Hungerford's Crawling Water Beetle (*Brychius hungerfordi*)

Best Practice Guide: For Practitioners of Restoration or Construction Related Work in Michigan

Overview

The Hungerford's crawling water beetle (*Brychius hungerfordi*) is a state and federally-listed endangered species found in isolated locations in northern Michigan and Ontario, Canada. They are aquatic, spending all phases of their life cycle in cool streams. Hungerford's crawling water beetle (HCWB) prefer habitats occurring below beaver dams or similar areas, such as in the plunge pools downstream from road culverts. They are also found in riffles and other well-aerated sections of streams. To protect the Hungerford's crawling water beetle and avoid violation of the Endangered Species Act, resource practitioners and construction workers need to follow certain steps when working in streams where this species may be present. The purpose of this guide is to summarize known information about this species and to provide guidance for those involved with project work on streams where the species may be present and potentially affected.

Identify It

Hungerford's crawling water beetles are a small (adults 3.8 to 4.3mm in length) aquatic beetle with an elongated and streamlined body shape. They are yellow-ish brown in color with irregular dark marking and longitudinal stripes composed of dark, finely spaced indentations (USFWS).

Figure 1. Hungerford's crawling water beetle. Source: N. Dingledine.

Hungerford's crawling water beetle belong to the family Haliplidae. Lookalike species within this family belong to the genera *Peltodytes* and *Haliplus*. Refer to Appendix A for tips on how to distinguish between these similar groups. Additionally, "Haliplidae of Eastern Canada" by Ashbee, Marshall and Alarie (2017) provides detailed information and images helpful in distinguishing the Hungerford's crawling water beetle from similar species.

Habitat and Range

Hungerford's crawling water beetle are found in cool, alkaline, fast-flowing streams with sand or gravel bottoms and are often concentrated below beaver dams or similar man-made structure such as the plunge-pools downstream from road crossing culverts. They tend to be found in association with algae species such as *Chara, Cladophora* and *Dichotomosiphon*, which are believed to be a primary food source for both larvae and adults. Hungerford's crawling water beetles seem to prefer seasonal streams that have some groundwater input. These streams do not dry up completely, but the water can drop considerably, exposing damp sand which is important for the pupation stage of the beetle's life cycle.

Figure 2. Michigan occurrences of Hungerford's crawling water beetle. Source: USFWS 2019

Hungerford's crawling water beetle have a patchy distribution, having been discovered in nine streams in northern Michigan and three additional streams in Ontario. Known systems in Michigan include the Carp Lake River and East Branch Maple River (Emmet County), Canada Creek (Presque Isle County), North Branch of the Boyne River (Charlevoix County), Middle Branch of Big Creek (Oscoda County), Stewart Creek, Van Hellon Creek and the East Branch Black River (Montmorency County), and Portage Creek (Kalkaska/Crawford Counties).

Restricted Activities

The Endangered Species Act prohibits take of listed wildlife. The term take means to harass, harm, kill or collect any threatened or endangered species. Activities that may result in take include construction or development projects that would damage the Hungerford's crawling water beetle or significantly alter its habitat. Even short-term impacts can cause "take". Such activities may include but are not limited to beaver dam removal, road/stream crossing replacement projects, dam removal, fish introductions and stream modifications such as dredging, channelization, etc.

Surveys for HCWB

It is likely that Hungerford's crawling water beetle is more widely distributed than currently known, as they are difficult to find and most areas of the state have not been surveyed for the beetle. Surveys should be conducted in all areas within 1 stream mile of a known occurrence, where suitable habitat is present. It is also helpful to survey other areas of the state for any streams that are highly suitable in order to help clarify the species' distribution. When conducting macroinvertebrate surveys throughout Michigan, we recommend keying Haliplidae to genus

(instead of to family) to help identify new populations (Appendix A). As new sites are discovered, new information about the Hungerford's crawling water beetle distribution helps the United States Fish and Wildlife Service (USFWS) accurately evaluate the species' status. Contact the USFWS for more information on whether a permit is required for macroinvertebrate surveys in your area, or if you discover a new population.

Procedural Guidance

1) Is your project in a suitable stream or does your project potentially impact suitable stream habitat?

- **A)** Yes – Go to step 2.
- **B)** No – This guidance document is not applicable.

2) Is your project located in one of the counties where Hungerford's crawling water beetle occurs (listed above)?

- **A)** Yes – Go to step 4.
- **B)** No – HCWB may still be present. Got to step 3.

3) Contact the USFWS Michigan Ecological Services Field Office to determine if they recommend a Hungerford's crawling water beetle survey for your project area. Even though the beetle is also a state listed species, permitting must been done through USFWS. If conducting a survey, got to step 4.

4) Hungerford's crawling water beetle surveys must be completed by a trained professional under a valid section 10(a)(1)(A) recovery permit, which must be obtained through the US Fish & Wildlife Service.

- **A)** If interested in obtaining a permit, contact the USFWS Michigan Ecological Services Field Office to obtain a permit application and learn about required qualifications/training. If you have a valid recovery permit, go to step 5.

Figure 3. HCWB surveyor training in the Maple River. Source: J. Leisen

- **B)** Alternatively, contact Huron Pines or USFWS for help connecting with a qualified surveyor. Surveys may be provided for a fee by qualified surveyors working under a valid recovery permit. If you choose to work with a qualified surveyor, go to step 5.

5) Surveys for adult Hungerford's crawling water beetle should be conducted from May through October. All suitable habitat within the potential area of construction impact must be surveyed thoroughly (e.g., at least 30-60 minutes per 500 square feet depending on habitat characteristics) using dip nets by a team of at least two trained individuals, at least one of which must possess a valid recovery permit. Follow all permit conditions. Ensure adherence to your organization's safety standards and secure landowner authorization to access sites if on private property.

A) If no Hungerford's crawling water beetles are found, submit survey data to the USFWS Michigan Ecological Services Field Office. Your survey data may be helpful when applying for an EGLE permit to streamline permit issuance.

B) If Hungerford's crawling water beetle are found at the project site, contact the USFWS Michigan Ecological Services Field Office for guidance on Endangered Species Act compliance. Coordinate with USFWS before starting construction activities. Note: All federally funded or connected projects fall under Section 7 of the Endangered Species Act. Contact USFWS for guidance on a Section 7 Consultation.

Recommended Strategies for Protection and Restoration

- **Avoid transporting invasive species.** Properly clean equipment and clothing before and after working in streams, especially when moving from one river system to another.
- **Stream work:** Follow best management strategies to limit bank disturbances and minimize sediment loading while implementing stream restoration projects.
- **Protect healthy water.** Limit the use of pesticides and fertilizers around any stream habitats.
- **Beaver dams:** Beaver dams can provide optimal habitat immediately below the structure. However, some beaver dams eliminate many miles of upstream habitat for HCWB and have an overall negative effect on populations. Make sure to get all of the facts or contact an expert before managing beaver populations in areas where HCWB is known to oocur.

Additional Resources

Huron Pines developed this guide in collaboration with the US Fish & Wildlife Service, drawing on the following resources:

- **USFWS HCWB Fact Sheet**: www.fws.gov/midwest/endangered/insects/pdf/hungerfords.pdf
- **USFSW Hungerford's Crawling Water Beetle Survey & Relocation Protocol** (July 2018 draft)
- **USFWS HCWB 5-year Review:** https://ecos.fws.gov/docs/five_year_review/doc5951.pdf
- **Michigan Natural Features Inventory:** mnfi.anr.edu/explorer/species.cfm?id=11555
- **Haliplidae of Eastern Canada.** H.V. Ashbee, S.A. Marshall, and Y. Alarie. Canadian Journal of Arthropod Identification 32: 1-80, 2017. cjai.biologicalsurvey.ca/ama_32/ama_32.pdf

Regional Contacts

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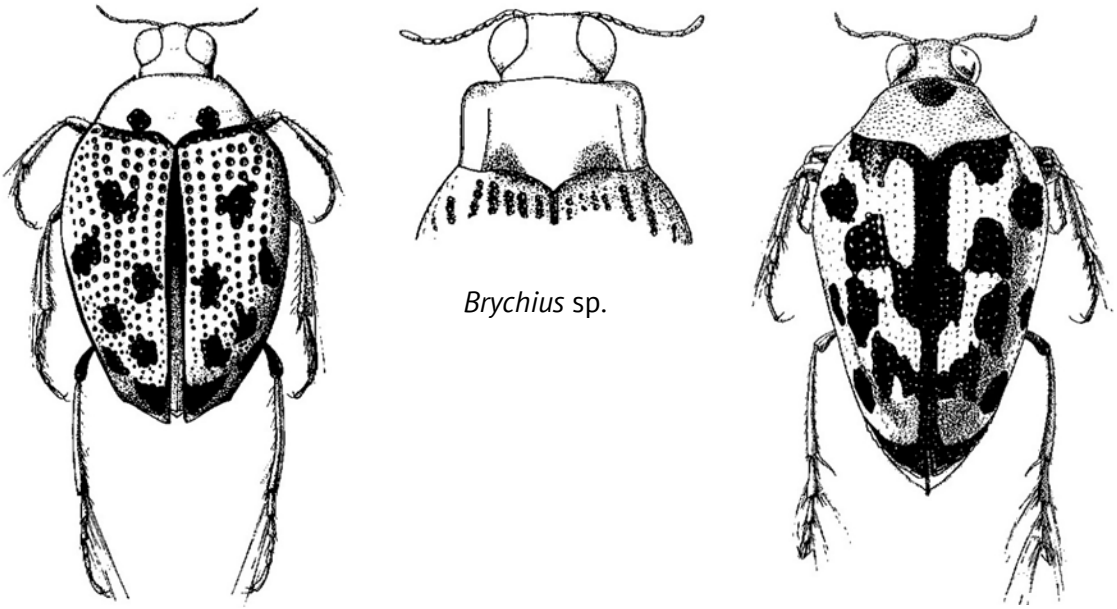
USFWS: Michigan Ecological Services Field Office, eastlansing@fws.gov, (517) 351-2555

Appendix A. Images of HWCB and other Haliplids.

Taken from the USFWS's Hungerford's Crawling Water Beetle Survey and Relocation Protocol. Used with permission.



Peltodytes sp. *Brychius* sp. *Haliplus* sp.

Figure A-1. Dorsal aspects of adults in the Haliplidae family. Image from Merritt and Cummins 1984.

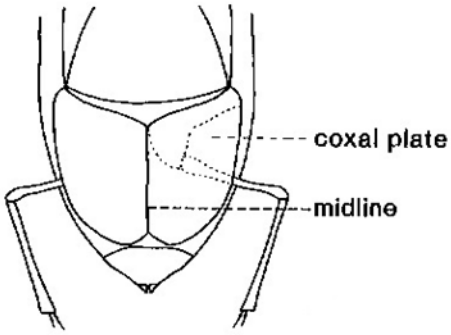


Figure A-2. Ventral aspect of metathorax and abdomen. Image from Merritt and Cummins 1984.

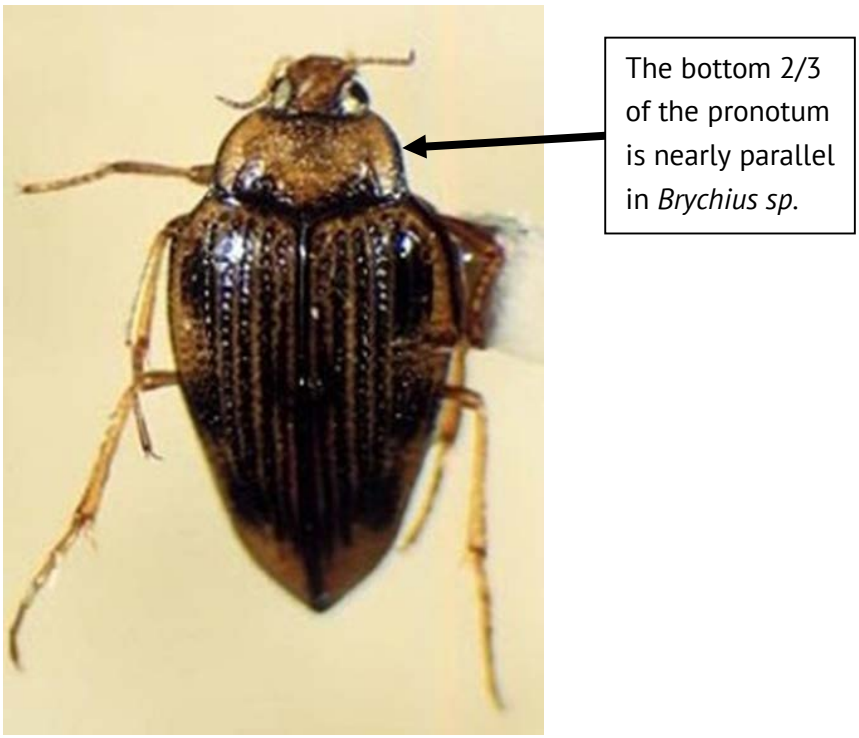


Figure A-3. Hungerford's crawling water beetle (*Brychius hungerfordi*). Photo by Bob VandeKopple.

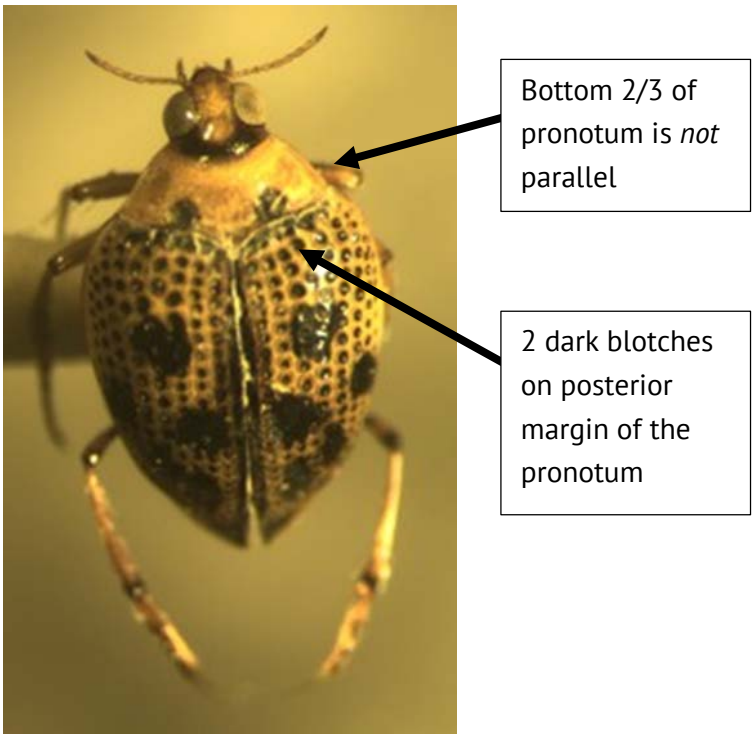


Figure A-4. *Peltodytes sp*. Photo by Bob VandeKopple.

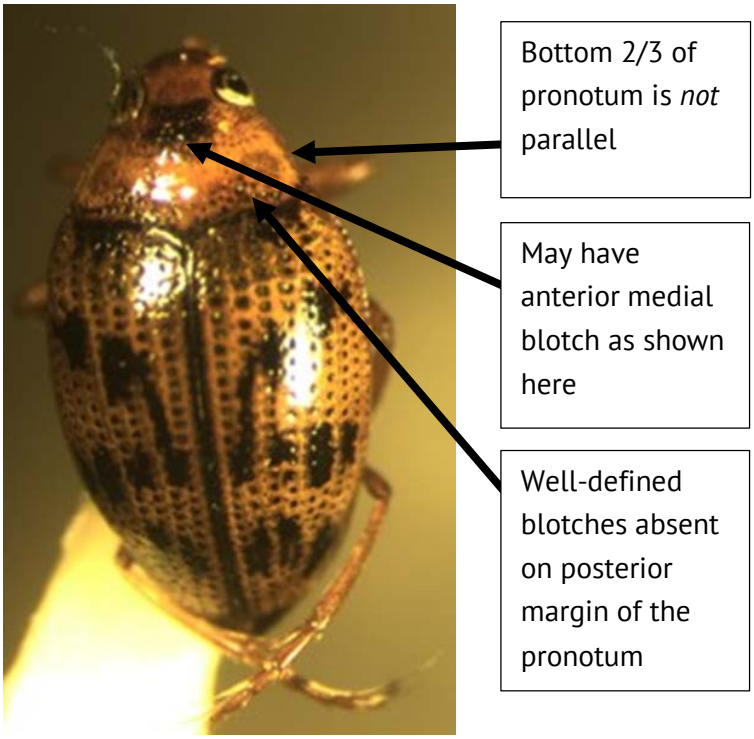


Figure A-5. *Haliplus sp*. Photo by Bob Vandekopple.