



Credit: Jim Williams

# Prothonotary Warbler Minnesota Conservation Summary

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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).

# Prothonotary Warbler

## Priority for Minnesota's Bird Conservation Plan:

- Prairie Hardwood Transition: Moderate Level Priority

## Other Status Classifications:

- Minnesota Species in Greatest Conservation Need
- On Audubon Minnesota's Action List
- On National Audubon Society's Yellow Watch List (2007)
- USFWS Focal Species (2005)
- USFWS Bird of Conservation Concern in BCR22 and Nationally (2008)
- On National Audubon's List of Species that have declined by 45% or more since 1966 (the Prothonotary Warbler has declined by 45%)
- A Focal Species for the Upper Mississippi River/Great Lakes Joint Venture Region
- Identified by Partners in Flight (PIF) as a Species of Continental Concern (moderately abundant or widespread with declines or high threats; Population Trend: 4); Action: Management
- PIF BCR22: Continental Concern and Regional Concern Species: Action is Management

## Population Information:

- U.S. and Canada population estimate: 1,800,000 (U.S. PIF Plan)
- Continental Population Objective: Increase 50%
- Minnesota Population Estimate: Unknown

## Minnesota BBS Data:

- Not adequately monitored by the Federal Breeding Bird Survey in Minnesota
- Minnesota does not include one of the species centers of highest abundance
- 3.37% of the species' North American breeding range occurs in Minnesota.

## Minnesota Residency:

- Breeds primarily in southeastern and east-central Minnesota
- The Prothonotary Warbler is a rare summer resident in southeast and southcentral Minnesota. It occurs primarily in bottomland forests along the Mississippi, Rum, Minnesota, and St. Croix Rivers (NRRI species account)
- Roberts (1932) suggested that the species gradually moved north to Minnesota by following the Mississippi River valley (NRRI species account).

## Habitat Requirements: Floodplain Forest

Key features: water near wooded area w/suitable cavity nest sites. Nest is over or near large bodies of standing or slow-moving water, including seasonally flooded bottomland hardwood forest; other important features: flat terrain, shaded forest habitats w/sparse understory; area sensitive, avoiding forests <100 ha in area & avoiding waterways with wooded borders <30 m wide (Birds of North America)

## *From the Wisconsin Bird Conservation Initiative (WBCI) Species Profile:*

The Prothonotary Warbler breeds in moist bottomland forests that are seasonally flooded or permanent wetlands. Along the Mississippi River in Wisconsin, Prothonotary Warbler breeding habitat contains a variety of overstory trees, including eastern cottonwood, black willow, silver maple, green ash, and river birch. Dominant understory plants include woodbine, wood-nettle, jewelweed, violet, and poison ivy (Flaspohler 2006), dead trees with suitable cavities for nests, flat terrain, and sparse understory (Petit 1999). Prothonotary Warblers also prefer large forest tracts. Sallabanks et al. (2000) documented a positive correlation between Prothonotary Warbler abundance and swamp forest patch size.

The Prothonotary Warbler is the only eastern warbler that nests in tree cavities. It uses either natural or woodpecker-excavated cavities in dead snags or limbs of live trees, as well as nest boxes (Petit 1999). Trees with nest cavities average 15 to 20 cm in diameter at breast height (Kahl et al. 1985, Blem and Blem 1991). Average nest height is 2 m above the ground or water surface. Nests usually are placed over water, either slow-moving or still (Petit 1999).

*From NRRI Species Account:*

- Walkinshaw (1953) found all territories within the immediate vicinity of well-shaded water.
- 50% of cavities used in Michigan were excavated by Downy Woodpeckers
- The species competes for nest cavities with Tree Swallows and House Wrens. However, because it arrives later in the breeding season than these two species, suitable nest sites are often occupied.
- The species is classified as a riparian species, cavity nester, forest interior species and a species that requires mature forests.
- The species will accept nest boxes.

*From UMVGL Joint Venture Landbird Species Profile:*

- Breeds exclusively in forested wetlands with standing water, including bald cypress swamps, floodplain forests, backwaters of rivers, and wooded margins of lakes and reservoirs.
- Other habitat features include low elevation, little topographic relief, sparse understory and ground cover, and 50-75% canopy cover with a height of 12-40 m.
- The species generally has a narrow (<50m wide) linear distribution along wooded river corridors.
- Appears to be area-sensitive, being largely absent from forests <100 ha and avoiding (<30 m wide) forest strips along waterways.

Migration: Neotropical

Area Sensitivity: Considered to demonstrate “Medium Sensitivity” to forest area

Climate Change Vulnerability: Medium (2); models predict no change in distribution or abundance in Minnesota

Threats/Issues:

*From BNA Species Profile:*

- Primary negative impact of silviculture is removal of decayed trees that could provide nest sites, and alteration of hydrological regime, causing drying of seasonally flooded areas.
- Channeling of streams to control flooding also lower habitat quality.

*From WBCI Specie Profile:*

- Loss of habitat
- Invasive plant species, particularly reed canary grass, may impede regeneration in floodplain forests.
- Stream channeling, flood control, and logging practices can reduce habitat suitability and availability
- Brown-headed Cowbird parasitism also is a concern. Brood parasitism rates for Prothonotary Warblers are higher than for any other cavity-nesting species.
- The House Wren is considered a major competitor, causing approximately 33% of mortality to eggs and young in Michigan.

*From UMVGL JV Species Profile:*

- Loss and degradation of forested wetlands through logging and conversion to other uses.
- Predation, competition, and loss of nest sites due to flooding.

- Frequency of nest parasitism by Brown-headed Cowbirds is reported to be 11-27%

**OVERALL MINNESOTA GOAL: The primary goal is to insure that Prothonotary Warblers remain a vital component of Minnesota's avifauna by insuring large tracts of floodplain forest are protected and restored in southeastern and east-central Minnesota. Eliminating the current population deficit in the Upper Mississippi Valley/Great Lakes Joint Venture region requires a 50% population increase or an average annual increase of 3% over a 15 year period.**

## BEST MANAGEMENT PRACTICES

*From WBCI Species Profile:*

- Management efforts should focus on maintaining large blocks of floodplain forests, particularly along the Mississippi, Rock, Wisconsin, lower Wolf and Yellow Rivers.
- Management practices that retain trees with nest cavities and/or retain snags and stumps in floodplain forests would likely benefit this species.
- Nest box programs in fragmented or degraded riparian areas may provide alternative nesting substrates.

*From NRRI Species Profile:*

- Populations may be limited by forest size (Galli et al 1976). Robbins (1979, 1980) estimated the minimum area required to sustain a viable breeding population at 250 acres.
- Whitcomb et al. (1981) found Prothonotary Warblers only in extensive forests; those larger than 200 acres.
- This species may be affected by forest management practices that remove trees with available cavities (Bushman and Therres 1988).
- Old-growth stands would most likely benefit this species because older trees are more likely to develop cavities (Conner and Adkisson 1977, Evans and Conner 1979).
- Timber harvest practices that leave snags or decaying trees in suitable habitats will be beneficial to the species. In addition, Bushman and Therres (1988) suggest leaving buffer strips in riparian habitats of at least 100 m on each side of streams.

*From UMVGL JV Species Profile:*

- Buffers of approximately 90 m (300 feet) wide around each side of the stream are recommended; territories might, on average, have 120 m of frontage along a river.
- In Iowa, nesting success was 82% in relatively large (>84 ha) unfragmented forest compared to <50% in a relatively smaller, fragmented forest corridor (Brush 1994).

## MONITORING RECOMENDATIONS

The Breeding Bird Survey is inadequate, particularly in the northern Mississippi River floodplain forests, because the survey routes under-sample floodplain forest and forested wetlands.

## 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**

**Action:** Protect and maintain existing habitat area and quality, and add (restore/enhance) floodplain forest interior habitat with the species current and historic breeding range. Connect and reduce fragmentation of current forested wetlands by creating large blocks (>100 ha). Obtaining permanent conservation easements through the Wetland Reserve Program (WRP) would be a mechanism for protecting floodplain forests with the appropriate hydrology.

Note: No specific acreage goals are provided for Minnesota since the species is not adequately monitored by the BBS in the state's floodplain forests.

## RESEARCH NEEDS

*From BNA Species Profile:*

- Collect information based on natural cavity nests in habitat of different quality to provide understanding of the impacts of habitat degradation on breeding populations.
- Better understand the impacts of mangrove destruction on overwinter survival.
- Study habitat use during migration.
- More information is needed about the biology of immatures, dispersal from the natal site and breeding ecology in the first year.
- How the combination of nest-site limitation, habitat specificity, and long-distance migration influences lifetime reproductive success.

*From WBCI Species Profile:*

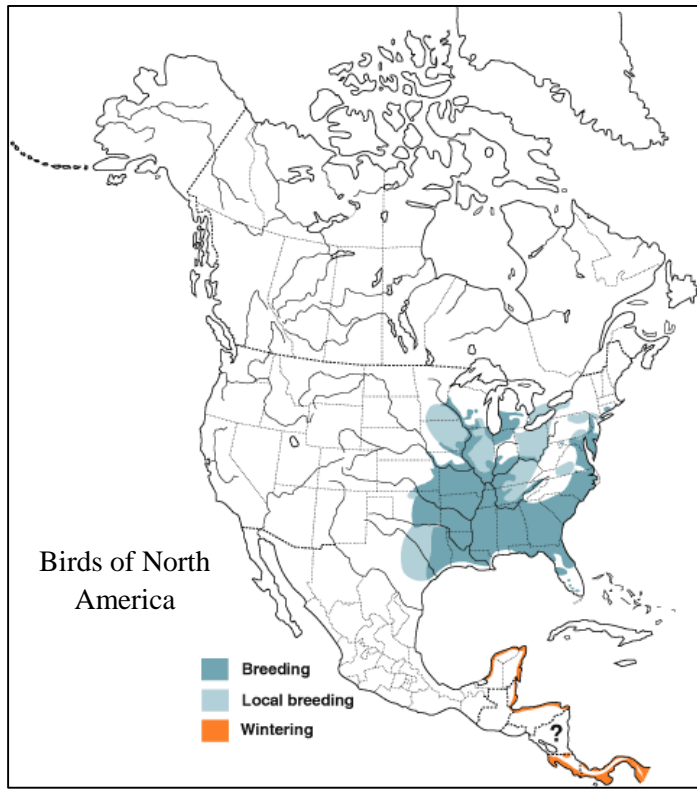
- Targeted surveys in appropriate habitats are needed to better understand the Prothonotary Warbler's population status.
- A better understanding of minimum area requirements and the health of floodplain forests would help future management efforts.
- Studies investigating success rates of natural cavity nests in habitats of different quality are warranted.
- On the wintering grounds, more information is needed on the impacts of mangrove forest loss.

*From UMVGL JV LBCP Species Profile:*

- Better information is needed to assess numbers, trends, and causes for population changes. Migration corridors and stopover locations need to be identified.
- Demographic information for populations, especially those using natural cavities and impacts of habitat loss on wintering grounds.

Effectiveness Measure: Eliminating the current population deficit requires a 50% population increase or an average annual increase of 3% over a 15 year period.

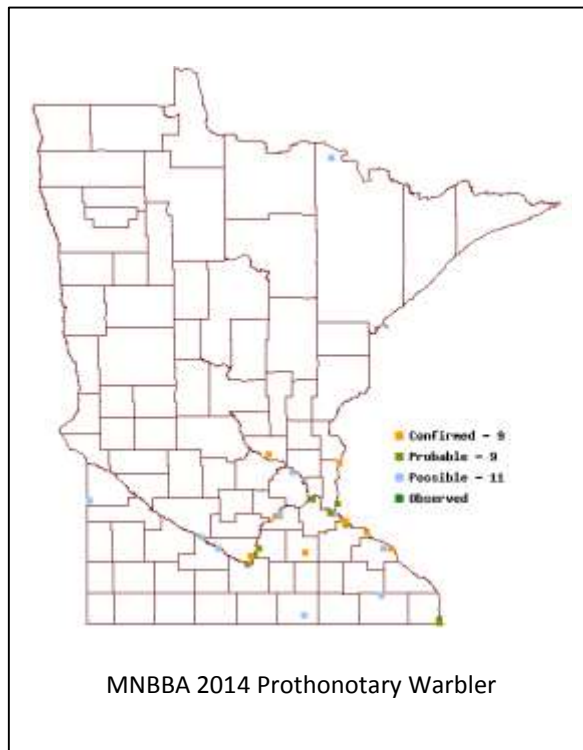
Prothonotary Warbler Distribution Maps



Birds of North America <http://bna.birds.cornell.edu/bna/>



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.mnbaa.org/>