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THE DISTRIBUTION AND STATUS OF Cryptobranchus Alleganiensis IN MARYLAND

Cryptobranchus alleganiensis is listed as endangered in Maryland and is declining throughout its range (Williams et al. 1981a; Gath et al. in press). In Maryland, it is known from: 1) the lower Youghiogheny River, 2) the Casselman River, and 3) the Susquehanna River and its tributaries (Fowler 1915; McCayley and East 1940; Meszoly 1966; Harris 1975). There are unsubstantiated accounts from fishermen of C. alleganiensis in the Potomac River and tributaries, where it may have dispersed from the Youghiogheny River via stream capture (Hendricks et al. 1983). An extinct Pliocene form of Cryptobranchus is known from the Potomac River watershed (Holman 1977). This study's objective was to determine the present distribution and status of C. alleganiensis in Maryland.

From 30 September 1980 through 20 November 1981, approximately six days per month (range = 1-18) were spent surveying the Youghiogheny, Susquehanna, and Potomac rivers and tributaries, depending on weather and stream conditions. Several rivers emptying into the northern Chesapeake Bay were also included, as well as the mouths of tributaries of the Potomac River in nearby West Virginia and Virginia (Fig. 1). No surveys were done from December through March. Most survey days (92.6%) occurred from May through October. Although several different techniques were employed in stream surveys (see Williams et al. 1981b), electrofishing with dip nets was the method used most often by the survey crew. A two- to four-man crew spent 308.5 in-stream hours (905.5 man-hours) sampling for C. alleganiensis. Two hundred and fifty-nine individual sites were sampled: 91 in the Youghiogheny River system, 44 in the Susquehanna River system and other streams emptying into the northern Chesapeake Bay, and 124 in the Potomac River system (Fig. 1). Multiple samples were often made where habitat appeared good. Twenty-four percent of the sites were sampled both day and night. Night sampling usually began about 0.5 hour after sunset. We spent an average of 54 (± 2.3 SE, range = 15-300) minutes per sample. All captured individuals were returned alive to the stream.

Additionally, 200 "hellbender wanted" posters were posted along the Youghiogheny and Susquehanna river drainages. Gunnison Falls, and Little Gunpowder Falls between 31 March and 7 May 1982. On 1-2 May 1983, 42 additional posters were placed along the Susquehanna River and its tributaries. No posters were posted along the Potomac River drainage.

Between 29 May 1980 and 30 September 1982, seven C. alleganiensis were captured within a one kilometer section of the Casselman River from 1.6 km north of Crab Run Road to 0.8 km south of the Pennsylvania state line (Fig. 1). Individuals ranged from 298-438 mm total length (212-270 mm snout-vent length) and weighed from 245-330 g. Our stream surveys were unsuccessful in locating C. alleganiensis elsewhere in the Youghiogheny River system, or in the Susquehanna and Potomac River drainages.

We received ten responses to our "Hellbender wanted" posters. Three resulted in documentation of C. alleganiensis in Maryland streams. One fisherman hooked and caught a C. alleganiensis in the Casselman River on 13 April 1982 near the river's exit to the

Figure 1. Location of sites surveyed for C. alleganiensis in Maryland.
alleganiensis there in doubt. The Conowingo Reservoir eliminated much habitat and is a definite barrier to dispersal. The same pollutants found in the Youghiogheny River system, excluding possibly acid mine drainage, are factors that might have affected populations. Low dissolved oxygen concentrations and nutrient enrichment are two of the concerns in the Susquehanna below Conowingo Dam (Rudisill 1979). However, several tributaries of the Susquehanna, especially Bear and Octoraro creeks, appear to be suitable habitat. Even in these two streams, elevated nutrient concentrations and siltation are problems (Rudisill 1979).

There is no evidence of the occurrence of C. alleganiensis in the Potomac River system. Water quality in the Potomac River basin ranges from poor in the North Branch, where acid mine drainage restricts most aquatic life, to good from the confluence of the North and South branches downstream to Little Falls Dam, Maryland. Nutrients, bacteria, and sediment from inadequately treated municipal sewage discharges and street and farmland runoff are the major forms of pollution in most of the Potomac River basin (Mason et al. 1976).

Cryptobranchus alleganiensis in Maryland is rightfully categorized as endangered. When found, populations appear to be low. We found no evidences of successful reproduction though we sampled during the late summer-fall breeding season. Besides different forms of pollution, fishing could have an impact on populations. Many fishermen believe that C. alleganiensis is poisonous and attempt to kill captured individuals before releasing them from the hook. Or, they may harvest their eggs and release the fish to the hook already inside the digestive tract (Nickerson and Mays 1973). Management of this impact is difficult, but could be considerable in certain areas. Better education of the fishing public would be an important means of reducing this source of mortality.

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EGGS AND HATCHLINGS OF THE YELLOW GIANT CHUCKWALLA AND THE BLACK GIANT CHUCKWALLA IN CAPTIVITY

Iguana lizards of the genus Cnemidophorus (chuckwallas) are found only in the southwestern United States, and in Northwestern Mexico. They are thought to have originated from Cnemidophorus (spray-tailed iguana) stock (Etheridge 1964; Hooton 1955; Smith 1948; Mittleman 1942). There are eleven subspecies, six belonging to the finely scaled "short group", five belonging to the coarsely scaled, "star group" (Robinson 1972). These subspecies are in the United States, one in Baja California, one on the Mexican mainland, and six in the islands of the Gulf of California, Mexico (Shaw 1949).