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# Boreal Owl

## Minnesota Conservation Summary

*Audubon Minnesota*  
*Spring 2014*



The *Blueprint for Minnesota Bird Conservation* is a project of Audubon Minnesota written by Lee A. Pfannmuller ([leepfann@msn.com](mailto:leepfann@msn.com)) and funded by the Environment and Natural Resources Trust Fund. For further information please contact Mark Martell at [mmartell@audubon.org](mailto:mmartell@audubon.org) (651-739-9332).

# Boreal Owl

## Priority for Minnesota's Bird Conservation Plan:

- Boreal Hardwood Transition: High Level Priority

## Other Status Classifications:

- Minnesota Species of Special Concern
- Species of Greatest Conservation Need in Minnesota
- On Audubon Minnesota's Action List
- USFS Sensitive Species on the Chippewa National Forest (2006)
- Considered a Partners in Flight (PIF) Priority Species in Minnesota

## Population Information:

- U.S. and Canada population estimate: 500,000 (U.S. PIF Plan)
- Continental Population Objective: Maintain (PIF)
- Not adequately monitored in Minnesota and no statewide population estimate

## Minnesota BBS Data:

- Not monitored by the Breeding Bird Survey

## Minnesota Residency:

- Permanent resident in the northeast region; irruptive in winter mostly in the northern region
- Although never common in Minnesota, nests have been documented in Lake, Cook, St. Louis and Roseau counties since the first discovery of a nest in the state in 1978 (MNDNR Species Status List, 2010); nevertheless, reports of nesting have declined in past decade.
- The Boreal Owl is likely a regular nesting species in the state and has been one for a long period of time. Breeding population levels likely fluctuate widely depending on a variety of factors including weather conditions during the winter and nesting season, especially snow depth during critical survival periods and population levels during the previous year (NRRI Species Account)

## Habitat Requirements: Forest

In northern Minnesota and Michigan, old aspen and mixed-forest sites; Minnesota nests located in old aspen clones intermixed with conifers. (Birds of North America)

Nest cavities (abandoned cavities originally excavated by woodpeckers) are usually in old aspen or birch trees located within older coniferous forest stands (MNDNR Species Status List, 2010). Song perches are usually located in conifer trees.

## *From NRRI Species Accounts:*

Found in aspen, especially those in older forests with a variety of other deciduous and coniferous trees. In addition, 76 of 86 roost sites occurred in lowland black spruce tracts. Because of its need for large trees, especially mature aspen for nesting cavities, the Boreal Owl is classified as associated with mature forests.

## *From Belmonte M.S. Thesis (2005):*

- Of the 56 trees used as song perches, 93% were coniferous species, with an average dbh and height of 35.6 cm and 18.5 m, respectively. Deciduous species represented 7% of song perches, with an average dbh and height of 39.7 cm and 19.7 m, respectively.
- Eighty-three percent of cavity sites were in deciduous tree species

- Coniferous tree species, particularly upland types, were a common forest component of Boreal Owl song and cavity sites.
- Electivity indices from this study indicate that Boreal Owls avoided deciduous tree species for use as song perches. Lack of foliage on deciduous species during the courtship period (March and April) may be one reason Boreal Owls avoid deciduous trees. Boreal Owls appear to use song perches that are in close proximity of one another and to a potential cavity tree and may use a preferred song perch.
- Taller overstory canopy, higher basal area, large snags and a higher percentage of coniferous canopy cover were found to be important predictors of song sites as compared with random sites. Balsam fir was also an important component at song sites.
- Eighty-five percent of the roost sites were within 100 m of a lowland conifer stand while 94% were located within 200 m of lowland conifer stands, indicating a probable association with lowland conifer.
- The majority of foraging locations occurred in heterogeneously mixed conifer and mixed coniferous deciduous habitats.

*From Lane M.S. Thesis (1997):*

- Stands supporting vocalizing male owls were generally located immature, mixed forest tracts, containing saw timber-sized quaking aspen (*Populus tremuloides*).
- Owls most often roosted in lowland conifer forests, even though these forest-types represented only 8.3% of the study area. Black spruce (*Picea mariana*) was identified as the roost tree on 94 (81.7%) of 115 observations.

Migration: Permanent Resident

Climate Change Vulnerability: Low (1)

Threats/Issues:

*From NRRI:*

- Loss of mature coniferous and mixed deciduous/coniferous forest stands

**OVERALL MINNESOTA GOAL: Ensure that the Superior National Forest and the State of Minnesota maintains sufficient mature mixed conifer stands to support a breeding population of Boreal Owls (refer to specifics in MFRC landscape plans, SFRMP and National Forest Plan)**

#### **BEST MANAGEMENT PRACTICES**

*From Birds of North America – Cornell Lab of Ornithology (BNA):*

- Retain large-diameter snags in clearcuts and establish systems of nest boxes to monitor populations.
- In coniferous forests with patches of large-diameter aspen, retain aspen for nesting.

*From PIF Plan for Physiographic Area 20 (BCR12); the Boreal-Hardwood Transition Zone relevant to Boreal Owls:*

- Promote structural diversity at the landscape scale, including patches of early-, mid-, and late-successional forest in a range of patch sizes.
- Where possible, maximize the amount of forest interior (and minimize disturbance within it) to benefit area-sensitive and forest-interior species.
- Remove unneeded dams, dikes, or levees to reestablish hydrological connections between riparian and floodplain habitats and provide a greater variety of successional habitats.

- Advise homeowners to limit the use of pesticides and other harmful chemicals in important nesting and foraging areas.

## MONITORING RECOMENDATIONS

Continue investments in Minnesota’s owl monitoring program

## CONSERVATION ACTIONS

- Identify and target high priority landscapes and habitats for conservation action

**Action:** Identify Important Bird Areas that are a priority for this species in Minnesota

- **Upper Mississippi Valley/Great Lakes Joint Venture Region:**

The UMVGL JV LBP outlines habitat goals for deciduous forest but the focal species were all southeastern forest species so those did not seem appropriate for the Boreal Owl. The habitat goals for Evergreen forest were dependent on the Cape May Warbler and again that did not seem an appropriate species for establishing habitat goals for the Boreal Owl. Minnesota forest plans for national, state and county land that focus on maintenance of mature mixed coniferous/deciduous forest seem to be the best tool for establishing and monitoring habitat needs for the Boreal Owl as well as targeting the identification of Forest Bird Management Areas as noted below.

**Action:** Establish multiple Forest Bird Conservation Areas within BCR12 that are large enough to maintain or restore components of the historic landscape that are important to birds. Each FBCA should be 4,500 hectares (11,000 acres) in size, each with an old-growth core of 3,000 hectares (7,400 acres). Where FBCA management units cannot be designated, satellite FBMA’s should be established. In general, 1,000 contiguous hectares (2,300 acres) of forest will meet the habitat area requirements of many priority forest birds.

The overall objective in establishing Forest Bird Conservation Areas (FBCAs) is to provide a framework for the long-term conservation of forest birds by applying general strategies known to benefit both bird generalists and specialists:

1. Maintain large contiguous forest tracts and manage in large blocks
2. Restore connectivity between large tracts
3. Minimize isolation of forest patches
4. Maintain a well-developed and diverse understory
5. Encourage a variety of seral stages and more forest interior for area-sensitive species
6. Limit narrow, linear tracts to reduce the ratio of edge to interior in managed areas.
7. Establish an old-growth core reserve area (surrounded by a buffer zone where no silvicultural activities occur) to benefit forest-interior species and other priority species.

The PIF Plan suggests the following sites in BCR12 of Minnesota as potential FBMA’s:

1. Beltrami Island State Forest
2. Boundary Waters Wilderness Canoe Area
3. Chippewa and Superior National Forests
4. Itasca State Park
5. Voyageurs National Park

Additional broad conservation actions from the UMVGL JV LBP:

1. Follow available “best practices” guidelines for land managers.

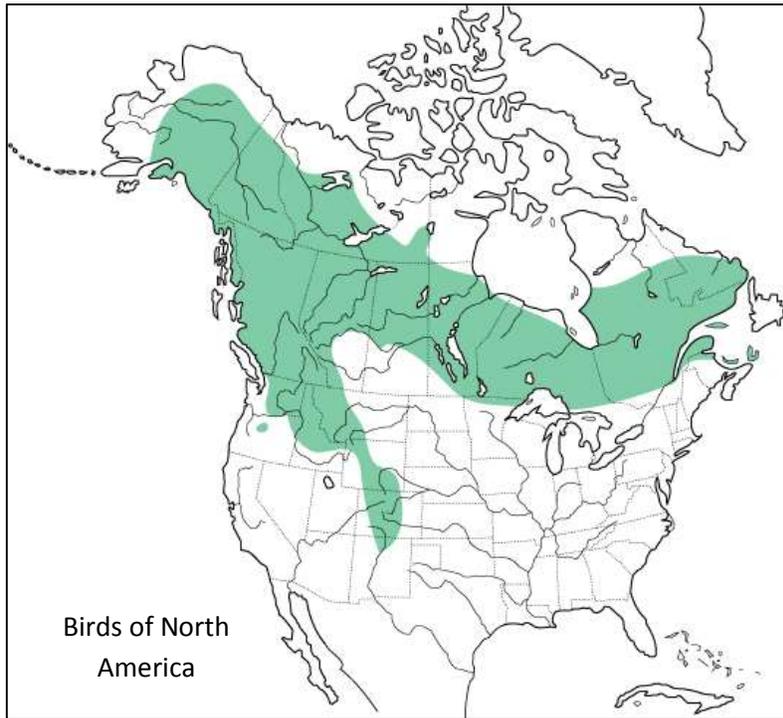
2. Promote landbird planning and conservation across ownerships, states, JV regions, and international boundaries.
3. Focus on land supporting viable populations of JV Focal species in relatively unfragmented landscapes >10,000 ha and with fewer threats.
4. Emphasize conservation on landscapes >70% intact (undeveloped) and contain core sites with source populations of JV focal species. Landscapes with <70% natural cover should also be conserved if focal species habitat needs are met, especially if there are few or no landscapes meeting the 70% criteria. In landscapes with <70% natural cover, retain or increase size of forest and grassland tracts, especially in central parts of the JV region.
5. Improve monitoring for species whose main breeding range is north of the BBS coverage area.
6. Create coordinated conservation programs in countries where birds winter and migrate, including identification, protection and management of key sites
7. Identify and/or maintain critical breeding areas for species where this JV is particularly important to breeding populations.

## **RESEARCH NEEDS**

*From UMVGL JV LP (A set of even more specific objectives is listed for each of these items)*

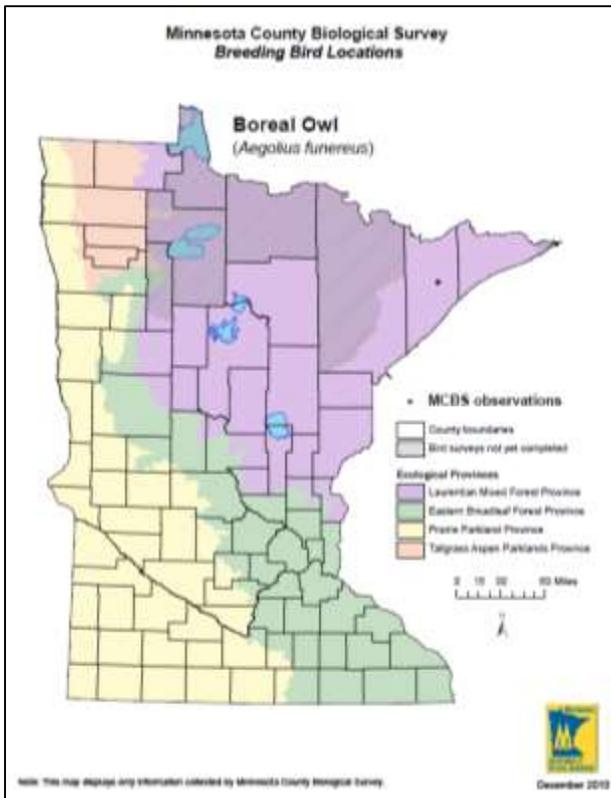
- Identify landscape and habitat characteristics (e.g., composition, structure, configuration) associated with high productivity and/or survivorship, including source populations. This information is needed to help ensure viable breeding populations at objective levels set for the region.
- Refine breeding density estimates across the JV region and improve models used to calculate habitat objectives. JV focal species whose estimated habitat requirements exceed the estimated habitat available should be completed first. This information is necessary to determine the location and amount of habitat needed to meet population objectives.
- Improve understanding of habitat requirements, management needs, and landscape attributes for species of high conservation concern (e.g., Kirtland's Warbler). This information is needed to develop site specific management protocols for bird population maintenance and restoration.
- Quantify fine scale site characteristics important to JV focal species by providing information for explicit habitat prescriptions and identifying research/monitoring needs for fine scale characteristics that are unknown. This information is needed to develop site specific management protocols for bird population maintenance and restoration.

Boreal Owl Distribution Maps

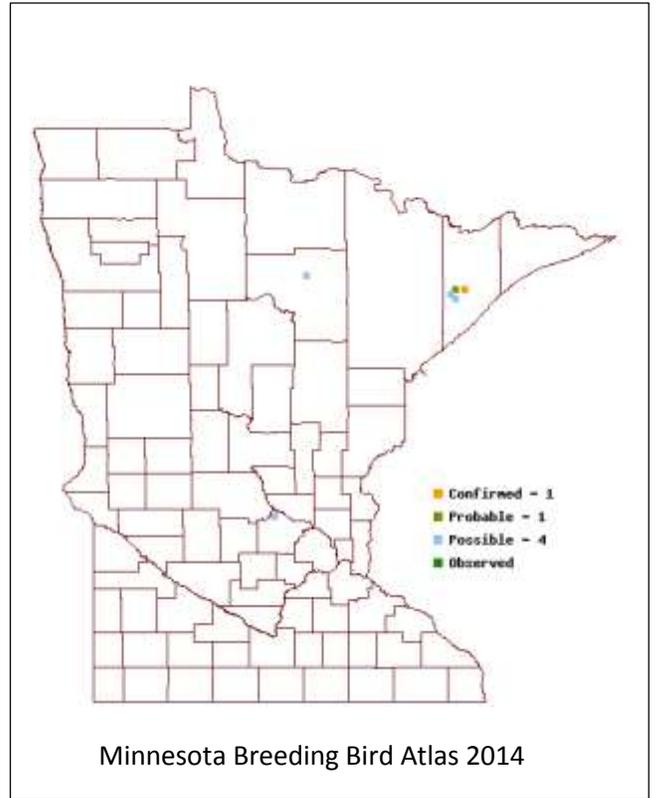


Birds of North America

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MN DNR [http://www.dnr.state.mn.us/eco/mcbs/bird\\_map\\_list.html](http://www.dnr.state.mn.us/eco/mcbs/bird_map_list.html)



MN Breeding Bird Atlas <http://www.mnbba.org/>