

Hine's Emerald Dragonfly

Somatochlora hineana Williamson

MICHIGAN ODONATA SURVEY Technical
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Hine's Emerald Dragonfly is listed as a Federally endangered species in the United States

HISTORY

Hine's Emerald Dragonfly is a member of the family Corduliidae, the emeralds and baskettails. This species was first described by E.B. Williamson from a site in northern Ohio in 1931. Subsequently, the species was virtually unknown to most people and few specialists. It was not until the 1990s that attention was given to refinding this species and associating it with the proper habitats. As a result of preliminary surveys, in 1995 it was given protection under the Endangered Species Act, and is now on the Federal Endangered Species List. This listing spurred an effort to document the existing sites for *Somatochlora hineana* and to search for new populations. As a result of the efforts by a few Odonata researchers, we now have a much better idea of the range and biology of Hine's Emerald. This note presents a summary of its biology and distribution with aids to identification.

IMPORTANT! If you believe you have found a population of Hine's Emerald, **DO NOT ATTEMPT TO COLLECT SPECIMENS**. Take photographs if possible, and contact one of the people listed at the end of this document so that the sighting may be verified by a qualified individual with a U.S. Fish and Wildlife permit.

BIOLOGY & HABITAT

Somatochlora hineana is a species restricted to calcareous areas where limestone lies close to, or at the surface, often overlain by a sandy or marly soil type. Larvae (= nymphs) are found in cool, shallow slowly-moving waters, which consist of spring-fed marshes, alkaline fens (= seepage sedge meadows), mineral-rich fens with shallow creeks, springs, small pools, and marl deposits and calcareous marshy streams. Many of these areas have small channels where the water moves very slowly through cattails and sedges. Recent work has shown that larvae often spend considerable periods of time within crayfish burrows (*Cambarus diogenes*) during the day, and these same burrows provide refuge for larvae during droughts. Once the adults emerge, they may be found within a kilometer of the breeding sites. Males establish small breeding territories which they defend against other males and sometimes even other species of dragonflies. They typically hover within 1-3 meters above the ground and slowly fly back and forth across their territory. Males will quickly dart out to challenge another dragonfly. Females flying into the male's territory are pursued by males and eventually mate with them. Females lay eggs by repeatedly plunging the rear end of their abdomen into the water. Larvae may take 2 to 4 years to fully mature, depending upon food resources, water levels, and temperature. Once a larva is mature, it crawls up the stem of a cattail or other support, the skin splits on the back, and the adult emerges from the now lifeless larval skin. Within a few hours, the adult's wings and body have hardened enough for it to fly off and feed. Adult emergence is a critical time and adults are susceptible to predation by birds. Adults are usually found flying from late June to late July.

Once adults are on the wing, they are characterized by their emerald green eyes, two yellow thoracic stripes and large size (6.5 cm long, 9 cm wingspan) in comparison to other emeralds. The males also have very distinctive terminal appendages. Without proper training, it is very doubtful that one can identify the larvae.

DISTRIBUTION

So far, Hine's Emerald appears to be restricted to an arc of populations centered around Illinois, Wisconsin, Michigan, and Ohio. No recent populations have been found in Ohio, and it is considered extirpated there. The Illinois populations are small and threatened by encroaching industrial and residential development. The Door Co. Wisconsin populations appear to be quite large and not in immediate danger. The populations in northern Michigan were discovered in 1998, and may yet represent the largest number of localities where this species is found. As of 2000, new records have been added from some other states not in the Great Lakes region, so it is possible that this species may be more widespread than previously thought.



General distribution of Hine's Emerald in Michigan



Hine's Emerald -male terminal appendages

In Michigan, *S. hineana* populations have been found in Mackinac, Alpena, and Presque Isle Counties. Additional sites may be anywhere with calcareous soils and/or mineral-rich fens. It is also possible that this species will be found in Canada.

DANGERS TO HINE'S EMERALD

Although predation on this species by other organisms constitutes a factor on population density, it is more likely that human-induced changes to the landscape and water quality have had a bigger impact upon it. Non-point pollution from golf courses and roadways certainly affect its habitat. Disruption of water flow to seepage fens and impoundment of slow-moving streams would certainly have a detrimental effect on this species. Since many populations are small and localized, a single catastrophic event at a marsh or breeding area could wipe out a local population.

MONITORING

The U.S. Fish and Wildlife Service is sponsoring efforts to monitor known populations of Hine's Emerald as well as to seek out new populations. If you believe you have seen Hine's Emerald Dragonflies, please contact any of the following people:

MICHIGAN: Mark O'Brien -- Michigan Odonata Survey Coordinator, Museum of Zoology, University of Michigan, Ann Arbor, MI 48109. email: mfobrien@umich.edu; telephone: (734) 647-2199

ILLINOIS & WISCONSIN: Tim Cashatt -- Dept. of Entomology, Illinois State Museum, Spring & Edwards Streets, Springfield IL 62706. email: cashatt@museum.state.il.us

OHIO: Bob Glotzhober -- c/o Ohio Historical Society, 1982 Velma Avenue, Columbus OH 43211-2497. email: bglotzhober@ohiohistory.org

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 Hine's Emerald Dragonfly at the Ridges Sanctuary -- <http://hinesdragonfly.org/>
 Illinois State Museum - Hine's Emerald Dragonfly Homepage - www.museum.state.il.us/research/entomology/mainpage.html.
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