Ontario Species at Risk Evaluation Report for

Paddlefish

Spatulaire

(Polyodon spathula)

Committee on the Status of Species at Risk in Ontario
(COSSARO)

Assessed by COSSARO as Extirpated

November 2020

Spatulaire *(Polyodon spathula)*

Le spatulaire est une ancienne espèce apparentée à l'esturgeon. Il se distingue par une large bouche dépourvue de dents et un museau (un rostre) en forme de spatule. Le spatulaire se nourrit principalement de zooplancton, de petits invertébrés et de larves d'insectes en utilisant ses longs arcs branchiaux pour filtrer les aliments contenus dans l'eau.

Le spatulaire se rencontre dans tout le réseau hydrographique du fleuve Mississippi, depuis le Montana jusqu'à la Louisiane, auquel s'ajoutent quelques rivières moins importantes qui se jettent dans le golfe du Mexique. Ce poisson n'a jamais été commun dans la région des Grands Lacs et n'a fait l'objet que de quatre observations dans la portion canadienne de son aire de répartition.

Ce poisson migre sur de longues distances, et il est possible que ces premières observations soient celles d'individus ayant pu se frayer un chemin vers les Grands Lacs par des embranchements naturels ou après la construction du canal de Chicago. Il n'existe toutefois aucune preuve tangible étayant cette récente dispersion, et l'espèce est considérée comme indigène dans les Grands Lacs.

Le spatulaire a disparu au moment où de nombreux poissons ont connu un déclin dans les Grands Lacs en raison de la pêche excessive, de la construction de barrages et de la dégradation des habitats de frai. L'espèce n'a pas été vue dans les eaux canadiennes depuis le début des années 1900, malgré un échantillonnage exhaustif et le fait qu'il s'agit d'un gros poisson très facile à reconnaître. Il est considéré comme disparu de l'Ontario et du bassin des Grands Lacs.

Cette publication hautement spécialisée «COSSARO Candidate Species at Risk Evaluation for Paddlefish» *n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère l'Environnement, de la Protection de la nature et des Parcs au cossarosecretariat@ontario.ca.*

Executive summary

Paddlefish (*Polyodon spathula*) is an ancient species related to sturgeon. It has a long, very distinctive paddle-like snout and a large, toothless mouth. Paddlefish primarily feed on zooplankton, small invertebrates and insect larvae by using their long gill rakers to filter food from the water.

Paddlefish occurs throughout the Mississippi River system from Montana to Louisiana, and some smaller rivers draining into the Gulf of Mexico. This fish was never common in the Great Lakes and there are only four records for the Canadian portion of its range.

This fish is a long-distance migrant, and it is possible that these early records represent individuals that were able to enter the Great Lakes through natural connections, or after the construction of the Chicago canal. However, there is no clear evidence to support these recent dispersal event and the species is considered native to the Great Lakes.

Paddlefish disappeared at a time when many fishes were declining in the Great Lakes due to overfishing, dam construction and degradation of spawning habitats. The species has not been observed in Canadian waters since the early 1900s despite extensive sampling and being a large distinctive fish that is easily recognizable. It is Extirpated from Ontario and from the Great Lakes basin.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Paddlefish is a distinct and valid species (COSEWIC, 2019).

1.1.2. Designatable units

Not applicable. However, if the Paddlefish was still extant in the Great Lakes it would be separated from the population in the Mississippi River watershed and may be considered a separate designatable unit.

1.1.3. Native status

Paddlefish is considered native to the Great Lakes including Ontario (COSEWIC, 2019).

1.1.4. Occurrence

Paddlefish is extirpated from Ontario. It once occurred in the Great Lakes, but the last records are from over a century ago. There are four historical records from Ontario (Halkett, 1913):

- Lake Huron (St. Clair River and Spanish River), Halkett (1913) also reports “Old fisherman near Point Edward on the Lambton country shore vaguely refer to other specimens occurring in Lake Huron”
- Lake Erie (open waters, also records from US)
- Lake Superior (Nipigon River)

Halkett (1913) also includes a report from Lake Ontario but there are no details on this record or its location.

The full historical range and abundance of the Paddlefish in Ontario and the Great Lakes is unknown. It appears to have been rare (Nash, 1908) or exceedingly rare (Halkett, 1913). It was reported as rare in the US portion of Lake Erie in the 1920s (United States Bureau of Fisheries, 1928).

This fish is a long-distance migrant, and it is possible that these early records represent individuals that were able to enter the Great Lakes through natural connections, or after the construction of the Chicago canal. However, there is no clear evidence to support these recent dispersal event and the species is considered native to the Great Lakes.

1.2. Eligibility results

Paddlefish (*Polyodon spathula*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G4 (NatureServe 2012)
- IUCN: Vulnerable (A3de) (2004)
- NRANK Canada: NX
- COSEWIC: Extirpated (May 2019)
- SARA: Extirpated (Schedule 1)
- ESA 2007: Extirpated (2007)
- SRANK: SX

2.2. Distribution in Ontario

The full historic range of Paddlefish is unknown. It formerly occurred in local areas of Lake Superior and Huron. It may have been more widespread in Lake Erie based on US reports. Halkett (1913) also includes a report from Lake Ontario but there are no details on this record or its location.

2.3. Distribution, status and the broader biologically relevant geographic range outside Ontario

Paddlefish occurs throughout the Mississippi River system from Montana to Louisiana, and some smaller rivers draining into the Gulf of Mexico.

It is assessed as Vulnerable on the IUCN Red List because of decline in the US (Grady, 2019). The population of Paddlefish that occurred in Ontario was restricted to the Great Lakes watershed and was not connected to the much larger population in the Mississippi. It is considered extirpated from the Great Lakes by all adjacent jurisdictions (Table 1). It is listed as Threatened in Ohio, Minnesota and Wisconsin (this only pertains to the Mississippi subpopulation).

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
Quebec	n/a	-	Does not occur
Manitoba	n/a	-	Does not occur
Michigan	n/a	SX	
Minnesota	n/a	S2	State listed as Threatened (Minnesota Department of Natural Resources, 2020)
Nunavut	n/a	-	Does not occur
New York	n/a	SX	Reintroduced*
Ohio	n/a	S2	State listed as Threatened (Ohio Department of Natural Resources, 2020)
Pennsylvania	n/a	SX	Reintroduced*
Wisconsin	n/a	S2	State listed as Threatened (Wisconsin Department of Natural Resources, 2020)
Other	n/a		

*Reintroduced to Allegheny Reservoir (Ohio River) (Budnik et al., 2014) but the population may not be self-sustaining (Argent et al., 2016).
Paddlefish does not occur in the Great Lakes basin in any adjacent jurisdictions.

2.4. Ontario conservation responsibility

Ontario's conservation responsibility for the species based on historic range is less than one percent. However, if the Great Lakes subpopulation was considered as a separate designatable unit, which is justified based on major watershed divided, Ontario's responsibility would be much greater.

2.5. Direct threats

Paddlefish disappeared at a time when many fishes were declining in the Great Lakes due to overfishing, dam construction and degradation of spawning habitats.

2.6. Specialized life history or habitat use characteristics

Paddlefish have three characteristics that increase their vulnerability:

- Paddlefish are long-lived and late in sexual maturation. Females may not breed until they reach at least ten years, and do not spawn every year.
- Paddlefish spawn in rivers and migrate long distances to spawning habitats.
- Paddlefish primarily feed on zooplankton, small invertebrates and insect larvae which are vulnerable to changes in water quality.

3. Ontario status assessment

3.1. Application of endangered/threatened status in Ontario

3.1.1. Criterion A – Decline in total number of mature individuals

Does not apply.

3.1.2. Criterion B – Small distribution range and decline or fluctuation

Does not apply.

3.1.3. Criterion C – Small and declining number of mature individuals

Does not apply.

3.1.4. Criterion D – Very small or restricted total population

Does not apply.

3.1.5. Criterion E – Quantitative analysis

Does not apply.

3.2. Application of Special Concern in Ontario

Not applicable.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Not applicable.

3.3.2. Status modification based on rescue effect or level of risk in broader biologically relevant geographic range

Not applicable.

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

3.4.2. Extinct or extirpated

Paddlefish have not been observed in Canadian waters since the early 1900s despite extensive sampling and being a large distinctive fish that is easily recognizable. It is considered extirpated from Ontario and from the Great Lakes basin.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

Paddlefish (*Polyodon spathula*) is classified as Extirpated in Ontario because it has not been observed in Canadian waters since the early 1900s.

This status of this species is consistent with the definition of extirpated under the Endangered Species Act, 2007.

5. Information sources

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Appendix 1: Technical summary for Ontario

Species: Paddlefish (*Polyodon spathula*)

Demographic information

Demographic attribute	Value
Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years.	16 years (males) 26 years (females)
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Not applicable
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Not applicable
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	Not applicable
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Not applicable
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over any 10 years, or 3 generations, over a time period including both the past and the future.	Not applicable
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?	Not applicable

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO). *If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.*	0 km^2
Index of area of occupancy (IAO). *If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.*	0 km^2
Is the total population severely fragmented? i.e., is >50% of its total area of occupancy is in habitat patches that are: (a) smaller than would be required to support a viable population, and	a. Not applicable b. Not applicable

Extent and occupancy attributes	Value
(b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	
Number of locations. *See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.*	0
Number of NHIC Element Occurrences *Request data from MNRF.*	0
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Not applicable
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Not applicable
Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?	Not applicable
Is there an observed, inferred, or projected continuing decline in number of locations?	Not applicable
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Not applicable
Are there extreme fluctuations in number of populations?	Not applicable
Are there extreme fluctuations in number of locations?	Not applicable
Are there extreme fluctuations in extent of occurrence?	Not applicable
Are there extreme fluctuations in index of area of occupancy?	Not applicable

Number of mature individuals in each sub-population or total population (if known)

Sub-population (or total population)	Number of mature individuals
Great Lakes	*0*

Quantitative analysis (population viability analysis conducted)

Not applicable.

Threats

Not applicable.

Rescue effect

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes
Status of outside population(s) most likely to provide immigrants to Ontario	Vulnerable globally, but rearing and stocking has been done in the US (Mississippi basin) portion of its range.
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	No. Extirpated from the Great Lakes.
Would immigrants be adapted to survive in Ontario?	Possibly
Is there sufficient suitable habitat for immigrants in Ontario?	Possibly
Are conditions deteriorating in Ontario?	Possibly. As a pelagic planktontivore Paddlefish may be negatively impacted by the decline in the pelagic productivity of the Great Lakes as a result of dreissenid mussels.
Is the species of conservation concern in bordering jurisdictions?	Yes
Is the Ontario population considered to be a sink?	Not applicable
Is rescue from outside populations likely?	No

Sensitive species

No

Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada
COSSARO: Committee on the Status of Species at Risk in Ontario
ESA: Endangered Species Act
EO: Element occurrence (as defined by NHIC)
EOO: extent of occurrence
GRANK: global conservation status assessments
IAO: index of area of occupancy
IUCN: International Union for Conservation of Nature and Natural Resources
MNRF: Ministry of Natural Resources and Forestry
NHIC: Natural Heritage Information Centre
NNR: Unranked
NRANK: National conservation status assessment
SARA: Species at Risk Act
SNR: unranked
SRANK: subnational conservation status assessment
S1: Critically Imperiled
S2: Imperiled
S3: Vulnerable
S4: Apparently Secure
S5: Secure
IUCN: International Union for Conservation of Nature and Natural Resources
CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario