



**STATUS: HIGH  
CONSERVATION  
PRIORITY IN IOWA**

## **Prothonotary Warbler**

*Protonotaria citrea*

### **Introduction**

One of the most striking wood-warblers of North America, Prothonotary Warblers, “the golden bird of wooded swamps,” intrigue and delight those who visit its very specialized habitat.

A medium-distance Neotropical migrant species, the Prothonotary Warbler inhabits wet forests throughout its range across the southeastern United States and northward into Iowa and other parts of the Upper Midwest. It is a bird of bottomland hardwood forests and other wooded wetlands.

Prothonotary Warblers have the distinction of being the only eastern wood-warbler that nests in tree cavities. It often uses holes excavated by Downy Woodpeckers, but will also nest in a variety of other cavities.

Because the species has specific habitat needs in breeding as well as wintering areas, the greatest threats to its survival are degradation and destruction of its habitat. Logging and agricultural conversion of bottomland hardwood forests throughout its breeding range have been detrimental.

Because of its tame nature and ready acceptance of artificial nest sites, the Prothonotary Warbler has become a relatively popular study species, and may be a useful indicator species for environmental quality of wooded wetlands. Although the species has been studied fairly well in breeding areas, information about effects of habitat loss on migrating and wintering populations is currently lacking and is critical for future conservation and management of the species.



Nest box programs are proliferating across the breeding range to bolster diminished local populations, as professional land managers recognize the educational and aesthetic value of this colorful warbler to the general public.

### **Habitat Preferences**

Prothonotary Warblers breed in floodplain, river bottom hardwood habitats, which include tree species of black willow, ash, red maple, and cottonwood. It also breeds near borders of lakes, rivers, and ponds, but normally only in areas with slow moving or standing water.

This colorful species is rarely found outside of its specialized habitat, and therefore are usually found only by the birders and others who specifically seek it. It may be locally common in optimal habitat in Iowa, where it is almost exclusively associated with larger rivers. It is more common in eastern Iowa, and there appears to be little historical change in distribution in the state despite major habitat destruction.

Habitats utilized at stopover and refueling sites during spring and fall migration are not well known; but are thought to be similar to the habitats used for nesting.

### **Feeding Habits**

Prothonotary Warblers primarily feed on insects throughout their annual life cycle, and capture butterflies, moths, flies, beetles, mayflies, and spiders; and also take other small invertebrates including mollusks. In non-breeding seasons it can be more opportunistic, feeding on some seeds, fruit, and even nectar.

Foraging is normally low in wooded thickets where it sometimes hops about on floating pieces of floating wood and mossy logs, searching crevices and gleaning insects from low-growing tree trunks, branches, twigs and foliage. It may occasionally forage by winding its way up tree trunks like a nuthatch.

Among the colorful wood-warblers, this is a relatively slow-moving, “thorough” forager.

### **Breeding Biology**

Prothonotary Warblers begin arriving in Iowa in late April and early May. Males precede females by several days, when they sing to establish territories. Some males may even start nest building at that time. Pairs form soon after females arrive. Males defend territories fiercely, and may even be aggressive toward other species that encroach.

Males display intensely to the female during courtship by fluffing plumage and spreading wings and tail. Only females build the real nest. Nests are most often 5 to 10 feet (but sometimes from 3 to 30 feet) above standing water. The holes excavated by Downy Woodpeckers are apparently favored, but rotting knotholes and other cavities are also used as nest sites, and this species may sometimes excavate its own holes in very rotten stumps. Artificial nest boxes and nesting gourds have proved to be effective as nest sites where natural sites are lacking.

In comparison to other warblers a high number of eggs are laid. Eggs usually number 4 to 6, but the range is 3 to 8. Incubation is by the female, and lasts from 12 to 14 days. Nestlings are fed by both parents, and are able to leave the nest at 10-11 days of age. Young can supposedly swim at fledging; often a second brood is raised in the same nesting season.

### **Concerns and Limiting Factors**

The greatest negative impacts to Prothonotary Warbler populations are the destruction, fragmentation or degradation of their specialized habitats throughout the breeding and migratory range.

Bottomland hardwood forests, the warbler's prime breeding habitat, have been logged or converted to pasture or cropland throughout south eastern U.S, and only

10% of original bottomland forest in the lower 48 states remains. Primary negative impact of woodland management is the 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 lowers habitat quality.

Prothonotary Warblers exhibit a moderate level of sensitivity to area size on breeding grounds, avoiding wooded tracts of less than 40 acres, and riparian areas that are less than 100 feet wide.

Direct contact with pesticides is probably limited due to the strict habitat associations that Prothonotary Warblers maintain. But there may be contact with biocides used in agricultural systems such as citrus groves, where species can be numerous during migration.

During migration, this species is frequently found among killed birds at TV and radio towers, and at tall buildings that remain lit up with lights through the night. Collisions with automobiles probably are very infrequent.

Although details of the general breeding biology of the Prothonotary Warbler have been well studied, most information has been collected through the use of nest boxes, which can influence the number of breeding birds and increase the annual reproductive success of individuals – but has little to do with the population as a whole.

More information is needed for a better understanding of the impacts of habitat degradation on breeding populations. Very little is known about the specific impacts of mangrove destruction or degradation on overwinter survival, and almost nothing is known about habitats used during migration. Such information is important to any future conservation or management efforts. Another limitation is the absence of information about dispersal from nest sites,

and breeding ecology in the first year. It is also not known how the combination of limited nest sites, strict habitat specificity, and long-distance migration influence lifetime reproductive success for this species.

### **Habitat Management Recommendations**

Prothonotary Warblers are vulnerable to destruction of their specialized breeding habitats, throughout their migratory range, and on wintering grounds. Consequently, Iowa DNR and the Iowa IBA Program are incorporating specific habitat management concerns into regional conservation plans being developed by Partners in Flight along with grassroots conservation projects.

Fortunately for researchers, land managers, and bird educators, this species is very tolerant of human activity and can be quite tame, sometimes foraging within 3 to 6 feet of human observers; and incubating females captured repeatedly at nests will not abandon their nests. This has led to a proliferation of nest box programs across the breeding range to bolster diminished local populations, as professional land managers recognize the educational and aesthetic value of this colorful, cavity nesting warbler to the general public.

Use of nest boxes in wooded wetlands where natural nest sites have been lost over time can be important tool for enhancing declining local populations and increasing public recognition of habitat conservation issues. However, birds dependent upon nest boxes may suffer elevated predation rates, particularly if high numbers of nest boxes are placed in close proximity to each other. In some areas, House Sparrows and House Wrens may out-compete warblers for nest boxes.

Despite some of these minor positive steps, it should always be remembered that placement of nest boxes is no substitute for long-term protection and oversight of the

large bottomland woodlands that will determine the ultimate fate of this beautiful species.

For assistance in this regard, see the section on Woodland Management for Birds, and for more specific information see the section Recommended Woodland Management Practices. Both of these sections are to be found in Part 3.