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COMITÉ SUR LE STATUT
DES ESPÈCES MENACÉES
DE DISPARITION AU
CANADA

OTTAWA (ONT.) K1A 0H3
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**STATUS REPORT ON THE BLACKCHIN SHINER
*NOTROPIS HETERODON***

IN CANADA

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Vol. 10

BY



J. HOUSTON

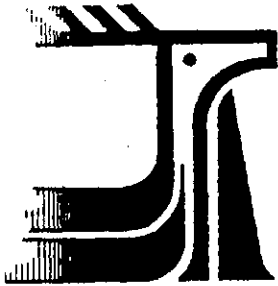
STATUS ASSIGNED IN 1994
NOT AT RISK

REASON: THE DISJUNCT MANITOBA POPULATIONS OF THE BLACKCHIN SHINER ARE VULNERABLE BECAUSE THEIR DISTRIBUTION IS RESTRICTED TO AGRICULTURAL AREAS WHERE THEY ARE SUBJECT TO TURBIDITY AND SILTATION ARISING FROM LAND USE PRACTICES, BUT OVERALL THE CANADIAN STATUS IS NOT AT RISK.

OCCURRENCE: QUEBEC, ONTARIO AND MANITOBA

COSEWIC - A committee of representatives from federal, provincial and private agencies which assigns national status to species at risk in Canada.

CSEMDC - Un comité de représentants d'organismes fédéraux, provinciaux et privés qui attribue un statut national aux espèces canadiennes en péril.



Committee
on the Status
of Endangered
Wildlife
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Comité sur le
statut des espèces
menacées
de disparition
au Canada

JUNE 1990

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**STATUS REPORT ON THE BLACKCHIN SHINER
*NOTROPIS HETERODON***

IN CANADA

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**STATUS ASSIGNED IN 1994
NOT AT RISK**

Status of the Blackchin Shiner, *Notropis heterodon*, in Canada

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Houston, J. 1993. Status of the Blackchin Shiner, *Notropis heterodon*, in Canada. Report to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Fish and Marine Mammals Subcommittee. Canadian Wildlife Service, Ottawa, Ontario.

The native range of the Blackchin Shiner, *Notropis heterodon*, in Canada extends westward from southwestern Quebec to southwestern Manitoba. Little information is available on the biology and ecology of the species and the present status in Quebec is uncertain as recent survey data are unavailable. The species is apparently secure in Ontario, but populations in southwestern Ontario should be monitored as streams in this area are subject to disturbances which could alter water quality as the species appears to be particularly sensitive to turbidity and siltation. Formerly thought to be a new addition to the fauna of Manitoba, the species appears to be native to the province and more widespread and abundant than previously thought.

Au Canada, l'aire de dispersion du menton noir, *Notropis heterodon*, s'étend du sud-ouest du Québec jusqu'au sud-ouest du Manitoba. On dispose de peu d'information sur la biologie et l'écologie de l'espèce, et la situation présente au Québec est mal connue vu l'absence de données récentes de relevé.

L'espèce semble être en sécurité en Ontario, mais les populations du sud-ouest de la province devraient être surveillées à cause des perturbations qui pourraient

affecter la qualité de l'eau dans certains couloirs de cette région; ce méné semble particulièrement vulnérable à la turbidité et à l'envasement. On a longtemps cru que cette espèce était une addition à la faune de Manitoba mais, on la considère maintenant, plutôt comme indigène de cette province où elle est plus répandue et abondante qu'on croyait.

Key words: Cyprinidae, *Notropis heterodon*, freshwater fishes, minnows, Blackchin Shiner, *menton noir*.

The Blackchin Shiner, *Notropis heterodon* (Cope, 1865), is a small cyprinid closely resembling the Pugnose Shiner, *Notropis anogenus*. The Canadian distribution was formerly thought to be restricted to Ontario and Quebec (Scott and Crossman 1973), but is now known to include southern Manitoba (Stewart et al. 1985), where it has been listed as being of special concern (Johnson 1987). This report was prepared for the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a basis for evaluation of the status of the species in Canada.

Description

Notropis heterodon (Figure 1) is a small minnow averaging about 64 mm in length. The body is slender and terete, typically silvery in colour, but straw coloured above and white to silvery below. The scales on the back have darkened edges and there is a prominent black lateral line from the tip of the snout to the caudal fin. The black pigment extends into the chin, accounting for the vernacular name and the black midlateral stripe often has a zig-zag appearance (Crossman, E. J. and E. Holm, Royal Ontario Museum, Toronto, Ontario; personal

communication). Spawning fish may develop a pale yellow tinge to the ventral surface (Scott and Crossman 1973) and breeding males develop tiny tubercles on the dorsal surface of the head and the upper surface of the pectoral rays (Trautman 1981). The fins are translucent, the dorsal is sharply pointed and situated above the insertion of the pelvics, the caudal is distinctly forked (see Scott and Crossman 1973; Smith 1979; Trautman 1981; Smith 1985) for definitive descriptions).

The species closely resembles the Pugnose Shiner from which it can be distinguished by the silvery peritoneum and the smaller, upturned mouth of *Notropis anogenus* (Scott and Crossman 1973; Smith 1979). Blackchin Shiners also superficially resemble the Weed Shiner (*Notropis texanus*), differing in the pointed dorsal fin and larger eye, 2 pharyngeal teeth on the lesser row on each side and an included lower jaw; the Mimic Shiner (*Notropis volucellus*), where the lateral band is very pale, and does not extend forward to the tip of the snout (Mimic Shiners also have dark pigment at the base of the anal fin), and a pharyngeal tooth count of 0.4-4,0; the Blacknose Shiner (*Notropis heterolepis*), where the lateral band is not as distinct and the pigmentation does not extend to the lower jaw and has 0,4-4,0 pharyngeal teeth and no mid-dorsal black band (Smith 1979). The species may also be confused with the Bridle Shiner (*Notropis bifrenatus*) to which it may be closely related (Gilbert 1980), but the ranges overlaps only in Quebec and eastern Ontario.

Distribution

The range of the Blackchin Shiner is limited to the Great Lakes Basin and the extreme upper Mississippi basin of the northern United States and southern Canada (Figure 2). In the U.S. the species ranges from eastern North Dakota east

to New York, probably no further south than 40°N (Scott and Crossman 1973; Gilbert 1980).

In Canada, the species is most widely distributed and abundant in Ontario, although the range more or less extends from the Upper St Lawrence near Trois-Rivières, Quebec, west to southern Manitoba (Figure 2; Appendices of all records are on file and available on request from COSEWIC).

The species is limited to the extreme southwestern region of Quebec (Figure 3) where it is known from tributaries of the Ottawa River in Hull, Pontiac, Papineau and Gatineau counties, and of the St Lawrence River as far downstream as Trois-Rivières (Mongeau et al. 1979; Bergeron and Brousseau 1983). Blackchin Shiners have also been collected from the south shore of the St Lawrence from the Richelieu and Châteauguay watersheds (Mongeau et al. 1974). No Ottawa River collections north of Pontiac County are known, although the species has been recorded from streams on the Ontario side of the river north to at least Temagami (Scott and Crossman 1973; ROM 34900). This perceived absence may be a sampling artifact, since suitable habitat does exist; surveys in the area should be on the alert for this species in any collections made from local streams.

Current Ontario records (Scott and Crossman 1973; Appendices of all records are on file and available on request from COSEWIC) suggest a disjunct distribution (Figure 4). The species occurs in the Ottawa River watershed north to Pembroke and throughout southwestern Ontario in lakes Ontario, Erie and Huron and their tributary streams, north to Sault Ste Marie. Blackchin Shiners have only recently been recorded from Canadian Lake Superior tributaries, Crossman and Holm (personal communication) indicate a collection from the Goulais River (46°45'N, 84°16'W) in 1990 (OMNR 5842). The species has been recorded from

several streams in Michigan tributary to Lake Michigan (Scott and Crossman 1973). It is also known in Ontario from the Lake of the Woods watershed, the Rainy River watershed in Quetico Park and the English and Wobigoon river watersheds of the Kenora District of northwestern Ontario (Crossman and McAllister 1986; Stewart 1988). There are also records from the Hudson Bay, Moose River drainage (OMNR L22, L31, L36).

Present knowledge of the Blackchin Shiner also suggests a disjunct distribution in Manitoba, (Figure 5) where it was first collected in 1973 (ROM 29840) from Oak Creek, near the junction of the Souris and Assiniboine rivers (Stewart et al. 1985). Further records followed in 1982 from the Assiniboine watershed in Spruce Woods Provincial Park (see Stewart et al. 1985) and from Dauphin Lake (Babaluk and Harbicht 1984). *Notropis heterodon* also occurs in the Winnipeg River in Manitoba and in the Lake of the Woods Watershed, in Falcon Lake Manitoba (Stewart 1988).

Protection

Blackchin Shiners are not subject to any specific protection in Canada. The species has been considered to be of "special concern" in Manitoba (Johnson 1987), but has not as yet been considered for protection under the provincial Endangered Species Act. In Quebec the species has been given little, or no attention, but could be given specific protection under provincial legislation (Endangered Species Act and laws on faunic habitats).

In the U.S., Blackchin Shiners have been considered to be of "special concern" only in New York State (Johnson 1987), even though it has been eliminated from Ohio waters since 1950 (Trautman 1981), and Iowa (Scott and Crossman 1973). The range is also apparently decreasing in Minnesota and

Illinois in concert with habitat loss due to siltation (Eddy and Underhill 1974; Smith 1979).

Population Sizes and Trends

There is no recent information from Quebec on this species where it is largely known only from presence and absence data (P. Houde, Ministère du Loisir, de la Chasse, et de la Pêche, Direction de la Gestion de la Faune, Hull, Quebec; personal communication). Mongeau et al. (1979) did not find this fish to be common in the Châteauguay system, although it appears to be fairly common in the Ottawa River tributaries of Hull, Pontiac and Gatineau counties (D.E. McAllister, Canada Museum of Nature, Ottawa, Ontario; personal communication). In short, there is insufficient information for an assessment of population sizes and trends of this species in Quebec where no general surveys have been conducted since the 1970s (Houde, personal communication).

The Blackchin Shiner is generally common where suitable habitat (clean, clear, weedy waters) exists (McAllister, personal communication) and is widely distributed in southern Ontario where it appears in some areas in sufficient numbers to be utilized as a bait fish (Scott and Crossman 1973). Although many streams have undergone habitat degradation similar to that responsible for the demise of the species in Iowa and Ohio, there is no direct evidence of a decline in the species in southern Ontario.

The species was not known west of Sault Ste Marie until 1968 when a number of specimens were collected in Quetico Provincial Park (ROM 26052). Since that time, the Blackchin Shiner has been recorded at a number of sites in the Rainy River - Winnipeg River system in the Lake of the Woods area and west into Manitoba (Falcon Lake, Manitoba 49°41'N; 95°19'W) and is apparently abundant

where found (Stewart et al. 1985; Stewart 1988). On the other hand, there has been no program of systematic surveys in the province so neither is there evidence to suggest the species is secure.

As in northwestern Ontario, the species was not recorded from Manitoba until 1973 (Stewart et al. 1985), but based on the size of specimens examined and the abundance where found, it has probably been there for some time. Stewart et al. 1985 and Stewart (1988) discussed the disjunct and scattered populations of this species in Manitoba and concluded that the species was not introduced and entered Manitoba naturally, surviving in areas of suitable habitat. The Dauphin Lake drainage has no direct connection with the Assiniboine River drainage and the species could not have moved naturally between the two in a relatively short time (Stewart et al. 1985). Similar arguments could be made for the dispersal of these fish from Mississippi headwaters to Rainy River headwaters in Minnesota and subsequent downstream dispersal in the Rainy River - Winnipeg River systems in northwestern Ontario and southeastern Manitoba (see Crossman and McAllister 1986). Stewart (1988) further concluded that the absence of the species from the Red River plain in Manitoba suggests westward dispersal through the Manitoba Great Lakes.

As elsewhere, population size and trend information is lacking, but the Blackchin Shiner is apparently abundant where found in Manitoba (Stewart et al. 1985). The fact that it was not recorded in Manitoba and northwestern Ontario until the latter half of this century is probably related to lack of collecting effort and/or confusion with similar species such as the Blacknose Shiner, *Notropis heterolepis*. So far, continued sampling effort has not produced additional records from the Winnipeg/Rainy River system or evidence of the species from the Interlake area of Manitoba, but has revealed the presence of the

Weed Shiner in the Interlake region (A.J. Derksen, Fisheries Specialist, Manitoba Department of Natural Resources, Winnipeg, Manitoba; personal communication). As in the U.S.A., the species is sensitive to siltation and may not be able to coexist with the Weed Shiner, since the two species have not been captured together in Manitoba (Derksen, personal communication).

Habitat

No specific details are available on habitat requirements other than that clear, clean, cool waters with plenty of submerged aquatic vegetation appear to be essential for the success of the species (Trautman 1981; Scott and Crossman 1973). They prefer quiet pools in creeks and rivers and weedy inshore areas of lakes (Scott and Crossman 1973) where the fish are usually found over bottoms of clean sand and/or gravel and quickly disappear when waters become turbid, bottoms silty and aquatic vegetation vanishes (Trautman 1981; Eddy and Underhill 1974; Smith 1979).

There is no information on preferred water temperatures, but the range is restricted to glacial pothole lakes and bays and tributary streams (Trautman 1981; Gilbert 1980). The range does not extend south of the Wisconsinian glacial maxima (Gilbert 1980) suggesting that water temperature may be an important to the success of the species.

Aquatic vegetation probably plays some role in reducing the risk of predation and is probably also a factor influencing the availability of appropriate food items. The diet consists of small Crustaceans (cladocerans, copepods and other entomostracans) and small insects (mainly Diptera) taken at the surface (Scott and Crossman 1973, Cooper 1983).

General Biology

The biology and ecology of this species have apparently not been well studied; there is very little information available on Canadian populations. The species is said to spawn in May to June in Illinois (Forbes and Richardson 1920), however Smith (1979) indicates that Forbes and Richardson were probably referring to the Weed Shiner, *Notropis texanus*, rather than the Blackchin Shiner. In Wisconsin, spawning occurs from June to August. Gravid females were collected in many samples taken through 9 August, and inspection of ovaries indicated a wide range in egg development. This suggests that spawning may extend over a period of several weeks (Becker 1983).

Blackchin Shiners are short-lived, most, in Ohio, not living past two years of age (Trautman 1981). In Ohio young-of-the year fish ranged from 18 to 36 mm by October, immatures 25 to 51 mm and adults 41-71 total length (Carlander 1969). Scott and Crossman (1973) reported that adults from Canadian waters averaged 51 to 61 mm; Stewart et al. (1985) recorded an average total length of 47.1 mm for specimens taken in Spruce Woods Provincial Park, Manitoba in 1982.

The species is considered to be a specialized feeder, due to the terminal position of the mouth (Willsman 1979 in Smith 1985), eating mostly Cladocera and flying insects (small Diptera) taken at the surface (Keast 1965; Smith 1985). There is a progression of foods from young to adult; the young fish feeding on algae and zooplankton while adults prefer larger zooplankters, water fleas and surface midges (Cooper 1983; Keast 1985). In some areas plants, including the algae *Oedogonium* and *Spirogyra*, may constitute a large part of the diet (Rimsky-Korsakoff 1930).

No information on behaviour in the wild is available, although Abrahams and Colgan (1985) have utilized the species in conducting some laboratory experiments

related to hydrodynamic benefits from schooling.

Parasites of this fish (mostly trematodes and nematodes) have been documented by Bangham and Hunter (1939), Bangham (1955) and Hoffman (1967).

Limiting Factors

As discussed previously the species appears to have a narrow range of habitat requirements and responds quickly to changes in habitat and water quality. Trautman (1981) indicated that Blackchin Shiners disappeared almost immediately from Ohio waters at locations where human or other disturbances resulted in increases in turbidity and siltation or decreased aquatic vegetation. Similar results have been noted in Illinois (Smith 1979), Iowa (Scott and Crossman 1973), and Minnesota (Eddy and Underhill 1974).

Ambient water temperature could also be a limiting factor as the species appears to favour cooler waters of glacial lakes and the headwaters of tributary streams, however no information exists on the temperature requirements of the species.

Fluctuations in water level may also be limiting. Eddy and Underhill (1974) have observed that Blackchin Shiners are abundant in Lake Itasca (Minnesota) for several years, and then rare for several years, before becoming abundant again. These fluctuations in population seem to correlate with rising and falling water levels due to differences in annual rainfall, high and stable water levels are followed by population increases (Becker 1983)

Special Significance of the Species

The Blackchin Shiner is probably an important forage species where abundant (Scott and Crossman 1973; Cooper 1983). It is apparently easily maintained in

aquaria and has been used as a laboratory species (Abrahams and Colgan 1985).

The disjunct distribution and habitat requirements are of interest to science in relation to the zoogeographic history and distribution of species subsequent to the Wisconsin Period of glaciation. Its critical habitat requirements could also make the species a useful indicator of changing water quality if the previous occurrence at a specific site were known.

Evaluation

The Blackchin shiner has a relatively wide distribution in Canada from southwestern Quebec to western Manitoba. There is insufficient information on which to determine the status of the species in Quebec, but it may be secure, at least in streams tributary to the Ottawa River which have undergone little or no disturbance since the last surveys undertaken in early 1970s. However, directed surveys are required to verify both this status and that no chemical or physical changes have occurred within the aquatic habitat.

There is no evidence that Ontario populations are in decline, although those of southwestern Ontario should be surveyed on a regular basis. Streams in this region are subject to a variety of human disturbances which could affect critical habitat resulting in demise of the resident stocks.

The species has been designated as being of special concern in Manitoba (Johnson 1987), based on earlier (prior to 1985) information indicating the presence of the species at only one location in the province, i.e., from Oak Creek, near Treesbank. During the 1980s, the species was found to occur in abundance at several other locations (Babaluk and Harbicht 1984; Stewart et al. 1985; Stewart 1988) and might exist in other suitable habitat (continued sampling has not as yet provided additional records) as well. Given that its occurrence

in Manitoba is of long standing and that it previously escaped detection for a variety of reasons, there appears to be no reason why the Blackchin Shiner should not be considered to be a naturally occurring species there.

The Blackchin shiner is of special concern in Manitoba because its distribution is mostly in agricultural areas of the Province; e.g., the small oxbow lakes along the Assiniboine River and the tributaries of Lake Dauphin. These areas are vulnerable to activities such as drainage works, channelization, damming, etc.

At the present time, there is no indication that the overall status of the species in Canada is at risk or a COSEWIC listing would be appropriate. However Manitoba populations are of special concern and more information is required on the status of the species in Quebec.

Acknowledgements

Funding for production of the report was made available through World Wildlife Fund (Canada) and the Department of Fisheries and Oceans. The author is grateful for the assistance of A. Derksen, Manitoba Department of Renewable Resources; Don E. McAllister, Canadian Museum of Nature; E.J. Crossman, Royal Ontario Museum; G. Gale, Ontario Ministry of Natural Resources and P. Hood, Quebec Ministry of Recreation, Hunting and Fishing in provision of collection records and advice, and to COSEWIC for the opportunity to present the report.

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List of Figures

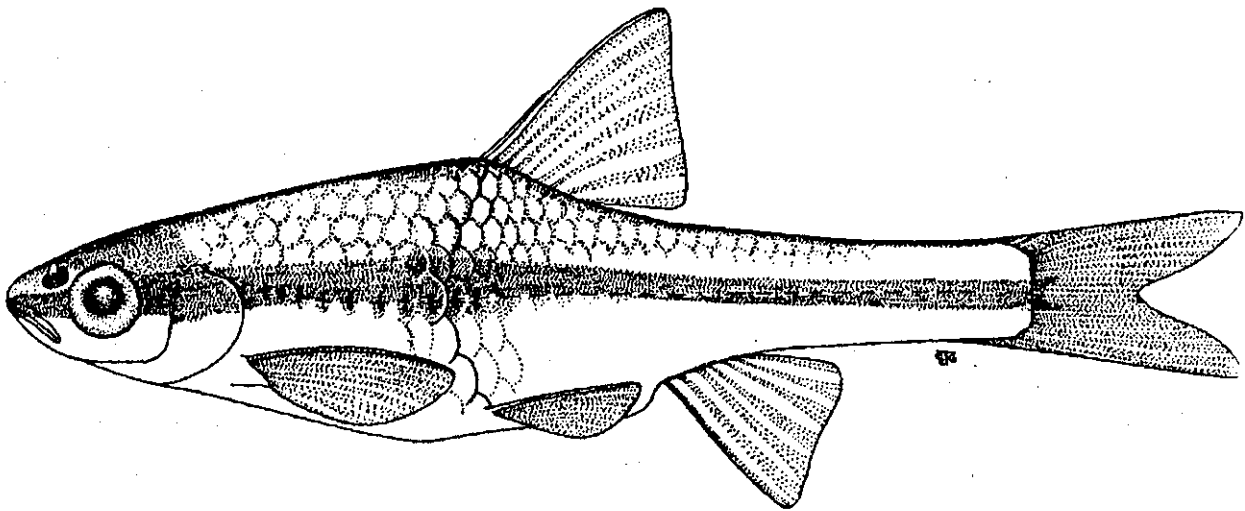
Figure 1. Blackchin Shiner, *Notropis heterodon*, [(Gravid female, 50.5 mm (C22 NMC68-0206, 21 July 1968) drawing by Sally J. Gadd, courtesy Don E. McAllister, Canadian Museum of Nature)].

Figure 2. North American range of the Blackchin Shiner (*Notropis heterodon*).
[Based on NMC, OMNR and ROM collection records and Gilbert (1980)]

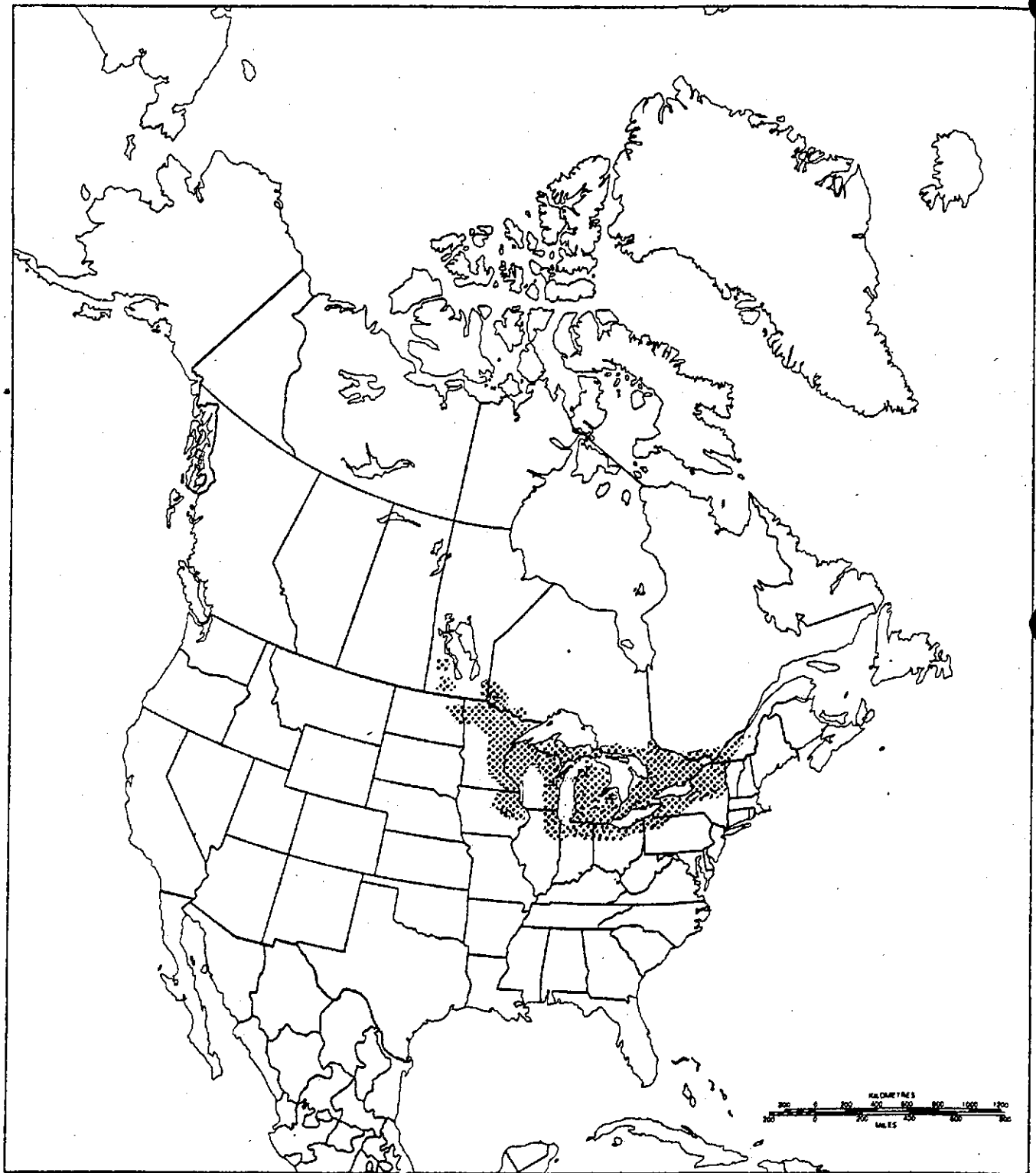
Figure 3. General distribution of collection records of *Notropis heterodon* in Quebec (from sources cited in the text).

Figure 4. General distribution of collection records of *Notropis heterodon* in Ontario (Mandrak and Crossman 1992).

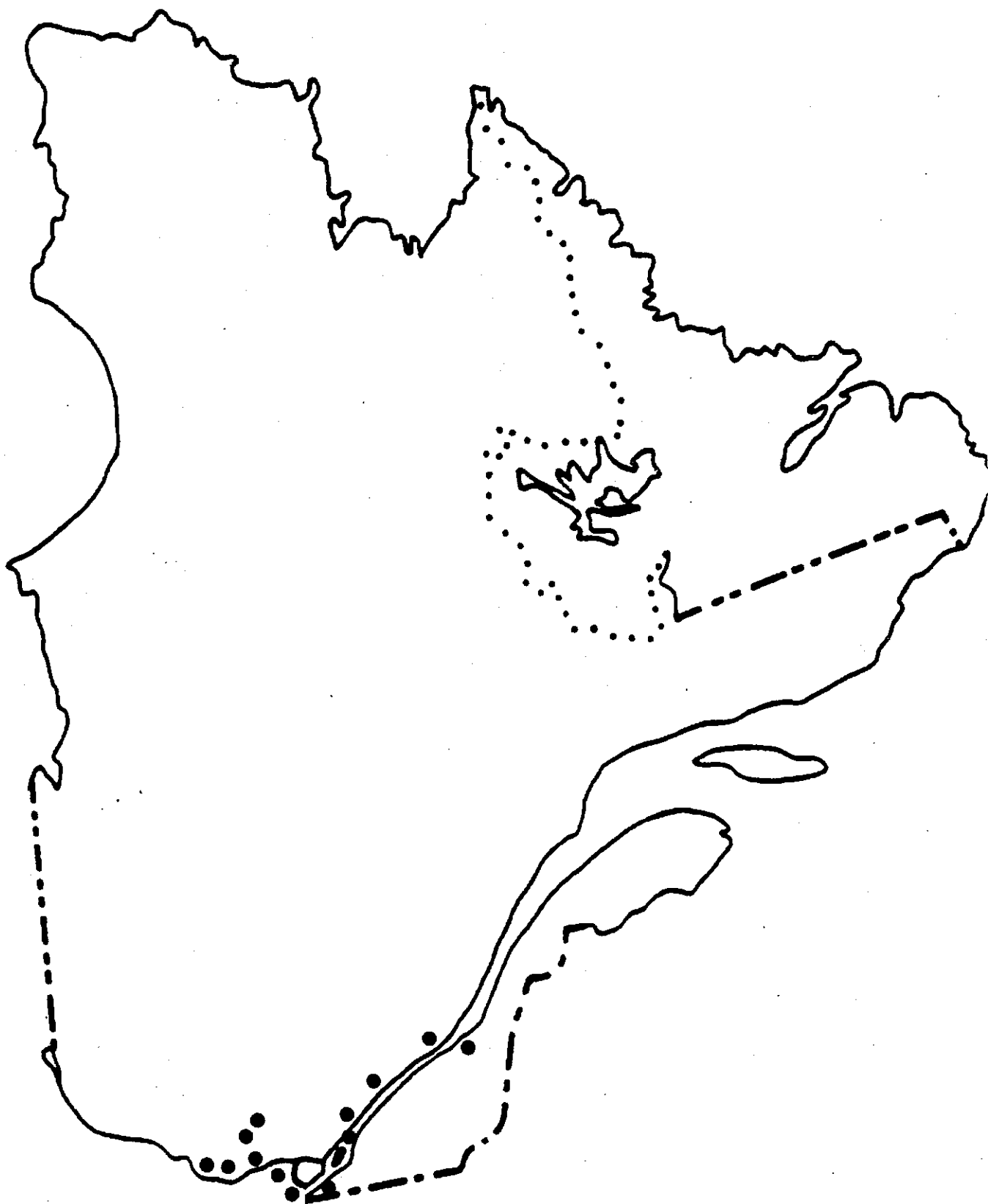
Figure 5. General distribution of collection records of *Notropis heterodon* in Manitoba (from sources cited in the text).



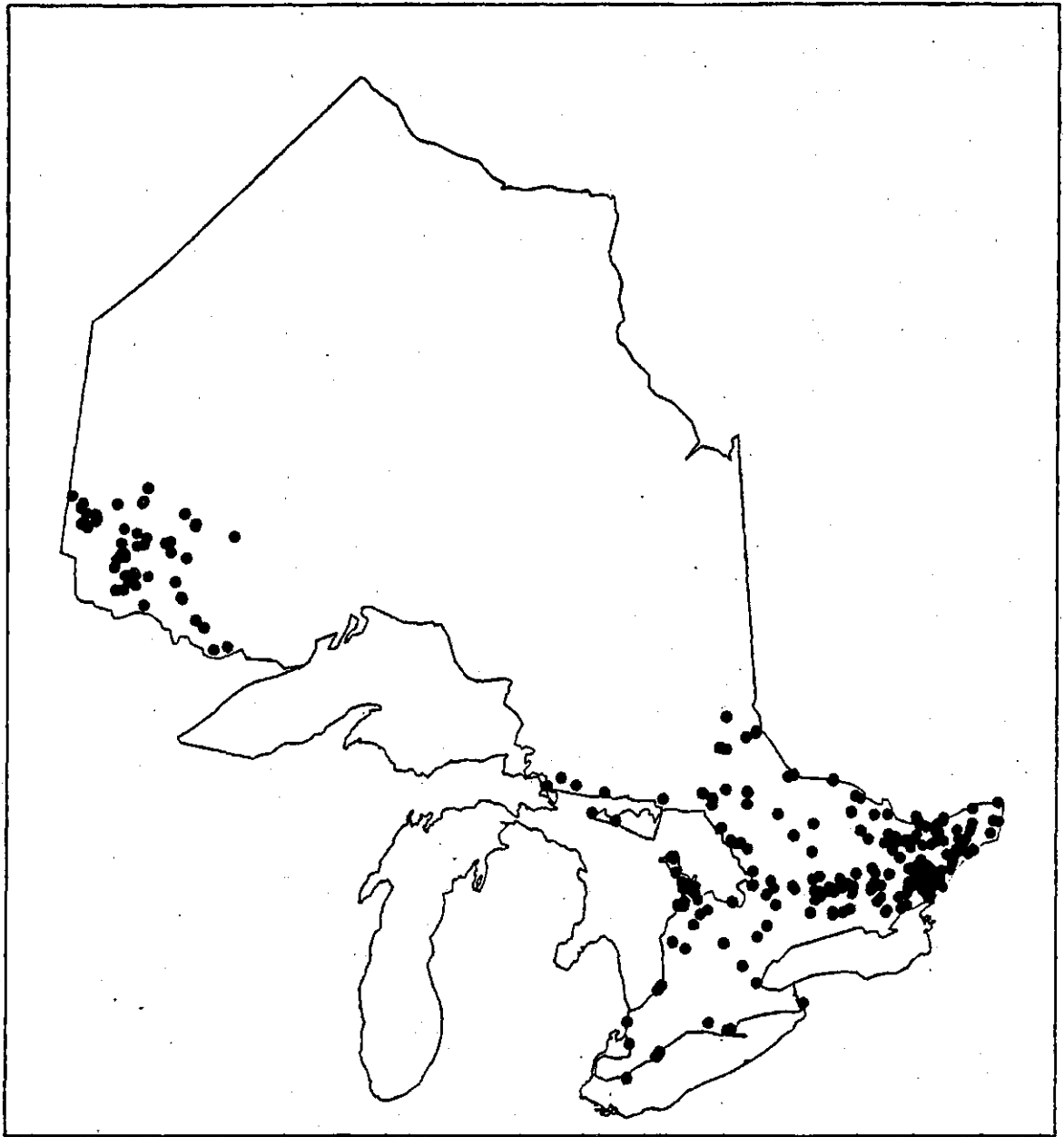
Houston
Blackchin
Fig. 1



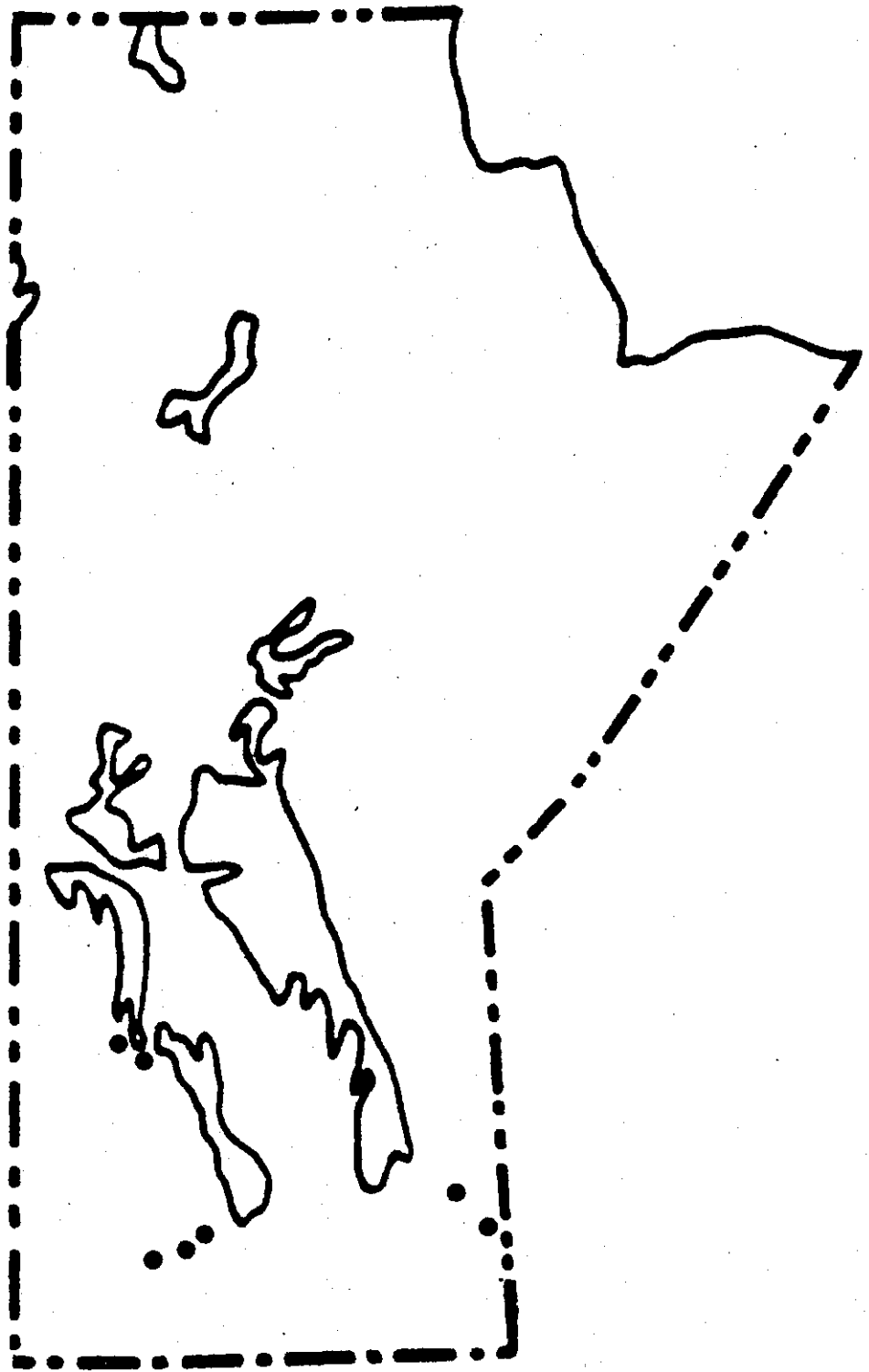
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Fig. 2



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Fig. 1



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