COSEWIC
Rapid Review of Classification

on the

Dwarf Wedgemussel
Alasmidonta heterodon

in Canada

EXTIRPATED
2021

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. 2021. COSEWIC Rapid Review of Classification on the Dwarf Wedgemussel *Alasmidonta heterodon* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html).

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COSEWIC
Assessment Summary

Assessment Summary – November 2021

Common name
Dwarf Wedgemussel

Scientific name
Alasmidonta heterodon

Status
Extirpated

Reason for designation
This freshwater mussel was previously known in Canada from only the Petitcodiac River drainage in New Brunswick. It disappeared after construction of a causeway across the river in 1967/68, presumably because of the loss of the host fishes which are required for completion of the mussel species life cycle. The species has not been found since, despite intensive systematic searches of its former habitat. The causeway has been partially removed, and is no longer fully blocking access to the river for the host fishes. Some host fishes have been observed in the river but the mussel remains Extirpated in Canada.

Occurrence
New Brunswick

Status history
Extirpated by 1968. Designated Extirpated in April 1999. Status re-examined and confirmed in May 2000, November 2009, and December 2021.

COSEWIC
Rapid Review of Classification

PREFACE

Dwarf Wedgemussel (*Alasmidonta heterodon*) is a small freshwater mussel found in small to large river systems in areas with slow to moderate flows. The species is usually found in areas with sand and fine gravel and is often associated with coarser substrates of stone or cobble. The species does not do well in areas with accumulations of silt or other fine substrates or in conditions of low dissolved oxygen (Department of Fisheries and Oceans 2007). Within Canada, the species was only ever recorded from the Petitcodiac River in New Brunswick (COSEWIC 2009). Like all freshwater mussels of the Family Unionidae, Dwarf Wedgemussel larvae are obligate parasites and the host in Canada is believed to be American Shad (*Alosa sapidissima*).

Dwarf Wedgemussel is found in the Atlantic Coastal Region of North America where it historically had about 70 occurrences in 15 major drainages (Moser 1993). In the United States, Dwarf Wedgemussel is found from North Carolina to Vermont but is declining across much of its historical range and has been listed as Endangered under the United States *Endangered Species Act* since 1990 (Nedeau 2005). Within Canada, the species was only ever recorded from the Petitcodiac River in New Brunswick (COSEWIC 2009).

Surveys in the Petitcodiac River in 1960 determined Dwarf Wedgemussel to be common (Clarke 1981; COSEWIC 2000). It is unclear how Clarke (1981) defined common as the species was only ever recorded from two locations in the Petitcodiac River system (North River and Petitcodiac River) and abundance information is not readily available. However, only 24 years later, in 1984, surveys uncovered no evidence that the species was still extant in the system (Department of Fisheries and Oceans 2007). Hanson and Locke (2001) surveyed 66 sites in the watershed between 1997 and 2000 and found no Dwarf Wedgemussel. Elward and Thongbee (2021) resurveyed the sites of Hanson and Locke and have found no Dwarf Wedgemussel after three years of sampling (2018 – 2020) a total of 19 sites.

This drastic decline between 1960 and 1984 followed the construction in 1967 of a causeway connecting the towns of Moncton and Riverview, New Brunswick. Installation of the causeway created a 21 km long headpond above the towns, restricted flows, impeded tidal bores, led to the deposition of fine sediments, and prohibited the passage of many anadromous fish species including American Shad. Prior to 1968 annual passage of American Shad was estimated at 50,000 – 75,000 but by 1972 only 19 were counted (Locke *et al*. 2003; Petitcodiac Riverkeeper 2020). It is believed that the loss of their fish host was the primary reason for the rapid extirpation of Dwarf Wedgemussel (Department of Fisheries and Oceans 2007).

Fisheries and Oceans Canada currently considers recovery of Dwarf Wedgemussel in Canada to be not feasible and has identified three conditions which must be met to change this determination: 1) changes to the Petitcodiac causeway to permit fish passage; 2) the re-establishment of American Shad; and 3) the availability of adequate numbers of Dwarf Wedgemussel from the U.S. for reintroduction (Department of Fisheries and Oceans 2007). Restoration of the Petitcodiac watershed is underway and the causeway gates have been left in the open position since 2011 allowing some degree of natural flow to return to the system (Petitcodiac Riverkeeper 2020). The causeway has since been replaced by a bridge in September 2021 permitting unimpeded free tidal flow of the Petitcodiac River. While some fish species are returning to the river, American Shad has not shown any signs of significant return and may require active augmentation to allow recovery within the watershed (AMEC Foster Wheeler 2017; Bagnall pers. comm. 2020; Redfield pers. comm. 2021). Source populations for Dwarf Wedgemussel reintroductions would necessarily be northern U.S. rivers (COSEWIC 2009). As these populations are likely derived from different glacial refuges (Nedeau *et al*. 2000) than the Petitcodiac population, the appropriateness of their use remains to be determined.

Status History:

Extirpated by 1968. Designated Extirpated in April 1999. Status re-examined and confirmed in May 2000, November 2009, and December 2021.

Updated map:

Not required. See previous assessment (COSEWIC 2009).

TECHNICAL SUMMARY

Alasmidonta heterodon

Dwarf Wedgemussel

Alasmidonte naine

Range of occurrence in Canada (province/territory/ocean): New Brunswick

Status and Reasons for Designation:

Status: Extirpated	**Alpha-numeric codes:** Not applicable
Reasons for designation: This freshwater mussel was previously known in Canada from only the Petitcodiac River drainage in New Brunswick. It disappeared after construction of a causeway across the river in 1967/68, presumably because of the loss of the host fishes which are required for completion of the mussel species life cycle. The species has not been found since, despite intensive systematic searches of its former habitat. The causeway has been partially removed, and is no longer fully blocking access to the river for the host fishes. Some host fishes have been observed in the river but the mussel remains Extirpated in Canada.	

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Not applicable. No individuals detected in Canada after causeway construction in 1967/1968.
Criterion B (Small Distribution Range and Decline or Fluctuation): Not applicable. No individuals detected in Canada after causeway construction in 1967/1968.
Criterion C (Small and Declining Number of Mature Individuals): Not applicable. No individuals detected in Canada after causeway construction in 1967/1968.
Criterion D (Very Small or Restricted Population): Not applicable. No individuals detected in Canada after causeway construction in 1967/1968.
Criterion E (Quantitative Analysis): Not done. No individuals detected in Canada after causeway construction in 1967/1968.

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WRITER OF RAPID REVIEW OF CLASSIFICATION

Todd J. Morris, September 2020. Updated August 23 2021.

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
(2021)

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.

Environment and Climate Change Canada
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