

## ABOUT THE COVER: WORM-EATING WARBLER

The Worm-eating Warbler (*Helmitheros vermivorus*) is somewhat misnamed because it does not eat earthworms, although it does specialize in caterpillars during the breeding season. This cryptic warbler is more often heard than seen. It spends most of its time near or on the ground, where it walks, rather than hops, with its tail cocked. When foraging in deciduous trees, the Worm-eating Warbler will sometimes spiral around the trunk or a branch much like the Black-and-white Warbler. It is distinctive in appearance—an olive-and-buff warbler that lacks wing bars and has distinctive black head stripes. The sexes are similar.

The bird's breeding range in the United States lies east of the prairies and south of the Great Lakes, from northeast Texas to southern New England. In Massachusetts it breeds in southern Berkshire County, where the first nest was found in 1949. Up to a dozen territorial males have been recorded at Mount Tom (north of Springfield), and more recently nesting has been recorded in scattered locations farther east, for example, in Dover and Weston. They winter in the West Indies, Mexico, and Central Mexico.

Worm-eating Warblers arrive in the United States in early April. In Massachusetts, where they are an uncommon but regular spring migrant, they arrive in late April or early May. They are rare migrants in Massachusetts in the fall, with a maximum of five reported in a single season.

Males are territorial, advertising with their song, which is a single trill, usually of the same pitch. The song is similar to that of the Chipping Sparrow, but the warbler's song has a thinner and dryer quality—a more insect-like buzz. Males also have a courtship flight song, which is musical and varied. Their breeding habitat is generally deciduous, wooded hills—along slopes or in ravines—with an understory of saplings and shrubs. They are reported to be site-faithful, returning year after year to the same nesting locality. They probably produce a single brood each year.

Worm-eating Warblers nest on the ground, usually under low bushes on hillsides. The nest is hidden by fallen dead leaves and is lined with the fine stalks of the hair-moss (*Polytrichum*) or other fine materials. The female relies on cryptic behavior and appearance for protection—females have been caught with hats and can sometimes be touched before bolting from the nest. The clutch is usually four or five white eggs, spotted or blotched with brown. The female apparently does all the incubating, but the male may feed her. The incubation period is about two weeks, and the young are altricial (born blind, naked, and helpless). They are fed by both parents and fledge in about ten days. If disturbed at the nest, an adult bird may give a distraction display, fluttering on the ground, wings open, tail dragging, enticing the intruder away from the young.

Worm-eating Warblers are entirely insectivorous, with caterpillars their main staple, but their diet also includes a wide variety of arthropods including

beetles, grasshoppers, and spiders. They have different foraging behaviors on their breeding and wintering grounds. During the nesting season they specialize in gleaning caterpillars from live leaf surfaces and are largely arboreal, rarely using hanging maneuvers during their leaf gleaning. In the winter, however, they become "aerial leaf-litter specialists," with more than three-quarters of their foraging done on hanging dead curled leaves. They use a variety of hanging maneuvers, such as the maneuver illustrated in the cover picture. Their relatively large bills and short tarsi (legs) are considered adaptations for this highly specialized foraging mode. They also show a pronounced propensity for manipulating the hanging leaf substrate. It is suggested that the change in foraging behavior between seasons results from the differing behavior of arthropods on the temperate breeding grounds and tropical moist forest wintering areas. In northern summers caterpillars are diurnal foragers on exposed leaf surfaces where they are easily attacked by gleaning, while tropical arthropods are largely nocturnal foragers that hide during the day in places like dead curled leaves, where more complex foraging behaviors are necessary.

Worm-eating Warblers are forest-interior nesters, and declining and extirpated local populations have been blamed on forest fragmentation of their breeding grounds. When large forest patches are fragmented into many smaller ones, the relative proportion of edge habitat increases, exposing, particularly, ground-nesting species to increased predation by mammals (e.g., raccoons, cats, dogs) and birds (e.g., Blue Jays). Worm-eating Warblers are subject to cowbird nest parasitism, and increasing the proportion of forest edge increases this risk dramatically. Deforestation on the tropical wintering grounds is a further threat to this vulnerable species and may become a more serious problem because moist tropical forests are being cleared at an alarming rate. Hence conservation efforts both in the United States and in the tropics are essential for the continued presence of this interesting warbler species.

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### MEET OUR COVER ARTIST

Julie Zickefoose is a freelance artist, writer, and naturalist who is devoted to the study, conservation, and appreciation of birds. She worked as a field biologist for The Nature Conservancy for six years before turning to art as a full-time career. Julie's drawings have been published in *The New Yorker*, and she has painted, drawn, and written for *Bird Watcher's Digest*, *American Birds*, *Bird Observer*, *Ladybug Magazine*, and numerous publications of the U.S. Fish and Wildlife Service. Exhibitions include one-woman shows at Harvard University's Museum of Comparative Zoology, the Cornell Laboratory of Ornithology, the Memorial University of Newfoundland, and the XIX International Ornithological Congress in Ottawa. Awards include a Radcliffe Traveling Fellowship to paint birds of Amazonian Brazil, and International Council for Bird Preservation and Sigma Xi stipends.

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