



Female golden-winged warbler on nest.

Photo by Liz Stout

A Golden Opportunity for Conservation

by Kyle R. Aldinger and Petra Bohall Wood



Kyle Aldinger

Golden-winged warblers require open habitat such as this grazing allotment on the Monongahela National Forest.

It is late April in central West Virginia. The temperature is barely above freezing as the sun breaks over the horizon, casting rays of light through newly grown leaves of hawthorn and goldenrod. Cattle are lowing in the distance, sounding the arrival of a small shrubland inhabitant who has just flown more than 2,000 miles from the mountains of northern South America. His golden crown and wing bars meld with the sun's light, leaving only a gray and black silhouette. A few days later his mate, a faded representation of the male's splendor, will arrive on the same isolated patch of shrubs, forbs, grasses and scattered trees which is maintained by the appetite of cattle. By mid-May the pair will be tending to their camouflaged ground nest, as countless generations have done before.

This inhabitant is the golden-winged warbler, whose scientific name – *Vermivora chrysoptera* – roughly translates to “worm-eating, golden-wing.” It is one of the most critically imperiled songbird species in the northeastern United States, experiencing significant population declines throughout most of its range. The exception to the decline is a northward range expansion. Its population in West Virginia has experienced a particularly

large decline. As a result, numerous wildlife agencies have given golden-wings special conservation status, and several states (along with Canada) list it as threatened or endangered.

Habitat losses on the breeding and wintering grounds, competition and hybridization with blue-winged warblers, and brown-headed cowbirds laying eggs in their nest (nest parasitism) are all suspected causes for these declines. Blue-winged warblers are a closely related species that have similar habitat requirements and sometimes interbreed with golden-wings, producing hybrid birds and potentially reducing reproductive output. Golden-winged warblers are habitat specialists in the sense that they require open, early successional habitats. They can also be considered

generalists, however, because they use a variety of different habitat types across their range such as grazing allotments, old fields, shrub wetlands, regenerating clearcuts and reclaimed mines. The common feature of all these habitats is a mix of shrubs, forbs, grasses, a few trees and a forested edge.

Golden-winged warblers have been the recent focus of much research and monitoring due to their declining populations. The



Andy Newman

Male golden-winged warbler.



Kyle Aldinger

Golden-wings often nest at the edge between dense shrubland and open areas.

main objective is twofold: to develop and implement a conservation plan involving monitoring, research and land management; and to determine the population status and habitat needs for golden-winged warblers, blue-winged warblers and their hybrids. An international initiative involving scientists from various institutions, many of which are part of the Golden-winged Warbler Working Group, are charged with achieving the first objective. The second objective is being accomplished through the Golden-winged Warbler Atlas Project (GOWAP), instituted in 2001 by the Cornell Laboratory of Ornithology. In October 2008, researchers traveled to Bogotá, Columbia, for the Cerulean and Golden-winged Warbler Summit to define a conservation strategy for these two species, which are undergoing similar declines. More information on these ventures can be found at the following Web sites.

- web.utk.edu/~buehler/GWWA/
- www.birds.cornell.edu/gowap/
- www.ecotours.com.co/summit_eng.html

The largest concentrations of golden-wings live in the Great Lakes region, with over 85 percent of the entire breeding population occurring in Minnesota, Wisconsin, Ontario and Michigan. West Virginia has the fifth largest concentration, with three to four percent of the global population. Statewide declines since the mid-1990s, however, are about 30 percent per year. Some populations in the Mountain State

represent an important conservation resource for several reasons. First, high-elevation patches of early successional habitat may contain some of the few remaining genetically pure populations of golden-wings. Biologists have noticed that golden-winged and blue-winged warblers segregate around 2,000 feet of elevation. Blue-wings have an affinity for lower elevations. Second, reclaimed mines and lightly grazed pastures used by golden-wings in West Virginia tend to persist as early successional habitat for longer periods of time than clearcuts, for example. A reliable, long-term refuge will be beneficial in restoring this rare songbird.

The leading threats (at least those that have received the most attention) to golden-winged warblers are interactions with blue-winged warblers and habitat loss on the breeding grounds. Golden-winged and blue-winged warblers are closely related, but for the most part their ranges did not overlap in the past. With widespread conversion of forest to open land and abandonment of farmlands came a range shift for both species, bringing them into close contact. Two forms of hybrids were first reported during the late 19th century, when they initially were mistaken as new species. Brewster's warblers, the more common of the two hybrids, appear mostly grayish with white or yellow wing bars, a yellow crown, and a black eye stripe like that of the blue-winged warbler. Lawrence's warblers are overall yellow, with the black facial pattern of a golden-winged warbler. Much variation exists among hybrids, and even seemingly pure golden-wings might display plumage characteristics of the blue-winged warbler and vice versa.

Research has shown that blue-wings tend to replace golden-wings within about 50 years of initial contact, although this is not always the case. This is bad news for golden-wings, since there is now much range overlap between the two species and the amount of suitable habitat is small. In stark contrast to the surplus of early successional habitat present a century ago, shrublands have largely grown into forests. In addition, disturbances responsible for creating open habitat, such as fire, have long since been extinguished from the landscape.

The Golden-winged Warbler Conservation Initiative, underway to help remediate these threats, is a cooperative effort by researchers and managers from nearly all states and provinces within the golden-winged warbler's range, including West Virginia. Research is focused on areas where golden-wings are currently most abundant. Biologists want to fill gaps in knowledge about this species and are employing a suite of survey techniques from nest monitoring to complex genetic analyses in search of answers. These answers will benefit not only golden-wings, but a host of other avian species associated with scrubland habitats, many of which are also of high conservation concern.

American woodcock, ruffed grouse, mourning warbler, Kentucky warbler and yellow-breasted chat are among some of the other species likely to benefit from conservation action. Even cerulean warblers and other birds that prefer mature forest will use golden-winged warbler habitat during the post-fledging period after young leave the nest and before they head south on migration. Numerous specific research questions exist, and some regions and states need individual solutions. In the southern Appalachians for example, much of the focus falls upon management of high-elevation balds, fire-dependent oak woodland-savannahs, and reclaimed mines. At lower elevations in West Virginia, blue-winged warblers tend to replace their

golden-winged counterparts more rapidly than in other areas, a phenomenon that demands an answer.

In 2008, the United States Geological Survey's (USGS) West Virginia Cooperative Fish and Wildlife Research Unit at West Virginia University, in collaboration with biologists from the U.S. Forest Service Monongahela National Forest and the West Virginia DNR Wildlife Resources Section Diversity Program, commenced a multi-year study of golden-winged warblers within the state. Data collection began in spring 2008 at five grazing allotments on the Monongahela National Forest near Stuart Recreation Area east of Elkins. The study was expanded in 2009 to include another large allotment north of Marlinton. This study is part of the range-wide conservation initiative where researchers in several states are measuring nest success and territory density of golden-wings, abundance of associated bird species, and vegetation characteristics of their preferred habitat. Male, female and nestling golden-winged warblers are color banded, not only to keep track of individual birds during the field season, but also to help researchers determine survival and return rates in following years.

One of the primary goals of the conservation initiative is to find out what types of habitat

Habitat alteration has increased hybridization between golden-winged and blue-winged warblers.

- Lower left: Brewster's warbler (hybrid)*
- Center: Golden-winged warbler*
- Right: Lawrence's warbler (hybrid)*



Matt Shumar



Molly McDermott

Kyle Aldinger

management benefit populations of golden-wings. While other states examine the effectiveness of such management actions as prescribed fire (Tennessee) and clearcuts (Wisconsin), researchers in West Virginia are measuring the response of golden-wings to brush-hogging and selective tree harvest implemented during the fall. Since an increase in territorial males by itself may not indicate better quality habitat, nest success will continue to be measured over the next few years.

Though not directly related to the conservation initiative objectives, researchers from the Coop Unit are interested in the response of golden-wings to different playback surveys as well as nest site characteristics. Playback surveys use golden-winged warbler song recordings to entice the birds into making an appearance, either visually or vocally. Biologists have cautioned against using point counts alone to monitor golden-wing populations since males are easily overlooked without the aid of song recordings. Two playback surveys are being tested: the 17-minute GOWAP survey, including type I, type II and mobbing sequences; and a custom 10-minute survey, with type II playback only. Type I songs are associated with mate attraction, whereas type II songs usually accompany interactions with other males, and the mobbing sequence features vocalizations of eastern screech-owls, black-capped chickadees and golden-winged warblers. Preliminary results show that similar numbers of golden-wings were detected with both surveys and that numbers of detections decreased as the day and season progressed. Males often approached the observer or vocalized in response to song playback, indicating that surveys with playback may reveal a considerable portion of otherwise inconspicuous males.

Information on nest site characteristics, on the other hand, will allow managers to design future management options for West Virginia. How close do golden-winged warblers nest to shrubs? What type of vegetation is used to support and



Kyle Aldinger

Golden-winged warbler fledgling with leg band.

conceal the nest? Are nests typically oriented in a certain direction? Is there an optimal mix of habitat characteristics for increasing nesting success? Although based on a small sample of nests, golden-wings on grazing allotments in the West Virginia study had an affinity for goldenrod and often placed nests less than six feet from a shrub, or at the edge between dense shrubland and more open areas. Other studies have documented similar findings where golden-wings nest.

West Virginia is rapidly losing one of its most striking songbirds. A task force interested

in conservation of golden-wings has more than 80 American, Canadian and Latin American ornithologists, conservationists, and managers from universities, state and federal agencies, international non-governmental organizations, and industry already involved. Everyone can get involved, whether it be buying shade grown coffee to protect vital winter habitat or signing up to help with the atlas project, we have a golden opportunity to rescue another warbler in trouble.

Kyle Aldinger is a graduate research assistant with the WV Cooperative Fish and Wildlife Research Unit at WVU. Petra Bohall Wood is a wildlife biologist and adjunct professor at WVU with the Coop Unit. The warbler research is partially funded by grants from the DNR Wildlife Diversity Program.



Mandy Weston

Nest with hatchlings.