USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Leveraging genetic tools and building partnerships to conserve Hine's emerald dragonfly

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The challenge

- **Hine's emerald dragonfly (*Somatochlora hineana*; HED) is federally endangered throughout its range.**
- Understanding the species distribution and habitat requirements is critical to design effective conservation strategies.
- But HED is challenging to survey given:

HED spends most of its life (4-5 yrs) as an aquatic larva (difficult to ID)[1] ...

... and often deep inside crayfish burrows, to avoid drying out[2].

Adults only live for 2-6 weeks (<2% of their lifetime)[1].

Known distribution

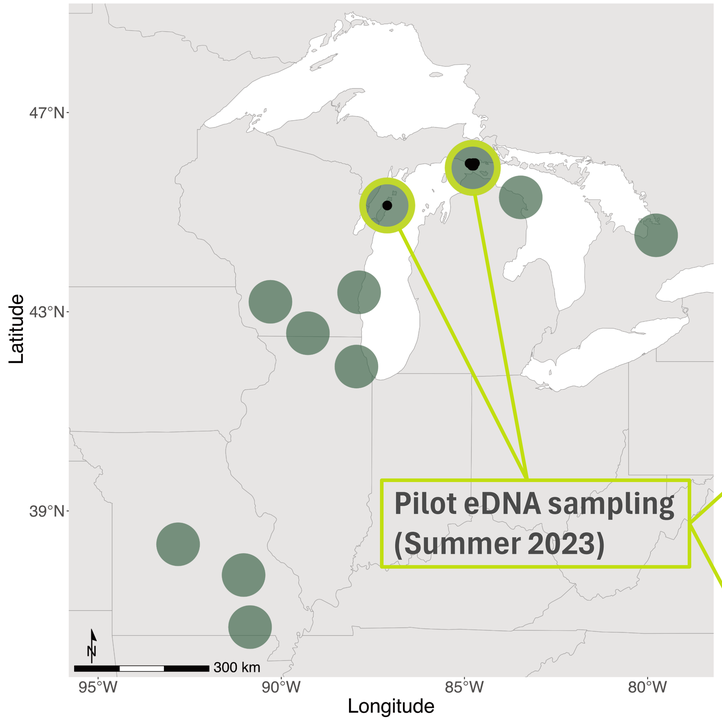
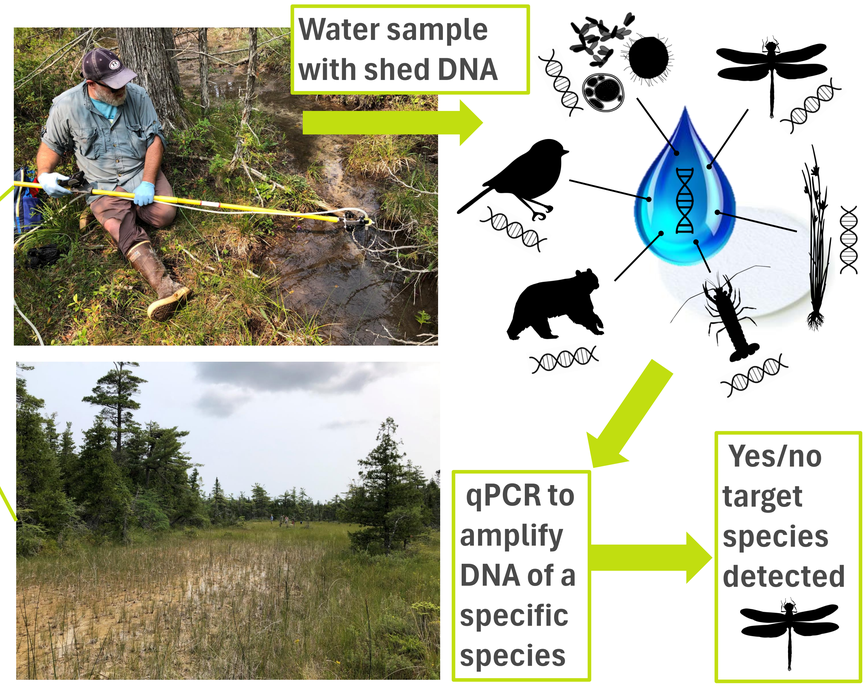


Fig. 1. There are few known populations of HED (dark green circles)[3]. **More potentially suitable habitat exists but is difficult to survey** with traditional methods (which require direct handling and ID of HED).

Environmental DNA for species detection

A non-invasive environmental DNA (eDNA) assay is being tested as a tool to better map (and detect new) HED populations[4].



References
1. Soluk D *et al.* (1998). Illinois Natural History Survey, Center for Aquatic Ecology Technical Report 98/3.
2. Pintor L & Soluk D. (2006). *Biological Conservation*. **130**:584-591.
3. US FWS. (2018). Hine's Emerald. https://www.fws.gov/species/hines-emerald-somatochlora-hineana
4. Schmidt K *et al.* (2021). *Scientific Reports*, **11**:18987.

Acknowledgements
Assistance: N. Bingham (technical), D. Huebner (field), D. Whiting (field, lab), G. Ostrowski (field).
Discussion: T. Wilcox, V. Zeller, D. Soluk, H. Britten, K. Lah, S. Schoville.
Funding: USDA Forest Service Northern Research Station funds awarded to R. H. Toczydlowski.

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