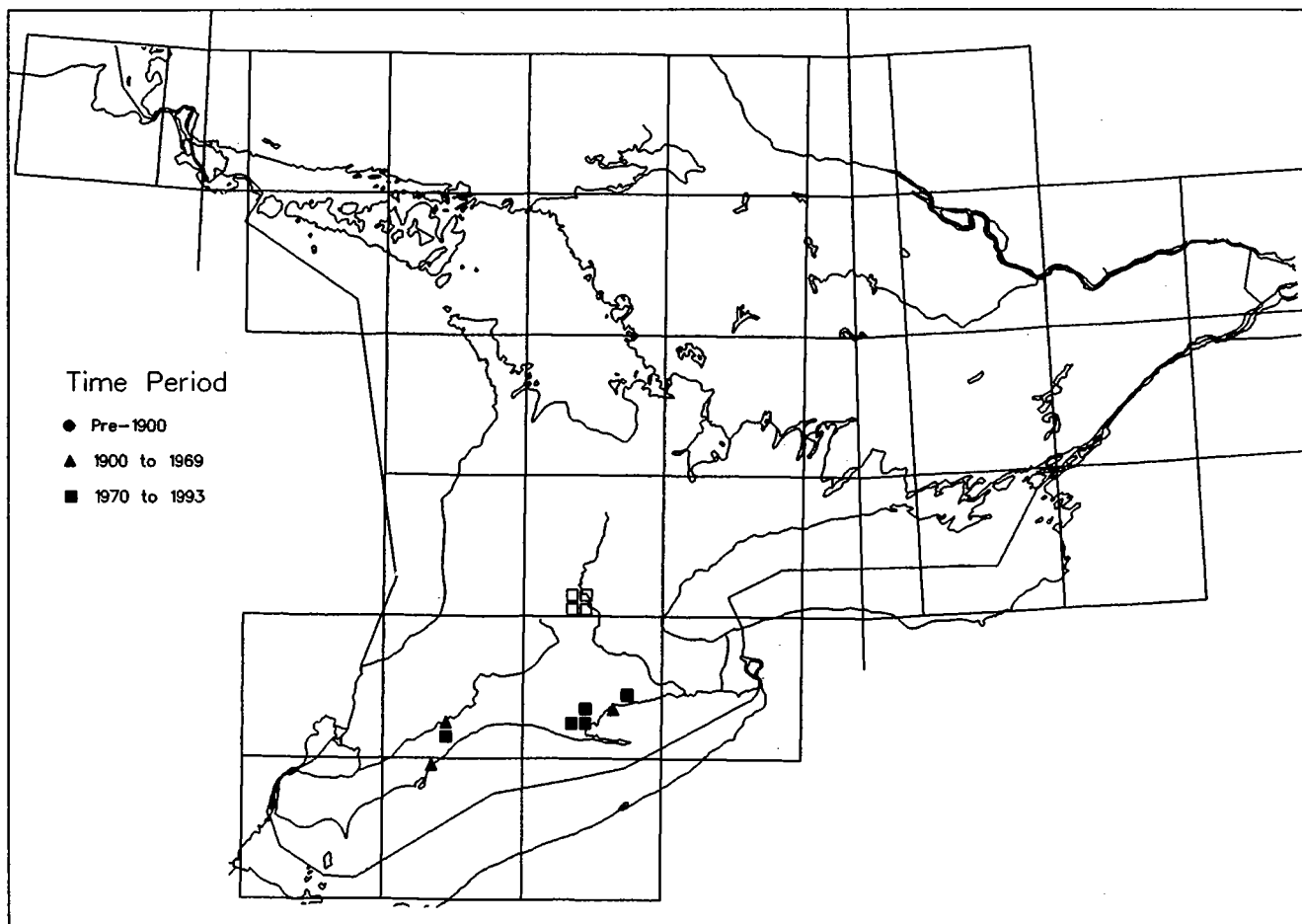
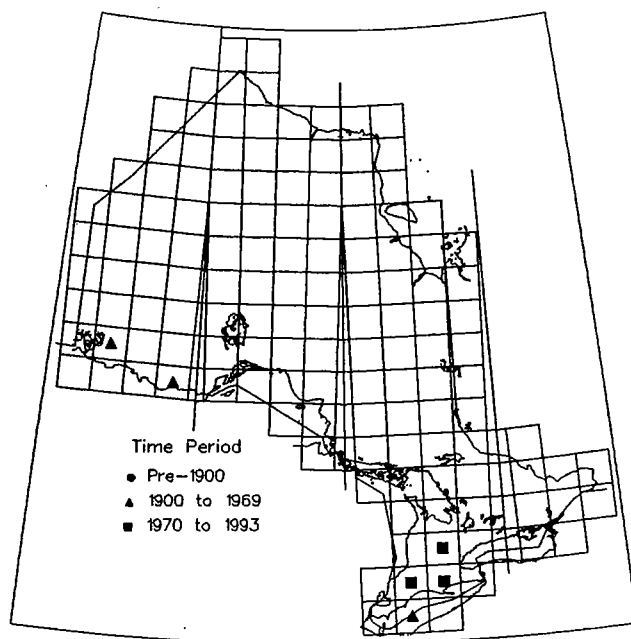
Badger

Taxidea taxus

The Badger is a mammal of the open grasslands. It can be found throughout the western half of the US and parts of the Canadian Prairies. In Ontario, there are only two small remnant populations of Badgers: the first is found along the north shore of Lake Erie; the second is found in the Rainy River area of northwestern Ontario (Peterson 1957).

Badgers are fossorial mammals that live only in areas where there is sufficient soil depth for burrowing. Habitat preferences make most parts of the Canadian Shield unsuitable for Badgers, and consequently they are restricted to the southern agricultural areas where adequate soil conditions exist.

In Ontario the Badgers main prey are Woodchucks and Eastern Cottontails.

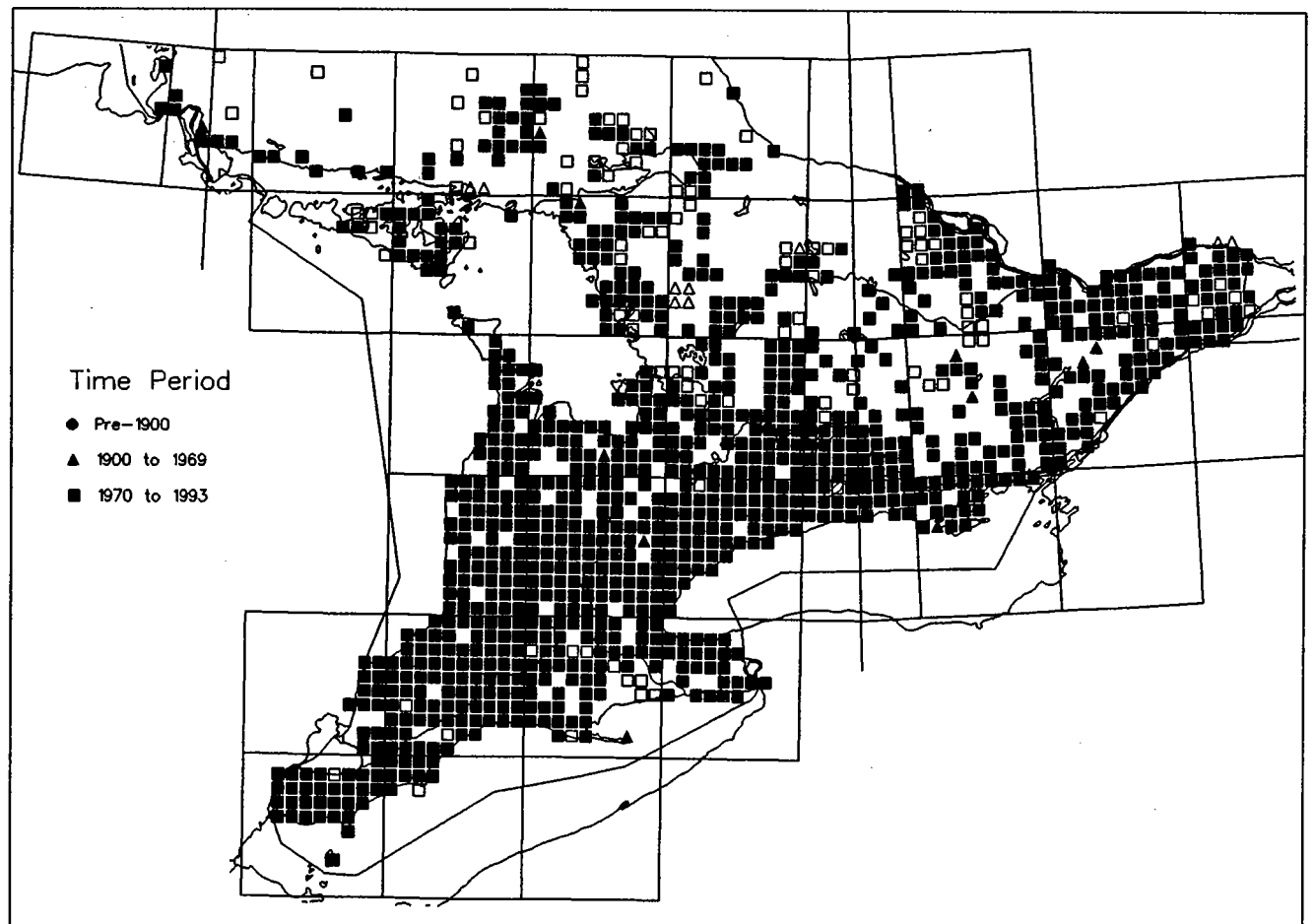
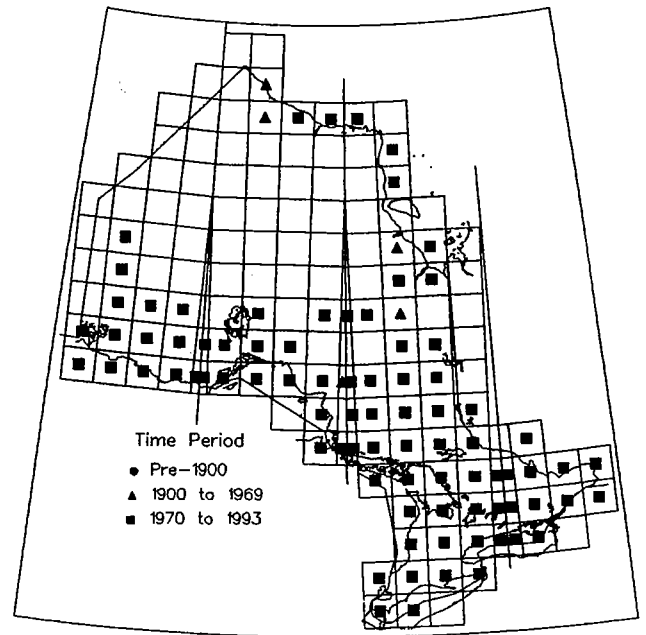


Striped Skunk

Mephitis mephitis

The Striped Skunk is a familiar mammal noted for its strong odour and distinctive white stripes. Skunks range throughout North America, as far north as Great Slave Lake. In Ontario, skunks are found throughout the southern portion of the province as far north as the southern shore of James Bay. They are also found along the James and Hudson Bay coastlines. Like Raccoons, Striped Skunks are plentiful in both urban and rural areas.

Although skunks are classed as furbearers, pelts are not in high demand. Consequently, the Mammal Atlas has relied heavily on volunteers to provide Striped Skunk records.

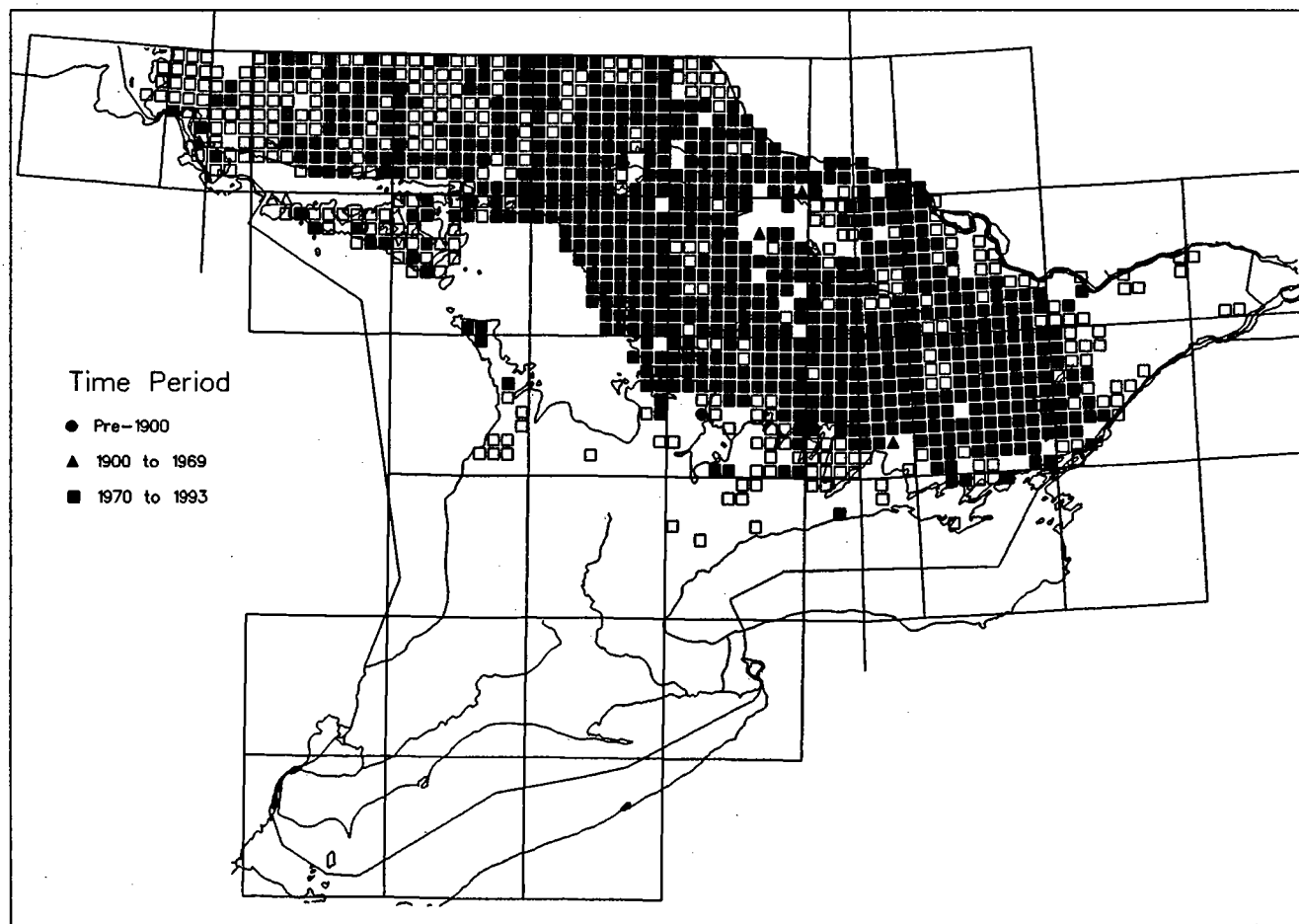
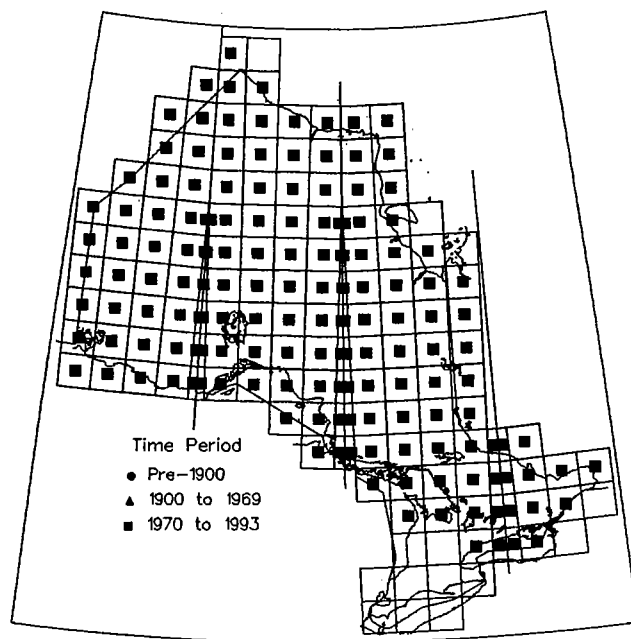


River Otter

Lontra canadensis

The River Otter can be found throughout many areas of the US and Canada, although agricultural development has depleted its range in southcentral Ontario. Otters are most common north of Lake Simcoe, including on the Bruce Peninsula, where there are numerous small lakes and streams.

In Ontario, River Otters are classified as furbearers. Ample fur harvest records provide abundant data with which to map River Otter range. However, in some fringe areas of the River Otter's range (such as the Bruce Peninsula), there is a zero harvest quota for otters, and the Mammal Atlas has had to rely heavily on volunteers to provide information.



Cougar

Felis concolor

Historically, the Cougar or Mountain Lion had one of the most extensive distributions of New World terrestrial mammals, ranging south from central and southern Canada to Patagonia (Young and Goldman 1946). With the encroachment of civilization, this species lost much of its original range (Peterson 1966). In Ontario, the Cougar was found in the southern part of the province as far north as Lake Timiskaming (Seton 1925). Historical records indicate that the Cougar had all but disappeared from the province by the 1860s (Peterson 1966). As southern Ontario was settled, the Cougar and the Wapiti (one of the Cougar's main prey species) were gradually eliminated.

In recent years there have been hundreds of unconfirmed reports of Cougars in Ontario, particularly in northwestern and northern Ontario. In 1973, the presence of Cougar was confirmed in eastern Manitoba within 80 km of the Ontario border (Nero and Wrigley 1977), which suggests that Cougar may be found in northwestern Ontario as well. A Cougar was shot recently in northwestern Quebec and has yet to be identified to subspecies. Transient Cougars have been known to make long journeys in search of new range and are, therefore, effective colonizers. Even though they are solitary mammals, they do not remain long in an area without other Cougars nearby (Seidensticker *et al.* 1973), which perhaps explains why Cougars are occasionally observed in areas and then never seen again (Nero and Wrigley 1977). Reports of Cougar sightings from southern Ontario are generally attributed to misidentification or escaped western Cougars kept as pets.

Although the Eastern Cougar was added to the provincial Endangered Species List in 1977, debate over its presence in Ontario continues.

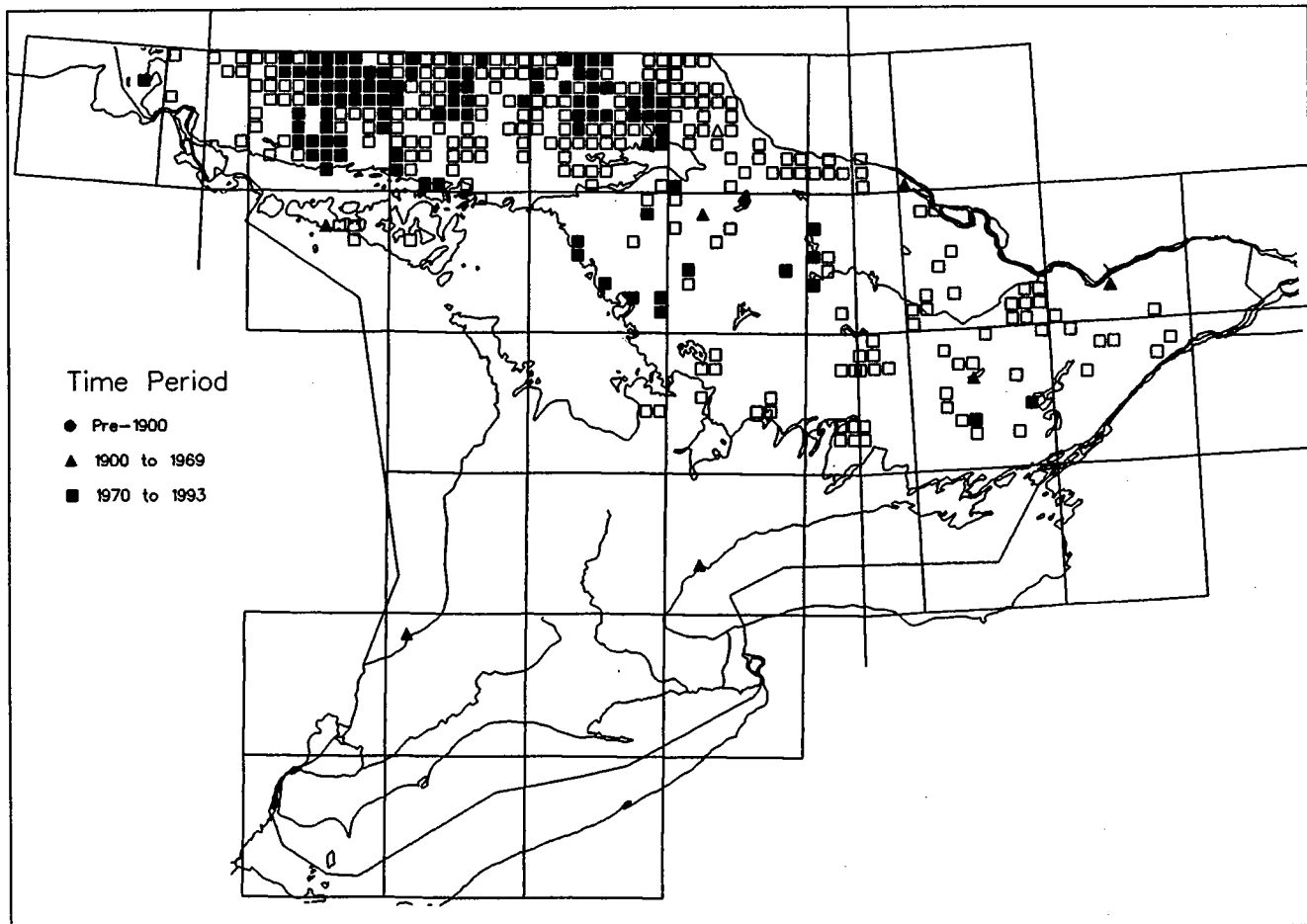
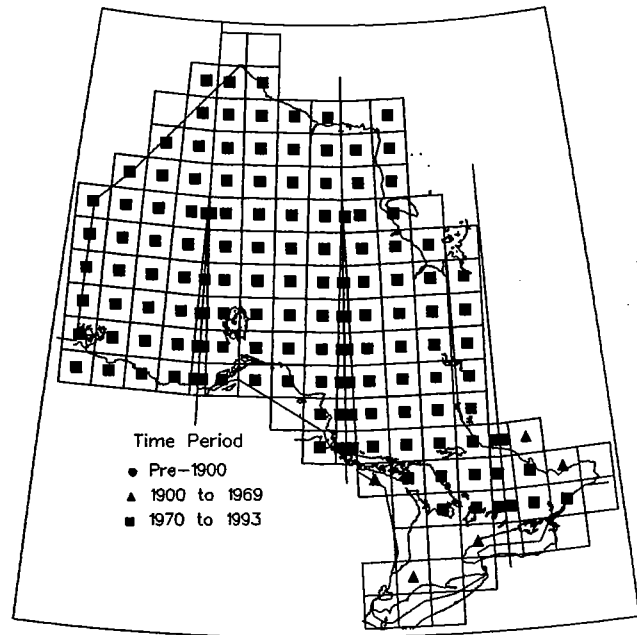
.. Judith Eger

Canada Lynx

Lynx canadensis

The Canada Lynx ranges throughout Canada and the western US. In Ontario, it is common north of the French and Mattawa rivers. Records south of the French and Mattawa rivers likely represent animals that have dispersed from the north. Historically, lynx were found sparingly throughout most of southern Ontario north of the Carolinian Forest region (Peterson 1957). Consequently, records from Kettle Point and Toronto (both from 1905) may be representative of that former range.

Lynx are found only in forests where there are sufficient numbers of Snowshoe Hares. Hare populations cycle every 7-10 years depending on the amount of natural browse available. Because lynx are dependent on Snowshoe Hares as a primary food source, Canada Lynx populations also consequently cycle (with a lag of one or two years) (Peterson 1966).

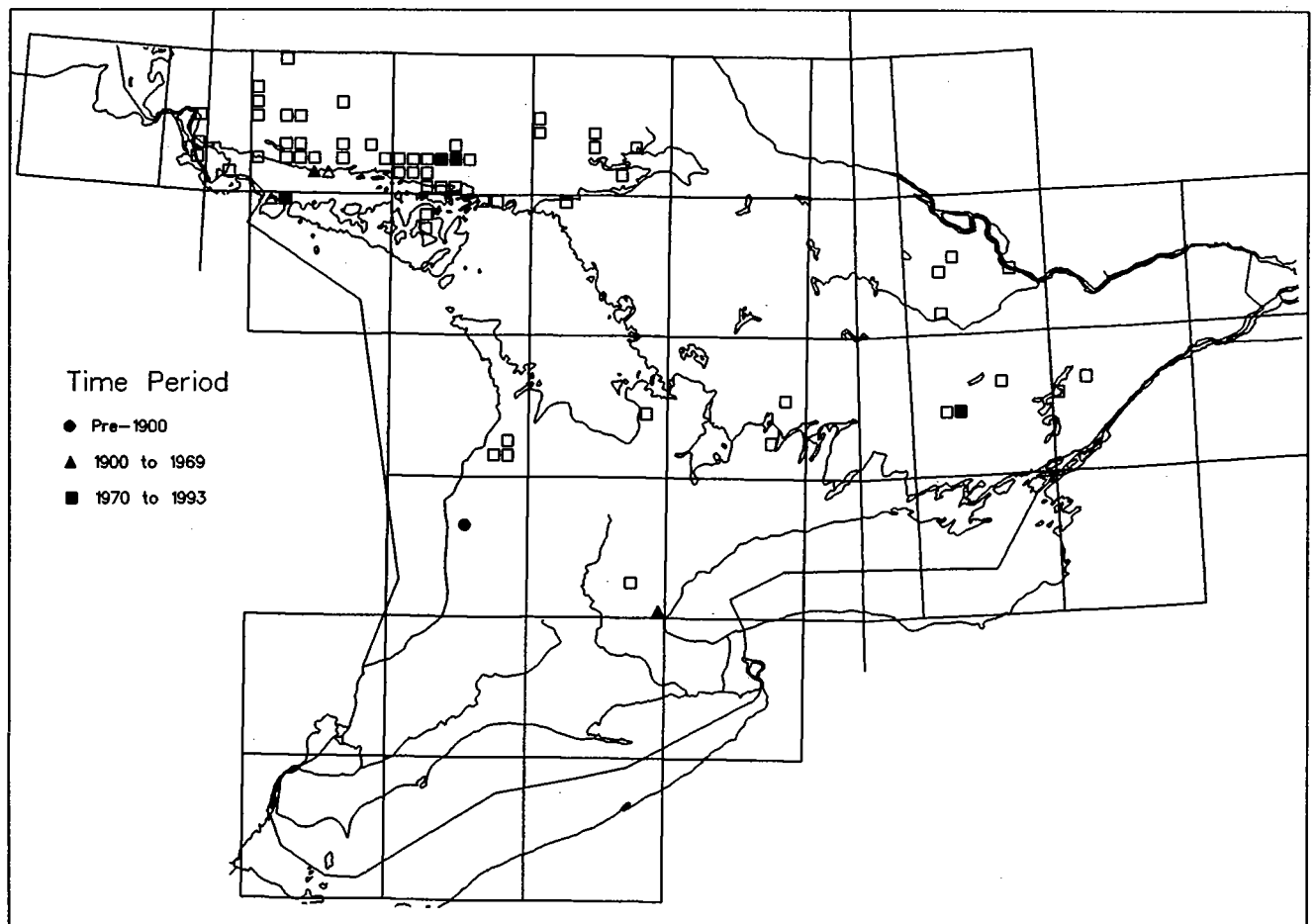
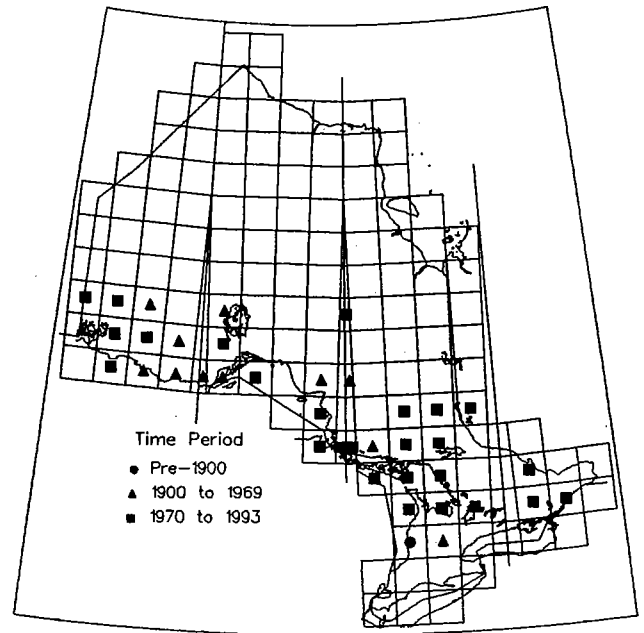


Bobcat

Lynx rufus

Bobcat range in North America is generally south of that of the Canada Lynx. Bobcats are found throughout much of the US, and, less prevalently, southern Canada. Although there are a few Bobcat records in southern Ontario, the main population foci for this species occur around Lake of the Woods, and between Sudbury and Sault Ste. Marie (immediately adjacent to the north shore of Georgian Bay).

Bobcats are not as dependant on Snowshoe Hares for food as Canada Lynx (Peterson 1966), and are therefore able to live further south. In the north, where the large-pawed Canada Lynx thrives, Bobcats are hampered by soft deep snow because their small paws penetrate the snow too easily.



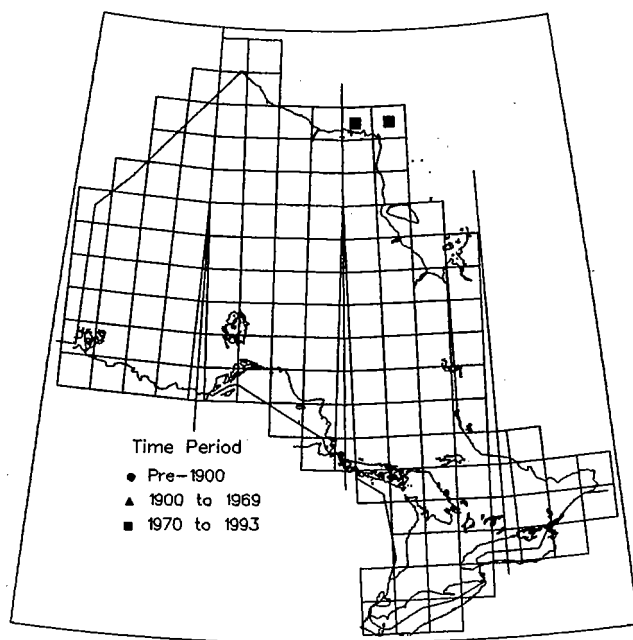
Walrus

Odobenus rosmarus

Walrus can be found at only one Ontario site: a shoal off the Ontario coast of Hudson Bay. This site represents the most southern range of the Atlantic Walrus (*Odobenus rosmarus rosmarus*) in North America (Chapman and Feldhamer 1982). Walrus are usually found in the shallow arctic seas of the continental shelves (Banfield 1974).

Photographs of the Ontario colony of this gregarious species indicate a viable population, with young age classes being present. Walrus are present on this shoal from the time that the ice fractures in late July until it forms again in late fall. Small variations in record locations likely represent feeding areas near the shoal.

.. Nancy Wilson



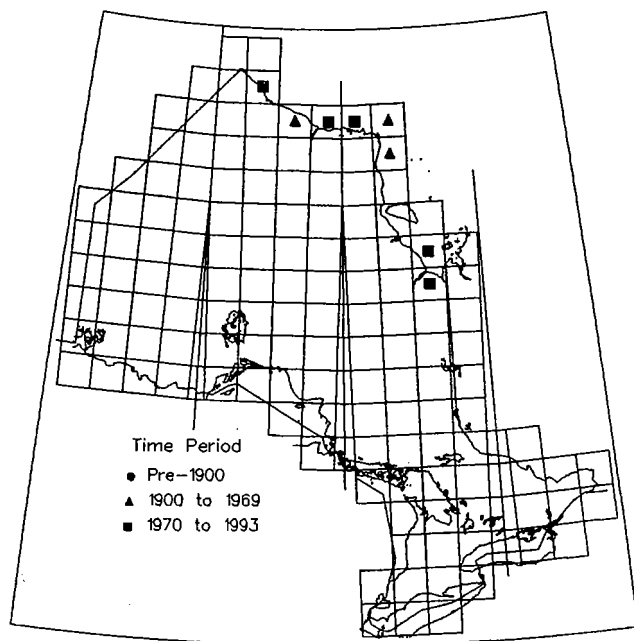
Ringed Seal

Phoca hispida

The Ringed Seal rarely wanders far from ice. Its range is circumpolar, stretching from the North Pole to the southern edge of the pack ice and extending into Hudson and James bays (Chapman and Feldhamer 1982).

Despite being perhaps the most numerous of the seal species along Ontario's remote maritime coast (Smith 1975), the Ringed Seal can be difficult to sight because of its small size (the Ringed Seal is the smallest pinniped in North America) and solitary nature. Observations of single animals occur along the coast when the sea ice has fractured substantially. Ringed Seals make use of Ontario's entire maritime coast for feeding and resting during ice-free summer months.

.. Nancy Wilson



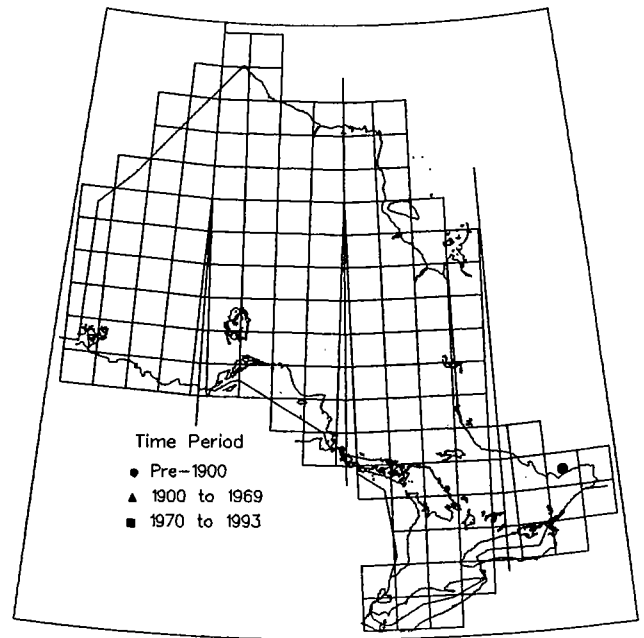
Harbor Seal

Phoca vitulina

The Harbor Seal tends to be gregarious on land (Chapman and Feldhamer 1982) and more sedentary in water. No confirmed observations of Harbor Seals have been made in Ontario. However, historical reports indicate the possible presence of Harbor Seals in the Ottawa River and that one was reportedly shot off New Edinburgh, Ottawa, in 1882 (Rand 1945) or 1883 “opposite to New Edinburgh” (Small and Lett 1885), which may place the record in Quebec waters. The validity of this record remains unknown.

Although clearly less abundant than the Ringed Seal, the Harbor Seal’s presence along our maritime coastal waters should not be unexpected. Increased survey coverage in James and Hudson bays would likely confirm the presence of Harbor Seals in Ontario.

.. Nancy Wilson



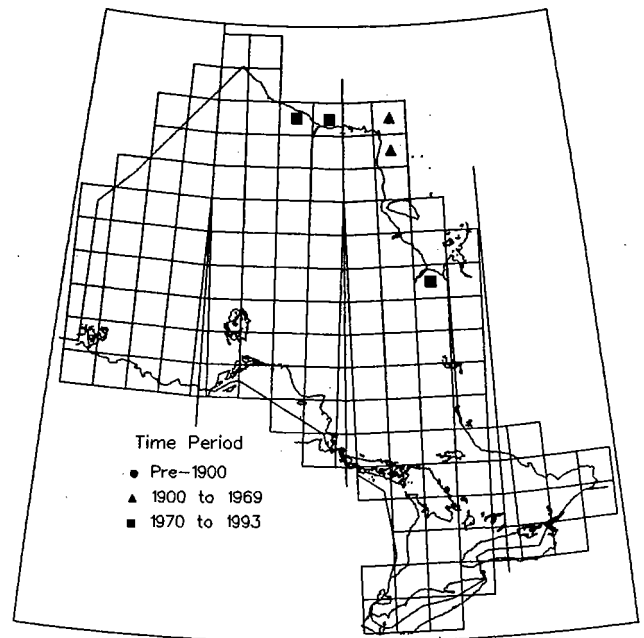
Bearded Seal

Erignathus barbatus

While the Bearded Seal inhabits circumpolar areas, its range stretches south into James Bay and the Gulf of St. Lawrence. The Bearded Seal’s solitary nature yields fewer observations than larger, more gregarious marine mammals such as the Beluga. The Bearded Seal has an intense curiosity (Chapman and Feldhamer 1982) and has been observed on boat docks in the Moosonee Area.

A benthic feeder, the Bearded Seal keeps to shallow water (less than 200 m) (Chapman and Feldhamer 1982) and consequently can be found along the entire Ontario coast during ice-free periods. Some areas along the coast are better haul-out sites for this relatively large seal and the documented sightings are primarily of seals resting on land.

.. Nancy Wilson



Deer and Bison

Artiodactyla



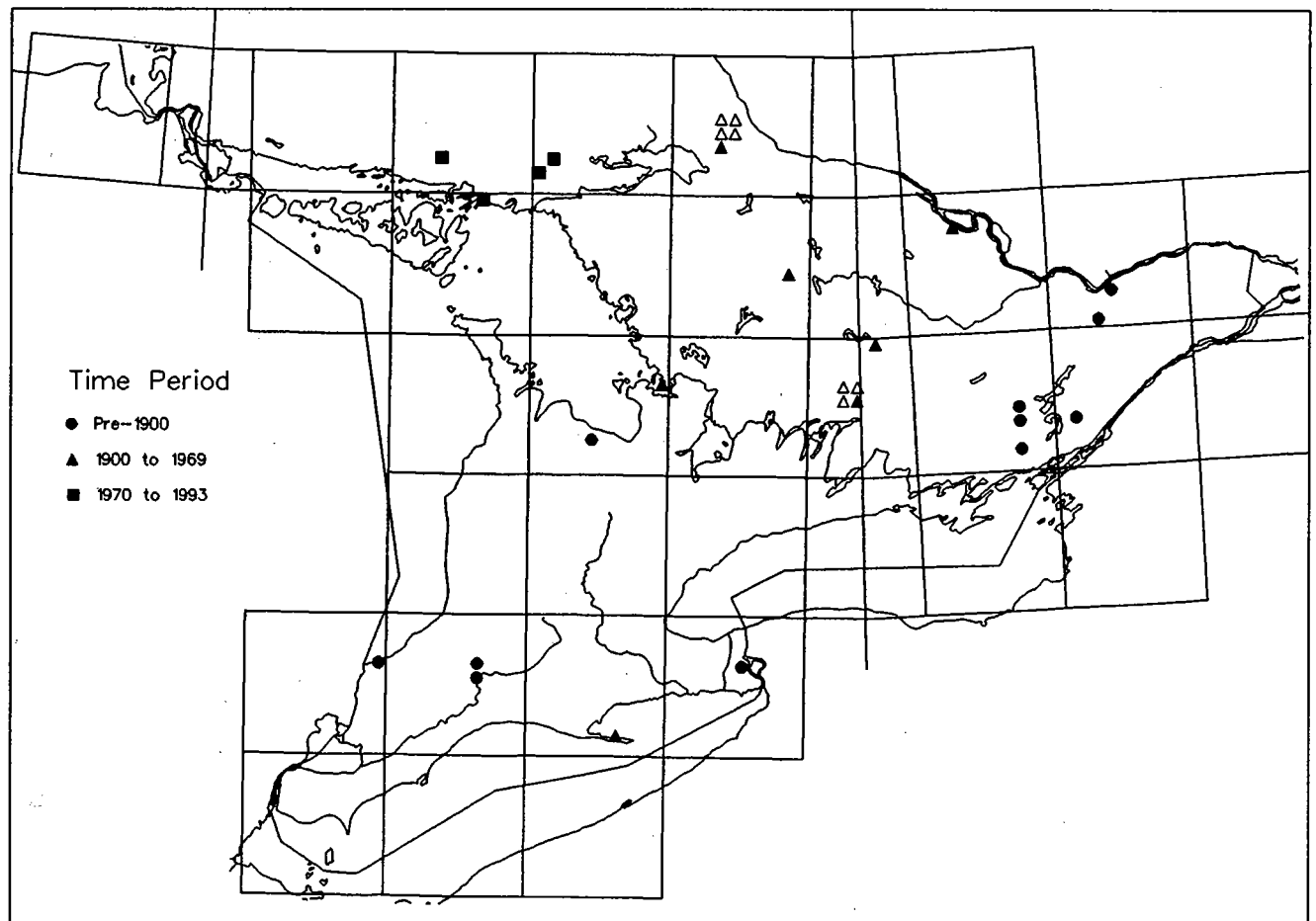
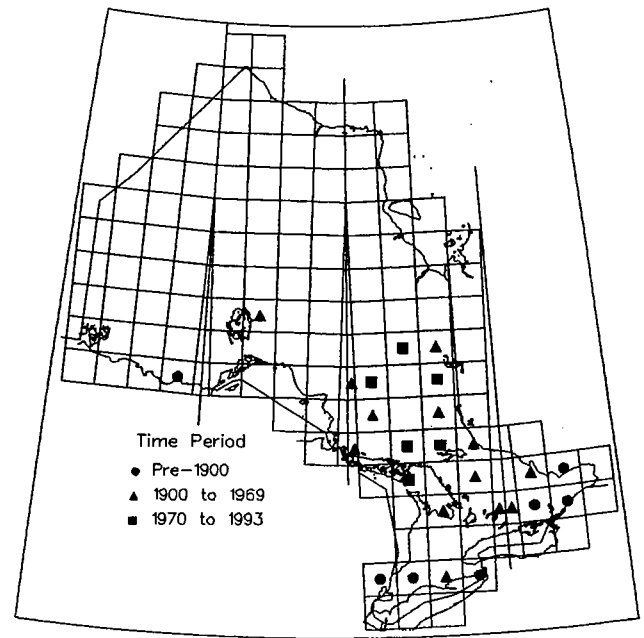
Moose: Linda Shaw

Wapiti

Cervus elaphus

When Europeans first settled Canada, the eastern race of Wapiti or "Elk" (*C. e. canadensis*) were found in the Rainy River area and throughout southern Ontario north to Lake Nipissing. But by 1750, excessive hunting and habitat loss resulted in a province-wide decline. By 1850, the eastern race had been extirpated from Canada and eventually became extinct (Peterson 1966).

Beginning in 1897, Wapiti were reintroduced to Ontario using Wapiti from Manitoba (*C. e. manitobensis*). Early attempts failed, but between 1932 and 1947 several introductions at various locations were successful. However, in 1949, disaster struck again. The Large Liver Fluke (*Fascioloides magna*), a parasite of deer, was discovered in cattle near one of the release sites. Ensuing panic led to a province-wide extermination and by 1970 all of the Wapiti in Ontario had been eradicated except for a scarce few in the Burwash/French River area and the Chapleau Crown Game Preserve (Peterson 1966, Ranta 1979).

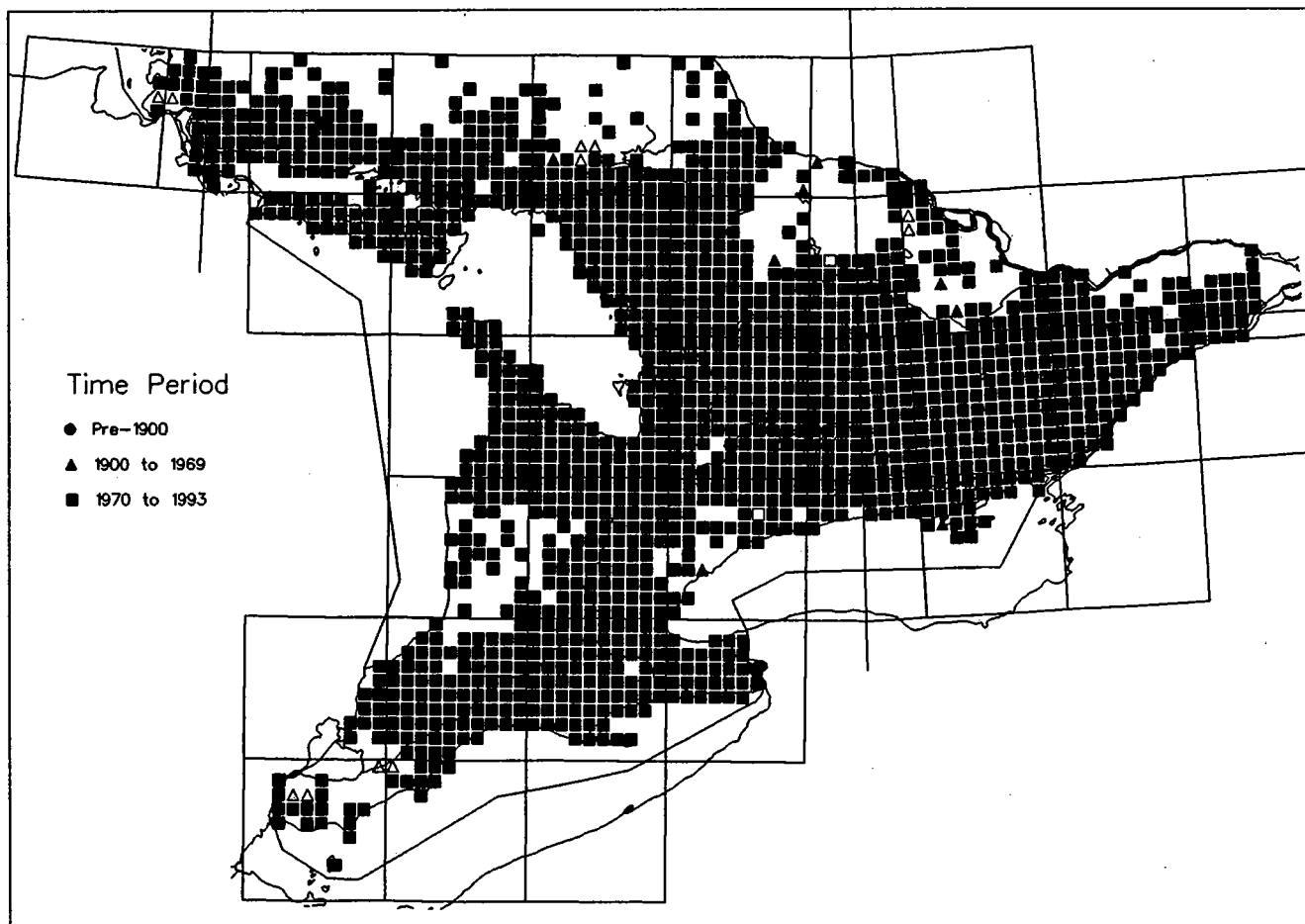
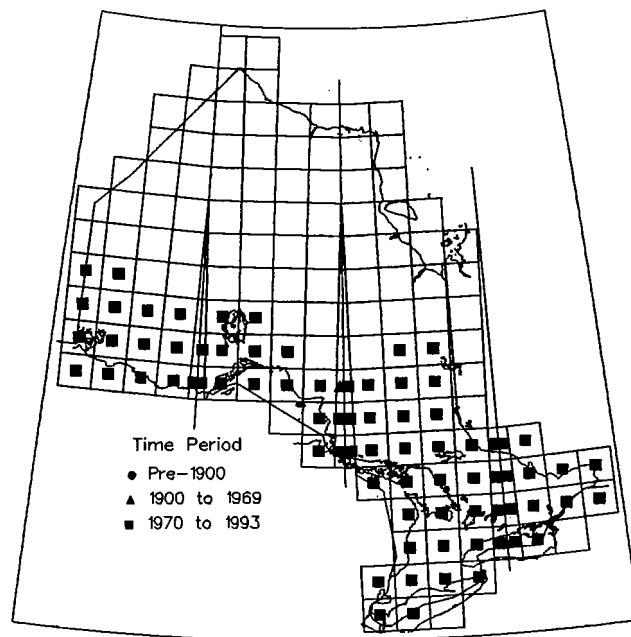


White-tailed Deer

Odocoileus virginianus

The White-tailed Deer is the smallest and most commonly seen member of the deer family in Ontario. It can be found throughout North America from Mexico to a point mid-way between Lake Superior and James Bay. However, in Essex and parts of Kent and Lambton counties, intensive agriculture practices have eliminated woodlots, resulting in the decline of deer in these areas.

White-tailed Deer range is partly dependent on land-use practices. Extensive logging earlier this century resulted in a second-growth forest that allowed populations in the north to increase and spread (Peterson 1966).

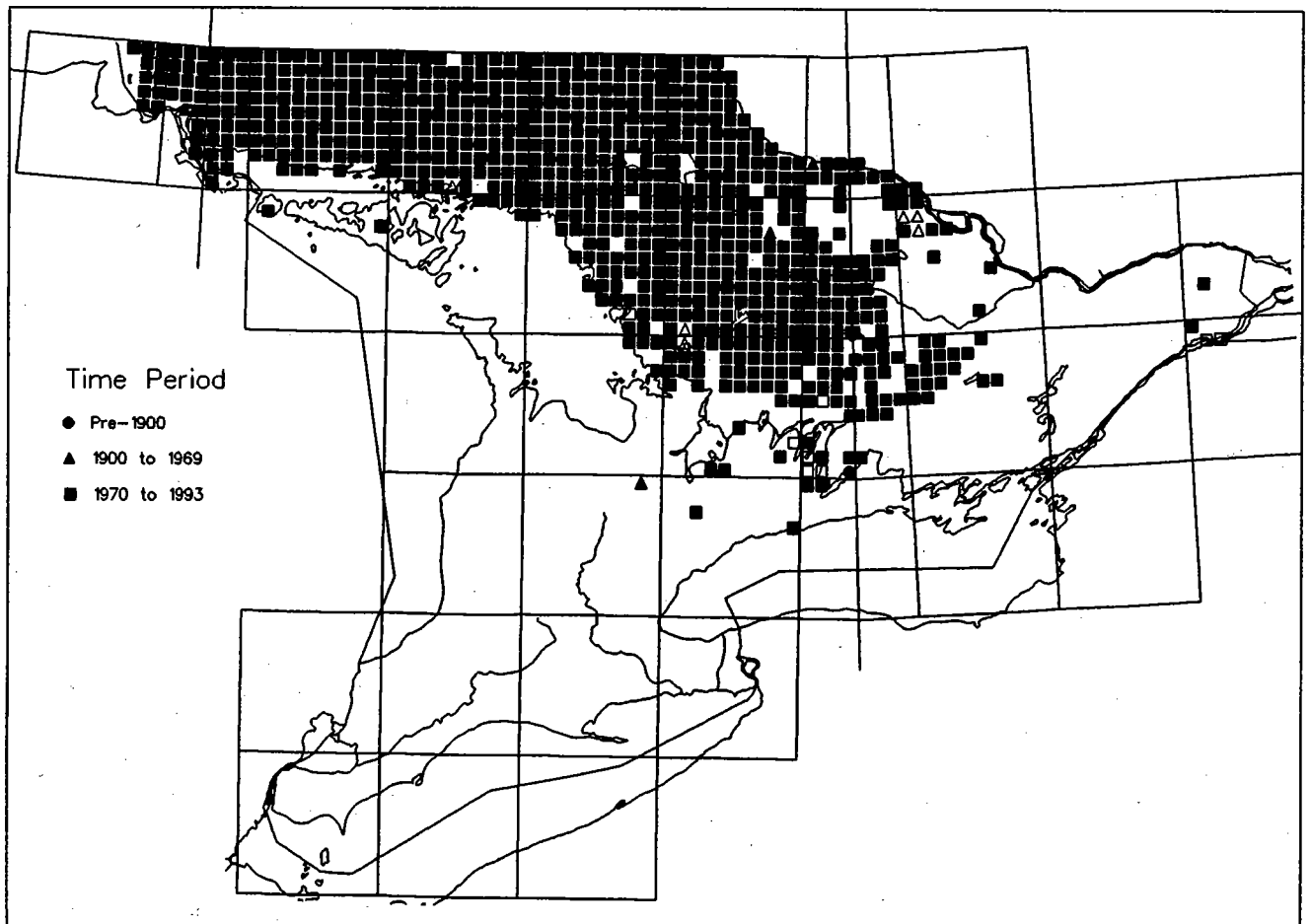
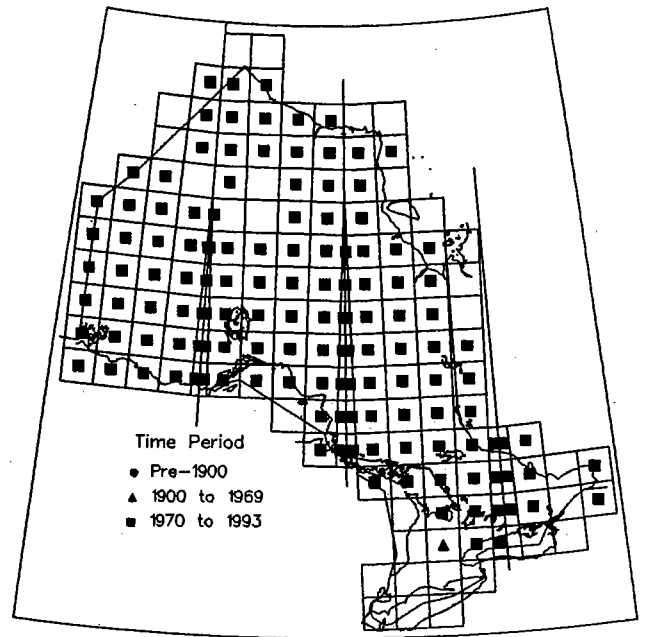


Moose

Alces alces

The Moose is the most widely-distributed member of the deer family, living in Boreal Forest regions throughout the northern hemisphere. In Ontario, Moose are found in forested areas near lakes and wetlands north from the southern edge of the Canadian Shield to the tree line. Occasionally, Moose will wander south of their normal range off the Canadian Shield. Moose have been seen in Peterborough County and even as far south as Markham and Alliston. These records are not a reflection of the Moose's true range, but rather the extralimital movements of a few individuals.

During the last century, the distribution of the Moose has remained relatively stable with only a small reduction in the southernmost portion of its range. Early logging in the south created a second-growth forest more suited to the White-tailed Deer than to Moose. However, those second-growth forests are now maturing, resulting in higher numbers of Moose returning to southern areas.

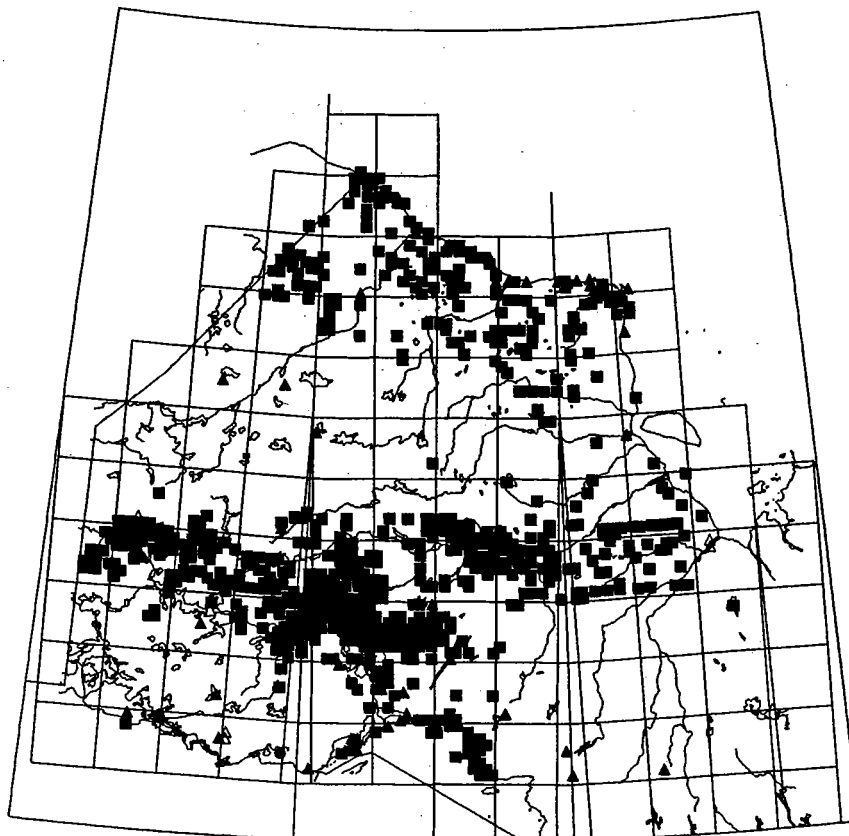
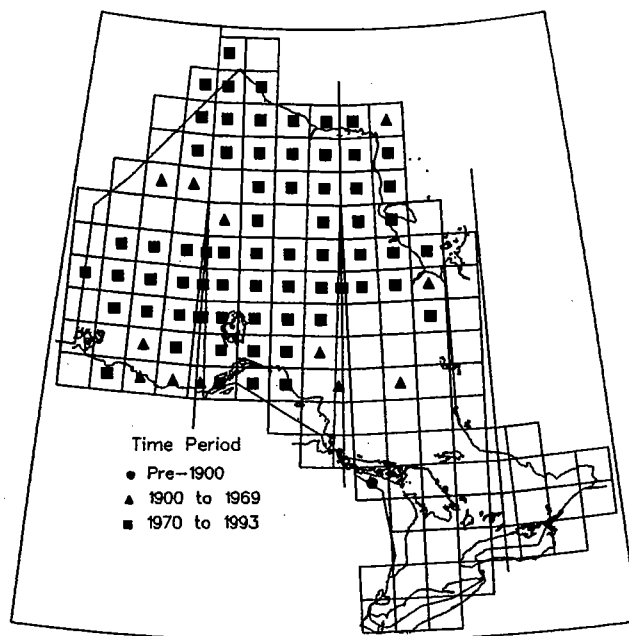


Caribou

Rangifer tarandus

Caribou once ranged across all territories and western provinces, into Ontario as far south as Lake Nipissing, across Quebec and into the Maritimes (Peterson 1966). Now in Ontario Caribou range north from 50° 20' latitude. Records from south of this line represent small remnant populations or historical finds (such as the antler found on Cockburn Island).

Caribou range in Ontario has decreased significantly since early settlement, because of a change in their habitat. Caribou prefer large expanses of mature, lichen-rich coniferous forest (particularly 80-120 year old jack pine), for use as winter habitat. Modern management practices aimed at maintaining such habitat focus on larger (10,000 ha) cuts to ensure large, uniformly-aged stands that are more suitable for Caribou than Moose. Historically, small-cut forest harvest techniques (50-100 ha) favoured Moose because of the abundant edge habitat created. High wolf populations supported by increased Moose numbers result in increased predation on the more vulnerable Caribou (OMNR 1993).

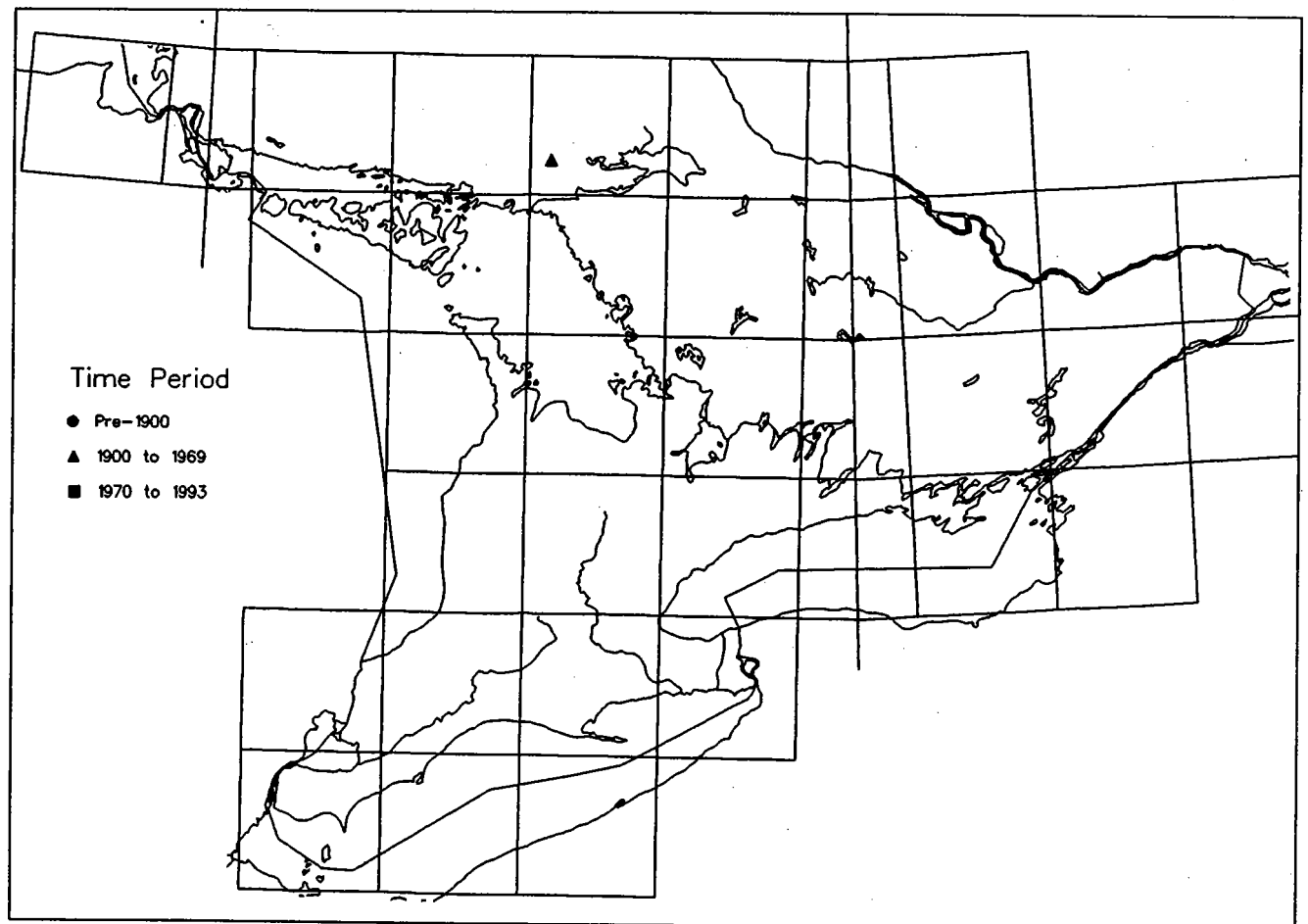
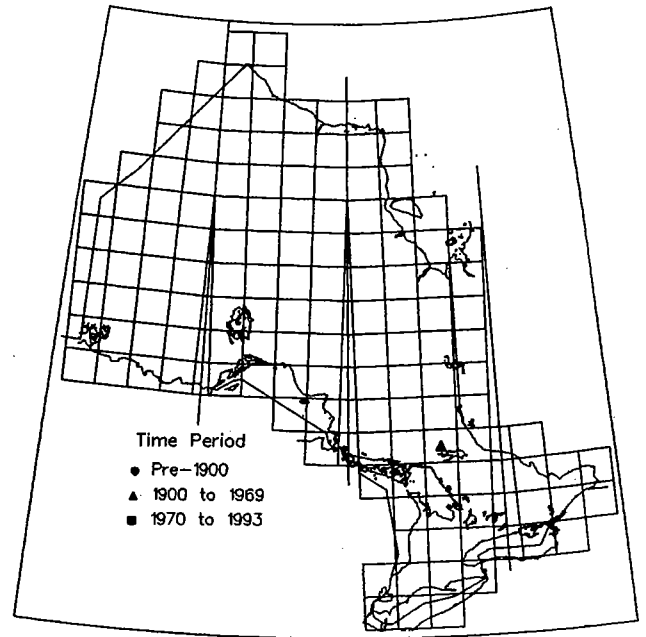


Bison

Bos bison

Prior to European settlement, Bison ranged from Mexico to Great Slave Lake and from Washington to the Rocky Mountain states in herds totalling over 40 million animals. In Canada, they were found from eastern Manitoba to eastern British Columbia and northward to the Peace River district and Great Slave Lake region. By 1873, however, Bison herds had been reduced to only a few hundred animals. Since that time, government protection has allowed that number to increase to over 10 000 (Banfield 1974).

There is no evidence that Bison ever naturally occurred in Ontario or the rest of eastern Canada (Banfield 1974, Peterson 1966). However, in 1939, 40 Bison were released along with a number of Wapiti into an enclosure at the Burwash Prison Farm south of Sudbury. The Bison and Wapiti eventually escaped from the enclosure, but remained within the vicinity of the Burwash farm (Ranta 1979). At present, there is no evidence of any remaining Bison in the Burwash area, or anywhere else in Ontario.



Exotics

Black Rat

Rattus rattus

Just as the Norway Rat originated in Europe, so also did the Black Rat. However, the Black Rat has not become established in Ontario. In Canada, the Black Rat is associated with ports where it has strayed from the ships that carried it from Europe. In Ontario, the Black Rat has been recorded at only one site. Strathroy, where several of the rats were inadvertently introduced in 1927 (Peterson 1966).

Norway Rats are occasionally mistaken for Black Rats when captured near international ports. The two are, however, easily distinguishable. The Black Rat has a tail that is as long or longer than its head and body, whereas the tail of a Norway Rat is shorter than its head and body (Peterson 1966).

Coypu

Myocastor coypus

The Coypu or Nutria is an exotic species that was brought to North America from southern South America to be farmed for fur. Coypu occasionally escaped from fur farms, creating the potential for feral populations. A few Coypu have been collected from the wild and the species was therefore included in the Mammal Atlas survey. However, there have been no recent Ontario records of Coypu, and it is unlikely that there are any feral Coypu left in the province.

The distribution of Coypu records in Ontario is consistent with the distribution of Coypu farms rather than any natural, distribution.

Domestic Ferret

Mustela putorius

The Domestic Ferret is not native to Ontario and it is unlikely that any populations exist within the province. It is more likely that all ferrets found in the province are recent escapees or have been released by owners who no longer want them. Mammal Atlas data don't show any natural distribution for the ferret, but rather indicate those areas where ferrets have escaped or were released. There is no evidence that ferrets ever breed and produce litters in the wild in Ontario or that these animals survive for any length of time.

Historically, Domestic Ferrets were brought to Ontario to help hunters catch rabbits. A ferret would be placed in the burrow of an Eastern Cottontail and the resulting chase would bring the rabbit to the surface. More recently, ferrets have been kept as pets, which has increased the number of animals escaping or being intentionally released.

Acknowledgements

The Mammal Atlas has received assistance from a great number of organizations and volunteers. Although all provided important contributions, a few individuals deserve special recognition for outstanding work.

Paul Gray first brought the idea of a Mammal Atlas to the Atlas Management Committee and both he and Jim Baker were instrumental in its funding. Don Smith chaired the Atlas of the Mammals of Ontario Technical Committee, a highly time-consuming task. Don was involved in almost every aspect of the project, from reviewing data and Unusual Species Report Forms to writing articles for the Mammal Atlas Newsletter and editing and reviewing most of the project's publications. Mike Cadman helped get the project started as Coordinator of the Mammal Atlas during its early years. Judith Eger and Nancy Wilson both graciously volunteered to write a number of the species accounts appearing in this book. The Royal Ontario Museum provided a great deal of assistance, from training staff in mammal identification to providing many of the illustrations that are included in this book.

To these people, and all of the others who have donated their time, funds and expertise to the Mammal Atlas, thank you.

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Federation of Ontario Naturalists

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The Atlas Management Committee recently managed both the Mammal Atlas and the Ontario Rare Breeding Bird Program.

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The FON currently has 15 000 individual members and a network of 80 local groups - 63 community-based naturalists' clubs and 17 associated groups. The FON is governed by a Board of Directors that represents the individual members, naturalists' clubs, and associated groups.

The FON is a leader in promoting the preservation of wetland habitats; the creation and management of parks; protection for Ontario's rare, threatened, and endangered species; and responsible forest management. The FON publishes *Seasons* magazine; produces a range of environmental education resources for schools and youth groups; and has an extensive program of trips, tours, and summer camps. As well, over the past 30 years, the FON has assembled the province's largest private nature reserve system.

The *Atlas of the Mammals of Ontario* is the result of a four year project to collect information on the distribution of Ontario's 86 wild mammal species. Over 161 000 records were collected and used to compile detailed distribution maps for each species. The final result is the best available representation of the distribution of Ontario's mammals and a benchmark with which to compare past and future changes in distribution. The *Atlas of the Mammals of Ontario* will be of particular interest to naturalists, biologists, environmental consultants and planners, but will be a welcome reference for anyone interested in Ontario's wildlife.

