



**Reproductive Ecology and Burrowing Behavior of Williams' Crayfish
and Meek's Crayfish in Missouri**

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Other than monthly observational data collected by DiStefano at two sites (unpublished data), little is known about the life history and reproductive ecology of Williams' crayfish. For example, DiStefano and co-workers have seen few females with eggs or young during their observations, and it remains unclear where the females are located when gravid or brooding. As noted by Pflieger (1996), essentially nothing is known about Williams' crayfish reproductive biology and ecology. Population dynamics such as growth, longevity, and mortality rates are unknown, and ecological interactions have been only cursorily studied. Furthermore, DiStefano (personal communication) recently documented that Williams' crayfish can be found underneath substrate of seasonally drying streams, which merits further study to assess the importance and role of this behavior.

Meek's crayfish, *Orconectes meeki meeki* (Faxon), occur in White River drainage tributaries in Stone County, Missouri, and is one of the rarest crayfishes in the state (Pflieger, 1996). It is also found in northwestern Arkansas. In certain streams, Meek's crayfish co-occurs with Williams' crayfish.

The Missouri Department of Conservation *Program Plan for Conservation and Management of Missouri's Non-cave Dwelling Crayfish Resources* (DiStefano, 2005) lists Goal B as "increase knowledge needed to conserve Missouri's crayfish fauna." Strategies 3 and 6 under that Goal are to document important life history and habitat association attributes for seven epigeal crayfishes (including Williams' crayfish and Meek's crayfish) that are listed in the *Missouri Species and Communities of Conservation Concern Checklist* (Missouri Natural Heritage Program 2006) as being "vulnerable to extinction" or "vulnerable to extirpation from the state." These two strategies are ranked as the plan's third and seventh highest priorities.

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Female hairy crayfish (Cambarus friaufi) with eggs.

The objectives of this project, led by fisheries biologist Hayden Mattingly, include describing population structure and estimating growth, longevity, and mortality rates of Williams' crayfish in two different streams.

Researchers will also determine surface and subsurface substrate conditions that permit Williams' crayfish borrowing behavior under different stream flows. They will also determine habitat use of female Williams' crayfish and Meeks' crayfish at different stages of reproductive condition (i.e., pre-mating, mating, post-mating, in glair, with eggs, or with young).

The rarity of these two species combined with the paucity of life historical and ecological data warrants attention. The knowledge gained from the study proposed herein will help inform and shape management strategies to conserve the species, and address highly ranked priorities in the MDC strategic crayfish management plan.