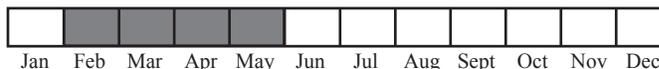


Best Survey Period



**Status:** State Threatened

**Global and state rank:** G5/S2

**Family:** Strigidae – Typical Owls

**Total range:** Long-eared owls are found in open and sparsely forested landscapes between about 30° and 65° north latitude, with additional isolated populations occurring in northern and eastern Africa, the Azores, and the Canary Islands (Marks et al. 1994). Marks et al. (1994) describe the breeding range of the long-eared owl as extending from southeastern Yukon, northeastern British Columbia, and northern Alberta across central Canada to the Maritime Provinces and south to northern Baja California, southern Arizona, southern New Mexico, east to Pennsylvania, New York, and northern New England, and south along the Appalachian Mountains to Virginia. Wintering can occur throughout the breeding range, but long-eared owls typically migrate south from the northern parts of the breeding range, with wintering primarily taking place in southern Canada and northern New England south to the Gulf Coast states and much of Mexico (Enriquez-Rocha et al. 1993, Marks et al. 1994, American Ornithologists’ Union 1998).

**State distribution:** Michigan is located at the southern edge of the long-eared owl’s breeding range. Surveys conducted for the first and second Michigan Breeding Bird Atlases (MBBA) indicate that although the long-eared owl is found throughout the State, most observations occur in the southern Lower Peninsula and the Upper Peninsula (Brewer et al. 1991, Monfils 2006, unpublished MBBA II data). Barrows (1912) stated that long-eared owl did not appear abundant in Michigan and that there were practically no records in the northern half of the State, but described the species as “by no means uncommon” in the southern half of Michigan. Wood (1951) listed long-eared owl as a resident that was uncommon north of Saginaw. Armstrong (1958) summarized long-eared owl nesting data from his study and several previous researchers, and all but two of the nesting records were from the southern half of the Lower Peninsula. The figure above indicates counties with confirmed breeding during the first (1983-1988) or second (2002-2008) MBBA or known breeding occurrences from the Michigan Natural Features Inventory database.

**Recognition:** The long-eared owl is a medium-sized owl measuring 35-40 cm (14-16 in) in length and 90-100 cm (35-39 in) in wingspan, and weighing from



220-435 g (8-15 oz), with females being larger than males (Mikkola 1983, Cramp 1985). This owl species has a large, round head with closely spaced, **upright ear tufts**, a round facial disc, and yellow to golden-yellow irides (Marks et al. 1994). The **facial disc is buff colored** with white “eyebrows” and a white patch below the bill (Marks et al. 1994). The back is a mix of black, brown, gray, buff, and white, while the ventral side is whitish-gray and buff with dark brown streaking and barring (Marks et al. 1994). The **upperwing** has a **buff patch** just distal to the bend of the wing, and the **underwing** has a **dark patch** just distal to the carpal region (Marks et al. 1994). Long-eared owl could be confused with the congeneric short-eared owl (*Asio flammeus*) when flying, as both owls have long wings with low wing-loading and buffy patches near the ends of the upper wings. Both species are also aerial hunters known to use similar open habitats for foraging. Long-eared owls are generally darker, the upper dark wrist markings contrast less with the rest of the wing, and the pale area at the base of the primaries is more orange toned when compared to the short-eared owl (Johnsgard 2002). Great horned owls (*Bubo virginianus*) have similar markings and coloration, but are much larger and have ear tufts that are more widely spaced and point outward when compared to long-eared owl (Marks et al. 1994). Marks et al. (1994) described the male advertising call as a series of 10 to greater than 200 *hoo* notes evenly spaced about 2-4 seconds apart. Mikkola (1983) noted the most common vocalization given by females is the nest call, which is a soft nasal *shoo-oogh* that is higher pitched than the male advertising call.

**Best survey time:** The best time to survey for this species is during the breeding season when males are actively calling and territorial. Armstrong (1958) observed males making advertising calls in late March in Michigan, and male long-eared owls have been heard calling from February through May in Idaho and Montana (Marks et al. 1994). Cramp (1985) noted that the male advertising call can be heard at a distance of up to one kilometer. The use of broadcast calls during surveys should increase the likelihood of long-eared owl detections during the breeding season.

**Habitat:** Long-eared owls use dense vegetation near grasslands and shrublands (Marks et al. 1994), and during the breeding season they are associated with open woodlands, forest edges, or forest patches of coniferous, deciduous, or mixed composition (Johnsgard

2002). Holt (1997) noted that although long-eared owls depend on trees or shrubs for nesting and roosting, they are probably best described as an edge species when in or near forests. In Michigan, long-eared owls have been observed nesting in both coniferous and deciduous forests near open lands (Armstrong 1958). A requirement for long-eared owl nesting success is the presence of optimal foraging habitat near breeding sites (Evers 1994). Foraging habitat consists of a variety of open lands containing high rodent populations, such as grasslands, abandoned agricultural land, and wet meadows (Getz 1961, Bosakowski et al. 1989a). Winter habitat requirements appear to be similar to those of the breeding season (Evers 1994). Most winter roosts in Michigan have been found in conifer stands (Wilson 1938, Craighead and Craighead 1956, Armstrong 1958). Johnsgard (2002) noted that roosting sites are sometimes used year after year by similar numbers of birds, which indicates a high level of roost fidelity.

**Biology:** Long-eared owls may be year-round residents in southern Michigan if prey is readily available; however, most probably winter further south (Evers 1991, 1994). Fall migration of northern populations through the Lake Superior region typically spans mid September through mid November and peaks in late October (Janssen 1987). At Whitefish Point most northward migrating long-eared owls have been observed between early April and late May, with migration peaking in late April (Grigg 1991). Armstrong (1958) observed competitive calling in long-eared owls during late March just prior to egg laying. Egg dates in Michigan have ranged from about mid March through late May, with most laying occurring from mid March through April (Wood 1951, Armstrong 1958). Nests initiated in mid to late April may be the result of first attempts by young birds from the previous year or renesting activity (Armstrong 1958, Evers 1991). Long-eared owls use abandoned nests or dense vegetation as nest sites, such as American crow (*Corvus brachyrhynchos*), hawk, and heron nests, brooms in conifers, and squirrel nests (Evers 1994). In Michigan, long-eared owl nests have been found in a variety of tree species, including hardwoods (Wilson 1938), white pine (*Pinus strobus*; Armstrong 1958), Scotch pine (*Pinus sylvestris*; Sturgeon 1940, Pirnie 1943), and elm (*Ulmus* sp.; Brigham 1946). Murray (1976) observed a mean clutch size in North America of 4.5 (range 2-10), with a slight increase in clutch size from south to north and east to west. Eggs are elliptical in shape,



white, slightly glossy, and smooth (Marks et al. 1994). Incubation is done by the female only and typically lasts about 26 to 28 days (Cramp 1985); males provide food for females during incubation (Marks et al. 1994). Young are semialtricial and covered by white down and are brooded by the female for at least two weeks after hatching (Marks et al. 1994). Young leave the nest at 20-26 days when flightless (“branching”), but do not attain flight until about 30-40 days of age (Johnsgard 2002). Armstrong (1958) stated that young appeared to be dependent on adults for food for at least two months as indicated by the feeding cry of a young owl 50 days old. Long-eared owls typically hunt on the wing 0.5-2 m above open lands (Marks et al. 1994). Long-eared owls feed primarily on small nocturnal mammals of open lands, with mammals accounting for more than 98% of the species’ diet in North America (Marti 1976). Marti (1976) found that voles (*Microtus* spp.) were the most common prey of long-eared owls. In addition to an array of mammal species, long-eared owls have been documented consuming birds, amphibian, reptiles, fish, and arthropods (Marti 1976). Armstrong (1958) found meadow vole (*Microtus pennsylvanicus*) to be the dominant prey found in long-eared owl pellets in southern Michigan.

**Conservation and management:** While long-eared owl is relatively common in the western U.S., there is scattered quantitative evidence of declines in parts of its range (Marks et al. 1994). Bloom (1994) found that the species has been extirpated in a substantial area of coastal southern California. Bosakowski et al. (1989a) observed decreasing numbers of long-eared owls during wintering in New Jersey. Marks et al. (1994) noted that the number of long-eared owls captured during fall migration at Duluth, Minnesota declined from 1976 to 1993. Marks et al. (1994) indicated that the loss of riparian woodlands and isolated forest patches could be especially detrimental to long-eared owls in the arid western U.S.

Although historically known as a widespread and local breeder in southern Michigan and a rare species in the northern portion of the State, the long-eared owl is thought to have declined in Michigan (Evers 1991). The loss of open foraging habitats, such as old fields, to intensive agriculture and development is cited as a contributing factor in its decline in Michigan (Evers 1991). Bosakowski et al. (1989a) stated that breeding habitats for long-eared owl in New Jersey were reduced

by the loss of open lands to urbanization and forest succession.

Chemical contamination has been observed in long-eared owls, but little information is available (Marks et al. 1994). Although Henny et al. (1984) found DDE in 81% and heptachlor residue in 33% of long-eared owl eggs sampled, nest productivity did not appear to be related to contaminant levels. Levels of DDE in owl eggs were considered low (Henny et al. 1984). Long-eared owls died in Britain after eating animals contaminated with Dieldrin (Ratcliffe 1980) and in Israel after feeding on voles poisoned with Azodrin (Mendelsohn and Paz 1977).

The maintenance and establishment of suitable nesting and foraging habitats has been suggested to conserve long-eared owls. Bosakowski et al. (1989b) recommended protecting grasslands and emergent marshes and the planting of conifer stands near open habitats. Marks et al. (1994) suggested that the maintenance of riparian woodlands would benefit long-eared owls in the western U.S. Evers (1994) noted that the planting of pine plantations near foraging areas enhanced conditions for breeding pairs in Michigan and suggested that nesting platforms placed at these sites would increase nest use and success.

**Research needs:** Few long-eared owls were observed during recent owl surveys conducted in Michigan for the MBBA II project (Monfils 2006, unpublished MBBA II data). Although regular surveys are needed for all owl species in Michigan to track long-term population trends, these surveys will probably not be sufficient to ascertain the status of long-eared owl. Targeted surveys are needed to understand the distribution and breeding status of long-eared owl in Michigan. Evers (1994) noted that the extent to which winter roosts are occupied by permanent residents is unknown. Armstrong (1958) found nesting sites near winter roosts, so surveys proximal to known roosts could help identify breeding territories.

Much remains to be learned about long-eared owl migration, postnesting movements, communal roosting, and parent-offspring recognition (Marks et al. 1994). Banding records indicate that some long-eared owls make long migrations to southern climes while others winter near nesting sites, but the factors that drive these differences remain unknown (Marks et al. 1994). For



example, are winter roosts in Michigan made up of local breeders, migrants from northern areas, or both? Marks et al. (1994) stated that postnesting long-eared owls have been documented making abrupt long-distance movements in Idaho, but it is not known if these movements occur in other parts of the species' range. Although communal roosting is well known in long-eared owls, little research has been conducted to understand the evolution of this behavior in owls (Marks et al. 1994). Young long-eared owls from multiple nests that are still dependent on adults for food sometimes mix together after leaving their nests, but it remains unknown if adults recognize their young or if they feed unrelated offspring (Marks et al. 1994).

**Related abstracts:** short-eared owl (*Asio flammeus*), dry northern forest, hardwood-conifer swamp, dry-mesic prairie, mesic prairie, dry sand prairie, mesic sand prairie, and wet-mesic sand prairie.

**Selected references:**

American Ornithologists' Union. 1998. Check-list of North American birds, seventh edition. American Ornithologists' Union, Washington, D.C.

Armstrong, W. H. 1958. Nesting and food habits of the long-eared owl in Michigan. Michigan State University Museum Biological Series 1:61-96.

Barrows, W. B. 1912. Michigan bird life. Michigan Agricultural Experiment Station Bulletin No. 94. East Lansing, MI.

Bloom, P. H. 1994. The biology and current status of the long-eared owl in coastal southern California. Bulletin of the Southern California Academy of Science 93:1-12.

Bosakowski, T., R. Kane, and D. G. Smith. 1989a. Decline of the long-eared owl in New Jersey. Wilson Bulletin 101:481-485.

Bosakowski, T., R. Kane, and D. G. Smith. 1989b. Status and management of long-eared owl in New Jersey. New Jersey Birds 15:42-46.

Brewer, R., G. A. McPeck, and R. J. Adams, Jr. 1991. The atlas of breeding birds of Michigan. Michigan State University Press, East Lansing, MI.

Brigham, E. M., Jr. 1946. Baker Sanctuary notes. Jack-Pine Warbler 24:74-75.

Craighead, J. J., and F. C. Craighead, Jr. 1956. Hawks, owls, and wildlife. Stackpole Company, Harrisburg, PA. Cramp, S. 1985. The birds of the western Palearctic, volume 4. Oxford University Press, Oxford, U.K.

Enriquez-Rocha, P., J. L. Rangel-Salazar, and D. W. Holt. 1993. Presence and distribution of Mexican owls: a review. Journal of Raptor Research 27:154-160.

Evers, D. C. 1991. Species account for long-eared owl (*Asio otus*). Pages 244-245 In The atlas of breeding birds in Michigan. Brewer, R., G. A. McPeck, and R. J. Adams, Jr. (eds), Michigan State University Press, East Lansing, MI.

Evers, D. C. 1994. Endangered and threatened wildlife of Michigan. The University of Michigan Press, Ann Arbor, MI.

Getz, L. L. 1961. Hunting areas of the long-eared owl. Wilson Bulletin 73:79-82.

Grigg, W. N. 1991. Spring owl banding at the Whitefish Point Bird Observatory, Michigan from 1981 to 1990. Part I: species status and occurrence. North American Bird Bander 16:25-29.

Henny, C. J., L. J. Blus, and T. E. Kaiser. 1984. Heptachlor seed treatment contaminates hawks, owls, and eagles of Columbia Basin, Oregon. Journal of Raptor Research 18:41-48.

Holt, D. W. 1997. The long-eared owl (*Asio otus*) and forest management: a review of the literature. Journal of Raptor Research 31:175-186.

Janssen, R. B. 1987. Birds in Minnesota. University of Minnesota Press, Minneapolis, MN.

Johnsgard, P. A. 2002. North American owls: biology and natural history, second edition. Smithsonian Institution Press, Washington, D.C.



Marks, J. S., D. L. Evans, and D. W. Holt. 1994. Long-eared owl (*Asio otus*). In *The Birds of North America*, No. 133 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.

Marti, C. D. 1976. A review of prey selection by the long-eared owl. *Condor* 78:331-336.

Mendelssohn, H., and U. Paz. 1977. Mass mortality of birds of prey caused by Azodrin, an organophosphorus insecticide. *Biological Conservation* 11:163-170.

Mikkola, H. 1983. *Owls of Europe*. Buteo Books, Vermillion, SD.

Monfils, M. J. 2006. Woodland owl surveys in support of the Michigan Breeding Bird Atlas II: year 3. Michigan Natural Features Inventory Report No. 2006-19, Lansing, MI.

Murray, G. A. 1976. Geographic variation in the clutch sizes of seven owl species. *Auk* 93:602-613.

Pirnie, M. D. 1943. A pine tree nesting of the long-eared owl. *Jack-Pine Warbler* 21:108-111.

Ratcliffe, D. 1980. *The peregrine falcon*. Buteo Books, Vermillion, SD.

Sturgeon, M. T. 1940. Sparrow hawk and long-eared owl nests on the Michigan State Normal College campus. *Jack-Pine Warbler* 18:3-6.

Wilson, K. A. 1938. Owl studies at Ann Arbor, Michigan. *Auk* 55:187-197.

Wood, N. A. 1951. *The birds of Michigan*. University of Michigan, Museum of Zoology Miscellaneous Publication No. 75.

**Abstract citation:**

Monfils, M.J. 2010. Special animal abstract for *Asio otus* (long-eared owl). Michigan Natural Features Inventory, Lansing, MI. 5 pp.

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Michigan State University Extension is an affirmative-action, equal-opportunity organization.

Funding for this abstract was provided by the Michigan Department of Natural Resources and Environment and the U.S. Environmental Protection Agency Region 5 through the Wetland Grant Program.

