

Osprey (*Pandion haliaetus*) Species Guidance

Family: Accipitridae – the hawks, kites, and eagles

Species of Greatest Conservation Need (SGCN)

State Status: [SC/M \(Special Concern/Migratory Bird Protection\)](#) (2009); formerly Threatened (1989) and Endangered (1972)

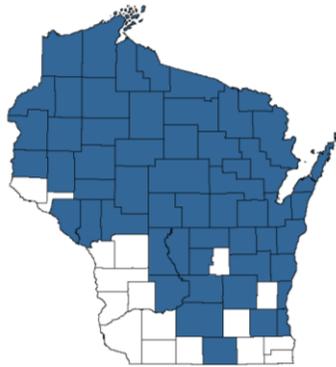
State Rank: [S4B](#)

Federal Status: [None](#)

Global Rank: [G5](#)

Wildlife Action Plan Mean Risk Score: [2.1](#)

Wildlife Action Plan Area of Importance Score: [2](#)



Counties with breeding locations of Osprey breeding or breeding evidence in Wisconsin. Source: Eckstein et al. 2010.



Photo by Len Blumin

Species Information

General Description: Ospreys are large raptors that prey almost exclusively on live fish. Adult length and wingspan measurements range from 56-64 cm (22-25 in) and 147-183 cm (58-72 in), respectively (National Geographic Society 1999). Adults are dark brown above and mostly white underneath, with brown wrist-patches on the ventral-side of the wing (National Geographic Society 1999). The head is mostly white with some brown and a prominent dark brown eye streak (Poole 1989). Adult females are more likely to have a necklace of dark streaking and are larger than males (Poole et al. 2002). Immature markings are similar to adult markings, but have a pale buff edging on the dark feathers of the upper parts. Nestlings are semi-precocial, and already have a down-covered body at hatching (Poole et al. 2002). The downy layer is mostly light-colored with brown patches, especially around the eyes and head, which is patterned after the adults (Poole et al. 2002). The lower nape and sides of neck are mostly white and the tail feathers are crossed by a greater number of dark brown bars than in adults, with broader and paler tips (Poole et al. 2002).

The four distinguishable calls of Ospreys are solicitation, guard, alarm, and scream (Bretagnolle and Thibault 1993). Guard calls are slow-whistled notes falling rapidly in pitch and are given by both sexes when an intruding Osprey approaches the nest or perch. The scream call is used by males defending a nest or territory during breeding season. Alarm calls are composed of short, clear whistles that fall in pitch, and are used mostly by females to indicate a predator or disturbance approaching nest or perch. A solicitation call is given by the female when begging for food. An example of vocalizations by Osprey adults and young can be heard here:

<<http://www.allaboutbirds.org/guide/osprey/sounds/ac>>

Definitive Identification: Ospreys are diurnal predators distinguished by their large size and long, narrow wings; in flight they keep their wings slightly arched at the wrist, and have distinctive brown wrist-patches on the undersides of their wings and mostly white heads.

Similar Species: At a distance, Bald Eagle (*Haliaeetus leucocephalus*) juveniles and subadults can appear similar to an Osprey depending on the individual bird's markings. Nearby, however, the two species are easily distinguished. Bald Eagles are significantly larger, have a much different call, lack the arched wing in flight, and adults have a completely brown body and white head.

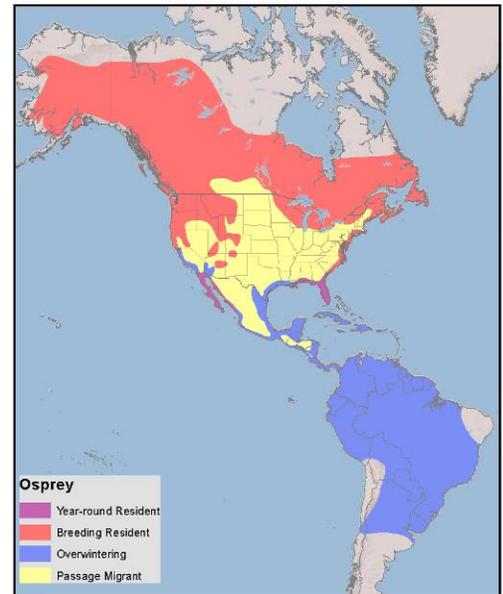
Associated Species: In certain parts of their range (including much of Wisconsin), Ospreys and Bald Eagles nest close to one another and compete for resources (e.g., food and nesting structures).

State Distribution and Abundance: Ospreys occurred throughout the state in suitable habitat before the 20th century (Kumlien and Hollister 1903). Fewer than 100 breeding pairs, all found in northern Wisconsin, were reported in the state by 1973 (Eckstein et al. 2010). A recent count confirmed 531 nesting pairs in 55 counties (Eckstein et al. 2010). Counties without nesting pairs are located in extreme southern and western Wisconsin (see map above).

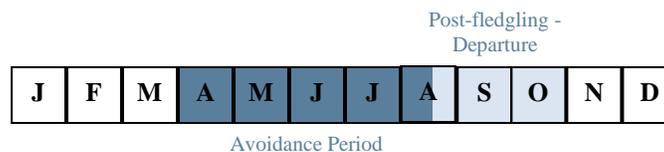
Global Distribution and Abundance: Ospreys are found on all continents except Antarctica (Poole 1989), and Ospreys' distribution is widespread and currently increasing, especially in North and South America (Poole et al. 2002). Breeding numbers, which have been estimated since 1990, show increases of up to 50-100% in many areas in recent years. These changes likely reflect increased availability of nest platforms and other artificial nesting sites, the Ospreys' ability to habituate to human activity, and the species' broad piscivorous diet (Poole et al. 2002). Band returns tell us that many of Wisconsin's Ospreys overwinter along the U.S. gulf coast to central and South America (J. Woodford, unpublished data).

Diet: Ospreys are the only raptor in North America that preys nearly exclusively on live fish (Poole et al. 2002). They generally hunt while gliding 10-40 m above open water, hover before they dive, and dive feet first into the top meter of water to catch fish (Poole et al. 2002).

Reproductive Cycle: Ospreys return to Wisconsin between early April and mid-May each year (Eckstein 2006). Copulation begins approximately 14 days before egg-laying, and peaks a few days prior to egg-laying (Birkhead and Lessels 1988). Eggs are laid one to three days after nest completion, and incubation begins immediately and lasts about 37 days (Steeger et al. 1992). Both sexes incubate eggs, with females doing a majority during the day (i.e., 70% of time) and all at night. The male supplies food to the female during incubation and incubates while the female feeds nearby (Poole 1989). Eggs hatch asynchronously in the order they were laid. Young fledge after 50 days, but continue to rely on parents for food during the next 10-20 days, and can remain in the nest area eight to ten weeks after fledging (Poole et al. 2002). Fall migration begins in mid-August and peaks in September with few Ospreys remaining in Wisconsin by October 31 (Woodford, unpublished data).



New World range map for Osprey. (NatureServe 2013)



Ecology: Many studies report Osprey longevity in the wild at 20 years or more and breeding beginning at three years of age (Poole 1989).

Nests

Historically, Ospreys built stick nests at the top of tree snags and rock ledges (Poole 1989). Today, most occupied nests in Wisconsin are found on artificial nest platforms and other man-made structures near inland open waters. In 2008, > 80% of occupied nests were found on man-made structures including utility and light poles, artificial platforms placed on poles and live trees, and communication towers (Eckstein et al. 2010). Predation, loss of suitable tree snags, and shoreline development are major reasons for this shift (Poole et al. 2002).

Eggs

In Wisconsin, an Osprey clutch is generally two to four eggs (Eckstein 2006). Egg color varies from creamy-white to pinkish-cinnamon, and eggs usually are marked with reddish brown spots (Poole et al. 2002).

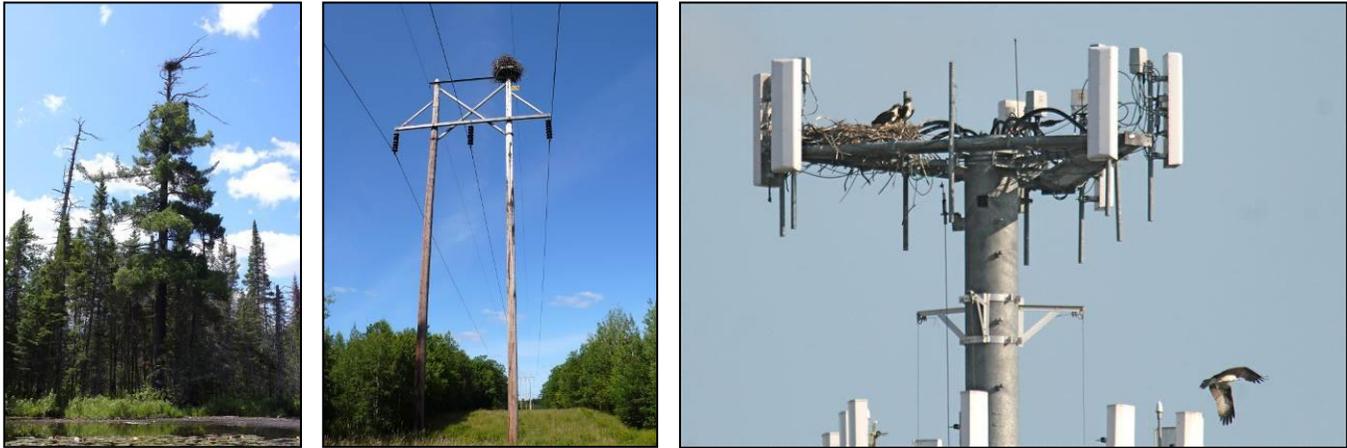
Natural Community Associations (WDNR 2005, WDNR 2009):

Significant: [impoundments and reservoirs](#), [inland lakes](#), [warm water rivers](#)

Moderate: none

Minimal: none

Habitat: Ospreys prefer open, elevated nest sites (e.g., tree snags, utility transmission poles) near shallow waters and marshes with an adequate fish supply (Poole et al. 2002). Because they eat only live fish (99% of prey), Ospreys reside and perch predominately along rivers, lakes, and coastlines during nesting, migration, and winter periods (Poole et al. 2002). Males generally select the nest site and start building before pairing, but sometimes pairs will build the nest together. Failed breeders may begin searching for new nest sites for the following year soon after a nest has failed (Poole 1989). Osprey pairs can habituate quickly to human activity such as highways, houses, or boats. Natural nest sites include trees (usually snags), cliffs, and ground sites on predator-free islands (Poole 2002).



Osprey nests built on natural and artificial structures (left to right): a) in a tall tree near water, b) atop a transmission line pole, and c) on a cell phone tower in Madison. Ron Eckstein, Wisconsin DNR

Threats: Osprey populations in Wisconsin declined dramatically from the 1950s to early 1970s in response to the loss of suitable nest habitat and organochlorine contamination (Eckstein 2006). Nesting habitat loss due to nest tree removal by lakeshore development or tree harvest is a major limiting factor for Ospreys in Wisconsin. Ospreys were initially listed as state-endangered in 1972, and subsequently down-listed to state-threatened in 1989 and special concern in 2009.

Climate Change Impacts: Most climate change projections for Wisconsin do not suggest a substantial positive or negative impact on Ospreys.

Survey Guidance: If surveys are being conducted for regulatory purposes, survey protocols and surveyor qualifications must first be approved by the Endangered Resources Review Program (see *Contact Information*). Osprey nests are normally built in tops of dead trees, on utility and communication poles, or on platforms installed on tops of the tallest available trees near a lake, stream or river. For this reason, they can be efficiently surveyed by ground, boat, or from a fixed-winged aircraft. A complete census of known Osprey nesting activity using fixed-winged aircraft has occurred in Wisconsin since 1973 (Eckstein et al. 2010). These surveys are timed to document nest activity during the incubation period (mid-April to late May) and to count young during the latter half of the nestling period (July). For project-specific surveys (e.g., communication tower placement, dam projects, and utility line maintenance), potential nesting habitat and nest structures usually can be surveyed from the ground or boat.

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>, keyword “rare animal field report form”>.

Inventory, Monitoring and Research Needs: Recent publications and reports have called for additional investigations on (1) why the statewide Osprey population plateaued during the late 1990s, but began to increase recently; (2) dynamics of breeding populations, especially changes in the adult breeding cohort; (3) understanding why Ospreys are declining where they were formally abundant, including the Turtle-Flambeau, Willow, and Rainbow Reservoirs; (4) and to determine why Osprey nestlings are dying late in the nesting season on certain reservoirs (WDNR 2007). Additional needs include research on the impact of an expanding bald eagle population on the distribution and abundance of Ospreys in the dense inland lakes region (Eckstein 2006), and to learn why Ospreys rely so heavily on man-made structures (WDNR 2007). A critical component for all research investigations is the continuation of Wisconsin’s long-term nest monitoring surveys (WDNR 2007).

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.

During the 1960s and through the 1980s, northern Wisconsin was Ospreys’ main breeding range in the state, except for a small population associated with the Castle Rock and Petenwell Reservoirs in central Wisconsin. Since 1990, Ospreys have pioneered into east-central, southeast, and southern Wisconsin. Oneida County leads the state with 89 Osprey pairs, but some counties have only one or two nesting pairs (Eckstein et al. 2010). Ospreys are expected to continue to pioneer into areas with large shallow lakes and reservoirs, including lakes Butte des Morts, Poygan, Winnebago, Beaver Dam, Koshkonong, and the Madison Lakes.

Suitable habitat includes large, shallow lakes and reservoirs for hunting, and tall snags for nesting. During the period of Osprey recovery in Wisconsin, managers placed numerous nest platforms to secure nests. A lack of natural nest sites in central, east-central, and southern Wisconsin forced Ospreys to nest on artificial sites and on platforms. Across Wisconsin, starting in the mid-1990s, Ospreys began to increase their use of electric transmission line standards (support poles). The power and electric transmission companies reacted by securing these nests with platforms. Today more than 80% of Wisconsin's Osprey population nest on artificial structures and platforms. When Ospreys were removed from the state's threatened species list, maintenance of the statewide system of platforms was recognized as an important part of long-term management.

Artificial nest platforms can be installed to:

- replace lost nest habitat and deteriorating nest sites
- provide an alternative when Ospreys attempt to construct a nest on a utility pole
- secure nests on electric transmission lines
- provide nest sites in suitable habitat

Always consider the larger landscape when maintaining and installing Osprey platforms. Important considerations include:

- the proximity of bald eagle nests (stay at least ¼ mile away)
- the proximity of commercial aquaculture facilities (privately owned fish farms, public hatcheries, etc.)
- the fish resources in the surrounding habitat (sites close to large, shallow lakes with abundant panfish populations are best)

Wooden artificial nest platforms should be constructed of pressure-treated lumber. The American Transmission Company has an all-metal platform designed to be installed on metal or wood transmission line poles. For all newly installed or repaired platforms, please report the GIS coordinates to the eagle/Osprey area contact (*see Contact Information*). Wooden platforms should be constructed to be as durable as possible, and should follow the assembly instructions below. These instructions also describe suitable locations for a platform. Note, however, that it is also important to think about the larger landscape before installing a platform.

Privately owned fish farms and other commercial aquaculture facilities can provide an abundant, reliable food supply that may attract foraging Ospreys and result in conflict. Ospreys can fly up to 6 miles from a nest to a food source. Accordingly, new Osprey platforms should not be erected within 6 miles of a commercial aquaculture facility unless approved by DNR's Bald Eagle/Osprey management team. Additionally, we recommend against maintaining and replacing existing platforms within a 6-mile radius of a privately-owned fish farm. We also encourage new commercial aquaculture facilities planned within a 6-mile radius of an Osprey platform to be constructed to deter depredations by Ospreys and other known avian predators (Ronald Eckstein pers. comm.; contact the Bald Eagle/Osprey area expert or USDA APHIS Wildlife Services with questions – *see Contact Information*).

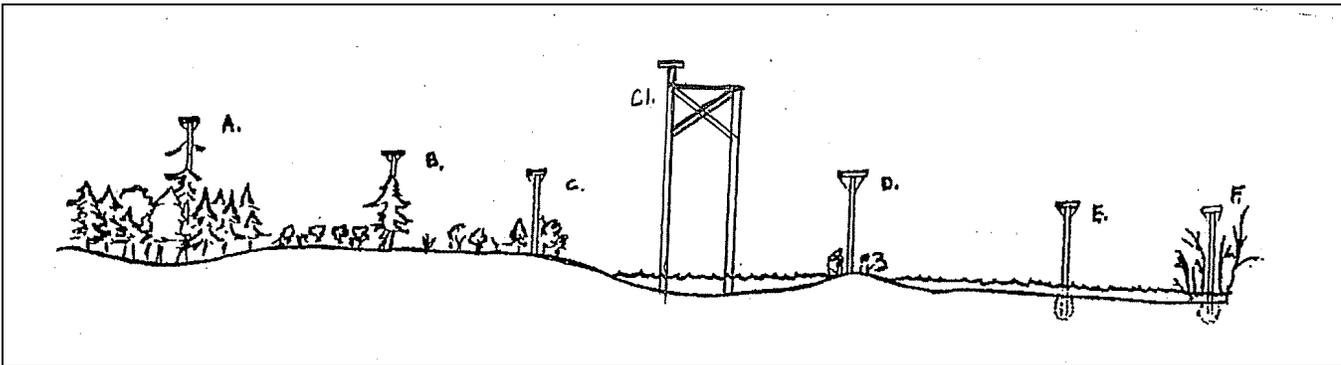


Figure 1. Possible platform placement on trees and utility poles near suitable foraging habitat. R. Eckstein, Wisconsin DNR

Platform placement should occur in a tree or utility pole following one of the examples listed in figure 1, and described below.

A. Place platform on a topped-off, super-canopy pine tree, preferably in a swamp conifer stand. Remove branches from the top 10 feet of tree.

B and C. Place platform on a pole, spruce, or tamarack tree located in a marsh, sedge meadow, or lowland brush. Remove limbs from top 10 feet of trees and place pole securely into ground. All poles should be placed > 150 feet from forest edge and have predator guards installed when placed on uplands or marsh habitats.

C1. Place platform above existing utility transmission pole (contact utility company for assistance).

D. Place platform on small islands in lakes or backwater areas away from forest edge. Predator guards should be installed.

E. and F. Place platform in shallow backwater area or flooded timber. Secure pole firmly in substrate and keep platform above surrounding trees. A permit may be required if placing these in a navigable water body.

Platforms should be built from pressure-treated lumber following a design similar to figure 2.

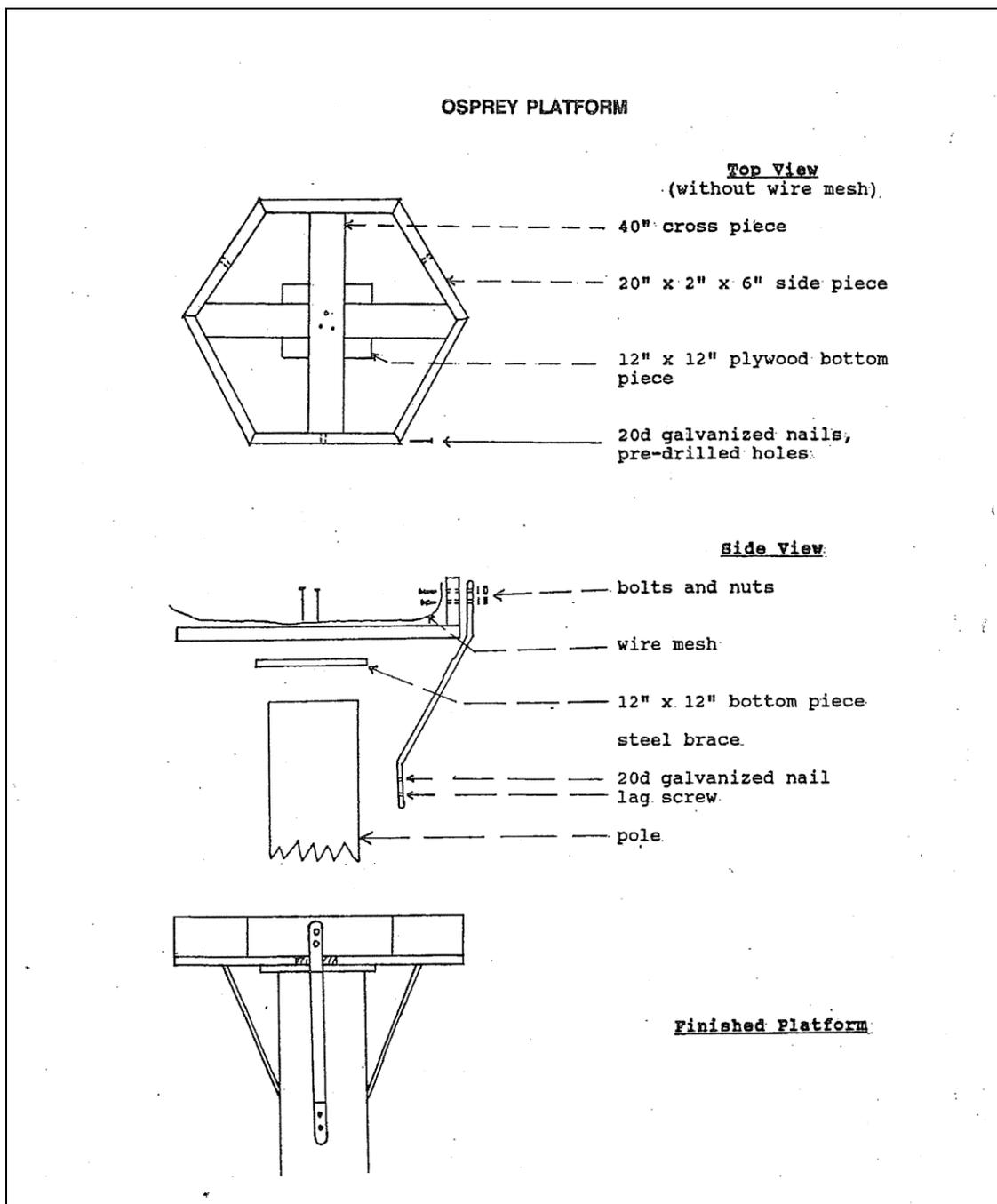
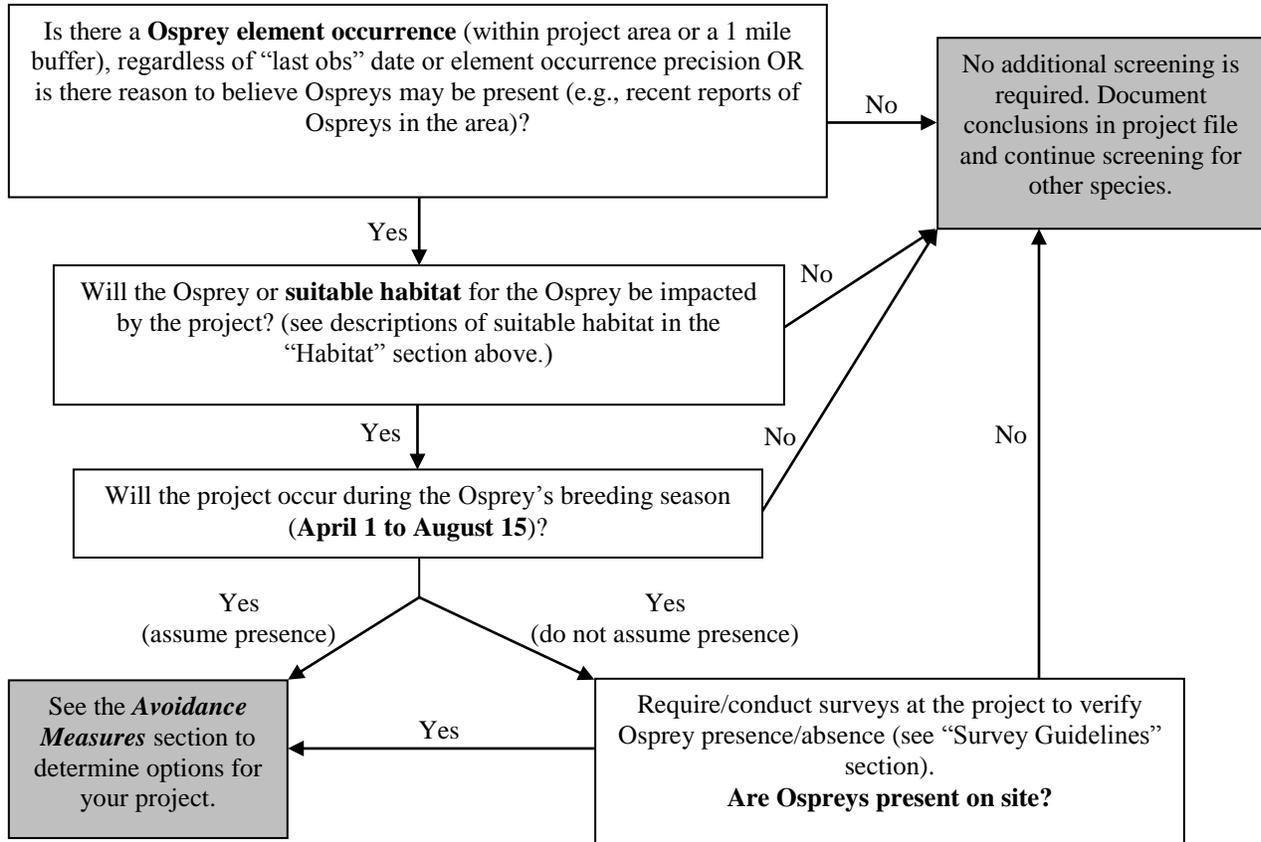


Figure 2. Osprey platform schematic and construction drawing. F. L. Johnson and V. Wolniewicz, Wisconsin DNR

Screening Procedures

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

Follow this guidance to review projects for potential impacts to the Osprey. For more information refer to the “Conducting Endangered Resources Reviews: A Step-by-Step Guide for Wisconsin DNR Staff” document (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.

Ospreys 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).

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

Ospreys can tolerate many activities near their nest sites. Nonetheless some activities can cause eggs not to hatch, or young to die. Major disturbances include timber harvest, road construction, building construction, and power line construction. These kinds of activities last for several days and can cause nest failure. Avoidance near nest sites can generally be attained by scheduling activities that would occur within 330 feet of an occupied nest outside the normal Osprey nesting period (April 1 to August 15).

Osprey nests may occasionally be removed for economic or safety reasons (e.g., repairs to communication towers or electric lines). A USFWS (federal) permit (see *Contact Information*) with state review is required for the removal of all active nests; a nest may only be removed without a permit if it is inactive. A nest is considered inactive outside of the nesting period (April 1 to August 15), and a nest can be determined to be inactive during the nesting season if it does not contain eggs or young. It is recommended that a state or federal wildlife biologist conduct a site investigation to help with that determination before removing any nesting material.

- For timber harvest activities within 330 feet of an occupied nest, schedule those harvest activities outside the nesting period.
- Electric power transmission lines are very important nest sites and companies that manage these transmission lines have secured Osprey nests with platforms. When a transmission line with an occupied Osprey nest must be upgraded, schedule activities that occur within 330 feet of the nest outside the nesting period. Existing Osprey platforms should be replaced with a new platform when a transmission line is upgraded. The integrity of the electric transmission line is critical so emergency repairs can be conducted at any time, but active nest removal under these circumstances requires a USFWS (federal) permit (see above).
- Telephone cell towers and communication towers provide Osprey nest sites across the state. Most of these towers can function with an Osprey nest in place. Attempt to schedule repairs outside the nesting season. Emergency repairs can occur at any time, but active nest removal under these circumstances requires a USFWS (federal) permit (see above).
- For Department of Natural Resources approved-projects, the recommendation is a 330 foot no activity zone during the nesting period for activities that take more than one day to complete. Avoid placing new recreational or infrastructure developments within 330 feet of an occupied nest.

For projects that must occur within 330 feet of an occupied nest during the nesting period, contact the area eagle/Osprey expert (see *Contact Information*).

Avoidance measures for fish farms or other commercial aquaculture facilities depend on site characteristics; please contact your region's Bald Eagle and Osprey species expert (see *Contact Information*). If problems with Ospreys continue, contact USDA APHIS-Wildlife Services (see *Contact Information*). The Wisconsin DNR partners with Wildlife Services in responding to nuisance bird complaints from the public. Wildlife Services will respond by conducting a site investigation and, if appropriate, completing a Migratory Bird Project Report (form 37) and a USFWS Depredation Permit application. These documents are then reviewed by Wisconsin DNR's Bureau of Wildlife Management and, if approved, are passed to the US Fish and Wildlife Service for concurrence and final approval and issuance of the federal Migratory Bird Depredation Permit. The U.S. Fish and Wildlife Service currently charges a \$100 fee for a Federal Migratory Bird Depredation Permit, which the applicant must submit along with the permit application. During the site visit, the USDA Wildlife Services wildlife biologist will often provide a number of non-lethal options to help reduce damage at the facility. In most cases, non-lethal abatement measures must be implemented before considering lethal control. An integrated damage-management approach is best, and often necessary, to reduce conflicts with Osprey at aquaculture facilities.

Additional Information

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Linked Websites:

- All About Birds, Cornell Lab of Ornithology: <<http://www.allaboutbirds.org/guide/Osprey>>
- Chequamegon National Forest Bird Survey (NRRI) species account: <<http://www.nrri.umn.edu/mnbirds/accounts/OSPRa2.htm>>
- E-bird (Wisconsin): <<http://ebird.org/content/wi>>
- Forest Birds of the Western Great Lakes: <<http://www.nrri.umn.edu/mnbirds/>>
- Natural Communities of Wisconsin: <<http://dnr.wi.gov> key word, "natural communities">
- North American Breeding Bird Survey: <<http://www.mbr-pwrc.usgs.gov/bbs/bbs.html>>
- 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 All-Bird Conservation Plan, Wisconsin Bird Conservation Initiative: <<http://www.wisconsinbirds.org/plan/species/ospr.htm>>
- Wisconsin Initiative on Climate Change Impacts: <<http://www.wicci.wisc.edu/>>

- Wisconsin Endangered and Threatened Species: <<http://dnr.wi.gov>, key word “endangered resources”>
- Wisconsin Natural Heritage Inventory Working List Key: <<http://dnr.wi.gov>, key word “Natural Heritage Working List”>
- Wisconsin’s Wildlife Action Plan: <<http://dnr.wi.gov>, key word “Wildlife Action Plan”>

Funding

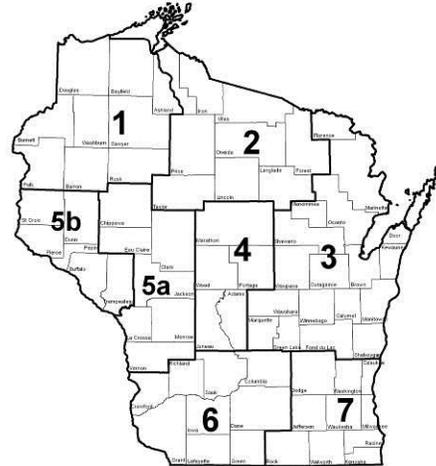
- Natural Resources Foundation of Wisconsin: <<http://www.wisconservation.org/>>
- USFWS State Wildlife Grants Program: <<http://wsfrprograms.fws.gov/subpages/grantprograms/swg/swg.htm>>
- Wisconsin Natural Heritage Conservation Fund
- Wisconsin DNR Division of Forestry

Wisconsin Natural Heritage Inventory (NHI)

DNR Area Eagle/Osprey Survey Contacts

For the latest and most complete information on the location of eagle and Osprey nests (rev. 3/2012)

- Area 1 [Ryan Magana](#), 715-635-4153
- Area 2 [Ron Eckstein](#), 715-365-8927
- Area 3 [Steve Easterly](#), 920-303-5427
- Area 4 [Erin Grossman](#), 715-421-7814
- Area 5a [Dean Edlin](#), 608-789-5514
- Area 5b [Jim Woodford](#), 715-365-8856
- Area 6 [Dan Goltz](#), 608-375-4231
- Area 7 [Seth Fisher](#), 262-878-5605



Damage or Conflict Contact

- [Jason Suckow](#), USDA APHIS Wildlife Services - WI, 732 Lois Drive, Sun Prairie, WI 53590 (609-837-2727, jason.suckow@aphis.usda.gov)

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 (608-264-6057, DNRRERReview@wisconsin.gov)

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