

Deformed Vertebral Columns in the Brown Bullhead, *Ictalurus nebulosus* (Lesueur), from the Ottawa River

Abstract. Deformed vertebral columns are reported for some specimens of the brown bullhead, *Ictalurus nebulosus*, from the Ottawa River at Ottawa-Hull. Deformities ranged from a simple vertebral column curvature to major fusions of centra.

Ecological studies on brown bullhead populations in the Ottawa River at Ottawa-Hull have necessitated examination of several thousand specimens. Occasionally individuals were found to have deformed vertebral columns. The vertebral osteology of some of these specimens is described, and data on the occurrence and frequency of the condition are summarized.

Materials and Methods

Bullheads were caught in trap-nets set in shallow water in the Ottawa River. Sample areas near the cities of Ottawa and Hull were (1) Shirley's Bay, (2) Brewery Creek, (3) Governor's Bay, (4) Kettle Island Bay, (5) Upper Duck Island, and (6) Lower Duck Island (see

Figure 1).

The standard length (mm), weight (g), and sex of each specimen were determined. Fish were aged by examination of pectoral spine sections (see Scholl 1968). The structure of the vertebral column was investigated by means of radiographs and by alizarin staining (see Hollister 1934). Drawings were made with the aid of a camera lucida.

Results

Most of the deformed specimens were caught in Brewery Creek (Table 1). Other areas in the Ottawa River which were not sampled as extensively as Brewery Creek, however, may contain deformed fish that were not observed. Details of one sample are given in Table 2, where three types of vertebral column deformity are recognised:

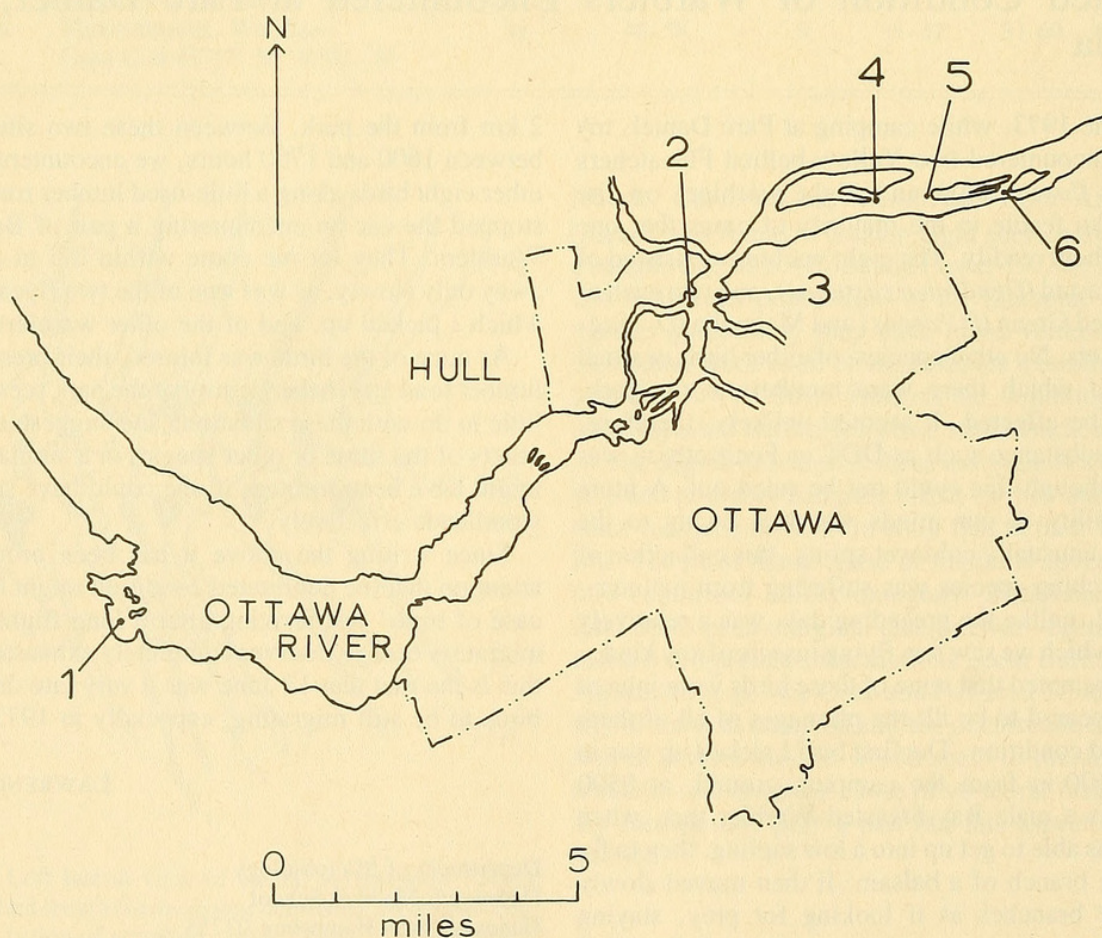


FIGURE 1. Sample areas for brown bullheads in the Ottawa River at Ottawa-Hull: 1, Shirley's Bay; 2, Brewery Creek; 3, Governor's Bay; 4, Kettle Island Bay; 5, Upper Duck Island; 6, Lower Duck Island.

TABLE 1. — Frequency of deformed brown bullheads in samples from the Ottawa River

Capture season	Capture site	Total number caught	Number deformed	Frequency %
Summer 1971	Brewery Creek	5,965	9	0.15
Summer -fall 1972	" "	9,759	22	0.23
" " "	Shirley's Bay	4,226	0	0
" " "	Governor's Bay	281	0	0
" " "	Kettle Island Bay	11,618	0	0
" " "	Upper Duck Island	610	0	0
" " "	Lower Duck Island	5,905	8	0.14

TABLE 2. — Data on deformed brown bullheads from Brewery Creek, 29 July 1971

Standard length (cm)	Weight (g)	Sex	Age	Type of deformity (see text)		
				(1)	(2)	(3)
13.9	85	♂	5+			*
25.3	224	♀	6+	*		
28.6	346	♂	6+	*		
28.9	274	♂	5+	*		
29.9	339	♂	5+		*	

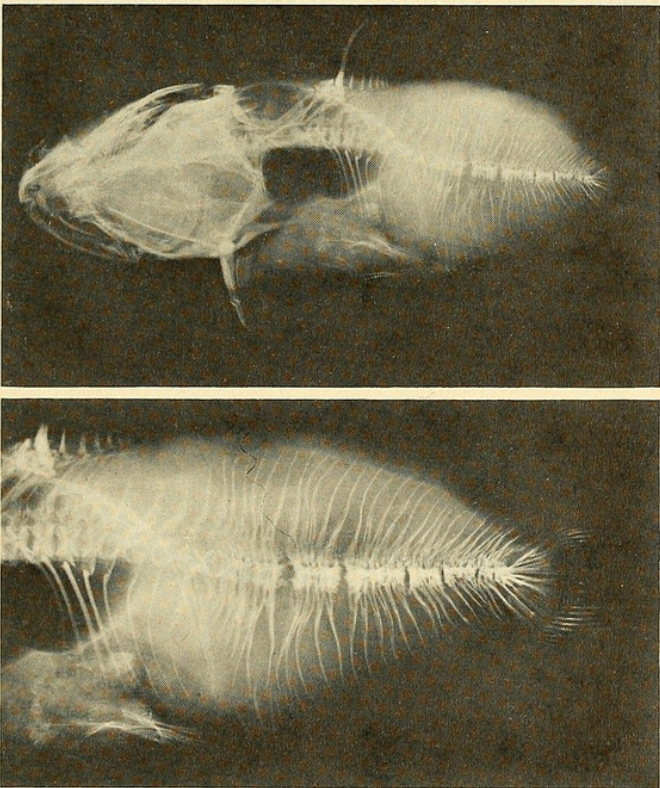


FIGURE 2. Radiographs of a deformed brown bullhead, 13.9 cm standard length, taken from Brewery Creek, 29 July 1971, showing major fusions of caudal centra. Above, whole specimen; below, enlargement of caudal region.

- (1) unilateral shortening of centra, causing the vertebral column to assume a gentle S-shape,
- (2) a similar condition to (1) but with some fusion of centra,
- (3) major fusions of centra, resulting in a markedly shortened body.

The appearance of one individual of type 3, taken in Brewery Creek, is shown in Figure 2. This specimen had a standard length of 139 mm, its weight was 85 g, and it was 5+ years old. Normally 5+-year-old specimens from Brewery Creek are about 265 mm and 233 g during July (based on data for 36 normal specimens). Less complex modifications are shown in Figure 3.

Discussion

The causative factor or factors for these deformities have not been determined. There appears to be no information in the literature on such deformities in brown bullheads (Dawson 1964, 1966, 1971). Various factors have been cited as causing similar deformities during ontogeny in other fish species, including parasite invasion, pollutants, environmental and hereditary factors (Schäperclaus 1954).

The survival of deformed fish depends on several factors. These include the availability of food and the effectiveness of predators. Brown bullheads are principally omnivores and scavengers (Emig 1966) and feed on a wide variety of items that a reduced swimming ability would not impede. Food analyses have shown that wall-eye and sauger (Priegel 1963) and northern pike (Lagler

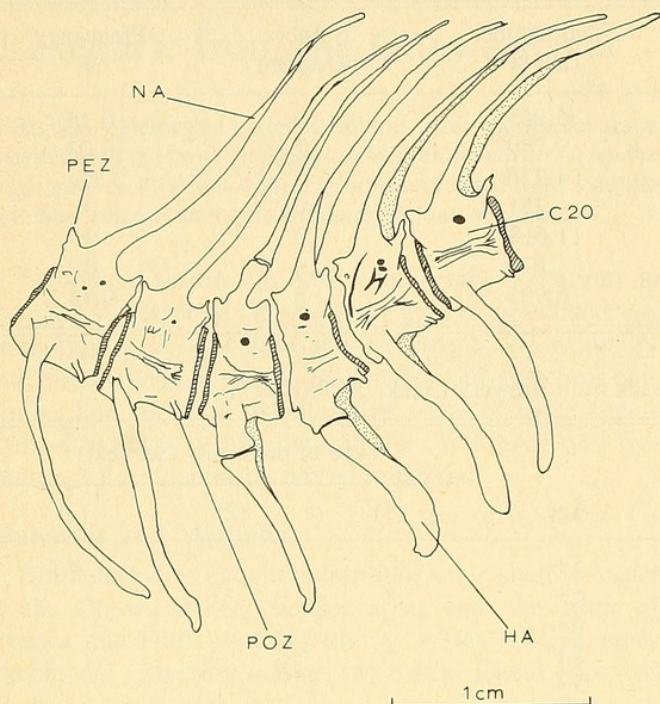


FIGURE 3. Left lateral view of deformed caudal vertebrae of a 29-cm standard length brown bullhead from Brewery Creek, 29 July 1971. C 20, twentieth centrum; HA, haemal arch and spine; NA, neural arch and spine; PEZ, prezygapophysis; POZ, postzygapophysis.

1956) will feed on brown bullheads. Perch may also capture the smaller bullheads (T. A. Clair, personal communication, 1973). Deformities which cause only a slight body curvature will have little effect on the predator escape ability of the bullheads. As their size increases bullheads become less available to predators. They are further protected by their dorsal and pectoral spines (Mauck and Coble 1971). Some indication of the tenacity of life of injured fishes has been given by Gunter and Ward (1961) and is further illustrated herein by the specimen shown in Figure 2.

Acknowledgments

The authors thank Dr. D. E. McAllister, Curator of Fishes, National Museum of Natural Sciences, Ottawa,

for providing X-ray facilities. The photograph for Figure 1 was taken from an X-ray plate by Mr. G. Bentchavtchavadze, Department of Biology, University of Ottawa. Financial support for this research was provided by the National Research Council of Canada to S. U. Qadri.

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Received October 2, 1973
Accepted December 28, 1973

Gray-headed Junco in Manitoba

On 26 January, 1964, Roy Calder reported to the late Harold Mossop an unfamiliar bird feeding in his St. Vital (Winnipeg) yard. Mossop (1964a) photographed the bird and published the following description: "it's a little less

in size than a House Sparrow (*Passer domesticus*). Its plumage is mostly soft grey, a little darker between eyes and bill with much lighter underparts. Outer tail feathers are white and there is a triangle of chestnut-brown on its



Coad, Brian W., Rubec, Peter J., and Qadri, S. U. 1974. "Deformed vertebral columns in the brown bullhead, *Ictalurus nebulosus* (Lesueur), from the Ottawa River." *The Canadian field-naturalist* 88(2), 224–226.

<https://doi.org/10.5962/p.344377>.

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