

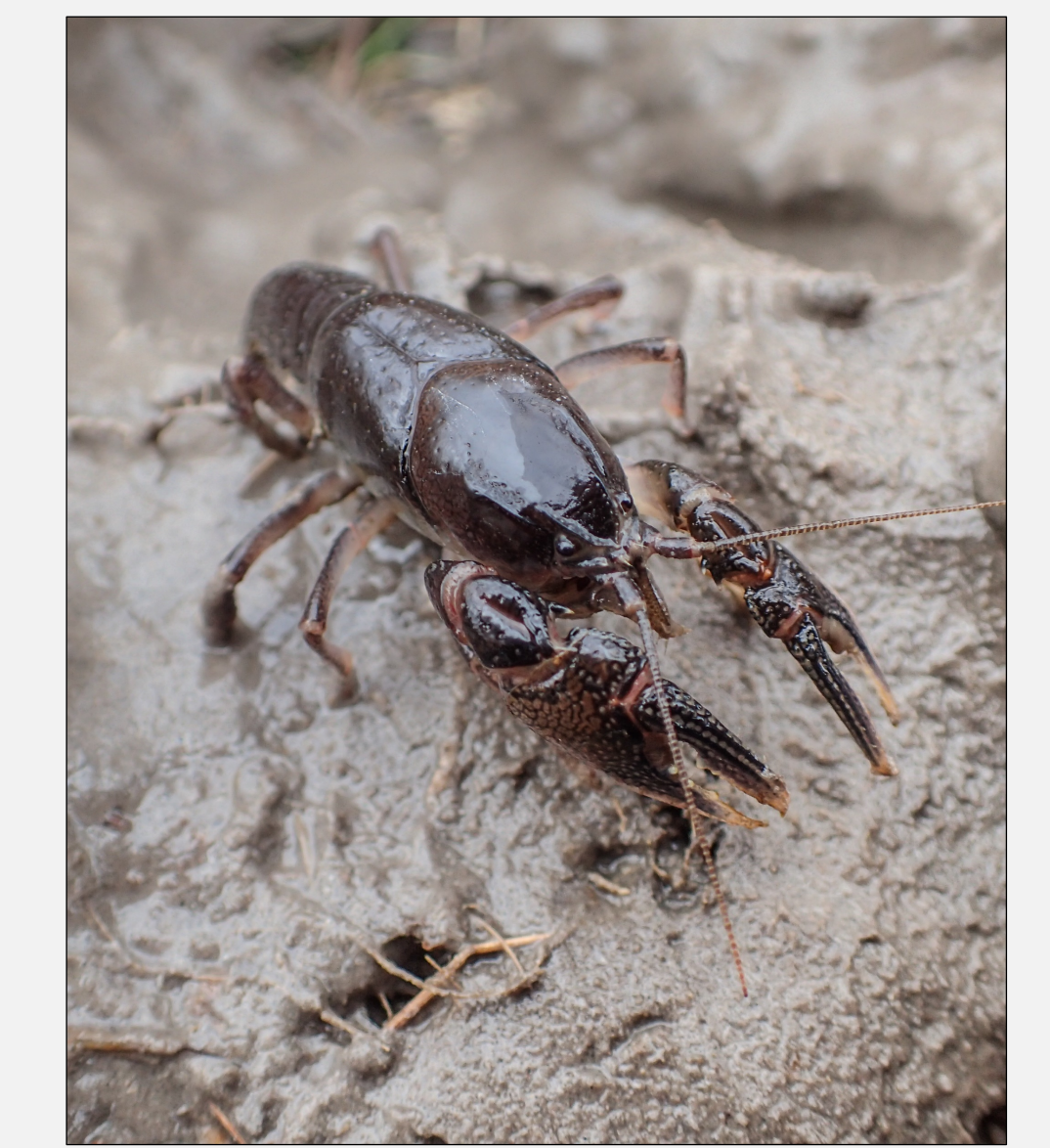


CRAYFISHES OF MISSISSIPPI: SPECIES DIVERSITY AND CHALLENGES

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Abstract

We compiled a new crayfish list for Mississippi, including 65 species and possibly 5 subspecies (Adams and Jones 2021). Over half of the species are endemic or occur in only 1 other state. We estimated that only 18% of counties were well sampled for crayfishes. Finally, we summarized several unresolved taxonomic issues.

Introduction

A current list of species and their distributions in Mississippi was desperately needed to facilitate future crayfish research and management in the state. Since the previous MS crayfish species checklist in 2002, there have been:

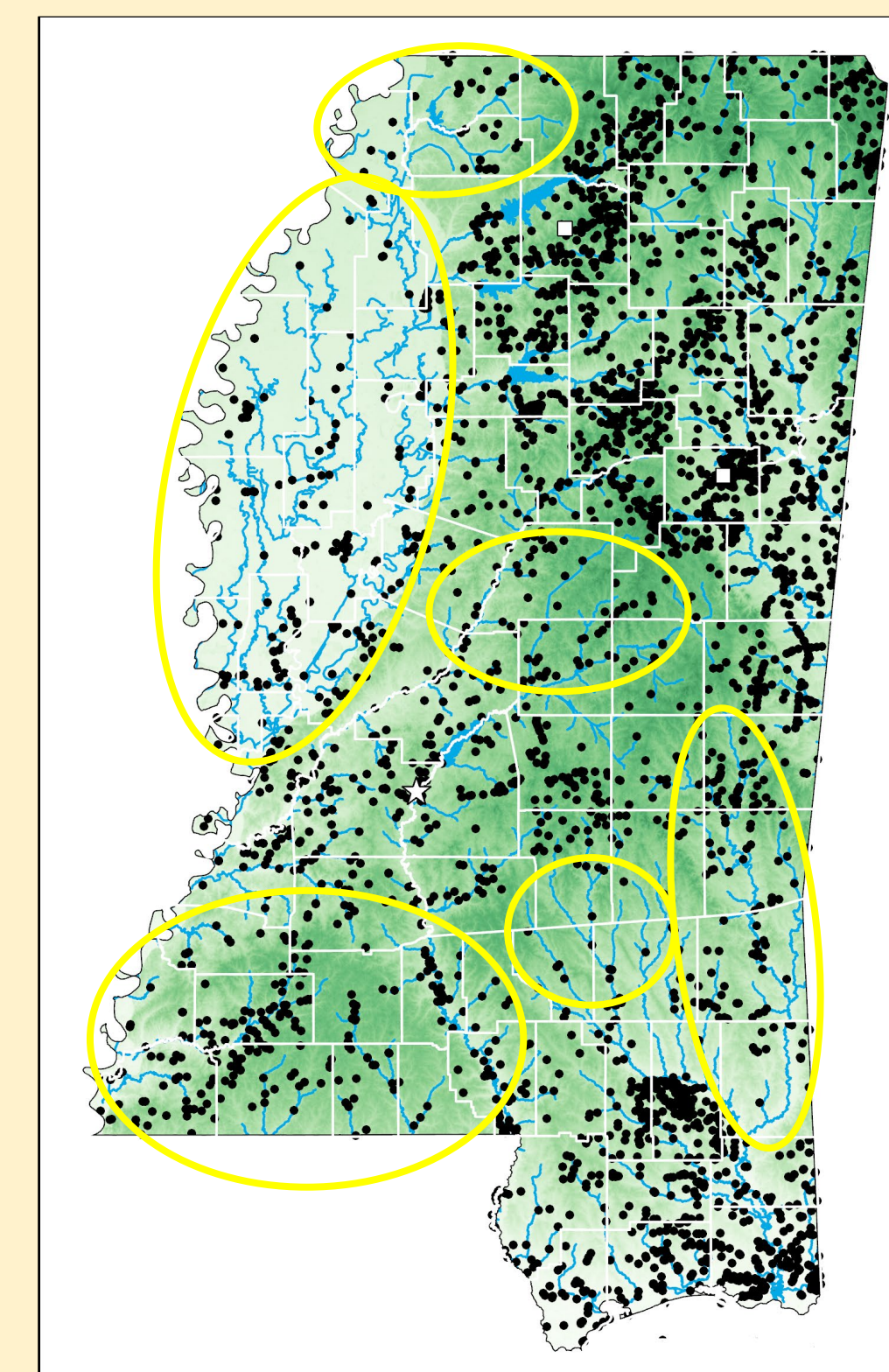
- numerous taxonomic changes,
- several new state species records,
- many new collections,
- and 17 MS crayfishes petitioned for listing under the ESA

We created an updated species checklist and distribution lists and discussed needs for further sampling and taxonomic clarifications.

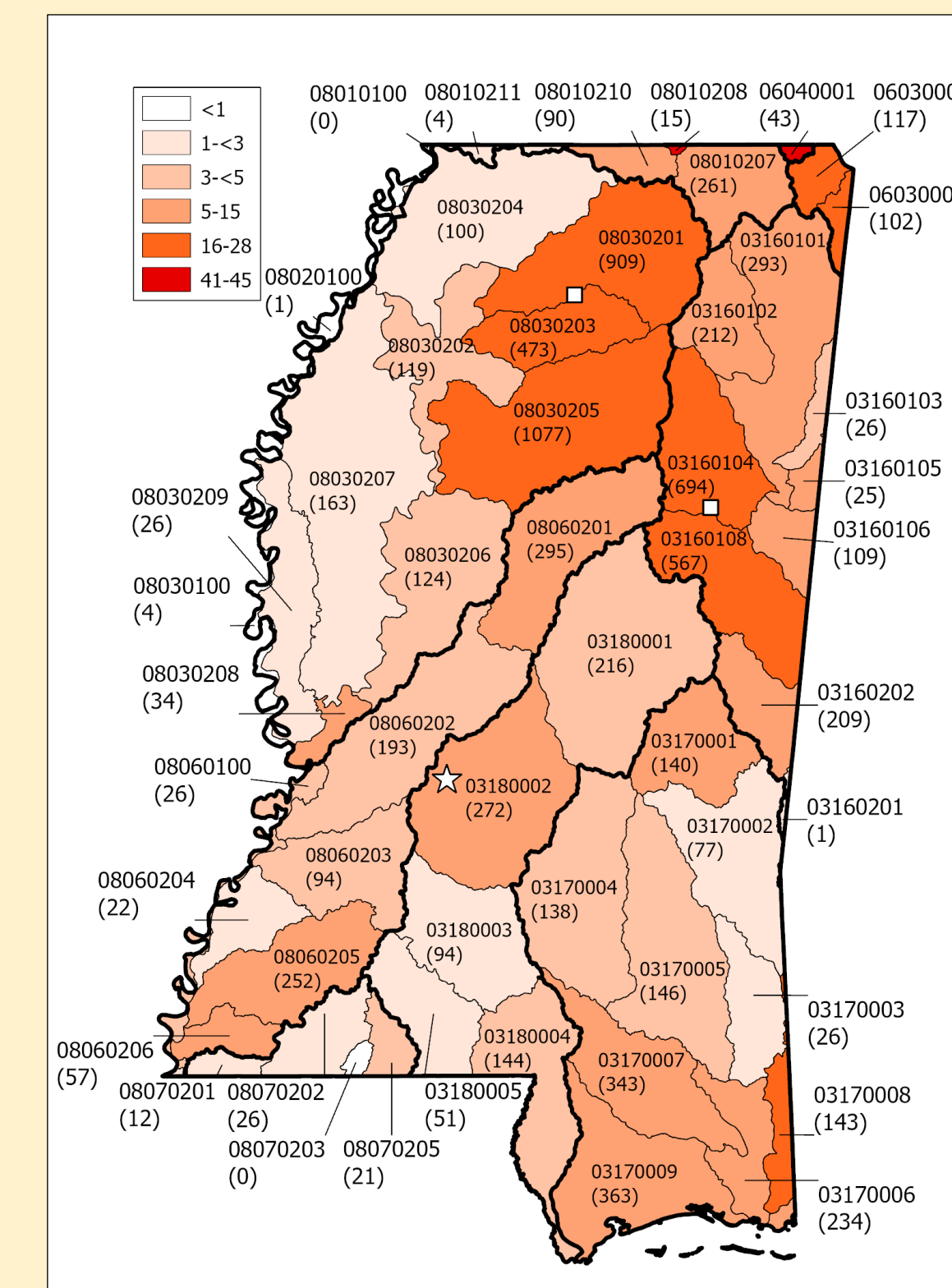
Methods

- We compiled 9,597 crayfish collection records from multiple sources, georeferencing localities that lacked coordinates.
- We created species lists by county and by 4- and 8-digit hydrologic unit codes (HUCs).
- To coarsely estimate sampling needed per county to assess crayfish diversity, we plotted the number of crayfish records by county species versus the number of species per record.

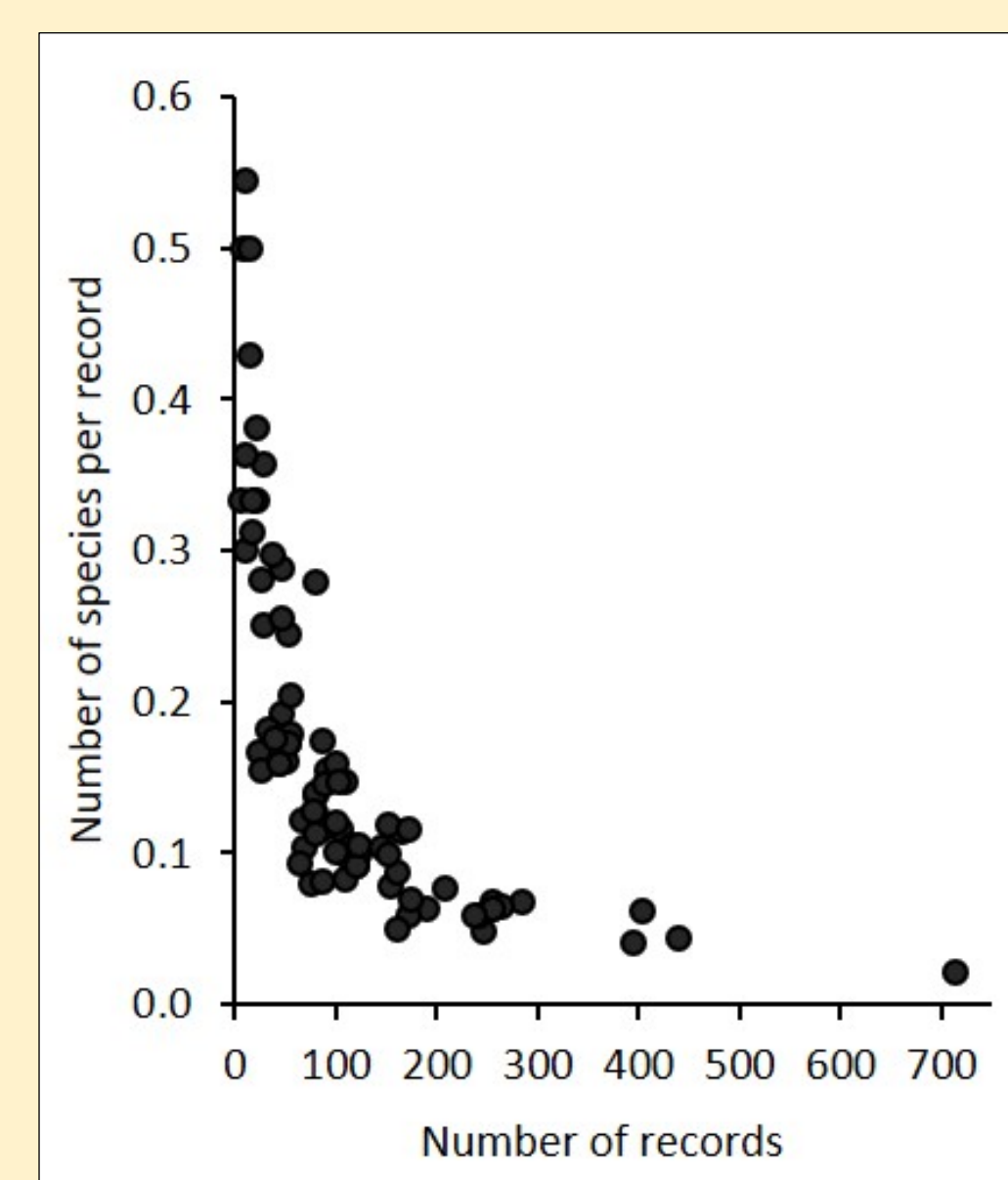
Results



Distribution of crayfish records with coordinates in Mississippi. Black dots indicate records (many dots are superimposed). Records do not imply that sampling was focused on crayfish. Yellow ovals highlight the most undersampled areas. Green shading indicates elevational relief (darker shades=higher elevations). Blue indicates water. White star locates Jackson, and white squares locate Oxford and Starkville.



Sampling intensity. Heat map indicating density of crayfish records (# of records/ha x 10,000) by USGS 8-digit HUC (HUC8) in Mississippi. Darker shades indicate higher density of records. HUCs with <100 ha in MS were excluded from calculations. Labels indicate HUC8 codes (number of records). Thicker lines indicate of 4-digit HUCs, roughly equivalent to "drainages."



Number of records by Mississippi county versus the average number of species per record for the county.



Cambarus cf. *rusticiformis* from northeast MS in the Tennessee River drainage. This will probably end up being a new species. Photo by Guenter Schuster

Thirteen species and 1 subspecies are endemic to the state, and another 21 occur in only 1 other state.

We estimated that roughly 175–200 records were necessary to consider a county well-sampled, but only 18% of counties had that many records.

Future needs

Major sampling needs:

- Regions with yellow ovals in Fig. 1 and drainages in the lighter 3 shades in Fig. 2.
- The Tennessee River drainages in northeast MS because additional taxa are suspected there.
- Primary burrowing crayfishes, as well as secondary burrowers that use seasonal water bodies, including intermittent or ephemeral streams.
- Large water bodies, including reservoirs and non-wadeable rivers.



The Lonesome Gravedigger (*Lacunicambarus mobilensis*) Glon 2020, a recently described primary burrowing species from MS and AL. Photo by Guenter Schuster



Chimney of a crayfish burrow next to a pitcher plant at the MS Sandhill Crane NWR.

Research needs:

Participants in the 2019 Mississippi Crayfish Working Group meeting voted unanimously that clarifying the numerous systematics issues was the most pressing crayfish research need in MS.

Taxonomic clarification or revision, or minimally re-examination of specimens, is needed for:

- Cambarus rusticiformis* (ongoing research)
- Creaserinus byersi*
- Creaserinus danielae* vs *C. oryktos* (ongoing research)
- Creaserinus fodiens* spp. complex
- Faxonius* spp. formerly assigned to the *Trisellescens* subgenus of *Orconectes*.
- Faxonius bartfieldi* (vs *F. perfectus* in several locations)
- Faxonius hobbsi*
- Hobbseus* spp.
- Lacunicambarus erythrobrachylus* (ongoing research)
- Procambarus acutus* species complex
- Procambarus clemmeri* vs *P. penni* (ongoing research)
- Procambarus* aff. *viaeviridis* (ongoing research)
- Procambarus vioscai* subspp.