COSEWIC
Rapid Review of Classification

on the

Gravel Chub
Erimystax x-punctatus

in Canada

EXTIRPATED
2019

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada

COSEPAC
Comité sur la situation
des espèces en péril
au Canada

The Rapid Review of Classification process is used by COSEWIC for Wildlife Species that have not changed status since the previous COSEWIC assessment. Readily available information from the previous status report or status appraisal summary, recovery documents, recovery teams, jurisdictions, conservation data centres, and species experts was initially reviewed by the relevant Species Specialist Subcommittees before being reviewed by COSEWIC. The following is a summary of the relevant information.

COSEWIC Rapid Review of Classification are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

COSEWIC. 2019. COSEWIC Rapid Review of Classification on the Gravel Chub *Erimystax x-punctatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html).

Production note:
COSEWIC acknowledges Pete Cott for writing the rapid review of classification on the Gravel Chub, *Erimystax x-punctatus*, in Canada, prepared under contract with Environment and Climate Change Canada. This rapid review of classification was overseen and edited by Nicholas Mandrak, Co-chair of the COSEWIC Freshwater Fishes Specialist Subcommittee.

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Également disponible en français sous le titre Examen rapide de la classification du COSEPAC sur le Gravelier *Erimystax x-punctatus*) au Canada.

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COSEWIC
Assessment Summary

Assessment Summary – May 2019

Common name
Gravel Chub

Scientific name
Erimystax x-punctatus

Status
Extirpated

Reason for designation
The historical Canadian range of this small minnow was originally a single watershed in southern Ontario. The most recent record for this species was in 1958 despite extensive, repeated sampling at known sites and other areas of suitable habitat over the last 60 years. Natural recolonization by the species is not possible because there are no adjacent populations in the Great Lakes watershed.

Occurrence
Ontario

Status history
Last recorded in 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, April 2008, and May 2019.

COSEWIC
Rapid Review of Classification

PREVIEW

Gravel Chub (*Erimystax x-punctatus*) is a small stream-dwelling cyprinid. This species is extirpated in Canada, with the last observations of Gravel Chub in the wild being in 1958. Despite substantial targeted sampling over the past six decades, no additional captures have been made. The EOO and IAO for this species each remain at 0 km^2.

Most recently, the Ontario Ministry of Natural Resources and Forestry (OMNRF) Lake Erie Management Unit initiated a gear-comparison study in the Thames River to determine the best gears to sample the small-bodied fish community. They used small-mesh gill nets, Siamese benthic trawls, and boat electrofishing. The Thames River was extensively sampled, including the areas where Gravel Chub was last known to occur. Despite this effort, as of September 2018, no Gravel Chub had been encountered (Thorn pers. comm. 2018). Additionally, DFO has conducted extensive small-bodied fish sampling in the Lower Thames River since the last assessment but not at, or near, the area where Gravel Chub was last observed. No Gravel Chub were captured during these surveys (Barnucz pers. comm. 2018; Drake pers. comm. 2018). DFO believes that targeted trawling surveys around Muncey (last known occurrence of this species) would be useful to confirm that Gravel Chub is extirpated (Barnucz pers. comm. 2018).

This species was listed as “Schedule 1 – Extirpated” under the *Species at Risk Act* (SARA) in 2003. No changes to the effective protection of Gravel Chub under SARA have occurred since the last assessment. The *Fisheries Act* was revised in 2012, with a change from protecting fishes and fish habitat for all fishes, to just those fishes supporting commercial, Aboriginal, and recreational (CAR) fisheries. If Gravel Chub was present in Canada today, it would not be part of a CAR fishery. In 2008, changes to the Ontario Fishery Regulations increased protection to Gravel Chub by removing species at risk fishes from the list of eligible baitfish species (DFO 2016).

A recovery strategy for Gravel Chub has been published (Edwards *et al.* 2007). The goal of the recovery strategy is to search for Gravel Chub, while improving habitat within the Thames River to be more suitable for the species, and considering reintroduction. With considerable effort in environmental stewardship, restoration, and public-education initiatives, progress has been made in improving the habitat of Gravel Chub. Water quality has improved with positive effects on instream biota (DFO 2016).

Updated map: □ Required x Not required

Explanation / updated map provided:

Not required.

Gravel Chub is extirpated from Canada. It was known from only two sites in the Thames River in southwestern Ontario. It was last observed 60 years ago and, despite extensive survey efforts every decade since then, no Gravel Chub has been captured. Gravel Chub is a searchable species in the Ontario Natural Heritage Information Centre database of the Ontario Ministry of Natural Resources and Forestry, in which there are no records since 1958.

TECHNICAL SUMMARY

Erimystax x-punctatus

Gravel Chub

Gravelier

Range of occurrence in Canada (province/territory/ocean): Ontario (Thames River)

Demographic Information

Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines(2011) is being used)	2-3 y (estimated)
Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	n/a
Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations]	n/a
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations].	n/a
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations].	n/a
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [10 years, or 3 generations] period, over a time period including both the past and the future.	n/a
Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	a. unknown b. no c. unknown
Are there extreme fluctuations in number of mature individuals?	no

Extent and Occupancy Information

Estimated extent of occurrence (EOO)	0 km²
Index of area of occupancy (IAO) (Always report 2x2 grid value).	0 km²
Is the population “severely fragmented” i.e., is >50% of its total area of occupancy in habitat patches that are (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	a. n/a b. n/a

Number of “locations”* (use plausible range to reflect uncertainty if appropriate)	0
Is there an [observed, inferred, or projected] decline in extent of occurrence?	n/a
Is there an [observed, inferred, or projected] decline in index of area of occupancy?	n/a
Is there an [observed, inferred, or projected] decline in number of subpopulations?	n/a
Is there an [observed, inferred, or projected] decline in number of “locations”*?	no
Is there an [observed, inferred, or projected] decline in [area, extent and/or quality] of habitat?	no Water quality has improved.
Are there extreme fluctuations in number of subpopulations?	n/a
Are there extreme fluctuations in number of “locations”*?	n/a
Are there extreme fluctuations in extent of occurrence?	n/a
Are there extreme fluctuations in index of area of occupancy?	n/a

Number of Mature Individuals (in each subpopulation)

Subpopulations (give plausible ranges)	N Mature Individuals
Total	0

Quantitative Analysis

Is the probability of extinction in the wild at least [20% within 20 years or 5 generations, or 10% within 100 years]?	n/a

Threats (direct, from highest impact to least, as per IUCN Threats Calculator)

Was a threats calculator completed for this species? No

Turbidity and sedimentation as a result of watershed land uses, primarily agriculture, are suspected to have been the greatest threat to Gravel Chub. Restoration and environmental stewardship activities are underway and have improved habitat, particularly water quality. Protection has been given to species at risk in baitfish fisheries. Education programs have been initiated to help limit the accidental capture of species at risk during baitfish harvest (DFO 2016).

What additional limiting factors are relevant? n/a

* See Definitions and Abbreviations on COSEWIC website and IUCN (Feb 2014) for more information on this term

Rescue Effect (immigration from outside Canada)

Status of outside population(s) most likely to provide immigrants to Canada. Note that in Great Lakes states in which it is not imperiled, it only occurs outside of the Great Lakes basin.	PA: S1 (critically imperilled) OH: S4 (apparently secure) NY: (possibly extirpated)
Is immigration known or possible?	no
Would immigrants be adapted to survive in Canada?	unknown
Is there sufficient habitat for immigrants in Canada?	unknown
Are conditions deteriorating in Canada?+	unknown
Are conditions for the source (i.e., outside) population deteriorating?+	unknown
Is the Canadian population considered to be a sink?+	unknown
Is rescue from outside populations likely?	no

Data Sensitive Species

Is this a data-sensitive species?	no

Status History

COSEWIC: Last recorded in 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, April 2008, and May 2019.

Status and Reasons for Designation:

Status: Extirpated	**Alpha-numeric codes:** Not applicable
Reasons for designation: The historical Canadian range of this small minnow was originally a single watershed in southern Ontario. The most recent record for this species was in 1958 despite extensive, repeated sampling at known sites and other areas of suitable habitat over the last 60 years. Natural recolonization by the species is not possible because there are no adjacent populations in the Great Lakes watershed.	

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Not applicable.
Criterion B (Small Distribution Range and Decline or Fluctuation): Not applicable.
Criterion C (Small and Declining Number of Mature Individuals): Not applicable.
Criterion D (Very Small or Restricted Population): Not applicable.
Criterion E (Quantitative Analysis): Not applicable.

+ See Table 3 (Guidelines for modifying status assessment based on rescue effect)

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WRITER OF RROC

Pete Cott is a biologist based in Yellowknife NWT, and is a member of the Freshwater Fishes Specialist Subcommittee for COSEWIC. His PhD research focused on the reproductive ecology of Burbot.

COSEWIC HISTORY

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. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS (2019)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* 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. Definition of the (DD) category revised in 2006.

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