Endangered and Threatened Crayfishes (Decapoda: Cambaridae)

Jezerinac, Raymond F.
INTRODUCTION

During the last 20 years, there has been considerable national and international interest in identifying those plants and animals that may be threatened or endangered species or populations. In Ohio, this has resulted in the publication of lists for vertebrates (Smith et al. 1973, Ohio Dept. Nat. Res. 1978), some invertebrates (Ohio Dept. Nat. Res. 1978), and plants (Cooperrider 1982). This paper provides information on the status of crayfish taxa (species, subspecies, and undetermined forms) in Ohio.

Of the 19 different species and forms of crayfishes occurring in Ohio (Table 1), only Orconectes obscurus is designated as endangered by Ohio law. Data presented in this paper indicates, however, that it is neither threatened nor endangered in most streams where it has been recorded. One species, O. sloanii, is herein recommended for threatened species status and one subspecies (O. sanbornii erismophorous) and three species (O. propinquus, O. virilis, and O. sp) for special interest status. The distributional ranges of these six crayfishes in North America and Ohio, including a map, are described. Pertinent literature is cited, and the status of these forms in Ohio as endangered, threatened, or of special interest is discussed.

METHODS AND MATERIALS

The nomenclature of Hobbs (1974) is followed. The distribution map is based upon catalogued material in The Ohio State University Museum of Zoology (OSUMZ), Columbus, Ohio, published literature, and collections in The Ohio State University at Newark Crayfish Museum (OSUNCM), Newark, Ohio. The number in parenthesis following a county name indicates the number of collections within that county. The OSUNCM data are in a computer data base (IBM PC-FIILE III) and will be provided to interested individuals upon request. The status of each taxon follows the definitions established by the Ohio Division of Wildlife, Division of Natural Areas and Preserves (Unpublished 1982). The literature cited in this report includes all published papers on Ohio populations of the crayfishes in the following list, as well as selected references concerning their taxonomy, identification, distribution, ecology, and life histories.

RESULTS AND DISCUSSION

ORCONECTES OBSCURUS (Hagen 1870).

Range: This species has a restricted range. It occurs in the upper Ohio River system in Ohio (Turner 1926, Rhoades 1944a), Pennsylvania (Ortmann 1906), West Virginia (Schwartz and Meredith 1960), and New York (Crocker 1957). It also occurs in the Genesee, Susquehanna, and Mohawk rivers in New York (Crocker 1957). This species has been introduced into Ontario, Canada. (Crocker and Barr 1968), Maine, and Massachusetts (Crocker 1979).

Ohio Distribution: This species is confined to streams and tributaries of the Ohio River north of the southern boundary of the Flushing Escarpment (Fig. 1). Collections are from Belmont (19), Columbiana (24), Jefferson (5), Mahoning (5), Monroe (5), Portage, Stark (1), and Trumbull counties.

Status: O. obscurus is the only Ohio crayfish designated as endangered by Ohio law (Ohio Dept. Nat. Res. 1978). This status should be changed, however, to non-endangered and non-threatened. During the last five years, this species has been found at 59 different sites in six east-central Ohio counties. The species occurs in 13 different tributaries of the Ohio River drainage (Table 2). In 12 of these streams, O. obscurus is common to abundant. However, this species is threatened in the Sunfish Creek drainage owing to the introduction of another crayfish species. In this stream, O. obscurus is found only in headwater tributaries, whereas Orconectes rusticus (Girard 1852) is abundant in the main stream. This dominance of O. rusticus within the main stream also occurs in Ohio Brush Creek (Flynn and Hobbs 1982), Rocky Fork Creek (Rhoades 1962a), and the Chagrin River (Jezerinac 1974). Orconectes rusticus is apparently replacing the native species (Jezerinac 1982, Flynn and Hobbs 1982).


ORCONECTES SLOANII (Bundy 1876).

Range: The range of O. sloanii is very restricted. It has been collected only in the Ordovician limestone and shale.
Table 1

A Taxonomic List of the Crayfishes (Decapoda: Cambaridae) of Ohio.

<table>
<thead>
<tr>
<th>PHYLUM ARTHROPODA</th>
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<tbody>
<tr>
<td>CLASS CRUSTACEA</td>
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<tr>
<td>ORDER DECAPODA</td>
</tr>
<tr>
<td>FAMILY CAMBARIDAE</td>
</tr>
<tr>
<td>SUBFAMILY CAMBARINAE</td>
</tr>
<tr>
<td>Genus Procambarus Ortmann 1905</td>
</tr>
<tr>
<td>Subgenus Ortmannicus Fowler 1912</td>
</tr>
<tr>
<td>Procambarus (Ortmannicus) acutus acutus (Girard 1852)</td>
</tr>
<tr>
<td>Procambarus (Scapulicambarus) clarkeii (Girard 1852)</td>
</tr>
<tr>
<td>Genus Orconectes Cope 1863</td>
</tr>
<tr>
<td>Section Limosus Ortmann 1905</td>
</tr>
<tr>
<td>Group Limosus Rhoades 1944b</td>
</tr>
<tr>
<td>Orconectes sloanii (Bundy 1876)</td>
</tr>
<tr>
<td>Section Propinquus Ortmann 1905</td>
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<tr>
<td>Subgroup Propinquus Fitzpatrick 1967</td>
</tr>
<tr>
<td>Orconectes propinquus (Girard 1852)</td>
</tr>
<tr>
<td>Orconectes sanbornii sanbornii (Faxon 1884)</td>
</tr>
<tr>
<td>Orconectes sanbornii erismophorous Hobbs &amp; Fitzpatrick 1962</td>
</tr>
<tr>
<td>Genus Cambarus Erichson 1846</td>
</tr>
<tr>
<td>Subgenus Cambarus Erichson 1846</td>
</tr>
<tr>
<td>Cambarus (Cambarus) bartonii carinirostris Hay 1914</td>
</tr>
<tr>
<td>Cambarus (Cambarus) bartonii carinatus Hay 1902</td>
</tr>
<tr>
<td>Cambarus (Cambarus) ortmanni Williamson 1907</td>
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<tr>
<td>Cambarus (Cambarus) sciutus Rhoades 1944a</td>
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<tr>
<td>Subgenus Lacunicambarus Hobbs 1969</td>
</tr>
<tr>
<td>Cambarus (Lacunicambarus) sp. A (eastern Ohio)</td>
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<tr>
<td>Cambarus (Lacunicambarus) sp. B (western Ohio)</td>
</tr>
<tr>
<td>Subgenus Puncticambarus Hobbs 1969</td>
</tr>
<tr>
<td>Cambarus (Puncticambarus) robustus Girard 1852</td>
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<tr>
<td>Genus Fallicambarus Hobbs 1969</td>
</tr>
<tr>
<td>Subgenus Creaserinus Hobbs 1973</td>
</tr>
<tr>
<td>Fallicambarus (Creaserinus) fodiens (Cottle 1863)</td>
</tr>
</tbody>
</table>

regions of southeastern Indiana and southwestern Ohio (Rhoades 1941, Hobbs 1974).

Ohio Distribution: In Ohio, O. sloanii occurs primarily in tributaries of the Great Miami River system south of the confluence of Greenville Creek (Rhoades 1941, 1944a, St. John 1982) (Fig. 1). Specimens have been obtained from Butler, Darke, Hamilton, Montgomery, Preble (1), and Warren counties.

Status: Threatened (T). Most of the distribution data for this species were provided by Rhoades (1941). The map for O. sloanii that is presented is probably incorrect since numerous visits to a number of formally occupied sites have failed to produce this species. Rhoades (1941) stated that individuals of this species are “most often found near algal beds and aquatic vegetation” in streams that have stabilized banks and flat, water-worn, stone bottoms. I collected this species from a small stream having a substrate of limestone cobbles and bedrock. The species was not abundant, but greater numbers were found in the absence of O. rusticus suggesting that O. rusticus competes with, or is displacing, O. sloanii. Orconectes sloanii is threatened by urban development, stream impoundment, water pollution, siltation, and by competition with O. rusticus. Because of its limited Ohio distribution, any additional population losses may lead to its extirpation in the state.


ORCONECTES PROPINQUUS (Girard 1852).

Range: O. propinquus has a rather extensive range that includes a portion of the upper Mississippi River and Great Lakes drainages. Records are from the upper Wabash River and upper Illinois River basins in Illinois; upper Mississippi River watershed in Illinois, Iowa, and Wisconsin; the Great Lakes drainage in Ontario and Quebec, Canada; Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, New York, and Vermont; and the upper Mohawk River drainage in New York (Crocker 1957, 1979, Crocker and Barr 1968, Hobbs 1974).

Ohio Distribution: Turner (1926), OSUMZ, and OSUNCM records document the presence of this species along the southern shore of Lake Erie, from waters surrounding South Bass island, and in Lake Erie tributaries except the Huron, Vermilion, Rocky, and Cuyahoga rivers (Fig. 1). Records are from Ashtabula (5), Cuyahoga (6), Erie, Geauga (49), Lake (17), Lorain, Lucas, Ottawa (1), Portage (7), Sandusky, Trumbull (1), and Wood counties.

Status: Special Interest (S). Although this species has a broad distribution, recent collections in Ohio suggest that it has been extirpated from the Maumee, Portage, Sandusky, and Rocky rivers. The Chagrin River popu-
lation is threatened because of the introduction of *O. rusticus* into the basin (Jezerinac 1982). The status of the species in the Grand and Ashtabula rivers and in Conneaut Creek is unknown. *Orconectes propinquus* is threatened by stream impoundment, pollution, siltation, and the introduction of *O. rusticus*. 


**ORCONECTES VIRILIS** (Hagen 1870).

**Range:** This species has an extensive native range including lakes and streams "from Saskatchewan to Ontario, Canada, and from Montana and Wyoming to New York and southwestern Maine" (Hobbs 1974). It has also been introduced into California, Maryland, parts of New England, and Tennessee (Hobbs 1974).

**Ohio Distribution:** This species occurs only in the East Branch of the Chagrin River in northeastern Ohio (Jezerinac 1974) (Fig. 1). Records are from Geauga (10) and Lake (3) counties.

**Status:** Special Interest (S). Jezerinac (1982) suggested that the Chagrin River population may be the last remnant of a much broader distribution of this species in northern Ohio, a range that has been shrinking because of the changing climatic conditions in the region since the Wisconsin glacial period. Another possibility is that the Chagrin River population may be the last remnant of a much broader distribution of this species in northern Wisconsin. Fortunately, a base-line study has been completed on the Chagrin River population (Jezerinac 1982); further study of this basin will clarify the status of *O. virilis*.


**ORCONECTES SANBORNII ERISMOPHOROUS** Hobbs and Fitzpatrick 1962.

**Range:** Disjunct. Recorded from the Big Kanawha, Little Kanawha, and Greenbrier River drainages in West Virginia (Hobbs and Fitzpatrick 1962) and from the lower Scioto River in Ohio (D. H. Stansbery, pers. comm.)

**Ohio Distribution:** D. H. Stansbery (pers. comm.) collected this subspecies from one locality in Scioto Brush Creek, Scioto River drainage, Scioto County (Fig. 1).

**Status:** Special Interest (S).没有什么 is known about the life history, ecology, or distribution of this subspecies within the state.

CONCLUSIONS

The only Ohio crayfish that appears to be threatened is *O. sloani*. *Orconectes obscurus* should be removed from the Ohio Department of Natural Resources threatened and endangered species list. Four crayfishes (*O. propinquus*, *O. virilis*, *O. s. erismophorous*, and *O. s.* (?)) belong in a special interest category because insufficient information exists to determine their status.

In retrospect, all of the Ohio crayfishes that are threatened or have special interest status are forms found mostly in moderate (>10 m width) to large-sized stream communities. If these species and subspecies are to survive, these communities must be protected from impoundment, siltation, channelization, and urban development. Also, the introduction of *O. rusticus* appears to be adversely affecting the native crayfish fauna. An effort should be made to control the introduction of this species in eastern Ohio and other areas that are outside of its natural range.

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LITERATURE CITED


