

Distributional Records of the Opossum in Ontario

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in eliminating this source of disturbance. The negligible amount of disturbance that occurred when the tubes were in use was probably the result of squirrel and chipmunk activity, since the wires at the end of the tubes were not spaced to prevent animals of this size from entering. In addition to their utility in preventing animal disturbance, the tubes also proved valuable in providing insulation and waterproof covering for the traps.

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DISTRIBUTIONAL RECORDS OF THE OPOSSUM IN ONTARIO

Published accounts of the opossum (*Didelphis marsupialis virginiana*) in Ontario leave some doubt concerning its status in this province. The earliest published account of this mammal in Ontario seems to be that contained in THE HAND-BOOK OF TORONTO (Anon. 1858) which indicates that an opossum had been taken locally in the Toronto area. Since no details were given, there remains considerable doubt concerning this record. The only other reference to opossums in this area, known to us, is that of Fleming (1913; see below). In later summaries of the status of this animal in Ontario, Cross and Dymond (1929) report it as formerly having occurred along the north shore of Lake Erie, but that none had been recorded from Ontario in many years; Saunders (1932) referred to the opossum as being of accidental occurrence only; Anderson (1947) notes "a few records from southern Ontario (Essex, Kent, and Middlesex counties), but not known to be definitely resident in Canada at the present time"; Downing (1948) classes it as a rare wanderer to the Lake Erie region; while Miller and Kellogg (1955) follow Anderson's (1947) account almost verbatim.

The following records, arranged in chronological order, provide an interesting history of the occurrence of this mammal in Canada. The number assigned to each locality record corresponds with those of Figure 1.

1. 1858. Toronto, York County. Listed among species said to have been taken locally (Anon. 1858). Listed as only "accidental, one record" by Fleming (1913) although the original notes of this author contain an entry under opossums—"Toronto record—October 1, 1906." (data files R.O.M.Z.P.)

2. 1875. Williams East Township (3 mi. S.E. Ailsa Craig), Middlesex County, Ontario.

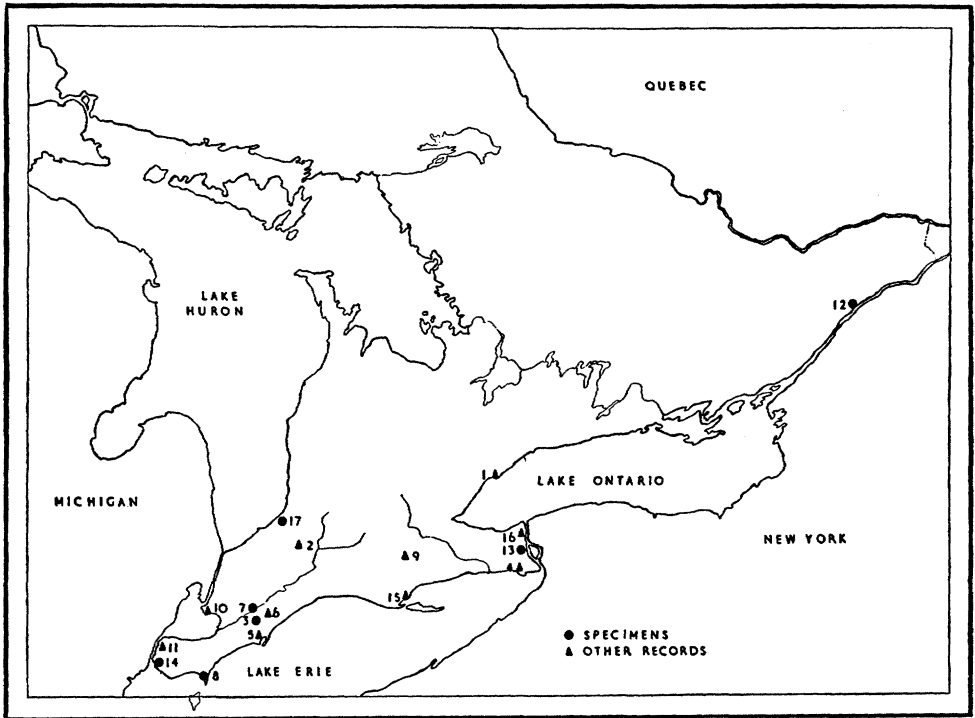


FIG. 1.—Map of southern Ontario showing the localities from which opossums have been recorded. See text for details of each locality record.

An unpublished note from Norman A. Wood of the Museum of the University of Michigan to P. A. Taverner of the National Museum of Canada is in the files of the latter institution (letter from Dr. Austin Cameron) which reports that a live animal, captured locally, was observed by a Mr. Oscar E. Schelt. This report apparently constitutes the basis of Anderson's (1947) Middlesex County record.

3. 1892. Harwick Township (Lot 16, Concession 6), Kent County. Recorded by Smith (1935), this specimen (No. 35-2-6-4) is now in the Royal Ontario Museum of Zoology and Palaeontology (listed below as R.O.M.Z.P.). It was taken alive in mid-February.

4. 1899. Near Port Colborne, Welland County. MacCallum (1901) reports that an opossum (male?) was taken in the middle of January and later mounted for a collection of Mr. Chas. Hays of Port Colborne. Mr. MacCallum also reports that a female with a number of young was killed a few miles west of Port Colborne. Saunders (1932) cites the first specimen only.

5. 1900. Blenheim-Rondeau area, Kent County. A specimen was recorded by MacCallum (1901) for this year, but Saunders (1932) reports on the same specimen indicating that it was taken about February. Saunders also states that "Another was got a week later near the marsh at Rondeau."

6. 1934. Howard Township, Kent County. Recorded by Smith (1935) as a female trapped on or about December 15 on the farm of Mr. Hiram McLarty.

7. 1947. Chatham Township, near Chatham, Kent County. Reported by Cull (1947) and Wood (1948), this specimen is now in the R.O.M.Z.P. collections (no. 16, 949). It was captured alive on February 15, 1947.

8. 1949. Point Pelee, Essex County. Recorded by Zavitz (1953) who found the animal dead and badly decomposed on the shore of Lake Erie on October 3, 1949. The skull only

was saved and deposited in the R.O.M.Z.P. (no. 21580). There is a specimen in the National Museum of Canada, no. 2505, bearing the notation "probably from Essex Co., Ont." This specimen is probably the basis for Anderson's (1947) Essex County record.

9. 1950. Six Nations Reserve, near Ohsweken, Brant County. Shot by Simon Wright at his home on or about March 6, 1950 (data files R.O.M.Z.P.).

10. 1950-51. Walpole Island, Lake St. Clair, Lambton County. Captured alive during either December, 1950, to January, 1951, this animal was sent to the Toronto Zoo (data files R.O.M.Z.P.).

11. 1951. Near Riverside, Essex County. The pelt of an opossum taken by a trapper in a trap set for muskrat was received by Regional Forester R. S. Newman of the Department of Lands and Forests. The final disposition of the pelt is not known. It was supposedly taken in March (data files R.O.M.Z.P.).

12. 1952. Near Morrisburg, Dundas County. A specimen collected by W. B. McConnell in mid-March is now (no. 21, 604 skin and skull) in the R.O.M.Z.P. This apparently constitutes the first record of this species north of the St. Lawrence River east of Lake Ontario.

13. 1952. Stamford Township, Welland County. A specimen, found dead on March 31, is now no. 21738 in the R.O.M.Z.P. collections (skin and skull). Jameson (1943) found no opossums in Welland County but notes that "residents spoke of its presence in former years". Mr. A. R. Muma, Senior Conservation Officer at Chippawa, provides the following information in a personal letter (R.O.M.Z.P. files): "On May 22, 1954, a female opossum, injured by a car on the northern outskirts of Niagara Falls, was taken alive. She was carrying eleven young in her pouch. In captivity she survived as did ten of the young until they escaped about August 1. On September 1 another female was captured alive at the site of the former capture and had survived the winter and still in captivity at the date of writing (April 25, 1955)." Mr. Muma sums up—"There are ten or eleven [recent] records for Welland County. Some were found dead on the highways, two were caught in traps, some were shot and reported later. . . . Most were near the Niagara River, but two were about fifteen miles inland."

14. 1953. Malden Township, Essex County. An opossum is said to have been caught by Mr. Joe Duba on January 19 (data files, R.O.M.Z.P.). Apparently the same animal was shipped alive to Riverdale Zoo in Toronto. (Anon. 1955).

15. 1953. Turkey Point, Norfolk County. A badly decomposed opossum was seen by Mr. George Francis and Mr. James Woodford on the beach along Lake Erie on March 29 (personal communication).

16. 1953. Highway 48, ½ mile south of St. David, Lincoln County. A road-kill picked up about June 18 by Conservation Officer R. Arbutnot, was forwarded to the R.O.M.Z.P. via the Maple Office of the Department of Lands and Forests. The badly crushed animal was examined and identified by S. C. Downing, and discarded. Two opossums were reported to have been taken in Lincoln County on June 15 and 16 respectively (Anon. 1955). One of these was captured alive but did not survive in captivity. The other is almost certainly the animal referred to above. A. R. Muma's report, referred to above, states, "There are also about six or seven [records of occurrence of the opossum] for Lincoln County."

17. 1955. Goderich Township, Huron County. An opossum was found on a railway right-of-way on March 5 in a near-dead condition by Mr. R. R. Billings. The specimen was forwarded to the Southern Research Station of the Department of Lands and Forests at Maple, where the animal was autopsied (no. 1564) and the skull retained in their reference collection. This apparently constitutes the most northerly record of the opossum in western Ontario. Possibly it had been transported to that point as an undetected stow-away on a train.

Of special interest is the inference from the above records that the opossum has invaded Ontario in a series of "waves." The earliest records may have been purely accidental. A statement that the opossum was "very rare" in "Canada West" (Small, 1866) might be cited as additional evidence of an early invasion although the reference may have been merely a restatement of the earlier record (Anon. 1858). Toward the turn of the century,

1892-1906, at least nine opossums together with an unstated number of young were recorded, after which time none was reported until 1934 when a single animal was recorded. The opossum again disappeared in Ontario until 1947 which seemed to mark the beginning of a stronger invasion with at least twenty-five adults plus a number of young being noted to date. The increased number observed may be a reflection of better organization of an increased number of observers although the opossum seems to have penetrated further northward during the past invasion than the previous one. The appearance of the opossum in Ontario around 1900 seems to correspond to Allen's (1901) report of northward spread in the state of New York. The last invasion seems to have followed, with a few years lag, a reported increase to the immediate south between 1932 and 1939 (Hamilton, 1933; Stoner, 1939). It seems likely that these invasions may be correlated with cyclic shifts in weather conditions. One or more severe winters may, in effect, eradicate resident populations.

A second interesting point is the time of the year when most appearances are discovered: October, 2; December, 1; January, 3; February, 4; March, 6, and only four in the non-winter months (May and June). From examination of Figure 1, it is evident that the majority of the records are clustered about the logical points of entry. Of the specimens found dead on the shore of Lake Erie, it seems possible they may have been carried across the lake after death. It might be inferred therefore that most opossums entering Ontario do so during winter, possibly crossing on ice or ice rafts. While there are numerous ways by which opossums could cross into Ontario, it seems more than a coincidence that most animals discovered were found during the winter months.

The opossum seems to be in the process of becoming well established as a resident of southern Ontario at the present time. It will prove most interesting to follow its fate in the future to determine whether or not it becomes permanently established and increases in numbers with continued range expansion or whether a series of events will again lead to its virtual disappearance in this province with perhaps a reappearance at some future date.

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THE SHREW *SOREX DISPAR* IN VIRGINIA

Knowledge of the distribution of the supposedly rare shrew, *Sorex dispar* Batchelder, in the southern segment of its range has evolved rapidly in recent years. It has been reported from Pennsylvania (Richmond and Grimm, *Ecology*, 31: 279, 1950; reports of the Pennsylvania Mammal Survey, by various authors, 1949-52), Maryland (Mansueti and Flyger, *Jour. Mamm.*, 33: 250, 1952), West Virginia (Jackson, *North Amer. Fauna*, 51: 91, 1928; Wilson and Friedel, *Proc. West Virginia Acad. Sci.*, 15: 86, 1942; McKeever, mimeo. report of West Virginia Mammal Survey, 1951), and North Carolina and Tennessee (Conaway and Pfitzer, *Jour. Mamm.*, 33: 107, 1952). In view of the existing information on its distribution in nearby states, it is not surprising that this shrew can now be reported as an addition to the fauna of Virginia.

From September 12-24, 1955, I trapped for *Sorex dispar* near Castle Rock ("Wind Rock" on Pearisburg quadrangle, U. S. G. S. topographic series), NW slope of Big Mountain, elevation 4100 feet, 4.2 miles NNE Mountain Lake, Giles County, Virginia. Big Mountain is a northeast-southwest trending ridge, whose sides slope gently to the southeast and precipitously to the northwest. Sandstone outcrops form a series of low cliffs a few feet below the crest of the mountain on the northwestern slope. Breakdowns on the flanks of the cliffs have created small areas of talus.

The entire mountain is forested. Dominant trees on the upper reaches of the northwestern slope are red oak (*Quercus borealis*) and red maple (*Acer rubrum*) in dryer places; black birch (*Betula lenta*) on talus and other moist spots. Blackberry (*Rubus* sp.), evergreen shield fern (*Dryopteris spinulosa*), and various annuals form a dense ground cover. As a result of a prolonged drouth, the northwestern slope, usually moist and lush, was abnormally dry at the time of this collection. Ferns and annuals were wilted and mostly prostrate.

Most traps were set among rocks, from 6 to 30 inches below the surface, in all instances as deep as possible, and were baited with oatmeal. Traps were left in place an average of five nights before being moved to a new location. In this habitat, trap lines usually produced as many specimens on subsequent nights as on the first. Trap nights totalled 1645.

A specimen of *Sorex dispar*, a non-breeding, immature female (USNM 301770), was secured on September 16 in a trap set about 12 inches below the surface in a patch of talus. Mature black birches shaded the site. Other mammals taken in the same trap line were *Sorex cinereus*, *Sorex fumeus*, *Blarina brevicauda*, *Peromyscus leucopus*, *Peromyscus maniculatus*, *Clethrionomys gapperi*, and *Napaeozapus insignis* (on the surface of talus). *Neotoma magister* and *Spilogale putorius* were trapped on nearby cliffs.

External measurements of the specimen of *Sorex dispar* are: Total length 114 mm., tail vertebrae 53, hind foot 15, and ear from notch 9. The skull was broken by the trap. Cranial measurements, taken as described by Jackson (*loc. cit.*), are: Palatal length 7.2 mm., interorbital breadth 3.4, maxillary breadth 4.5, and maxillary tooth row 6.5.

This specimen and one from Raleigh County, West Virginia (USNM 160787), resemble typical *Sorex dispar*, which presumably occurs from Pennsylvania northward to Maine. However, they verge toward an unnamed form that inhabits the Great Smoky Mountains of North Carolina and Tennessee.—CHARLES O. HANDLEY, JR., *U. S. National Museum, Washington 25, D. C. Received November 17, 1955.*