

Crayfishes (Class Malacostraca) Overview

The freshwater crayfishes (Order Decapoda) are one of the better known crustacean groups in Kentucky. Worldwide, freshwater crayfishes are represented by over 640 species (Crandall and Buhay 2008) with the southeastern United States being one of the epicenters of diversity. Three hundred sixty species are represented in the United States (Taylor *et al.* 2007). All of Kentucky's crayfish fauna falls into the family Cambaridae and is represented by the genera *Barbicambarus*, *Cambarus*, *Cambarellus*, *Fallicambarus*, *Orconectes*, and *Procambarus*. Kentucky is home to one of the richer freshwater crayfish faunas in North America with 54 species, with some of those species still under taxonomic review and others potentially awaiting discovery. Seven species are endemic to the state of Kentucky (*Cambarus batchi* – Bluegrass Crayfish, *Orconectes margorectus* – Livingston Crayfish, *Orconectes bisectus* – Crittenden Crayfish, *Orconectes jeffersoni* – Louisville Crayfish, *Orconectes rafinesquei* – Rough River Crayfish, *Orconectes tricuspis* – Western Highland Crayfish, *Orconectes packardi* – Appalachian Cave Crayfish). The most comprehensive treatments of Kentucky's crayfish fauna includes Rhoades (1944) and Taylor and Schuster (2005).

Modification of habitats, sedimentation, and dams are serious threats to freshwater crayfishes. A larger threat that has not yet impacted Kentucky is the introduction and establishment of non-native crayfishes. Several studies have shown the displacement of native species by more aggressive or opportunistic non-native species (Capelli 1982; Taylor and Redmer 1996; Hill and Lodge 1999). Many introductions are suspected to be from fisherman dumping their purchased live crayfish into the stream at the end of the day.

Nationally, about 48% of crayfish species are of conservation concern (ranging from Vulnerable to Endangered); over a third (37%) of the Kentucky fauna falls into this category (KSNPC, 2010). Within the Commonwealth, much of this is driven by concerns related to very small distributional extents or endemism. For instance, The Crittenden Crayfish (*Orconectes bisectus*) and Livingston Crayfish (*Orconectes margorectus*) are only found in a few streams within a couple of counties in northwestern Kentucky. The recently discovered Cumberland Plateau Cave Crayfish, recently differentiated from other species using genetic data (Buhay and Crandall, 2008), is one of our rarest crayfishes. Its global distribution is underground cave streams within an area of less than 180 square miles in southeastern Kentucky. Currently, no crayfish species are federally-protected in Kentucky although the Louisville Crayfish has been previously reviewed as a candidate for federal listing and more recently, the Blood River Crayfish.

The crayfishes of Kentucky all depend on a connection to groundwater. This facilitates burrowing, a behavior common to all crayfishes. Some species, such as stream dwellers (known as tertiary burrowers), spend only a short time of the year burrowed into the groundwater, an example being drought periods. Other species spend a majority of the year in groundwater burrow systems (primary burrowers), coming out only to breed or forage (Taylor and Schuster 2005). An example of this behavior can be seen by walking through fields in the spring and looking for mud chimneys made by the excavation activity of a crayfish. The Upland Burrowing Crayfish (*Cambarus dubius*), for instance, can be seen doing this at certain times of the year. Secondary burrowers are an intermediate between these two strategies, spending time in the year between streams and burrow systems.

Cave species are particularly at-risk from upland activities that pollute groundwater flowing into cave systems; this includes issues with chemical spills, agricultural runoff, salt from roads, and siltation from poor land use. Best Management Practices are needed to guard against perturbations to groundwater.

Crayfish Conservation Areas

Species occurrence data was used to determine 8-digit hydrologic units (watersheds) where there were endemic or multiple species of SGCN crayfish. Eleven 8-digit watersheds were identified as Crayfish Conservation Areas ([Appendix 4.35](#)), in alphabetic order: Barren, Bayou De Chien, Kentucky Lake, Little Kentucky, Lower Ohio-bay, Middle Green, South Fork Cumberland, Upper Cumberland, Upper Cumberland-Lake Cumberland, Upper Green, and Upper Levisa.

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Kentucky's Crayfish of Greatest Conservation Need and their statuses.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Malacostraca (25 species).					
An Amphipod (Stygobromus vitreus)	<i>Stygobromus vitreus</i>	N	S	G3	S1
Appalachian Cave Crayfish	<i>Orconectes packardi</i>	N	T	G2	S2
Big Sandy Crayfish	<i>Cambarus veteranus</i>	N	S	G3	S1
Big South Fork Crayfish	<i>Cambarus bouchardi</i>	N	E	G2	S2
Blood River Crayfish	<i>Orconectes burri</i>	N	T	G2	S2
Bottlebrush Crayfish	<i>Barbicambarus cornutus</i>	N	S	G3	S2

Bousfield's Amphipod	<i>Gammarus bousfieldi</i>	N	E	G1	S1
Cajun Dwarf Crayfish	<i>Cambarellus shufeldtii</i>	N	S	G5	S2
Clifton Cave Isopod	<i>Caecidotea barri</i>	N	E	G1	S1
Crittenden Crayfish	<i>Orconectes bisectus</i>	N	T	G2	S1
Cumberland Plateau Cave Crayfish	<i>Orconectes barri</i>	N	T	G2	SNR
Ghost Crayfish	<i>Orconectes inermis inermis</i>	N	S	G3	S3
Gray-speckled Crayfish	<i>Orconectes palmeri palmeri</i>	N	E	G5	S1
Hairy Crayfish	<i>Cambarus friaufi</i>	N	S	G4	S3
Livingston Crayfish	<i>Orconectes margorectus</i>	N	T	G2	S2
Longclaw Crayfish	<i>Cambarus buntingi</i>	N	S	G4	N
Louisville Crayfish	<i>Orconectes jeffersoni</i>	N	E	G1	S1
Mammoth Cave Crayfish	<i>Orconectes pellucidus</i>	N	S	G3	S3
Mammoth Cave Shrimp	<i>Palaemonias ganteri</i>	LE	E	G1	S1
Mountain Midget Crayfish	<i>Cambarus parvoculus</i>	N	T	G4	S1
Mud River Crayfish	<i>Orconectes ronaldi</i>	N	T	G3	S3
Ohio Shrimp	<i>Macrobrachium ohione</i>	N	E	G4	S1
Shrimp Crayfish	<i>Orconectes lancifer</i>	N	E	G5	S1
Swamp Dwarf Crayfish	<i>Cambarellus puer</i>	N	E	G4	S1
Vernal Crayfish	<i>Procambarus viaeviridis</i>	N	T	G5	S1

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