BRIEF NOTE

Discovery of the Federally Endangered Freshwater Mussel, *Epioblasma obliquata obliquata* (Rafinesque, 1820) (Unionidae), in Ohio[1]

MICHAEL A. HOGGARTH, DANIEL L. RICE, AND DIANA M. LEE, Department of Life and Earth Sciences, Otterbein College, Westerville, OH 43081 and Division of Natural Areas and Preserves, Ohio Department of Natural Resources, Fountain Square, Columbus, OH 43224

ABSTRACT. **Discovery of the purple catspaw, *Epioblasma obliquata obliquata*, in Killbuck Creek, Coshocton County, OH, is reported. This subspecies of unionid mollusc was thought to have been extirpated from the state in the mid to late 1800s and was known only from two nonreproductive populations in Kentucky and Tennessee. The mussel was thought to be on the verge of extinction. Fifteen living and 23 dead specimens of this subspecies were collected in September 1994 from Killbuck Creek. This is the largest known population of this rare subspecies and it is the only known population to currently support breeding individuals. It is threatened by soil erosion resulting from agricultural land-use practices such as clearing of the stream banks for farm fields and cattle grazing and by muskrat predation.**

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INTRODUCTION

The purple catspaw, *Epioblasma obliquata obliquata*, was listed as an endangered species by the U.S. Fish and Wildlife Service on 10 July 1990 (USFWS 1990a). At that time, this subspecies was known to occur only in isolated populations in the Green River in Kentucky, and the Cumberland River in Tennessee (USFWS 1990b). Both populations were in decline and neither had provided evidence of recent reproduction. The subspecies was thought to be on the verge of extinction (USFWS 1990b).

In October of 1991, a single dead shell of *E. o. obliquata* was collected from the Walhonding River downstream of the U.S. Route 36 bridge, below the mouth of Killbuck Creek (Hoggarth 1994). Prior to this, Ohio records for the purple catspaw included single specimens from the Ohio and Muskingum rivers (Stansbery et al. 1982) and a single specimen from the Licking River (Specimen #23039 in the Field Museum of Natural History, Chicago, IL). The Ohio River and Muskingum River specimens were collected in the mid 1800s (Sullivant 1838, Sterki 1907), while the Licking River specimen probably was collected in the late 1800s. No other records for this subspecies existed for the state.

An intensive search for this mussel occurred in the Walhonding River following the discovery of the single dead specimen in 1991 (Hoggarth 1994). However, no additional specimens were collected. Since that specimen was collected downstream of the mouth of Killbuck Creek, and because that creek supports at least one rare species of fish (the eastern sand darter, *Ammocrypta pellucida*), the authors undertook this study to determine if the lower reaches of Killbuck Creek supported *E. o. obliquata*. The purpose of the present paper is to describe the discovery of a population of the purple catspaw in Killbuck Creek.

MATERIALS AND METHODS

Mussels were collected from Killbuck Creek on 1 September and 6 September 1994. These collections were made from the covered bridge in Section 18 of Clark Township to the mouth of Killbuck Creek in Bethlehem Township, Coshocton County, OH. Mussels were collected for a total of three hours by three collectors while canoeing the creek from the town of Blissfield to the mouth of the creek on 1 September 1994. On 6 September the reach of stream from the covered bridge to Blissfield was sampled. Four collectors spent approximately five hours looking for living specimens and freshly dead shells. Living mussels were collected by hand from the streambed and shells of dead specimens were collected from the stream channel, the banks, and from muskrat (*Ondatra zibethicus*) middens. All living mussels were identified, counted, and returned to their original habitat. Dead shells were collected and transported to the laboratory for identification. They have been deposited at The Ohio State University Museum of Zoology as voucher specimens.

RESULTS

A total of 20 species of unionid molluscs was collected from Killbuck Creek on 1 and 6 September 1994 (Table 1). The two most abundant species, the pimpleback (*Quadrula pustulosa pustulosa*) and the Wabash pigtoe (*Fusconaia flava*), each comprised 25% of the living and dead specimens collected. The purple catspaw comprised 14% of the living and dead specimens collected and represented the third most common species in this reach of Killbuck Creek. This mussel was so common here that it supported predation by muskrats. Many of the dead shells found scattered on the banks had claw and/or teeth marks in the periostracum, while other shells were collected from muskrat middens. Other rare species of unionid molluscs found in this same reach included the fanshell (*Cyprogenia stegaria*), the black sandshell (*Ligumia recta*), the snuffbox (*Epioblasma*

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Table 1

Unionidae collected from Killbuck Creek from covered bridge in Section 18, Clark Township to the mouth of Killbuck Creek, Bethlehem Township, Coshocton County, OH, on 1 and 6 September 1994.

Species	Number
Pyganodon grandis (Say, 1829)	2 live, 2 dead
Strophitus undulatus (Say, 1817)	2 live
Alasmidonta marginata Say, 1818[e]	1 live, 2 dead
Lasmigona costata (Rafinesque, 1820)	1 dead
Lasmigona complanata complanata (Barnes, 1823)	18 live, 1 dead
Tritogonia verrucosa (Rafinesque, 1820)	7 live, 3 dead
Quadrula pustulosa pustulosa (Lea, 1831)	27 live, 41 dead
Amblema plicata plicata (Say, 1817)	9 live
Fusconaia flava (Rafinesque, 1820)	13 live, 53 dead
Pleurobema sintoxia (Rafinesque, 1820)[d]	2 dead
Elliptio dilatata (Rafinesque, 1820)	2 dead
Ptychobranchus fasciolaris (Rafinesque, 1820)	4 dead
Cyprogenia stegaria (Rafinesque, 1820)[a]	1 weathered
Actinonaias ligamentina carinata (Barnes, 1823)	4 live, 2 dead
Leptodea fragilis (Rafinesque, 1820)	3 live, 3 dead
Ligumia recta (Lamarck, 1819)[c]	3 live, 1 dead
Lampsilis radiata luteola (Lamarck, 1819)	2 live, 5 dead
Lampsilis cardium Rafinesque, 1820	7 live, 1 dead
Epioblasma triquetra (Rafinesque, 1820)[b]	3 live, 8 dead
Epioblasma obliquata obliquata (Rafinesque, 1820)[a]	15 live, 23 dead

[a]Federal and Ohio Endangered
[b]Ohio Threatened and Federal Category 2
[c]Ohio Threatened
[d]Ohio Special Interest
[e]Federal Category 2 Candidate Species

triquetra), and the round pigtoe (*Pleurobema sintoxia*) (see Table 1). The fanshell is a federal endangered species, however the single specimen found during this study was a very old dead shell and the species may not be extant in the creek today. All other species were found as living or freshly dead specimens.

DISCUSSION

The distribution of the freshwater mussels in Ohio is as well documented as anywhere else in the United States. This statement represents the accumulated life's work of many individuals, both residents and nonresidents of the state, over the last two centuries. Therefore, it is a surprise to find living specimens of a mussel that was thought to have been extirpated from the state as many as 150 years ago. It certainly suggests that there is much more work still to be done to document the distribution of these animals in the rivers, lakes, and streams of the state.

The population of *E. o. obliquata* in Killbuck Creek represents the single largest population of this mussel known anywhere (USFWS 1990b). Furthermore, this population appears to support reproducing individuals. Gravid females were found and specimens from three years to eight years of age were collected. This suggests that the potential for continued existence for this subspecies is good.

Immediate problems that may affect this population are those associated with land-use in the Killbuck Creek watershed. Very few living mussels were collected in reaches of the stream where the adjacent land was intensively farmed. These areas lacked wooded riparian corridors, had significant erosion problems, and often had uncontrolled livestock access to the creek. Only one such reach yielded specimens of *E. o. obliquata*, and here only dead shells were taken. Within reaches of the stream, where the creek flowed through wooded riparian corridors, the substrate in the stream was much more stable and less silted, and habitats were more varied. The purple catspaw, and other mussels, thrived in these reaches of the creek.

The purple catspaw was found in sand to fine gravel substrates in run and riffle habitats. Many individuals were found where there was diversion to flow such as that produced around woody debris. Other specimens were taken from depositional substrates composed mostly of fine to coarse gravel. Prior to this discovery, the purple catspaw was considered to be a large-river subspecies while the white catspaw (*Epioblasma obliquata perobliqua*) was found in smaller streams (Bates and Dennis 1985, USFWS 1990c). In large rivers, *E. o. obliquata* had been found in shallow to moderately deep water with moderate to swift currents in a wide variety of substrates (Bogan and Parmalee 1983, USFWS 1990b). This mussel apparently has a much wider range of habitat acceptability than was previously thought. It is of interest that both subspecies of the catspaw occur in Ohio. The white catspaw is extant only in Fish Creek in Williams County, OH (Hoggarth 1986, USFWS 1990c), while the purple catspaw may only occur in Killbuck Creek.

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