



The Prothonotary Warbler in Canada: On the Road to Recovery?

The Prothonotary Warbler is one of the most dazzling of North American birds. Males and females look alike, but males are more brightly coloured. They have golden yellow heads and breasts, olive-green backs, and azure blue wings and tails. Prothonotaries don't have wing bars, but white tail spots are quite prominent.

"Prothonotary" is a big name for such a little bird. Human prothonotaries are religious and legal clerks who sometimes wear a golden hood and a blue cape. The Prothonotary Warbler is also known as the "golden swamp warbler" in some regions.

For a warbler, the Prothonotary Warbler has quite a long bill — one of the diagnostic features that places it in its very own scientific genus (Protonotaria). The average Prothonotary weighs about 14 grams (about ½ ounce), and measures about 14 cm long (5½ inches).

The male's territorial song is a very loud, ringing "Tsweet-tsweet-tsweet-tsweet," uttered emphatically in groups of four to six.

Breeding Range

The Prothonotary Warbler is the quintessential "Carolinian" species, breeding throughout the eastern U.S. and north to southwestern Ontario. It is most abundant in the southeastern U.S. and up the Mississippi River.

Being at the northern edge of its range in southwestern Ontario, the Prothonotary is almost entirely restricted to a few areas on and adjacent to the Lake Erie shoreline (Holiday Beach, Pelee Island, Point Pelee, Wheatley, Rondeau, Long Point, and Point Abino). It also regularly occurs in Hamilton, and occasionally nests at Pinery Provincial Park on Lake Huron. The main populations in Canada reside on publically-protected lands in Rondeau Provincial Park, Holiday Beach and in the Long Point region.

Prothonotaries in the Spring

In spring, the Prothonotary begins to return to southern Ontario in the first week of May. Males generally precede females by about 2 weeks, and



A male Prothonotary Warbler. Photo - C.R. Sams (VIREO)

older birds of both age groups precede younger ones. Most of the population is usually back on its nesting grounds by the first week of June, but some younger females take their time and may not arrive until the end of June. By the time the females are back, the males have already established their territories and begun to select potential nest sites for the females to inspect.

The Prothonotary is the only warbler in eastern North America that builds its nests in tree cavities. Since it cannot excavate its own, it uses naturally formed hollows and those excavated in previous years by chickadees and Downy Woodpeckers.

Small, shallow cavities that are situated fairly low (usually at heights of 1-3 metres) are greatly favoured, especially if they are over open pools of water.

Prothonotaries have been known to use some pretty



strange nesting sites, including a tool box, the pocket of an old coat, a paper sack, a coffee can, a tin pail, a mail box, a box on a moving ferry, a Chinese lantern, an old hornet's nest, a glass jar, and a tea cup. Like many other cavity-nesters, Prothonotaries also readily nest in bird boxes, both traditional wooden ones, and others that are made of more unusual materials. For example, one "nest box" program in Michigan uses wax cardboard milk containers with great success, while another program in Ohio uses plastic bottles!

Whatever the cavity, Prothonotaries fill it almost to the brim with green moss, usually mixed with a few dead leaves. The nest is lined with fine grasses and rootlets. It is thought that the green moss acts as a natural fumigant to suppress lice infestations and that it also helps keep the nest insulated against temperature extremes. In any case, the Prothonotary Warbler is able to find ample supplies of moss in its favourite habitat — swamp forests.

Indeed, the Prothonotary is very much dependent on deciduous swamp forests. In Ontario, such swamps are typically dominated by silver maple or buttonbush. The best Prothonotary swamps have large pools of open standing water and little shrub cover. Prothonotaries also frequently live along the margins of slow-moving, warm-water creeks and rivers, lined with large willows.

Territories are large and well-defended, and usually encompass about 2 hectares (e.g. 100 metres by 200 metres). This means that very small pools of open water swamp are insufficient; the open water area required for each pair is almost always a hectare or more in size.

Why Build "Dummy" Nests?

Male Prothonotary Warblers frequently build one or more incomplete or "dummy" nests, adding just a shallow layer of moss to cavities scattered within its territory. These partial nests appear to serve several functions. First, the male may use them to demonstrate to the female that he has chosen a good territory with lots of nesting opportunities. He may also be trying to fool potential predators into thinking that cavities with "nests" do not necessarily mean a free lunch. As well, he is informing other nest competitors (House Wrens, Tree Swallows and other male Prothonotaries) that his territory is occupied. Finally, the "dummy" nest is quite often adopted by the female upon her arrival, who then takes over completing the functional nest. Because the male has already spent a day or two laying the foundation for the functional nest, it saves her time in nest building, and thus gives her a jump-start on the all-too-short nesting season.

Nesting is What it's all About

By late May and early June, many of Ontario's Prothonotaries have established territories and finished making their nests. For a songbird, the Prothonotary lays an unusually large number of eggs. The normal clutch is 5 to 6 eggs, but 8-egg clutches are also fairly common.



A typical Prothonotary Warbler swamp in southwestern Ontario. *Courtesy - J. McCracken*

The female does all of the incubation. The male tends her on the nest by bringing her green caterpillars to snack on, when he isn't too busy chasing away avian intruders or incessantly singing.

The eggs usually hatch in about 12 days and the parents are kept busy for another 10-12 days feeding the insatiable young. Again, green caterpillars are a particular favourite. On this protein-rich diet, the young grow quickly, and the nest cavity rapidly fills up with baby Prothonotaries. Because the cavity is small and shallow, and because the Prothonotary family is often a big one, there isn't room for anybody to exercise their growing wings, let alone stretch!

Owing to the crowded conditions, the young leave the nest as soon as they're able to. This is a dangerous first flight. The nestlings haven't been able to exercise their wings, so the best they can muster at this age is a short hop of only a few metres. Because the inaugural flight is invariably over open water and since Prothonotaries aren't built for swimming, they need to land on the nearest branch.

When one of the youngsters finally gathers the courage to fledge, the rest promptly follow the leader. Upon landing in a nearby low-hanging branch, the fledglings call incessantly to their parents, and then quickly begin working their way up the tree — branch by branch — to the highest parts of the tree canopy. In no time at all, they are high up, and nearly impossible to see from the ground. For the next month or so, they become tree-top birds, perhaps because this gets them out of the way of marauding mammalian predators.

If this all happens before mid June, there is a chance that the parents will attempt a second nesting. In Ontario, however, the Prothonotary Warbler usually has only enough time to bring off one brood of nestlings.

By mid August, nearly all of Ontario's Prothonotary Warblers are beginning to migrate southward to their wintering grounds in Latin America. All told, our family of Prothonotaries has been in Canada for only about 3 months. It is no wonder that "our" birds are considered to be "their" birds by the people of Latin America, where Prothonotaries actually spend the majority of their lives.

Winter in Latin America

Prothonotaries migrate south to the U.S. Gulf Coast and then make a hazardous non-stop flight across the Gulf to land in central America and northern South America. The bulk of the population winters in the coastal lowlands of Panama, northern Venezuela and northern Colombia, where it is concentrated in mangrove and other lowland forests. Hence, a very large breeding population is



effectively compressed into a relatively small geographic area during the winter. It is easy to see how the Prothonotary Warbler's population is particularly vulnerable on the wintering grounds, whether it arises from natural disasters such as hurricanes, or from human-caused changes in the coastal environment.

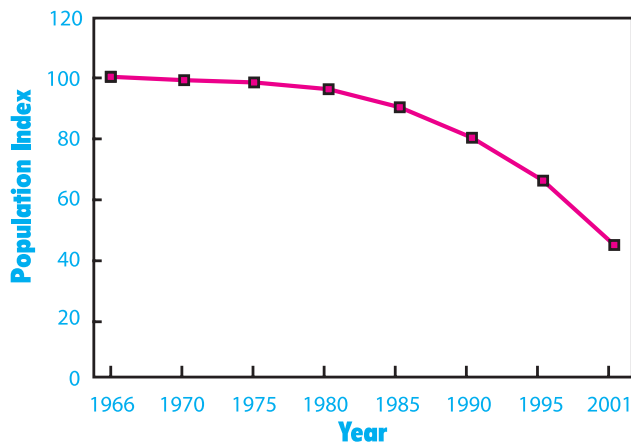
Population Size and Trend

In the early 1930s, the Ontario population of Prothonotary Warblers probably consisted of about 100 to 150 pairs, most of which were located at Rondeau Provincial Park. By the mid 1980s, there were still as many as 80 pairs left in the province, and the species was considered "vulnerable" in Canada.

Population monitoring, based upon the continental Breeding Bird Survey, shows that serious declines began to take hold by the late 1980s. By 1996, the Ontario population of Prothonotaries had been reduced to no more than about 10 pairs, and the species jumped from being "vulnerable" to "endangered" in Canada. Meanwhile, south of the border, U.S. scientists listed it as a species of "special conservation concern." Although the Prothonotary Warbler is still abundant in its core breeding range in the southeastern U.S., scientists estimate that the continental population has declined by an average rate of 1.6% per year since 1966. At first glance, this doesn't sound like much, but it translates to a loss of about 50% over just 30 years.

Efforts to restore the Prothonotary in Canada began in 1997, and there are some encouraging signs that the species is responding positively. In 2000, the adult population was estimated to consist of up to 22 mated pairs, plus an additional 8 unmated males, for a total of 52 adult birds.

Continental Population Trend of the Prothonotary Warbler (1966 - 2001)



Limiting Factors

Why is the North American population of Prothonotary Warblers declining? A combination of things is probably responsible. Loss of both breeding and wintering habitat are primary concerns. Increasing populations of nest site competitors, nest predators, and nest “parasites” (i.e. Brown-headed Cowbirds) are also believed to contribute to the decline.

Although the rate of wetland loss has slowed in recent decades, southern Ontario has still lost about 70% of its original wetlands, much of which was formerly forested swampland. Most of this loss has been brought about by drainage practices, but some of the loss has also been due to development activities. Several of the formerly occupied sites have also been degraded by logging. More insidious, sustained high water levels on Lake Erie during most of the 1980s and 1990s caused trees to die-back in several of the most important lakeshore sites, effectively turning forest swamp into scrubby marshes that are no longer very suitable for Prothonotaries. At the other extreme, severe droughts dry up swamp forests.

In the U.S., habitat loss and degradation are of great concern, especially in the southeastern states that support the “core” breeding population of Prothonotaries. Because these core populations act as important sources for the maintenance of outlying populations, their declines are especially troublesome. Despite tremendous conservation efforts, forest swampland is still under intense pressure in the U.S.. Over 6% of the forested swampland in the U.S. was drained and/or converted to other uses in the last decade alone, and most of this loss occurred in the southeastern states. Loss of breeding habitat in the U.S. has probably been responsible for the elimination of

about 20% of the North American Prothonotary Warbler population since 1966.

While loss of habitat on the breeding grounds is undoubtedly contributing to the Prothonotary Warbler’s declining population, loss of wintering habitat — especially mangrove forest — in Latin America is perhaps even a greater problem. It is estimated that as much as 30% of the species’ wintering habitat has been destroyed since 1966, and the rate of loss has been accelerating alarmingly in the last two decades.

Mangrove forest, which provides winter habitat to the bulk of the Prothonotary Warbler population, is regarded as one of the world’s most threatened habitats. It is being destroyed to make way for shrimp aquaculture and coastal resort developments, and is under increasing pressure from the charcoal industry. As well, coastal developments like roads, dykes and channelization interfere with nutrient exchange, and increase siltation rates and salinization, which have resulted in massive die-backs of mangrove in many areas. Mangrove ecosystems are also under pressure from pesticide contamination (including DDT) and oil pollution. Ultimately, without efforts to save this critical habitat, the future of the Prothonotary Warbler (and numerous mangrove-dependent species of fish and wildlife) is worrying.

Meanwhile, back on the breeding grounds, the chief competitors that the Prothonotary Warbler faces for nest sites are Tree Swallows and House Wrens. Numbers of both of these species are normally quite small in large blocks of undisturbed forest. However, their populations quickly increase in response to forest fragmentation and in response to logging or natural events that open up the tree canopy cover. In places where these competitors are common, they usurp many Prothonotary nests, and can have a very serious and long-term impact on local populations. “Vandalism” caused by House Wrens destroys many Prothonotary nests and eggs.

Even though the Prothonotary nests in tree cavities, roughly a third of its nests in Ontario are parasitized by Brown-headed Cowbirds, a species that has only recently invaded eastern North America. The most conspicuous nest predator is the raccoon, populations of which have increased dramatically in southern Ontario in recent decades.

When you put all these things together, you can see that the Prothonotary Warbler faces an uphill battle.

What the Recovery Team is Doing

The Prothonotary Warbler Recovery Team is a multi-agency group, with representatives from non-government organizations, private stakeholders,

and federal and provincial governments. Established in 1997, one of its first tasks was to prepare a recovery plan. The goals of the plan are to ensure that the Prothonotary Warbler does not become extirpated in Canada, and to increase the population to at least 25 mated pairs.

Through a carefully-planned nest box program, the Recovery Team is attempting to address four of the limiting factors faced by Prothonotaries on their Canadian nesting grounds: 1) a general shortage of suitable cavity nest sites in some of the core nesting areas; 2) a high level of interspecific competition for natural cavity nest sites from Tree Swallows and House Wrens; 3) a high rate of cowbird parasitism; and 4) a high rate of nest predation by raccoons.

The program consists of over 200 nest boxes that have been erected in suitable habitat in most of the historic breeding locations in southwestern Ontario, and in a few other promising locations. Early results from the program are encouraging — the birds are readily accepting the boxes. Moreover, because the nest boxes afford protection against predators and cowbird parasitism, they are fledging more young than birds nesting in natural cavity situations.

While we have learned a lot about the problems faced by Prothonotary Warblers, there

are still some key questions that need to be answered. The recovery team plans to band the majority of the Canadian population of Prothonotary Warblers, using special colour bands, to determine population turnover, site faithfulness, and the extent to which the Ontario population is augmented by birds from the U.S.

The recovery plan also addresses broader issues related to habitat protection and forest management practices in Canada, the U.S. and Latin America. Providing information to the general public, landowners, land managers, and policy makers are other activities that the recovery team is increasingly involved in.

What You Can Do

- The Prothonotary Warbler is understandably sought after by birders and wildlife photographers. While the Prothonotary is relatively tame and tolerates moderate amounts of human company, it is sensitive to human disturbance around its nest site. Remember that the Prothonotary is an endangered species in Canada, so please enjoy it from a distance. Try to stay at least 15 metres away from any known nest site. If the birds start to chip excitedly, it means that you're too close. These alarm calls can alert possible predators to the nest. Also, refrain from broadcasting song recordings to try to lure the bird into the open.
- Decayed tree stubs that are home to Prothonotaries can be so rotten and fragile that they can easily topple over if you brush against them.
- You can help the Recovery Team by offering to build predator guards and/or nest boxes. The nest box program follows specific guidelines, so be sure to contact the Team before considering installing boxes on your own.
- Report your sightings of Prothonotary Warblers to the Recovery Team at all times of the year, even on the wintering grounds! Your sightings are very important!
- Consider making a monetary donation to directly support the work of the Recovery Team.
- Remember that the prawn aquaculture industry is being increasingly implicated in the destruction of mangrove forests, and that this endangered habitat provides a critical winter home for Prothonotaries. Continue to enjoy eating shrimp, but try to avoid those raised by aquaculture operations that destroy mangrove forests.



A male Prothonotary Warbler at one of the recovery team's nest boxes. *Courtesy - J. McCracken*

Information for Landowners

- Most of the deciduous swamp forest in southwestern Ontario has already been drained, and it is especially important to maintain what little we have left. Deciduous swamps are home to many wetland-dependent plants and animals, several of which are of conservation concern. By not draining swamps, you also maintain your local water table, which has dropped dramatically in many areas in recent years. Landowners may even wish to reflood previously drained swamp forest, but be sure to consult with your neighbors and local municipality first.
- In order to protect Prothonotaries, swamps need to be protected from logging. Logging opens up the tree canopy, which attracts nest site competitors and cowbirds. The extra light penetration also kills mosses, robbing the Prothonotary of essential nesting material. It also results in the proliferation of shrubs and marshy vegetation, which close-in the pools of open water that Prothonotaries require.
- It is important to retain all standing dead trees for nest sites, so even fuel-wood cuts in Prothonotary Warbler swamps need to be avoided.

About Ontario's Endangered Species Act

In 1999, the Prothonotary Warbler was designated as an endangered species under Ontario's Endangered Species Act. This Act provides legal protection to the bird, its nest and eggs, and its nesting habitat in Ontario. The habitats of endangered species in Ontario are classified as "Conservation Lands" for which landowners may apply for an exemption from municipal property taxes.

Landowners whose properties contain Prothonotary Warbler habitat are eligible to apply to participate in Ontario's Conservation Land Tax Incentive Program (CLTIP). This program offers 100% tax relief to landowners for the portion of their property that is considered to be endangered species habitat. Under the Provincial Policy Statement, the CLTIP also offers tax relief to owners of provincially significant wetlands, which could provide protection of Prothonotary Warbler habitat at a broader scale. Contact your local District Office of the Ontario Ministry of Natural Resources for details.

More information . . .

For more information about the Prothonotary Warbler or the activities of the recovery team, contact:

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ACKNOWLEDGMENTS: *This pamphlet and the work of the Prothonotary Warbler Recovery Team have been supported by the following sponsors and partners: Bird Studies Canada, Canadian Wildlife Service, Endangered Species Recovery Fund, McBride Foundation, Millennium Partnership Program, Mountain Equipment Co-op, Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Ontario Parks, Shell Environmental Fund, and World Wildlife Fund Canada.*



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