Short-eared Owl (Asio flammeus) Species Guidance

Family: Strigidae – the typical owls

Species of Greatest Conservation Need (SGCN)

State Status: SC/M (Special Concern/Migratory Bird Protection) (1985)

State Rank: S1B

Federal Status: None

Global Rank: G5

Wildlife Action Plan Mean Risk Score: 3.6

Wildlife Action Plan Area of Importance Score: 2

Species Information

General Description: The Short-eared Owl is a medium-sized owl (34-43cm [13.4-16.9 in]) with long, narrow wings that are tipped with black. It has a large, round head, yellow eyes, and short ear-tufts, but the ear tufts are rarely prominent in the field. Their crown, nape, and upperparts are dark brown and mottled buff. The ventral surfaces are much lighter with bold vertical brown streaking on the breast confined mainly to the upper breast and neck and a pair of barely visible “ear” tufts close together. Underwing coloration is whitish with a bold, dark wrist mark, and the upperwing has a broad, buffy patch at the base of primaries and a dark wrist patch. Although the facial disk is pale, the yellow eyes are surrounded by dark patches. The belly is pale and slightly streaked, the long wings have a buffy patch beyond the wrist above and a dark patch at the base of the primaries below, and the legs and feet are feathered (NGS 1983). Sexes are alike in plumage, but females are slightly larger than males, and considerably heavier (Mikkola 1983).

The male’s song is generally described as “ Boo-boo-boo-boo” with up to 20 notes per song. Bark, whine, and scream calls are given when Short-eared Owls defend the nest (Mikkola 1983, Johnsgard 1988, Sibley 2000, Wiggins et al. 2006). An example of a typical song and various calls can be heard here: <http://www.allaboutbirds.org/guide/Short-eared_Owl/sounds>

Similar Species: Short-eared Owls look similar to Long-eared Owls (Asio otus), but Long-eared Owls have more prominent ear tufts, darker upperparts, and heavier streaking underneath. Long-eared Owls are found in more forested habitats than Short-eared Owls and are seldom seen foraging during the day (Johnsgard 1988, Konig et al. 1999, Wiggins et al. 2006). The Barn Owl (Tyto alba) is somewhat similar but has small dark eyes, lacks ear tufts, and has a white to buff breast and belly with no streaking and a distinctive heart-shaped facial disk.

Associated Species: Within dry to mesic grasslands, wet meadows, and lowland shrub landscapes in Wisconsin, Short-eared Owls may occur with the following Species of Greatest Conservation Need: Blue-winged Teal (Anas discors), American Bittern (Botaurus lentiginosus), American Woodcock (Scolopax minor), Barn Owl (Tyto alba), Northern Harrier (Circus cyaneus), Greater Prairie-chicken (Tympanuchus cupido), Northern Bobwhite (Colinus virginianus), Upland Sandpiper (Bartramia longicauda), Willow Flycatcher (Empidonax traillii), Bell’s Vireo (Vireo bellii), Henslow’s Sparrow (Ammodramus henslowii), Grasshopper Sparrow (Ammodramus savannarum), LeConte’s Sparrow (Ammodramus leconteii), Vesper Sparrow (Pooecetes gramineus), Field Sparrow (Spizella pusilla), Eastern Meadowlark (Sturnella magna), Western Meadowlark (Sturnella neglecta), Dickcissel (Spiza americana), and Bobolink (Dolichonyx oryzivorus).

State Distribution and Abundance: The Short-eared Owl is declining across North America (Sauer et al. 2012), but its status in Wisconsin varies from year to year according
to prey density (Dechant et al. 2003). It appears to have always nested irregularly in Wisconsin. Hamerstrom (1972) and Robbins (1991) note large variability with nesting irruptions taking place at a small number of sites between 1937-1981. Short-eared Owl is a rare summer resident in the northern and central parts of the state. The Wisconsin Breeding Bird Atlas documented 14 nesting records, as indicated on map to the right (source: Cutright et al. 2006) from the following counties: Marathon, Portage, Burnett, Calumet, Oneida, and Shawano (Evvard 2006). The Short-eared Owl also is an uncommon winter resident in the southern and central part of the state (Robbins 1991).

**Global Distribution and Abundance:** The Short-eared Owl is widely distributed in North America, from northern Alaska and the Bering Strait east to northern Labrador, south to central California, southern Nevada, Utah, northeastern Colorado, Kansas, Missouri, southern Illinois, northern Indiana, northern Ohio, Pennsylvania, New Jersey, and northern Virginia. It also occurs in Greenland, the Caribbean, Galapagos, Juan Fernandez, Hawaiian, and Falkland Islands, as well as southern South America, and locally from western and central Europe east through central Asia to northeastern Siberia, Kamchatka, Sakhalin, and northern China (Mikkola 1983, Konig et al. 1999, Wiggins et al. 2006).

**Diet:** Short-eared Owls hunt both day and night during the breeding season, likely dictated by hunger, prey density, and nestlings’ hunger. Overwintering birds, however, may be essentially crepuscular (Clark 1975). Their diet varies little throughout their range, by season, or by sex or age of individuals. Small mammals, particularly voles, are the dominant prey in North America (Johnsgard 1988, Konig et al. 1999, Wiggins et al. 2006). Other prey items include: shrews, moles, mice, lemmings, rabbits, and pocket gophers. Rarely eaten mammals are the big brown bat (Eptesicus fuscus; Holt 1993), short-tailed weasel (Mustela erminea; Walley 1982), and adult Muskrat (Ondatra zibethicus; Wiebe 1991). Birds are eaten very infrequently and more in coastal areas than at inland sites. Food is sometimes cached during the breeding season, (Young et al. 1988).

**Reproductive Cycle:** Migrating Short-eared Owls arrive in Wisconsin between early March and early May (Robbins 1991). In Wisconsin, dates for nests with eggs range from April 25 to May 10 (Robbins 1991). Females begin incubation with first egg and are fed by the male throughout the incubation period. The young depart the nest after 14-18 days and take their first flight at 23 or 24 days (Johnsgard 1988, Wiggins et al. 2006). Short-eared Owls exhibit a Complex Basic Strategy for molt (Howell et al. 2003), including partial preformative, complete prebasic, and no prealternate molts (Wiggins et al. 2006). Individuals depart Wisconsin after molt is completed, typically from early October to late November. Some individuals remain throughout the winter, however, and are occasionally seen in groups of 15 or more birds (Robbins 1991). Those that do leave to go farther south are likely replaced by migrants from more northerly areas. Clark (1975) suggests that separate populations may occupy the same areas during the different seasons.

![New World range map for Short-eared Owl.](NatureServe 2013a)

**Ecology:** Short-eared Owls are excellent fliers and are often seen flying close to the ground with floppy, moth-like wingbeats reminiscent of Northern Harrier (Circus cyaneus) wingbeats. They use hearing, vision, feather, and flight adaptations to locate and capture prey. Short-eared owls forage both day and night over grasslands and wet meadows during the breeding season, but they are largely crepuscular hunters (active at dawn and dusk) in winter (Clark 1975). Short-eared Owls are probably the most diurnal of owls (Lockie 1955, Clark 1975); during the breeding season they hunt day or night, and during winter they are crepuscular and hunt almost exclusively in late afternoon until nightfall or at dawn. Short-eared Owl occurrence is variable year-to-year due to fluctuations in small mammal abundance (Dechant et al. 2003). Males sky-dance over territory to attract females, but it is not known which sex selects the nest site (Holt et al. 1992). The duration of the pair bond is also unknown but presumed to be a single breeding season. Short-eared Owls are mostly monogamous during a breeding season, but some instances of polygamy are suspected to occur.

Nests are built on the ground – usually on dry sites and often on small knolls, ridges, or hummocks – within grasslands and wet meadows. Ground nesting is a unique characteristic of the family Strigidae. Nest bowls are scraped out by the female and lined with grasses (Clark 1975) and downy feathers (Holt et al. 1992). Females have been known to use previous years’ nests, but breeding-site fidelity is apparently limited (Johnsgard 1988, Wiggins et al. 2006). For example, none of 28 females banded in Montana from 1987...
to 1993 returned (Wiggins et al. 2006). Males establish territories by wing clapping displays, and territories are defended through skirmishes and chases (Johnsgard 1988, Konig et al. 1999, Wiggins et al. 2006). Females typically lay 5-10 cream/white elliptical eggs, with a mean clutch size of 5.6 (Wiggins et al. 2006) and may be able to adjust their clutch size to the available food supply (Mikkola 1983). Only the female incubates the eggs. Territory size often corresponds to prey density and has ranged from approximately 45 to 600 acres (Dechant et al. 2003, Wiggins et al. 2006). Nests typically do not last long beyond the last young fledging and are not commonly re-used in following years.

Short-eared Owls are somewhat gregarious in winter, and groups may gather where prey is abundant (NGS 1983, Tate 1992). Non-migratory individuals may defend their feeding territory in winter (where prey is sufficient). Breeding density in different areas varies from 0.6-6 pairs/km² (NatureServe 2013b). Reported average home range size: 15-200 ha (NatureServe 2013b). In coastal Massachusetts, 10 territories averaged 64 ha (48-126 ha) (Holt et al. 1992). In Manitoba, mean size of five territories was 73.9 hectares (Clark 1975).

**Natural Community Associations** (WDNR 2005, WDNR 2009):
*Significant:* wet-mesic prairie, mesic prairie, surrogate grasslands
*Moderate:* dry prairie, shrub-carr, northern sedge meadow, southern sedge meadow, wet prairie, dry-mesic prairie
*Minimal:* none

**Habitat:** Short-eared Owls in Wisconsin prefer large grasslands with a well-developed litter layer and significant residual vegetation, especially grasslands dominated by tall grass (>35 cm; 14 in) and little to no woody vegetation (Sample and Mossman 1997). Sample and Mossman (1997) categorize this species as area-sensitive and note that typical nests occur in blocks of idle grasslands 100-250 acres or larger. Evrard et al. (1991) found two nests in Conservation Reserve Program (CRP) fields in western Wisconsin with maximum vegetation heights of 71-89 cm (28-35 in). During migration and winter, owls generally forage and roost in large grasslands or wetlands with abundant small mammal populations, sometimes adjacent to shelterbelts or woodlots. Short-eared Owls are commonly encountered in groups of 15 or more during winter in southern Wisconsin. Since 1950, observers have reported such flocks on Christmas Bird Counts from Beloit, Lake Geneva, Kenosha, Racine, Milwaukee, and Waukesha (Robbins 1991). Winter habitats frequently used in Wisconsin include native prairies, old-fields, sedge meadows, idle warm- and cool-season grass fields (e.g., CRP fields), and hayfields.

**Threats:** Short-eared Owls, like other grassland birds in Wisconsin, have likely declined from habitat lost to development and intensified agriculture (Sample and Mossman 1997). Ehrlich et al. (1992) note that the species is declining in many parts due to destruction and degradation of wetlands and changing land-use patterns (loss of low-use pastures, changing farming practices). Conversion or succession of open grasslands to forests in Wisconsin may also contribute to habitat loss and fragmentation. The increased predation pressure associated with fragmented grassland habitats may be particularly problematic for this ground nester (Wiggins et al. 2006), but more study is needed. Maintaining multiple large grasslands within an unfragmented grassland landscape will ensure adequate food resources and account for cyclic small mammal populations (Mueller 2013).

**Climate Change Impacts:** Short-eared Owls in Wisconsin are not considered sensitive to effects of climate change, and no climate change adaptation activity is recommended for this species (LeDee & Ribic in press). Changes in current land use, including bioenergy development, loss of grassland and wetland habitats to row crops, and development coupled with succession of grassland to more forest cover may result in a loss or gain of grasslands and constrain the suite of climate change adaptation strategies available to...
landscape-scale grassland managers (WICCI 2011). Overall, grasslands are more likely than forests to tolerate the increased frequency and intensity of drought that are projected under climate change (Craine et al. in press), and therefore Short-eared Owl breeding populations may not be affected by climate-driven habitat shifts or alteration. Swengel and Swengel (2013) speculate a warming climate may increase Short-eared Owl numbers in winter because much more of Wisconsin has become within the Short-eared Owl’s winter tolerances.

**Survey Guidelines:** Line transects are an effective technique for surveying open-landscape birds (Bibby et al. 2000) such as Short-eared Owls. Conduct breeding season surveys from April 1 to July 15 and winter roost surveys from December 1 to February 15. Carry out three surveys before initiating any project activities, preferably 10 days apart, including at least one survey less than one week before proposed project activity that may impact Short-eared Owls (see Screening Procedures). Conduct surveys from two hours before sunset to one hour after or from one hour before sunrise to two hours after. Perform surveys during appropriate weather (i.e., no fog, rain, or wind >10 mph; Ralph et al. 1993). Personnel conducting surveys must be able to identify Short-eared Owls by sight and sound.

Survey the entire affected area that contains suitable nesting or roosting habitat for Short-eared Owls. Mark the entire area with parallel line transects spaced 46m (50 yd) apart. To efficiently survey projects larger than 100 acres, two or more surveyors should conduct concurrent surveys. Survey the site by walking slowly along each line transect, stopping every 91m (100 yd) to scan the area with binoculars or a spotting scope. At each 91m (100 yd) stop, and while walking between stops, record the following data: all Short-eared Owls seen or heard, numbers of pairs and juveniles, and behavioral observations such as courtship displays or food carries. Whenever possible, also map the approximate territory boundaries or roost sites.

Summarize results, including survey dates, times, weather conditions, number of detections, detection locations, and behavioral data and submit via the WDNR online report: [http://dnr.wi.gov](http://dnr.wi.gov), keyword “rare animal field report form”.

**Management Guidelines**

*The following guidelines typically describe actions that will help maintain or enhance habitat for the species. These actions are not mandatory unless required by a permit, authorization or approval.*

Short-eared Owls are strongly associated with open grassland and wet meadows in Wisconsin during breeding and non-breeding periods. They typically forage in open or shrubby grasslands, old-fields, meadows, and marshes where small mammal population densities are high.

To manage habitat for Short-eared Owls, create large areas of open grassland habitat or maintain multiple large grasslands within a region to ensure adequate food resources and account for cyclic small mammal populations (Sample and Mossman 1997, Dechant et al. 2003, Wiggins et al. 2006). Sample and Mossman (1997) suggest the need for grassland patches that are unfragmented by treelines and woodlots and, preferably, embedded within a landscape of high grass cover. The configuration of habitats within a landscape may be more important to some species than site-specific structural features. Managers need to maintain multiple large grasslands within a region to ensure adequate food resources and account for cyclic small mammal populations (Mueller 2013). To this end, the WDNR has joined forces with a group of conservation partners, local governments, and landowners throughout the state to establish grassland Bird Conservation Areas (BCA).

The Bird Conservation Area (BCA) concept (first proposed by the Midwest Working Group of Partners in Flight) will be applied within the Central Wisconsin Grassland Conservation Area (CWGCA) and could be considered in other resident and wintering Short-eared Owl priority landscapes. The BCA concept has been recommended as an important conservation strategy for grassland birds in our region by both Partners in Flight (Rich et al. 2004) and the USFWS Upper Mississippi River and Great Lakes Region Joint Venture (Potter et al. 2007). Grassland BCAs are comprised of at least 10,000 acres of public and/or private lands with an open landscape. A 2,000-acre “core” area within the BCA harbors protected, high-quality grassland habitat. The open landscape surrounding the core should be a matrix of scattered parcels of permanent grass cover (at least 10% of the area), areas in long-term grass cover (e.g., CRP, pasture, and old field, totaling 10-20% of area), and agricultural lands that are managed either deliberately to favor bird habitat or with neutral impacts on birds (50-60% of area). Buena Vista Marsh Wildlife Area is the largest BCA in the state with 10,000-15,000 acres of grassland within the 29,000-acre CWGCA landscape.

Short-eared Owls generally avoid disturbed areas (Dechant et al. 2003), yet periodic disturbance is often required to maintain grassland habitat. Therefore, schedule individual grassland site disturbances on relatively long rotations (3-8 years), or limit disturbance to 20%-30% of a site in any given year. Mowing, burning or rotational grazing can provide suitable habitat conditions for Short-eared Owls (Dechant et al. 2003). Conservation and management strategies for this species should be focused in the following Wisconsin ecological landscapes: central sand plains, southeast glacial plains, southwest savanna, central Lake Michigan coastal, central sand hills, southern Lake Michigan coastal, western coulee and ridges, and western prairie (WDNR 2005).
Follow the “Conducting Endangered Resources Reviews: A Step-by-Step Guide for Wisconsin DNR Staff” document (summarized below) to determine if Short-eared Owl will be impacted by a project (WDNR 2012):

**Screening Procedures**
The following procedures should be followed by DNR staff reviewing proposed projects for potential impacts to the species.

Follow the “Conducting Endangered Resources Reviews: A Step-by-Step Guide for Wisconsin DNR Staff” document (summarized below) to determine if Short-eared Owl will be impacted by a project (WDNR 2012):

**Avoidance Measures**
The following measures are specific actions required by DNR to avoid take (mortality) of state threatened or endangered species per Wisconsin’s Endangered Species law (s. 29.604, Wis. Stats.). These guidelines are typically not mandatory for non-listed species (e.g., special concern species) unless required by a permit, authorization or approval.

Short-eared Owls are protected by the Federal Migratory Bird Treaty Act of 1918, which established a prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention... for the protection of migratory birds... or any part, nest, or egg of any such bird." (16 U.S.C. 703). Contact the US Fish and Wildlife Service directly for any permits related to the Federal Migratory Bird Treaty Act (see Contact Information).

If you have not yet read through Screening Procedures, please review them first to determine if avoidance measures are necessary for the project.

1. The simplest and preferred method to avoid take of Short-eared Owls is to avoid directly impacting individuals, known Short-eared Owl locations, or areas of suitable habitat (described above in the “Habitat” section and in Screening Procedures).

2. If Short-eared Owl impacts cannot be avoided entirely, avoid impacts during the breeding season (March 20 to August 1).

3. If Short-eared Owl impacts cannot be avoided, please contact the Natural Heritage Conservation Incidental Take Coordinator (see Contact Information) to discuss possible project-specific avoidance measures. If take cannot be avoided, an Incidental Take Permit or Authorization is necessary.
References


Linked Websites:
➢ Cornell Lab of Ornithology All About the Birds: <http://www.allaboutbirds.org/guide/Short-eared_Owl/id>
➢ Natureserve Explorer: <http://www.natureserve.org/explorer/index.htm>
➢ Natural Communities of Wisconsin: <http://dnr.wi.gov, key word “natural communities”>
➢ Rare Animal Field Report Form: <http://dnr.wi.gov, key word “rare animal field report form”>
➢ Wisconsin Breeding Bird Atlas: <http://www.uwgb.edu/birds/wbba/>
➢ Wisconsin Endangered and Threatened Species: <http://dnr.wi.gov, key word “endangered resources”>
➢ Wisconsin Initiative on Climate Change Impacts: <http://www.wicci.wisc.edu/>
➢ Wisconsin Natural Heritage Inventory Working List Key: <http://dnr.wi.gov, key word “Natural Heritage Working List”>

Funding
➢ Natural Resources Foundation of Wisconsin: <http://www.wisconservation.org/>
➢ Wisconsin Natural Heritage Conservation Fund
➢ Wisconsin DNR Division of Forestry

Contact Information (Wisconsin DNR Species Experts for Short-eared Owl)
➢ Refer to the Bird contact on the Rare Species and Natural Community Expert List

Contact Information (Federal Migratory Bird Treaty Permits or Questions)
➢ Larry Harrison, U.S. Fish and Wildlife Service, 5600 American Blvd. West, Suite 990, Bloomington, MN 55437-1458 (612-713-5489, Larry_Harrison@fws.gov)
➢ See also <http://www.fws.gov/migratorybirds/mbpermits.html>

Endangered Resources Review Program Contacts
➢ General information (DNRERRReview@wisconsin.gov)

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