

## Endangered Species Protection: Kirtland's Warbler

*Breeding population of rarest North American warbler approaches 1,500 pairs while breeding range shows signs of expansion*

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**By Robert Winkler**

Census takers have counted nearly 1,500 male Kirtland's warblers in the jack-pine forests of northern Michigan, a population milestone for an endangered species with highly specific habitat requirements. Northern Michigan is the only place where this bird, the rarest warbler in continental North America, breeds in significant numbers.

The June 2006 census of the warbler's breeding population found 1,486 singing males, an all-time high and an almost ninefold increase over the 1987 census, when the population bottomed out at 167 singing males. By 1990, recovery efforts mandated by the Endangered Species Act had begun to bring back the population, which reached 1,000 pairs in 2001.

On the heels of last season's record-setting census, a birder this spring discovered an active Kirtland's warbler nest in central Wisconsin on land owned by the Plum Creek Timber Company. The only other confirmed modern breeding record outside northern Michigan had occurred in Ontario in the 1940s. For the past two seasons, several singing male warblers at an unspecified Wisconsin location have raised hopes that the species was colonizing new territory. With breeding now confirmed, federal and state wildlife agencies will protect the Wisconsin warblers and their habitat with an eye toward attracting more pairs.

Kirtland's warbler has a loud, distinctive song; the males sing in June at the height of the nesting season to alert other males to their territorial boundaries and to attract females. Each singing male is presumed to represent a breeding pair. The females do not sing.

A relatively large warbler with a gray back, yellow underparts with black-streaked sides, an incomplete white eye-ring, and a habit of pumping its tail, Kirtland's warbler has a breeding range largely confined to the north-central counties of Michigan's Lower Peninsula. Nesting first occurred on the Upper Peninsula in 1995.

The bird is a ground-nesting "habitat specialist" that breeds in young, dense, extensive stands of jack pines. Its breeding success is greater when such stands are interspersed with small, brushy openings.

Historically, wildfires that periodically swept through northern Michigan created good

habitat for Kirtland's warbler, though it has probably always been uncommon and localized. As the fires consumed old jack pines, they propagated a new generation of trees by opening jack-pine cones, which need heat to release their seeds. The fires also burned off competing ground vegetation.

Human settlement of the warbler's habitat brought with it forest-fire control measures that largely halted the natural regeneration of jack pines, and wide-scale logging around the turn of the 20th century cleared the way for the brown-headed cowbird.

Before Europeans colonized North America, the cowbird was most abundant on the Great Plains, where it followed the vast herds of American bison, feeding on seeds and insects in their wake. With the clearing of forests and the spread of farming, the cowbird's range expanded north and east.

The cowbird builds no nest. It is a "brood parasite"—the female finds another bird's nest, often discards one of the eggs, and lays her own. Cowbirds are larger than most of the species they parasitize, so when the eggs in a nest hatch, the cowbird nestling monopolizes the food brought by the parents, and the nestlings of the host species often starve.



To defend their nests, some host species remove the cowbird egg; others cover it with additional nesting material. Kirtland's warbler, a relative newcomer to cowbird parasitism, has evolved no such defense.

The annual census began in 1971, when only 201 singing males were found. Cowbirds were parasitizing about 70 percent of warbler nests.

"It was a prescription for extinction," said Michael E. DeCapita, a wildlife biologist in the East Lansing, Michigan field office of the U.S. Fish and Wildlife Service. "We wouldn't be able to maintain the warbler's population without cowbird control."

Since 1972, decoy traps baited with seeds and live cowbirds have been set out across the warbler's breeding grounds. Cowbirds enter the large wire cages through funnel-like openings and usually can't get out. Trappers kill the cowbirds by asphyxiating them with automobile exhaust or by breaking their necks. During the 2001 nesting season, 67 cowbird traps caught 4,399 cowbirds. Some 150,000 cowbirds have been trapped and killed since 1972.

A few years after the control program began, cowbirds were parasitizing only 6 percent of warbler nests, and the number of warbler fledglings had tripled.

To sustain the population, the Michigan Department of Natural Resources and the U.S. Forest Service had set aside land as Kirtland's warbler habitat. Controlled burning and pine plantings kept these areas attractive to the warblers.

Still, the number of males heard in the annual census hovered around 200 well into the 1980s. Wildlife biologists estimate that over 60 percent of the Kirtland's warblers that leave Michigan for their wintering grounds in the Bahamas never return. With cowbird control measures in place, the breeding population had been expected to rise despite this high rate of natural mortality.

A tragic accident in 1980 would lead to an explanation for the warbler's stagnating numbers. As part of its habitat management strategy, the U.S. Forest Service started a prescribed burn in the area of Mack Lake. Winds whipped the fire out of control, and what had been intended as a 200-acre burn turned into a wildfire that consumed nearly 24,000 acres, destroyed 40 homes, and killed one Forest Service worker.

"In human terms, the Mack Lake burn was a terrible shame," said DeCapita. "But it was the kind of event Kirtland's warbler depended on before we started putting fires out. It eventually created prime habitat, and the warblers flooded in."

By 1989, jack pines in the Mack Lake burn had grown enough to provide good warbler habitat, and by 1993, the census found 485 singing males—roughly double the numbers of the previous two decades.

Robert A. Askins, professor of zoology at Connecticut College, summed up the Mack Lake burn experience in his book, *Restoring North America's Birds*.

"Kirtland's warblers may have declined after 1961 because of the absence of large burns," he wrote. "After cowbirds were removed, the steep decline in warbler numbers ended, but the warbler population did not increase until a large area of new habitat became available as a result of a massive fire." Quantity is as important as quality, researchers concluded.

"Government agencies got better at habitat management after the Mack Lake burn jumpstarted the warbler population, but the key is the amount of habitat managed each year," said DeCapita. "We need 30,000 to 40,000 acres available at all times to support 1,000 pairs of warblers, and we didn't have that in early 70s."

Today, 150,000 acres of public land are reserved for Kirtland's warbler management. At least 30,000 acres are always kept in appropriate condition for nesting. To maintain that

30,000-acre base, government foresters and wildlife biologists use a combination of clear-cutting, burning, seeding, and replanting.

At least 1,500 acres are planted or seeded with jack pines each spring, and up to 1,000 more acres are planted in the fall. It takes six to ten years of growth for the habitat to be suitable for the warblers.

As required by the Endangered Species Act, a recovery plan was developed for Kirtland's warbler in 1976 and revised in 1985. The plan set a population goal of 1,000 breeding pairs. Although that number was reached in 2001, the warbler won't be removed from the Endangered Species List because the act also requires the population to be self-sustaining, and the warbler's survival hinges on human intervention.

How long will it be before the warbler can make its own way?

"Due to the essentially permanent human-caused changes to the landscape in the warbler's range," said DeCapita, "extensive management—in the form of breeding-habitat creation and cowbird control—probably will be needed forever."

#### **Kirtland's Warbler (*Dendroica kirtlandii*) Facts**

- The first known Kirtland's warbler, a migrant, was shot on the Ohio farm of Jared Kirtland in May of 1851. Kirtland, a physician and naturalist, sent the specimen to Spencer Baird, a renowned bird biologist at the Smithsonian Institution. Baird named the species after Kirtland.
- The warbler's wintering grounds in the Bahamas were known by the 1870s, but the first Michigan nest wasn't found until 1903.
- Kirtland's warbler nests almost exclusively in 11 counties of Michigan's north-central Lower Peninsula, among jack pines.
- The jack pine occurs in other parts of the upper Midwest and across much of Canada. Why, then, is the warbler's breeding range so tiny? The jack pines where the warbler nests grow in soil known as Grayling sand, which is found only in Michigan. Grayling sand is very porous, so it protects the warbler's ground nest from flooding. This may explain the warbler's narrow habitat preference.
- Kirtland's warbler nests in groups, with each pair requiring at least 30 acres. The area must have a dense growth of young jack pines—close enough so branches of adjacent trees touch, yet spaced so sunlight passes to the ground. Exposed to the sun, lower branches of the pines grow thickly and conceal the warbler's nest, which is often hidden directly beneath in grass or shrubs. The pines must be about 5 to 15 feet tall. When they grow taller, their upper branches block the sun, killing the lower branches and thinning

the ground cover. The warblers then seek younger, more protective pine stands.

- Blue jays and squirrels sometimes raid the warbler's nest.

- Kirtland's warbler is very tame, but it can be hard to see because it prefers dense habitat and forages on or near the ground. Singing males can be conspicuous, however—they often perch atop jack pines.

- The warbler's nesting areas are closed and posted during the nesting season, but the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the Michigan Audubon Society run guided tours from mid May through early July for \$5 per person.