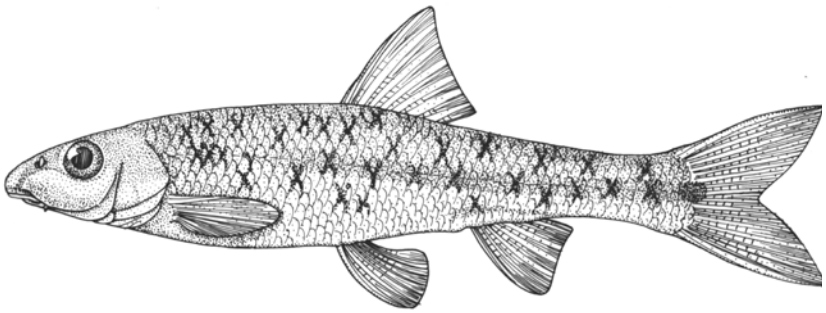
COSEWIC
Assessment and Update Status Report

on the

Gravel Chub
Erimystax x-punctatus

in Canada



EXTIRPATED
2000

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA

COSEPAC
COMITÉ SUR LA SITUATION DES
ESPÈCES EN PÉRIL
AU CANADA

COSEWIC status reports are working documents used in assigning the status of wildlife species suspected of being at risk. This report may be cited as follows:

Please note: Persons wishing to cite data in the report should refer to the report (and cite the author(s)); persons wishing to cite the COSEWIC status will refer to the assessment (and cite COSEWIC). A production note will be provided if additional information on the status report history is required.

COSEWIC 2000. COSEWIC assessment and update status report on the gravel chub *Erimystax x-punctatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 9 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

Parker, B., P. McKee and R.R. Campbell. 1987. Update COSEWIC status report on the gravel chub *Erimystax x-punctatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-9 pp.

Previous report:

Parker, B., and P. McKee. 1985. COSEWIC status report on the gravel chub *Hybopsis x-punctata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 13 pp.

Production note:

Scientific name changed from *Hybopsis x-punctata* to *Erimystax x-punctatus* based on fifth (1991) edition of American Fisheries Society List of Commmon and Scientific Names of Fishes from the United States and Canada. *Hybopsis x-punctata* is used throughout this report.

Please note that the status recommended in the Section “Evaluation and Recommended Status” of the report may differ from the latest status assigned to the species by COSEWIC.

For additional copies contact:

COSEWIC Secretariat
c/o Canadian Wildlife Service
Environment Canada
Ottawa, ON
K1A 0H3

Tel.: (819) 997-4991 / (819) 953-3215
Fax: (819) 994-3684
E-mail: COSEWIC/COSEPAC@ec.gc.ca
http://www.cosewic.gc.ca

Également disponible en français sous le titre Rapport du COSEPAC sur la situation du gravelier (*Erimystax x-punctatus*) au Canada – Mise à jour

Cover illustration:
Gravel chubb — Illustration by Susan Laurie Bourque, reproduced with permission from the Canadian Museum of Nature, Ottawa, Canada

Catalogue No. CW69-14/128-2002E-IN
ISBN 0-662-32036-0


Recycled paper

COSEWIC
Assessment Summary

Assessment Summary – May 2000

Common name
Gravel chub

Scientific name
Erimystax x-punctatus

Status
Extirpated

Reason for designation
Last reported in Canada in 1958, this species was lost in Canada due to siltation of the rivers where it had occurred.

Occurrence
Ontario

Status history
Last recorded in the Thames River drainage, Ontario in 1958. Designated Endangered in April 1985. Status re-examined and designated Extirpated in April 1987. Status re-examined and confirmed in May 2000. Last assessment based on an existing status report.

COSEWIC
Executive Summary
from the 1987 Status Report

Gravel Chub
Erimystax x-punctatus

Distribution

The gravel chub is widely distributed in east central North America but in a discontinuous fashion. In Canada, the species was only known to occur in southwestern Ontario in the Thames River drainage area.

Habitat

In North America, the gravel chub is known to occur in clear to moderately turbid streams with permanent flow. The streams typically have well-defined sand, gravel or rocky riffles, and their currents keep the bottom free of unconsolidated silts and clays. The species tend to avoid areas with macrophytes, larger algae species and aquatic moss species. In Ontario, the species once inhabited sections of the Thames River. These river sections have constant flow and are 1-3 m deep; the bottom is composed of sand, rock and stone with areas of soft organics and silt. The water is turbid here, and there is very little vegetation along the riverbanks.

General Biology

Little is known about the gravel chub's general biology. Adult specimens from Canada were 52-57 mm in length and spawning occurs in Kansas sites in early spring. The main food is probably epibenthic insects. The gravel chub is also thought to probe under rocks and into crevices with its sensitive snout.

Population Size and Trends

The gravel chub has been reported at only two Canadian sites. The original collections were composed of six specimens and nine specimens. Since these sightings, the gravel chub has not been found, either at these sites or other suitable sites in Canada. These gravel chub populations are assumed to have been localized.

Limiting Factors and Threats

The gravel chub has specific habitat needs. It is only found where there is enough current to keep the bottom silt-free and low in turbidity. These conditions limit the species' occurrence. In addition, impoundment of riffle areas is a threat to the gravel chub. It is thought that the increase in turbidity and silt and clay in the Thames River may have led to the extirpation of the gravel chub.

Existing Protection

The gravel chub is considered to be endangered in Kansas, has been recommended for endangered status in Wisconsin and has been variously listed as under legal protection in Indiana and Wisconsin. In addition, the gravel chub has been listed as special concern in Kansas, Kentucky, Minnesota and New York. The species is not protected in Canada, but has general protection under the fish habitat section of the Fisheries Act.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) determines the national status of wild species, subspecies, varieties, and nationally significant populations that are considered to be at risk in Canada. Designations are made on all native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fish, lepidopterans, molluscs, vascular plants, lichens, and mosses.

COSEWIC MEMBERSHIP

COSEWIC comprises representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biosystematic Partnership), three nonjurisdictional members and the co-chairs of the species specialist groups. The committee meets to consider status reports on candidate species.

DEFINITIONS

Species	Any indigenous species, subspecies, variety, or geographically defined population of wild fauna and flora.
Extinct (X)	A species that no longer exists.
Extirpated (XT)	A species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A species facing imminent extirpation or extinction.
Threatened (T)	A species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk (NAR)**	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)***	A species for which there is insufficient scientific information to support status designation.

* Formerly described as “Vulnerable” from 1990 to 1999, or “Rare” prior to 1990.
** Formerly described as “Not In Any Category”, or “No Designation Required.”
*** Formerly described as “Indeterminate” from 1994 to 1999 or “ISIBD” (insufficient scientific information on which to base a designation) prior to 1994.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list.

Environment Canada | Environnement Canada
Canadian Wildlife Service | Service canadien de la faune

Canada

The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.

Update
COSEWIC Status Report

on the

Gravel Chub
Erimystax x-punctatus

in Canada

B. Parker
P. McKee
R.R. Campbell

1987

TABLE OF CONTENTS

List of figures

ABSTRACT

The gravel chub, *Hybopsis x-punctata*, is extirpated in Canada. It had previously been reported only from the Thames River drainage of southern Ontario at the northeastern fringe of its North American range. The last record was in 1958 despite recent efforts to capture specimens. Siltation is the most likely factor affecting its distribution and survival. The gravel chub was not specifically protected in Canada, although general protection is afforded through the fish-habitat section of the Fisheries Act.

DISTRIBUTION

The range of the gravel chub is wide, but discontinuous in east central North America (Fig. 1). In Canada, this species was known only from the Thames River drainage of southwestern Ontario, approximately 300 km from the nearest American records in Ohio (Fig. 2). Ontario populations had been assigned to the subspecies *H. x-punctata trautmani* by Hubbs and Crowe (1956).

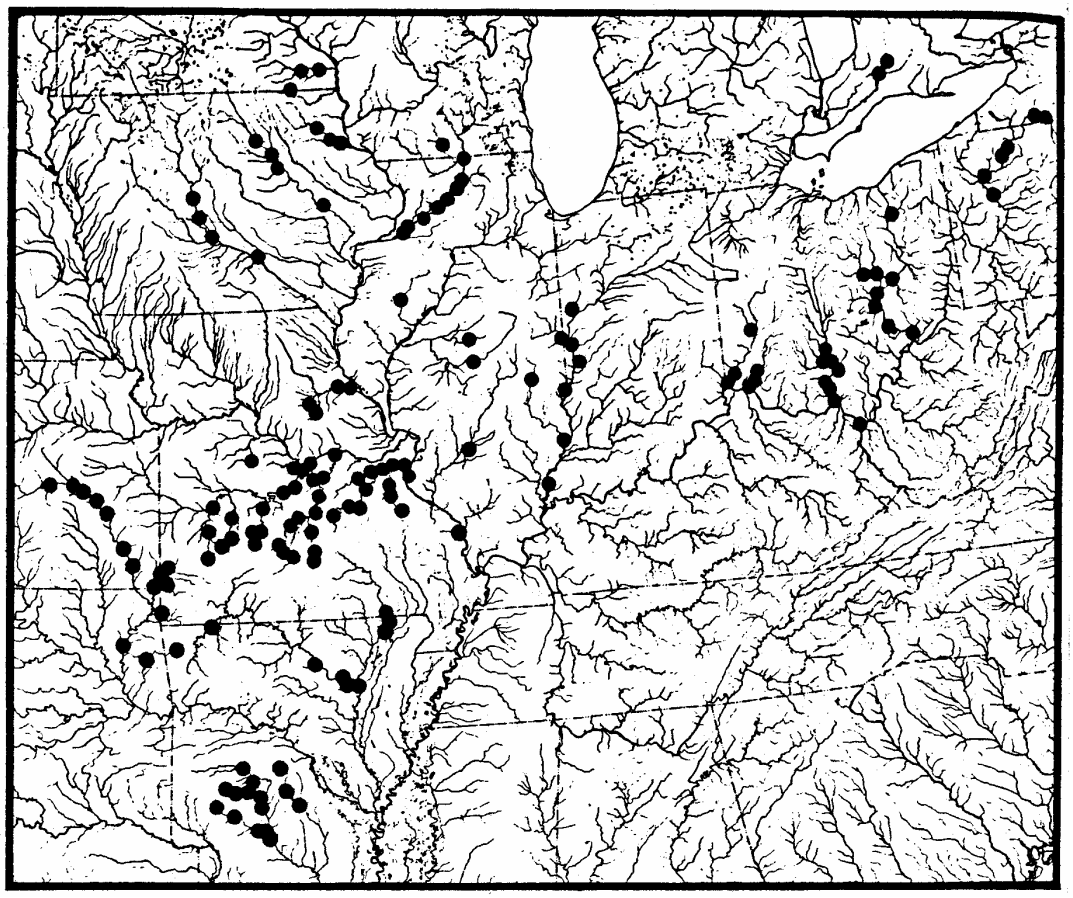


Figure 1. North American distribution of the gravel chub *Hybopsis x-punctata* (after Gilbert 1980).

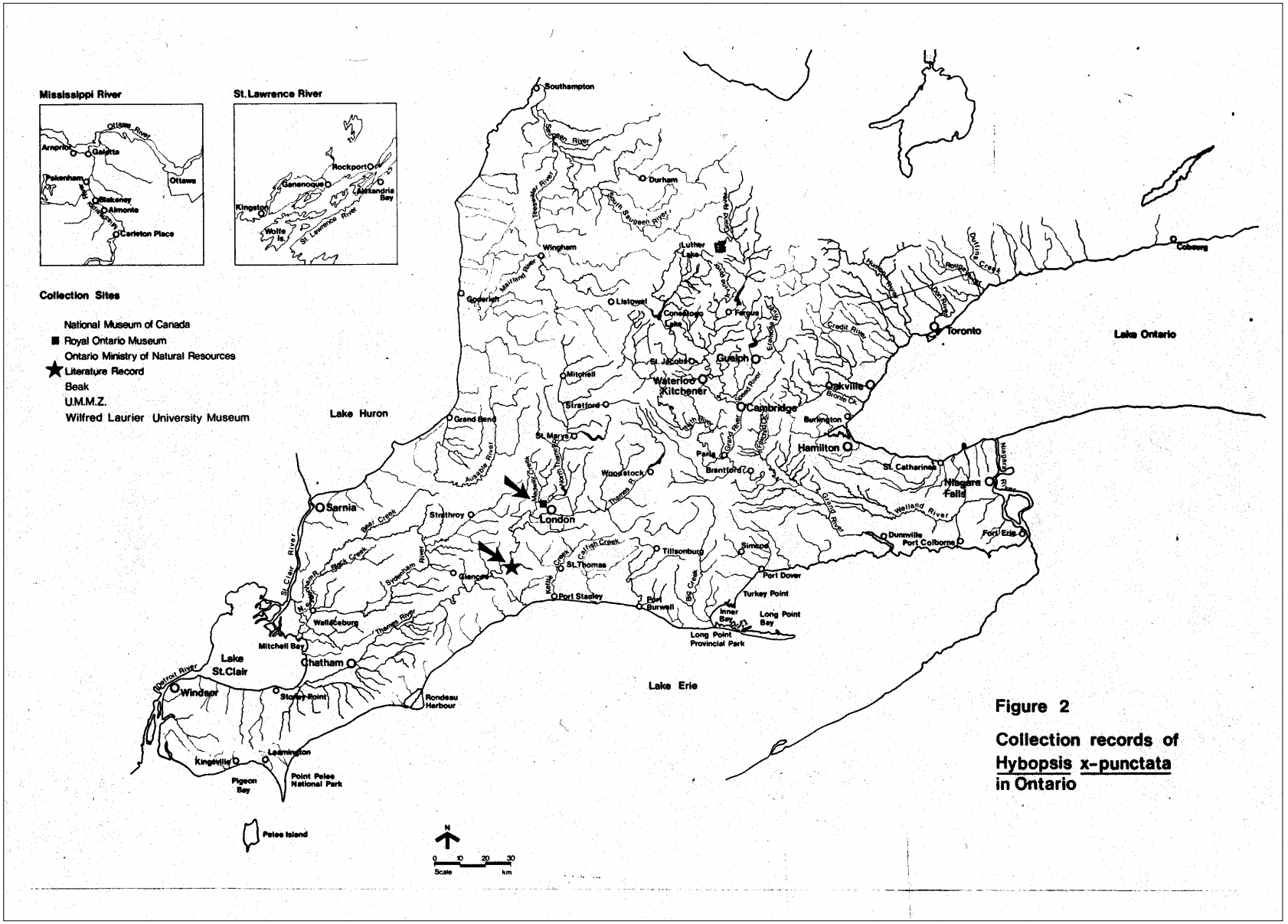


Figure 2. Collection records of *Hybopsis x-punctata* in Ontario.

PROTECTION

International

Considered to be endangered in Kansas (Platt, 1974) and has been recommended for endangered status in Wisconsin (Anonymous, 1979). Gilbert (1980) reported it as now extirpated from many localities where it was formerly found in the U.S. The species has been variously listed as under legal protection in Indiana and Wisconsin, and of special concern in Kansas, Kentucky, Minnesota and New York (Becker 1983, Johnson 1985).

National

Not protected in Canada, although fish habitat sections of the Fisheries Act afford general protection. The species was listed as endangered in 1985 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) based on a report by Parker and McKee (1981).

POPULATION SIZE AND TRENDS

The gravel chub has been reported at only two localities in Canada. The earliest collection was of six specimens seined from the Thames River at the Muncey Indian Reserve, in 1923 by D.E.S. Brown of the University of Michigan Museum of Zoology (Holm and Crossman 1986). Collections by Dymond and Harkness in 1941 for the Royal Ontario Museum (ROM), at or near the same site recorded no specimens of this species. One A.H. McIntyre (possibly a commercial fisherman) took nine individuals of the species in 1958 from a site southwest of the Moravian Indian Reserve at Muncey (Holm and Crossman 1986). Six of his specimens have been catalogued as ROM 20018.

Attempts to collect this species in the early 1970's by the National Museum of Natural Sciences (NMNS), ROM and the Ontario Ministry of Natural Resources (OMNR) were unsuccessful as were the efforts of B. Parker and P. McKee in 1971-80 (Parker and McKee, 1980). The scarcity of collected material indicates that populations were localized. Parker and McKee (1980, 1981) suggested that the failure of recent attempts specifically directed to locating specimens at previously known sites left the continued existence of Canadian populations in doubt (Scott and Crossman, 1973). McAllister and Gruchy (1977) listed the gravel chub as endangered in Canada and this listing was confirmed by COSEWIC in 1985.

Because of the doubt concerning the continued existence of the species two field trips were undertaken by the ROM 22-26 July and 20-23 October, 1985, specifically to sample sites at or near previously known sites. In addition other suitable habitats along a 17 km stretch of the Thames above and below the previous sites were sampled by seining and/or electrofishing (see Holm and Crossman 1986). No *H. x-punctata* specimens were found in the 1985 collections.

HABITAT

In Ontario, the gravel chub inhabited sections of the Thames River. Present conditions at capture sites are as follows. The river has a constant flow, is 20-30 m in width and 1-3 m in depth with pool and riffle habitats predominating. Substrate material is composed of sand, rock and stone with areas of soft organics and silt. The water is quite turbid [Secchi disc reading less than 1 m (Parker and McKee 1980, Holm and Crossman 1986)] because of siltation. Bank cover is minimal and instream vegetation is restricted to encrusting and filamentous algae. Water temperatures ranged from 18 to 25°C in July (Holm and Crossman 1986), 21 to 24°C in August (Parker and McKee 1981) and 12 to 15°C in October (Holm and Crossman 1986).

Elsewhere in North America, gravel chub have been reported as inhabiting clear to moderately turbid streams with permanent flow and well-defined sand, gravel or rocky riffles where the current keeps the river bottom free of unconsolidated silts and clays (Pflieger 1957, Trautman 1981). Trautman (1981) reported that the species avoided areas with macrophytes, larger species of algae and aquatic mosses. Presumably these areas would show silt accumulation. Moore and Paden (1950) described the preferred micro-habitat of the gravel chub as small cavities beneath rocks in riffle areas where the current is reduced.

GENERAL BIOLOGY

Nothing is known of the biology of gravel chub in Canada and little has been reported on this species for American populations (see Becker 1983). Specimens from the North Thames River were 52-57 mm long and based on data for specimens from Ohio (Trautman, 1981) it is probable that the Ontario specimens were adults. Spawning is reported to occur in early spring on swift gravelly riffles in Kansas (Cross, 1967). Food probably consists of epibenthic insects (Parker and McKee, 1980). Davis and Miller (1967) found that taste buds on the gravel chub's barbels were extremely large suggesting that this species feeds by probing under rocks and into crevices with its sensitive snout.

LIMITING FACTORS

The habitat requirements of the species are narrow and populations are confined to areas where there is sufficient current to keep the bottom free of silt (see Becker 1983). The species is susceptible to turbidity and siltation (Becker 1983). Increased siltation was associated with the extirpation of this species in many parts of Ohio (Trautman 1981) and Wisconsin (Becker 1983). Impoundment of riffle areas is also a threat to the species (Becker 1983).

Similar habitat changes in the Thames River drainage may have caused extirpation of the gravel chub in Canada. Brown in his 1923 collections described the Thames River

as clear, with a fast current at his capture sites (Holm and Crossman 1986). He described the bottom as sand and gravel with capture depths of up to 5 feet. The 1985 collections of the ROM suggest a shift in environmental conditions adverse to the species as silt and clay was in evidence at all sites and the water was quite turbid (Holm and Crossman 1986). Holm and Crossman (1986) also found an increase in the abundance of species such as the spotfin shiner (*Notropis spilopterus*), known for their tolerance to turbidity (Trautman 1981). In addition less tolerant species such as the mimic shiner (*Notropis volucellus*) and the eastern sand darter (*Ammocrypta pellucida*) were absent or in reduced abundance from previous collections (Holm and Crossman 1986).

SPECIAL SIGNIFICANCE OF THE SPECIES

The Ontario populations were the only representation of this species in Canada and the only evidence for the existence of this species in waters of the Great Lakes Basin. Scott and Crossman (1973) suggest that the greatest importance of this species to man may be as an indicator of pollution due to its sensitivity to siltation. Smith (1985) indicated that the species was a good indication of water quality.

EVALUATION

The following factors were used in the evaluation of the status of the gravel chub in Canada:

1. Populations of this species have only been reported from the Thames River drainage in Canada, the last specimens having been caught in 1958 despite recent attempts at capture.

2. There is no recent evidence of reproducing populations in Canada.

3. The gravel chub was at the northeastern fringe of its range in Canada. Canadian populations provided the only evidence for the existence of the species in the Great Lakes Basin.

4. This species is particularly sensitive to environmental deterioration in the form of siltation and is important to man as a pollution indicator. The high turbidity and abundant silt found at collection sites in recent years suggests that the substrate of the Thames is heavily silted and less suitable now for a number of species.

5. *H. x-punctata* was probably never abundant in the Thames and has not been collected since 1958 despite the considerable efforts expended to locate the species.

Based on the information available it is apparent that the gravel chub is now extirpated in Canada.

ACKNOWLEDGEMENTS

This paper is the result of the efforts of many dedicated individuals and much has been extracted from the field work and discussion of the species in Parker and McKee (1980) and Holm and Crossman (1986). Parker and McKee's efforts were funded through the National Museum of Natural Sciences, the Department of Fisheries and Oceans and Supply and Services Canada. The 1985 surveys of the ROM were funded by the Ontario Ministry of Natural Resources.

REFERENCES

Anonymous. 1979. Wisconsin ups its protection of native animals and plants. Endangered Species Technical Bull. 4(1): 7-12.

Becker, G.C. 1983. Fishes of Wisconsin. Univ. Wisconsin Press; Madison, Wis. xii + 1052 p.

Cross, F.B. 1967. Handbook of fishes of Kansas. Univ. Kans. Mus. Nat. Hist., Misc. Public. 45: 1-357.

Davis, B.J., and R.J. Miller. 1967. Brain patterns in minnows of the genus *Hybopsis* in relation to feeding habits and habitat. Copeia, 1967 (1): 1-39.

Gilbert, C.R. 1980. Gravel Chub, *Hybopsis x-punctata*, In: Atlas of North American Freshwater Fishes (D.S. Lee *et al*. Eds.). North Carolina Biol. Survey Publ. No. 1980-12: 196.

Holm, E. and E.J. Crossman. 1986. Report on the search for an Ontario population of *H. x-punctata* and on a search for the species. ROM Rep. to OMNR, Toronto, March 1986.

Hubbs, C.L. and W.R. Crowe. 1956. Preliminary analysis of the American cyprinid fishes, seven new, referred to the genus *Hybopsis*, subgenus *Erimystax*, Occas. Pap. Mus. Zool. Univ. Mich. No. 578.

Johnson. J.E. 1985. Protected fishes of the United States and Canada. Unpubl. MS, 26 p.

McAllister, D.E. and C.G. Gruchy. 1977. Status and habitat of Canadian fishes in 1976. In: Canada's threatened species and habitats (T. Mosquin and C. Suchal Eds.). Can. Nature Fed. Spec. Publ. No. 6: 151-157.

Moore, G.A. and J.M. Paden. 1950. The fishes of the Illinois River in Oklahoma and Arkansas. Am. Midl. Nat. 44 (1): 83 p.

Parker, B. and P. McKee. 1980. Rare, threatened and endangered fishes in southern Ontario: Status reports. A report for the Department of Supply and Services, Department of Fisheries and Oceans, and National Museum of Natural Sciences. Beak Consultants Ltd., Mississauga.

Parker, B. and P. McKee. 1981. Status of the gravel chub *Hybopsis x-punctata*, in Canada. Unpubl. COSEWIC Status Rep. CWS Ottawa.

Pflieger, W.L. 1975. The Fishes of Missouri. Missouri. Dept. of Conserv., Jefferson City, Mo.

Platt, D.R. 1974. Rare, endangered and extirpated species in Kansas. Trans. Kansas Acad. Sci. 76: 97-106.

Scott, W.B., and E.J. Crossman. 1973. Freshwater fishes of Canada. Fish. Res. Bd. Canada Bull. 184.
Smith, C.L. 1985. The inland fishes of New York State. New York Dept. Environ. Conserv., Albany, N.Y. 572 p.
Trautman, M.B. 1981. The fishes of Ohio with illustrated keys. Ohio State Univ. Press, Columbus, Ohio.