Distribution and Status of Orconectes (Rhoadesius) sloanii (Bundy) (Crustacea: Decapoda: Cambaridae)

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The Ohio Journal of Science. v88, n5 (December, 1988), 202-204
http://hdl.handle.net/1811/23288

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BRIEF NOTE

Distribution and Status of Orconectes (Rhoadesius) sloanii (Bundy) (Crustacea: Decapoda: Cambaridae)^1

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ABSTRACT. The distribution of the crayfish, Orconectes sloanii (Bundy), is revised from Rhoades' (1962) report. Five county records are added: Dubois, Lawrence, Perry, Rush and Spencer, Indiana; the species has been extirpated from three counties: Miami and Shelby, Ohio, and Shelby, Indiana. Where O. sloanii is sympatric with Orconectes (Procericambarus) rusticus (Girard), the number of O. rusticus collected usually exceeded the number of O. sloanii. The status of the species as a threatened Ohio crayfish is supported.

INTRODUCTION

The range of O. sloanii is limited to southern and southwestern Ohio (Hobbs 1972), and a further definition of its range is presented herein. Rhoades (1941) collected the first O. sloanii in Ohio from Shakers Creek, Warren County, in 1938. Additional Ohio specimens were collected from Butler, Darke, Hamilton, Montgomery and Preble counties (Rhoades 1941, 1944). Rhoades (1941:95) described the Indiana distribution of O. sloanii as the Whitewater, White, Muscatatuck and Blue rivers in "...southern and eastern Indiana." Rhoades (1962) further defined the range of O. sloanii by listing it as occurring in the following counties: Indiana—Bartholomew, Clark, Decatur, Fayette, Floyd, Franklin, Henry, Jackson, Jefferson, Jennings, Randolph, Ripley, Scott, Shelby, Union, Washington and Wayne; and Ohio—Butler, Darke, Hamilton, Miami, Montgomery, Preble, Shelby and Warren.

The purpose of this paper is to compare the present distribution of O. sloanii with that reported by Rhoades in 1962 and to evaluate the species' threatened status. Additionally, the implications of the sympathy of O. sloanii and Orconectes rusticus are discussed.

MATERIALS AND METHODS

Collecting trips were made to southwestern Ohio, southern Indiana, and much of north-central Kentucky in 1975, 1977, 1978, 1982, and 1985, resulting in 220 collections. Specimens were collected by hand, with a metal strainer, or with a minnow seine (1.2 x 1.8 m; 0.64-cm mesh). The crayfish were fixed and preserved in the field in a mixture of ethyl alcohol (70%), glycerine (2%), and water (28%). They are currently housed at The Ohio State University at Newark Crayfish Museum (OSUNCM), Newark, Ohio. Forty-five additional collecting sites were added to the study by examining catalogued and uncatalogued specimens in The Ohio State University Museum of Zoology (OSUMZ), Columbus, Ohio. The nomenclature of Hobbs (1974) and Fitzpatrick (1987) is followed.

RESULTS AND DISCUSSION

The present distribution of O. sloanii is summarized in Figure 1. Considerable modification of the report of Rhoades (1962) is necessary. The species no longer occurs in Miami and Shelby counties in Ohio and in Shelby County, Indiana. New county records are Dubois, Lawrence, Perry, Rush and Spencer counties, Indiana.

The occurrence of O. sloanii in Rush County, Indiana, although a new county record, was not surprising since the location was within the previously recognized range of the species. The only specimens taken in Rush County were from the Little Flatsrock River. Orconectes sloanii is typically found in small tributary streams. It was probably missed by Rhoades (1962) in Rush County and is, therefore, not a range expansion. In fact, the species may be in danger of extirpation in Rush County because of competition from O. rusticus which is found throughout the Flatsrock River system.

Rhoades (1962) did not include Martin County, Indiana, in the range of O. sloanii. However, the OSUMZ contains specimens collected from this county in 1961 and 1964 near the village of Shoals on the East Fork of the White River. My recent collecting at this site failed...
Ohio, Orange, Shelby, and Switzerland counties in Ohio, nor in Crawford, Dearborn, Harrison, to yield any 0.

The species has probably been found (East with stream systems in which 0. sloanii appears to have been extirpated from these latter three counties. Harrison and Orange counties, Indiana, are confluent counties. Inasmuch as the stream systems in Crawford, as Eberly (1955) inferred. Recent collec-

Wyandotte. This would be either in Orange or Craw-

Orconectes sloanii (Fig. 1), it would not be surprising to find this species in these three counties. The present range of 0. sloanii was suggested by Faxon (1914) who described the original description of the species’ range (Bundy 1876) was probably in error.

Throughout much of its present range 0. sloanii is sympatric with 0. rusticus. In 27 of the 35 sympatric collection sites, 0. rusticus accounted for more than 50% of the specimens collected (Fig. 1). This information can prove useful in further evaluations of the impact of 0. rusticus on 0. sloanii.

The long-term survival of populations of 0. sloanii in sympathy with 0. rusticus is questionable. Jezerinac (1982) found that 0. rusticus was replacing 0. (Crockeri-

nus) propinquus (Girard) in the Chagrin River in northeastern Ohio and suggested that the aggressiveness of 0. rusticus was a possible cause for this replacement. Burler (1983) discussed the success of 0. rusticus in competition with 0. (C.) sanbornii (Faxon) in Ohio, and concluded that 0. rusticus was more aggressive, grew more rapidly, produced more young, and attained a larger adult size than 0. sanbornii. Orconectes rusticus was reported to be replacing 0. propinquus and 0. virilis in the Kawartha Lakes region of southern Ontario (Berrill 1978). Capelli (1982) found 0. rusticus displacing other species of Orconectes in lakes in northern Wisconsin, but was uncertain of the mechanism responsible for the success of 0. rusticus. However, Lodge et al. (1986) reported that in Trout Lake, Wisconsin, 0. rusticus invaded between 1973 and 1979, but has since remained in low abundance and has not displaced other species of Orconectes in the lake.

In Ohio, 0. sloanii has been extirpated from two of the eight counties originally reported by Rhoades (1962). At only one collection site was 0. sloanii found without 0. rusticus being present, and at only five of the 19 sites where the two species are sympatric did 0. sloanii specimens constitute more than 50% of the collection. This appears to support Jezerinac’s (1986) statement that 0. sloanii is a threatened species in Ohio.

In 10 counties in southern and southeastern Indiana, 0. sloanii was collected without 0. rusticus in the following stream systems: the East Fork of the White River, the Muscatatuck River, and Graham Creek; and the Anderson River, the upstream portion of the Blue River, and Silver Creek. Four (Dubois, Lawrence, Spencer, and Perry) of these 10 counties are new records for 0. sloanii. Rather than a range expansion by the species, the new records probably reflect a lack of collections. The rugged topography of the area (the Crawford Upland and Mitchell Plain) has been an impediment to urbanization and industrialization and their accompanying pollution and destruction of habitat. Rhoades (1962) suggested that this area was probably a refugium of 0. sloanii during pre-Wisconsin glaciation.

Nine of the 10 counties in which 0. sloanii was found without 0. rusticus are contiguous with counties in which 0. rusticus was either sympatric with 0. sloanii or
existed to the exclusion of *O. sloanii* (Fig. 1). *Orconectes rusticus* was found in Sand Creek, the Flatrock River, and the Big Blue River which are all tributaries of the East Fork of the White River. Likewise, *O. rusticus* was present in the downstream portion of the Blue River. The long-term viability of the *O. sloanii* populations in these areas of southern Indiana may be threatened by the encroachment of *O. rusticus*, if the latter species is indeed more successful when in competition with *O. sloanii*.

**ACKNOWLEDGMENTS.** I gratefully acknowledge the assistance of my sons David and James in collecting specimens. R. F. Jezerinac and three anonymous reviewers read the paper and made many helpful suggestions. The Ohio State University Newark Campus Research and Scholarly Activity Committee generously supported the project.

**LITERATURE CITED**


