Red-shouldered Hawk (*Buteo lineatus*) Species Guidance

Family: Accipitridae – the hawks, kites, and eagles

State Status: Threatened (1979)

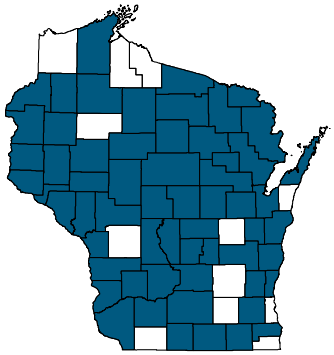
State Rank: S3S4B, S1N

Federal Status: None

Global Rank: G5

Wildlife Action Plan Mean Risk Score: 2.7

Wildlife Action Plan Area of Importance Score: 2



Counties with documented locations of Red-shouldered Hawk breeding or breeding evidence in Wisconsin. Source: Natural Heritage Inventory Database, October 2018.

Photo by Gene Jacobs

Species Information

General Description: Red-shouldered Hawks are medium-sized forest raptors. Adult wingspans are 81-112cm (32-44 in) and body lengths 43-58cm (17-23 in) for males and 48-61cm (19-24 in) for females (Dykstra et al. 2008). Males and females are similarly marked but exhibit slight sexual dimorphism, with females larger than males (Jacobs and Jacobs 2002). Adults have a tan or rust colored underside with whitish horizontal barring that becomes progressively thicker lower on the belly. The underside of the tail has wide, white bands that accent the dark tail (Dykstra et al. 2008). The head, back, and dorsal side of the wings are darker and browner than the front side and become progressively darker toward the tail. The reddish or tan shoulder patches, for which the hawk is named, are only visible at close range. Full adult plumage and the reddish shoulder patches do not begin to develop until the second year (Bent 1937). Sexual maturity occurs at around two years, but year-old birds do sometimes breed (Dykstra et al. 2008). Nestlings are covered with long, thick down that is much lighter-colored than adults.

Two vocalizations are common among Red-shouldered Hawks; one is a 'kee-aah' during breeding season (which can be heard here: <http://www.allaboutbirds.org/guide/Red-shouldered_Hawk/sounds/ac>). The second is a single or repeated 'kip' given by a male when delivering prey to the nest (Jacobs and Jacobs 2002).

Definitive Identification: When Red-shouldered Hawks are soaring (especially on sunny days), a translucent crescent-shaped patch is visible at the "wrist" area of the wings (Dykstra et al. 2008). This wing patch, the territorial call (i.e., kee-aah), and more than two visible white tail bars are the best diagnostic characteristics.

Similar Species: Two other species – Broad-winged Hawks (*Buteo platypterus*) and, to a lesser extent, Red-tailed Hawks *(Buteo jamaicensis*) – closely resemble Red-shouldered Hawks. The Broad-winged Hawk has a reddish barring pattern across the chest and belly that is very similar to the Red-shouldered Hawk, and usually only one or two white tail bands are visible. The territorial call of the Broad-winged Hawk, a soft whistle, is very distinct from that of Red-shouldered Hawks. Red-tailed Hawks are a much larger and broader member of the Buteo group with a solid red tail, pale chest, and a dark band across the belly. The territorial call of the Red-tailed Hawk is also different from that of the Red-shouldered Hawk. Red-shouldered Hawks can also be confused with juvenile Northern Goshawks (*Accipiter gentilis*; National Geographic Society 1999), but Red-shouldered Hawks have more rounded wings, pale crescents in the wing, and a shorter tail with distinctive tail bands (Sauer et al. 2008).

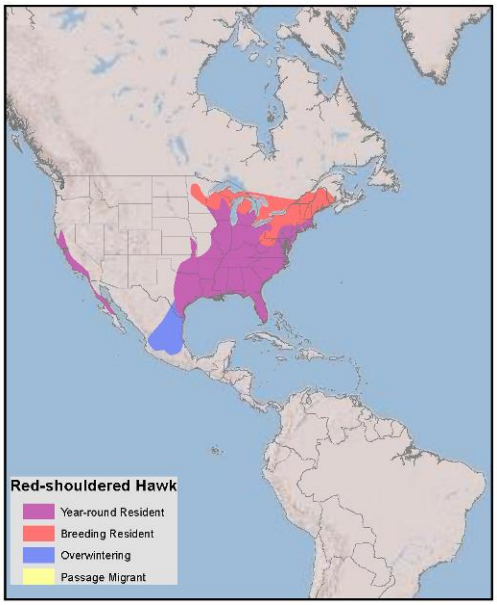
Associated Species: Barred Owls (*Strix varia*), Pileated Woodpeckers (*Dryocopus pileatus*), and Northern Goshawks (*Accipiter gentilis*) are just a few of the many bird species that are also associated with preferred Red-shouldered Hawk habitat (i.e., mature, contiguous forests). These species tolerate each other and have used the same nest trees and nesting areas in different years (J. Woodford pers. obs.).

State Distribution and Abundance: Red-shouldered Hawks are a widely distributed but uncommon hawk in Wisconsin (Jacobs 2006). Recent breeding records exist for 60 of 72 counties in Wisconsin, and most records are near the major river systems and tributaries, including the Peshtigo, Wolf, Wisconsin, Chippewa, Mississippi, and St. Croix (Jacobs 2006). More recently, Red-shouldered Hawks have been reported nesting in woodlots developed into residential and suburban areas (Dykstra et al. 2008; J. Woodford, unpublished data). The Red-shouldered Hawk is a short-distance migrant that occasionally overwinters in Wisconsin, but it generally spends winters in southern Illinois or further south. Peak fall migration for Red-shouldered Hawks in Wisconsin occurs

from late October to mid-November (Mueller et al. 1997), and hawks return between early March and mid-April (Jacobs 2006). The individuals that overwinter in Wisconsin occupy a much broader array of habitats in winter than during summer, including woodland edges, highway right-of ways, parks, and residential areas (Jacobs and Jacobs 2002). Distribution information for this species may not reflect its full extent in Wisconsin because many areas of the state have not been thoroughly surveyed.

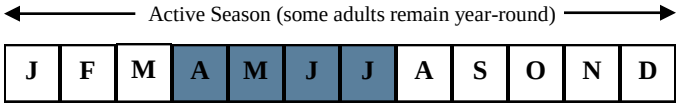
Global Distribution and Abundance: The Red-shouldered Hawk is classified into numerous subspecies across North America. The eastern subspecies (*B. lineatus lineatus, alleni, texanus* and *extimus*) presently occur in the U.S. from central Minnesota eastward to Maine and from southern Canada south to Florida, the Gulf Coast, Texas, and eastern Mexico (Dykstra et al. 2008). The western subspecies (*B. lineatus elegans*) occurs in the U.S. from southwestern Oregon south to northern Baja California, and Mexico (Jacobs and Jacobs 2002, Dykstra et al. 2008).

Diet: The Red-shouldered Hawk's diet is broad and includes mammals, reptiles, fish, amphibians, birds and invertebrates. In Wisconsin, prey brought to the nest includes chipmunks, mice, voles, moles, snakes, frogs, fish, earthworms, and crayfish (Welch 1987, Jacobs and Jacobs 2002, J. Woodford, unpublished data). Red-shouldered Hawks normally hunt from a perch that overhangs shallow water or wetland (Jacobs and Jacobs 2002).



Global range map for Red-shouldered Hawk. (NatureServe 2013)

Reproductive Cycle: Red-shouldered Hawks return from migration between late February and mid-April and immediately begin copulating. Copulation continues several times a day until females lay and begin incubating eggs (Jacobs and Jacobs 2002). Eggs are laid from early April to May, and incubation lasts 28-32 days. The female incubates most of the time and the male supplies food to the female and later to the hatchlings (Jacobs and Jacobs 2002). Chicks remain in the nest for 40-45 days while they develop flight feathers and muscles. Adult Red-shouldered Hawks are very secretive around their nests during incubation and nestling periods because nests with young are vulnerable to predation by larger avian and mammal predators including raccoons (*Procyon lotor*), fishers (*Martes pennanti*), and Great-horned Owls (*Bubo virginianus*; Jacobs and Jacobs 2002). Young fledge at about 45 days (mid-June through July) and immediately hunt their own food but will rely on food from adults for another 30-50 days (Jacobs 2006). Breeding begins at two years; however, some one-year-old females have occupied nests (Dykstra et al. 2008).



Avoidance Period

Ecology:

Nests

Nests are constructed from sticks and twigs and are usually lined with conifer sprigs during the courtship and incubation periods. After eggs hatch, live sprigs from both coniferous and deciduous trees (i.e., "greens") are used to line the nest. Nests are approximately 65cm (25.5 in) wide by 35cm (14 in) high and are generally built in a lower fork of a large, mature deciduous tree (Jacobs 2006). Studies have reported Red-shouldered Hawks nesting in over 43 different tree species; the most common nest trees reported in Wisconsin were, in declining order of frequency, oaks (*Quercus* spp.), birch (*Betula* spp.), aspens (*Populus* spp.), maples (*Acer* spp.), American beech (*Fagus grandifolia*), and pines (*Pinus* spp.; Jacobs and Jacobs 2002, Woodford et al. 2008, King 2008).

Eggs

Eggs are white to buff-colored with faint reddish-brown specks, and a typical clutch size is two to four eggs (Palmer 1988, Jacobs and Jacobs 2002).

Natural Community Associations (WDNR 2005, WDNR 2009):
Significant: ephemeral pond, floodplain forest
Moderate: northern dry-mesic forest, northern mesic forest, southern dry-mesic forest, southern mesic forest, white pine-red maple swamp
Minimal: none

Figure 1. a) Lower stem of a Red-shouldered Hawk nest tree with surrounding forest. Rich Staffen, Wisconsin DNR; b) Red-shouldered Hawk nest located near the top of a tree. © Gene Jacobs; and c) a nest tree located near an ephemeral pond in Sheboygan County. Rich Staffen, Wisconsin DNR

Habitat: Red-shouldered Hawks depend on wetlands and other shallow water habitats for prey, and on large trees for nesting. Preferred breeding habitat is characterized by large tracts of contiguous, mature forests with interspersed open wetlands (McLeod et al. 2000, Naylor et al. 2004, Woodford et al. 2008). Suitable habitats range from mature bottomland hardwoods, riparian areas, deciduous swamps, to mixed deciduous-coniferous upland forests (Dykstra et al. 2008). Recent studies have reported Red-shouldered Hawks nesting in areas where residential development is interspersed with native woodlands (Dykstra et al. 2008). It is unclear if this phenomenon is an indication that the species is adapting to these habitats or if they are merely hanging on temporarily in increasingly developed landscapes. Generally, forest condition and structure (Morris and Lemon 1983, Dykstra et al. 2000, McLeod et al. 2000) and proximity to habitat with abundant prey appear more important to this species than specific forest type (Woodford et al. 2008, King 2008).

Threats: The Red-shouldered Hawk was reportedly one of Wisconsin's most common hawks before the 20th century (Kumlien and Hollister 1903), but a dramatic, range-wide population decline in the first half of the 20th century through the 1960s and 1970s prompted the species' listing as a rare or endangered species in many Midwestern states. Region-wide population declines appear to coincide with the widespread loss of nesting and foraging habitat. Unsustainable timber harvesting and wetland draining eliminated substantial amounts of suitable nesting habitat during the first half of the 20th century and aided in the widespread decline of this species (Jacobs and Jacobs 2002). Availability of suitable nesting habitat now appears to be the biggest limiting factor for this species in Wisconsin (Jacobs 2006).

Climate Change Impacts: Red-shouldered Hawks in Wisconsin are at or near the northern edge of their continental breeding distribution. Warmer temperatures would therefore likely improve conditions for this species. Model simulations based on climate projections (<http://www.nrs.fs.fed.us/atlas/bird/RFbirdmod_3390.html>) suggest a northward shift in Red-shouldered Hawk distribution, and increased abundance in Wisconsin. Adult birds may more often take up year-round residency, rather than migrating south during winter.

Survey Guidelines: Persons handling Red-shouldered Hawks must possess a valid Endangered and Threatened Species Permit. 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*).

Territory Surveys: Broadcast surveys of conspecific calls are effective for territorial Red-shouldered Hawks during spring (McLeod and Andersen 1998, Woodford et al. 2008, King 2008). Adults respond to broadcasted calls up to one mile from their occupied nest tree (J. Woodford, unpublished data), and therefore systematic surveys along roads and forest trails are efficient methods to determine presence, breeding activity, and nest tree locations.

Conduct broadcast surveys in Wisconsin between 6am and 10am from March 15 to May 1 in southern Wisconsin, and from April 1 to May 15 north of Highway 64. Run surveys under weather conditions used for other breeding bird surveys: wind speeds < 10 mph and no constant precipitation. Play recorded calls on any commercially available broadcasting product or game caller, as long as the volume exceeds 90 decibels, measured at 1 meter from the source. A detailed protocol is described by Woodford et al. (2008) and King (2008).

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:
Red-shouldered Hawks are a secretive, forest interior species that have not been surveyed very well with general bird survey techniques. Therefore, future inventory projects in Wisconsin should focus on identifying suitable habitat and conducting focused surveys using previously described broadcast survey methods (Woodford et al. 2008, King 2008) or other appropriate survey

techniques. These types of inventories are occurring during the planning stages for all forest harvesting activities within the Chequamegon-Nicolet National Forest (USFS 2004), for some state-managed forests during or after property plans have been developed (e.g., Lower Chippewa River State Master Plan), and on some county forests (e.g., Marinette and Wood County Forests). At the very least, forest stands in or near known Red-shouldered Hawk nesting areas should be inventoried for nesting pairs before timber harvesting activities begin.

Other general research needs include investigating (1) direct and indirect impacts of forest habitat fragmentation, (2) determining minimum forest patch size for successful nesting, (3) assessing the effects of human disturbance on productivity, and (4) quantifying differences in habitat, diet, and reproductive success between birds living in suburban habitats and those in more remote heavily forested (Jacobs and Jacobs 2002, Dykstra et al. 2008). Based upon recent research in this region, a statewide volunteer-based survey has potential to provide meaningful results that would aid in assessing their status in Wisconsin (King 2008).

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.

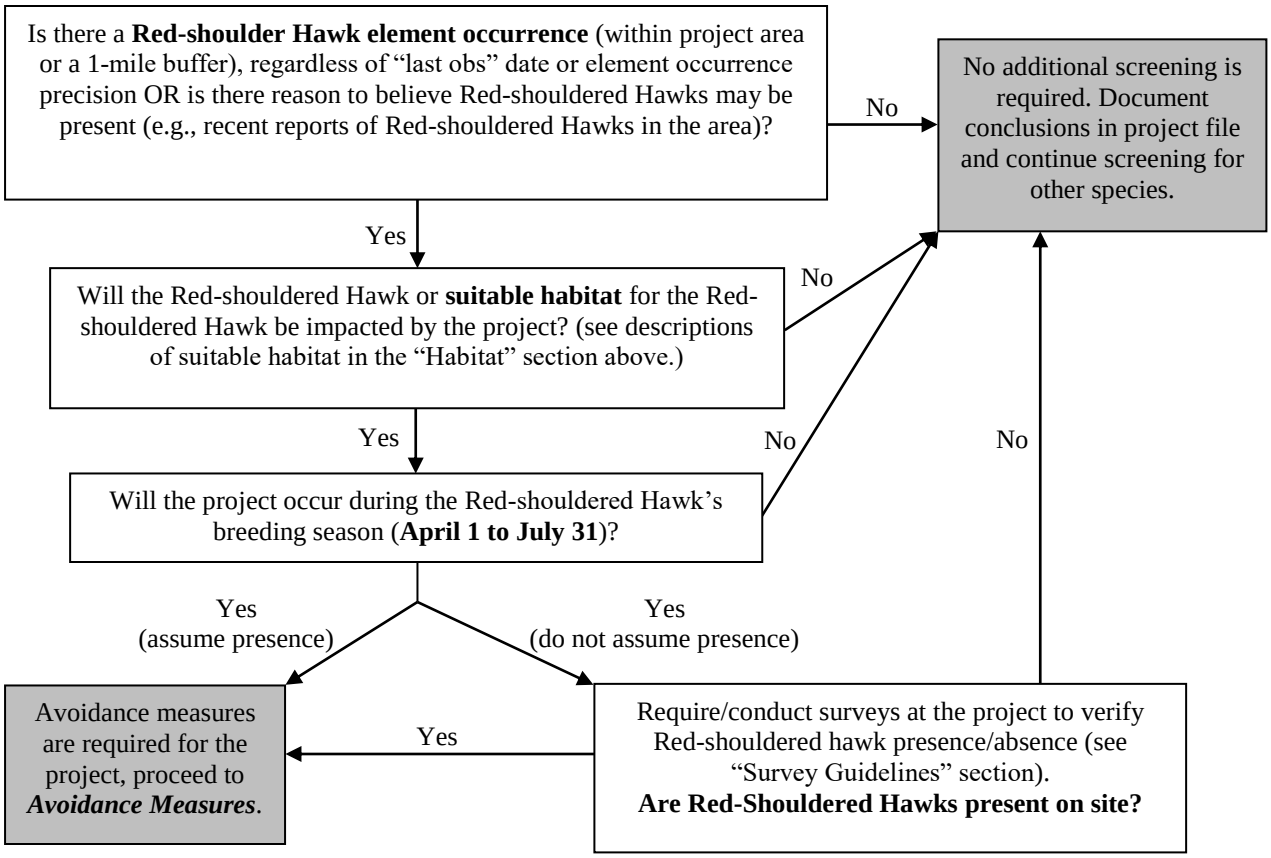
Availability of suitable nesting habitat appears to limit breeding Red-shouldered Hawks in Wisconsin (Jacobs 2006). This constraint can be alleviated through proper nesting-habitat management. Practices that retain a minimum of 70% of pre-cut basal area and make efforts to maintain 70% canopy closure, retain a minimum of 15 live trees >38.1cm (15 in) in diameter per acre, and use small-gap and individual-tree-selection harvesting within suitable nesting habitat conserve breeding territories. In addition, forestry practices that increase tree species diversity and maintain or increase levels of downed woody debris benefit Red-shouldered Hawks (King 2008, King et al. 2011).

Red-shouldered Hawks are directly and indirectly affected by anthropogenic disturbances (e.g., timber harvesting, utility and transportation corridor construction, etc.) and prefer large blocks of unfragmented mature-forest habitat (Jacobs 2006, Woodford et al. 2008). Activities that disturb nesting adults or nestlings should not occur within 91.5m (300 ft) of a known nest tree from March 1 to July 31. Retaining and expanding additional large blocks of bottomland hardwoods with suitable nest trees >38.1cm (15 in) in diameter near wetlands, rivers, and streams, supports continued recovery of this species in Wisconsin.

Screening Procedures

The following procedures must 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 Red-shouldered Hawk. 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.

According to Wisconsin's Endangered Species Law (s. 29.604, Wis. Stats.), it is illegal to take, transport, possess, process, or sell any wild animal on the Wisconsin Endangered and Threatened Species List (ch. NR 27, Wis. Admin. Code). Take of an animal is defined as shooting, shooting at, pursuing, hunting, catching or killing. Red-shouldered Hawks are further 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 *Screening Procedures* above indicate that avoidance measures are required for a project, follow the measures below. If you have not yet read through *Screening Procedures*, please review them first to determine if *Avoidance Measures* are necessary for the project.

The following measures to protect existing nesting areas were developed for statewide use in forest stands with potential Red-shouldered Hawk habitat. These guidelines can be adjusted somewhat – in consultation with a species expert (see *Contact Information*) – to suit local conditions.

Avoidance Measures to protect Red-shouldered Hawks in known nesting areas:

Avoidance can generally be attained by scheduling activities so that they do not occur during the normal Red-shouldered Hawk breeding season (April 1 to July 31), and this is the avoidance measure for project areas where RSHA is confirmed by survey but where the nest tree location cannot be determined.

Where an occupied nest tree is confirmed, the occupied nest tree area (NTA) should be assumed to be a circular area approximately 37 acres in size (radius = 720ft), and these avoidance measures should be followed:

1. Seasonal Restrictions - no marking, harvesting, or trail building – all of which can cause the adults to leave the nest during the most sensitive periods and result in take of the young – within the NTA during the breeding season (April 1 to July 31).
2. Selective harvesting only allowed within the NTA if the following conditions are met:
   - retain 70% or more of pre-cut basal area following harvest, and
   - retain 15 or more live trees per acre >15 inches DBH; retain the largest diameter live trees available within the NTA, as well as the greatest possible level of tree species diversity; large (>20 inches DBH) yellow birch trees, if present, are highly desirable as reserve or leave trees during forest management activities.

3). Prohibit construction of permanent transportation and utility corridors within occupied NTAs (note: logging trails may be constructed within NTA, if trail width is <30 ft and seasonal restrictions [#1] are followed).

Strict adherence to these avoidance measures for Red-shouldered Hawk nesting areas should, in most cases, avoid take of breeding adults, nestlings, and eggs. For projects that cannot avoid Red-shouldered Hawk impacts, please contact a species expert or the Natural Heritage Conservation Incidental Take Coordinator (see *Contact Information*) to discuss other site-specific avoidance measures. If take is unavoidable, an Incidental Take Permit or Authorization is required from DNR, and the US Fish and Wildlife Service may require further permits (see *Contact Information*).

Additional Information

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Linked Websites:

- All About Birds, Cornell Lab of Ornithology: <http://www.allaboutbirds.org/guide/Red-Shouldered_Hawk>
- Chequamegon National Forest Bird Survey (NRRI) species account: <http://www.nrri.umn.edu/mnbirds/accounts/RSHAa2.htm>
- E-bird (Wisconsin): <http://ebird.org/content/wi>
- Forest Birds of the Western Great Lakes: <http://www.nrri.umn.edu/mnbirds/>
- Forest Raptor Online Field Guide: <http://wiatri.net/inventory/Raptors/>
- 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/rsha.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 Endangered and Threatened Species Permit: <http://dnr.wi.gov, key word "endangered species permit">
- 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

Contact Information (Wisconsin DNR Species Expert for Red-shouldered Hawk)

- Refer to the Red-shouldered Hawk 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 (DNRERReview@wisconsin.gov)
- Rori Paloski, Incidental Take Coordinator, Wisconsin DNR, Bureau of Natural Heritage Conservation (608-264-6040, rori.paloski@wi.gov)

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