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Distribution of the Blacknose Shiner, *Notropis heterolepis* Eigenmann and Eigenmann, in Clay, Dickinson and Osceola Counties, Iowa

VIRGIL E. DOWELL¹

Abstract. Four collections of the blacknose shiner, *Notropis heterolepis* Eigenmann and Eigenmann, were made from three different streams in Clay, Dickinson and Osceola Counties, Iowa. Twenty-six specimens were collected. These are the only known specimens of this species collected from a stream environment in Iowa in the last twenty years. Thus, it was demonstrated that the species is not yet extinct in Iowa streams.

With the exception of a population in Trumbull Lake, the present status of the blacknose shiner (*Notropis heterolepis* Eigenmann and Eigenmann) in Iowa is not well known, and the belief has been expressed that it is now absent in flowing water (Harlan and Speaker, 1956, p. 98). This paper contains recent evidence of additional localities for its distribution and demonstrates that, though its original distribution has apparently been greatly reduced, it has not yet become extinct in Iowa streams.

The blacknose shiner was once rather widely distributed in the streams of Iowa as evidenced by Meek's collections of the 1890's (Meek 1892, 1893 and 1894). It is listed by Meek under the name, *Notropis cayuga*. In the years following Meek's collections the population of the blacknose shiner declined. It was thought to be extinct within the State until it was collected in 1941 from a small stream entering West Okoboji Lake, Dickinson, County, by Dr. Raymond Johnson and again in 1955 from Trumbull Lake, Clay County, by a fishery survey crew (Cleary, 1956). The population in Trumbull Lake has continued to maintain itself in fair abundance to the present time.

Although formerly rather widely distributed, the blacknose shiner has apparently always been a relatively unstable species over most of Iowa. Meek (1893) considered *Notropis heterolepis* (listed by him as *Notropis cayugoa*) along with *Notropis anogenus* and *Notropis heterodon* to be "the most feeble and insignificant of the fresh-water fishes of Iowa." It should not, therefore, be unexpected that its distribution has been much reduced in recent years. Meek's data indicate that it may have always

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been most strongly established in the general region of Trumbull Lake, even at a time when it was much more widely distributed. Meek considered it to be common in the Des Moines River at Estherville, the Iowa River at Belmond and in Squaw Creek near Ames. He found it to be rare in the following streams: Beaver Creek near Des Moines, Lizard Creek near Fort Dodge, Cedar River and its tributaries, Wapsipinicon River at Wheatland and the Maquoketa River at Hopkinton. It was not taken in his collections from the Turkey River, Yellow River and Upper Iowa River in the eastern part of the State. In western Iowa, he found it rare in the Big Sioux River at Sioux City, in limited numbers in the Floyd River at Sioux City and LeMars, and absent from collections made from the Missouri River at Sioux City, Soldier River at Charter Oak and the Boyer River at Arion Station.

During the summer of 1961 the members of my fishery class at the Iowa Lakeside Laboratory and I collected the blacknose shiner from three different localities in addition to Trumbull Lake where a collection was made for comparative purposes. The three additional localities all represent streams, and all were flowing and turbid at the time the collections were made. The bottoms of the streams were chiefly silt or sand-silt with localized regions of gravel and boulders at riffle areas. All possessed some aquatic vegetation, though not in abundance. The collections were made with a minnow seine. Data relative to these collections are presented in Table 1. The specimens are stored in the museum collections of the Iowa Lakeside Laboratory.

Table 1.

Collections of the blacknose shiner, *Notropis heterolepis* Eigenmann and Eigenmann, made from Clay, Dickinson and Osceola Counties, Iowa.

Collection Number	Date	Locality	Number of Specimens
D61-13	20:VII:1961	Stream in Soat's pasture, southwest of Milford; T-98N, R-37W, Section 26.	2 adults
D61-15	22:VII:1961	Same as D61-13 above.	3 adults
D61-18	26:VII:1961	Big Meadow Creek, 4½ miles east of junction of Highways 18 and 71 north of Spencer; T-97N, R-36W, Section 35.	16 adults
D61-21	1:VIII:1961	Ocheyedan River, 2 miles west of Ocheyedan on Highway 9 and 1¼ miles south; T-99N, R-40W, Section 8.	5 adults

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Further Studies on Mixed Colonies in Ants

R. L. KING¹ AND R. M. SALLEE²

Abstract. Mixed colonies of ants (*Formica fossiceps* Buren and *Formica obscuriventris clivia* Creighton) offer unique opportunities to determine the extent to which two species living together share a single communal life. The proportion of workers of the two species present in a single colony differs from colony to colony but is relatively constant over periods lasting up to 16 years. Worker ants from four pure and from four mixed colonies have been measured with the scape as an index of size. The same size series of workers is found in pure and in mixed colonies, but the relative proportion of workers of different sizes in mixed colonies is similar within a given colony from year to year. In certain colonies the mean size of the two species is alike, but in others it is different. Whether these differences are trophogenic or blastogenic has not been determined.

In a series of papers the authors have published in these proceedings the results of studies on two closely related members of the fossiceps group of the genus *Formica*: *Formica fossiceps* Buren and *Formica obscuriventris clivia* Creighton. (1, 2, 3, 4, 5, 6). Although each of these usually lives in pure colonies, both species are occasionally found in a single colony. The mixed colonies, contrary to expectations, have remained mixed for periods up to 16 years. The workers of the two species are present in relatively constant proportions in a given colony, but the proportions differ from colony to colony. The figures for the eight mixed colonies surviving from those already reported (5), and for the six new ones found since 1956 are presented in the second part of this paper. In our second paper on mixed colonies (2) the following statement was made: "the same size series of workers of both species is present, but the proportion of workers

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