

Curatorial Report Number 8

Nova Scotia Museum  
1747 Summer Street  
Halifax Nova Scotia Canada

# Freshwater Mussels in the Nova Scotia Museum Collection

By Ursula Grigg  
December 1972

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NOVA SCOTIA MUSEUM

CURATORIAL REPORTS

The Curatorial Reports of the Nova Scotia Museum contain information on the collections and preliminary results of research projects carried out under the program of the museum. The reports may be cited in publications but their manuscript status should be clearly indicated.

## INTRODUCTION

Freshwater mussels are large bivalve molluscs, sometimes seven inches long, found in the ponds, lakes, streams and rivers of Nova Scotia, different species being characteristic of different habitats. They remain buried in the bottom with their posterior ends projecting, and are usually collected as dead shells from strand lines and muskrat houses, though some are found alive by swimmers.

They are not economically important in Nova Scotia although elsewhere they are fished commercially for pearls or for use in the manufacture of mother-of-pearl ornaments or buttons. There is a tale of Canadian raftsmen collecting them on bundles of brush tied behind the rafts, but this probably did not refer to the Maritimes. The mussels are supposed to have snapped onto the brush when it dragged over river shallows, and were then taken off and eaten. A Prince Edward Island resident who has eaten *M. margaritifera* described the meat as tasteless, watery and gritty.

It is possible that the grittiness was due to the presence of glochidia in the tissues. Glochidia are larval mussels; they develop in the gill pouches of female mussels and are expelled through the exhalant siphon. They are external parasites of fish, and are usually armed with hooks with which they cling to the host, which subsequently encysts them. The usual sites are the gills and fins. While on the fish the glochidia metamorphose, undergoing internal rearrangement to the adult pattern. When they are sloughed off, often some distance from the place where they were picked up, they are ready to start an independent life on the bottom.

It is usually accepted that glochidia of different species of mussel are obligatory parasites of certain species or genera of fish: the correlation is especially good, for instance, between the mussel *Margaritifera margaritifera* (L.) and salmonid fish. There is speculation that the relationship between mussel and fish may depend on the feeding habits of fish bringing them into contact with the mussels and on the immunity of certain species to the parasite. Athearn and Clarke (1962) comment that in Nova Scotia "the distribution of freshwater mussels corresponds roughly to the pattern observed by Livingstone (1951) for the freshwater fishes, i. e., an irregular but progressive decrease in the number of species present with increased distance from the Isthmus of Chignecto". However, the extent of collecting effort has decreased in the same way. Athearn, Clarke and Rick apparently made no collections in Shelburne or Pictou Counties, and made few collections in some others, including Lunenburg, Queens, Yarmouth and Digby. A new detailed study of this group in the province, with special attention to correlations with the fish fauna and the physical and chemical characteristics of the waters would be extremely interesting.

The freshwater mussel collection of the Nova Scotia Museum consists mostly of dry shells. Earlier acquisitions were the scanty results of casual collecting, often without adequate records. D. A. Livingstone deposited a considerable number of specimens collected during his survey of the fish fauna, but much of the material was preserved in formalin, which has spoiled the shells, and some of the shells are missing entirely, only

the bodies remaining. The bulk of the collection was deposited by H. D. Athearn, who collected in the province between 1946 and 1954. His collections formed the basis of the paper by Athearn and Clarke (1962), followed by Clarke and Rick (1964); these two papers form the definitive work on Nova Scotian unionids. The last specimens to be added were collected during the systematic surveys started by the museum staff in 1969. Quite a lot of Athearn's material was collected in New Brunswick, including 3 specimens of *Alasmidonta heterodon* Lea, which has not been found in this province. The museum collections also include a few specimens from Ontario, New York and South Carolina.

The museum collection has recently been reorganized and catalogued: for this, the two papers mentioned above have been used as the authority. In partial accordance with the finding of Clarke and Rick, Athearn's specimens *Anodonta cataracta brooksiana* (Van der Schalie) have been relabelled *Anodonta cataracta fragilis* (Lam.); later additions of *Anodonta cataracta* have not been assigned to a subspecies, and one specimen from Debert Lake labelled *A. grandis?* has been left so labelled pending the revision of this genus in eastern North America.

## REFERENCES

Athearn, H. D. and A. H.  
Clarke, (1962).

The freshwater mussels of Nova  
Scotia. Contributions to  
Zoology 1960-61. Nat. Mus. of Canada  
Bulletin No. 183. pp. 11-41  
4 plates.

Clark, A. H. and A. M.  
Rick, (1964)

Supplementary records of *Unionacea*  
from Nova Scotia with a discussion  
of the identity of *Anodonta fragilis*  
Lamarck. Contributions to Zoology  
1963. Nat. Mus. of Canada Bulletin  
No. 199.

UNIONACEA  
Family MARGARITIFERIDAE  
Subfamily MARGARITIFERINAE

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*Margaritifera margaritifera margaritifera* (Linnaeus)

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ANNAPOLIS COUNTY

Nictaux River, Middleton: no date

HALIFAX COUNTY

Little Salmon River,  
Lower Sackville: 9 IX 1923  
Musquodoboit River, W. of  
Musquodoboit Harbour: - VII 1946  
Musquodoboit River, 2 mi.  
above Elderbank: 8 VII 1954  
Sackville River, Lower Sackville 4 VI 1970

GUYSBOROUGH COUNTY

St. Mary's River, Sherbrooke: - VII 1946

ANTIGONISH COUNTY

South River, Antigonish: 4 VII 1952  
West River, Route 7, 2 mi.  
S. of Antigonish: 4 VII 1954

PICTOU COUNTY

East River, St. Mary's: no date

COLCHESTER COUNTY

Beaver Brook: 1 VII 1951  
Stewiacke River, 5 mi.  
above Stewiacke: 1 VII 1951  
Tatamagouche River, Routell,  
2 mi. above Tatamagouche: 15 VII 1954

CUMBERLAND COUNTY

River Hebert, 3 mi. below  
Halfway River, West Lake: 4 VII 1954  
River Philip at Oxford: 20 IX 1971

RICHMOND COUNTY

River Framboise, 3 mi. N. of  
Framboise: 4 VII 1952  
Grand River, 2 mi. above  
Grand River: 4 VII 1952

INVERNESS COUNTY

River Inhabitants, 3 mi.

S-SW of Glendale:

5 VII 1952

N. E. Margaree River, 1 mi. above

Northeast Margaree:

5 VII 1952

NEW BRUNSWICK

Turtle Creek, Albert County:

4 VII 1954

Nevers Brook, 8 mi. N-NW of

Salisbury, Kent County:

16 VII 1948

Petitcodiac River, 2 mi. above

Salisbury, Albert County:

3 VII 1951

Pollett River, 2 mi. ESE of

River Glade, Westmorland County:

3 VII 1951

Renous River, Renous, Northumberland

County:

6 VII 1948

Black River, Glenelg Twp., Northumberland

County:

6 VII 1948

Kennebecasis River, Penobsquis,

Cardwell Twp., King's County:

3 VII 1951

Kennebecasis River, Norton,

King's County:

3 VII 1951

Studholm Brook, Fenwick, 3 mi. N-NW

of Sussex, King's County:

4 VII 1953

Plaster Rock, Victoria County:

no date

Grant's Lake, Millstream,

Northumberland County:

no date

Subfamily UNIONINAE

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*Elliptio complanatus* (Solander)

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DIGBY COUNTY

Cupits Lake, Hectanooga, Lake

1 mi. SE of North Range:

6 VII 1953

Bonang's Lake, 1 mi. NE of

Hectanooga:

6 VII 1953

SHELBURNE COUNTY

Horseshoe and Clam Lakes:

no date



ANNAPOLIS COUNTY

Annapolis River, Lawrencetown: 5 VII 1953  
Springfield Lake, Springfield: 4 VII 1953

KINGS COUNTY

Aylesford Lake: 26 VIII 1960  
South end of Gaspereau Lake: 17 X 1969

QUEENS COUNTY

Ponhook Lake, 4 mi. S-SE of  
South Brookfield: 5 VII 1953

LUNENBURG COUNTY

LaHave River: no date  
Lake Lawson, New Ross: 18 VI 1969  
Lake William near New Germany: 12 X 1969

HANTS COUNTY

Kennetcook River, 3 mi. above  
Clarksville: 5 VII 1954

HALIFAX COUNTY

Second Dartmouth Lake, N. end,  
2 1/4 mi. N. of Dartmouth: about 1895  
Rawdon River, south end of  
Grand Lake, Wellington: 19 IV 1902  
Shubenacadie River, Enfield: 15 VII 1948  
Musquodoboit River, 2 mi. above  
Musquodoboit Harbour: 7 VII 1954  
Fish Lake, R. R. #2, 2 mi. S. of  
Waverley: 13 VII 1954  
Lower Egmont Lake at outlet: 13 VII 1954  
Lake William at outlet, Waverley: 13 VII 1954  
Rocky Lake, 5 mi. NE of Bedford: 13 VII 1954  
Gay's River: 13 VII 1954  
Fish Lake, 2 mi. S. of Waverley: 13 VII 1954  
Musquodoboit River, 2 mi. above  
Elderbank: 8 VII 1954  
Petpeswick Lake, near Musquodoboit  
Harbour: 5 VIII 1969  
Shubenacadie Grand Lake, Enfield,  
Oakville: 27 VI 1969  
Grand Lake (Shubenacadie Lake): - - 1970  
Musquodoboit River, 1 mi. N. of  
Musquodoboit Harbour: 14 VII 1971

GUYSBOROUGH COUNTY

McKeen Lake, 1 mi. South of Aspen: 17 VI 1969  
St. Mary's River, N. of Sherbrooke: 10 VIII 1971

ANTIGONISH COUNTY

Lochaber Lake (by route 7): 17 VI 1969

PICTOU COUNTY

Garden of Eden Lake: no date  
Forbes lake: no date  
Grant's Lake: - - 1946  
Chance Harbour: no date

COLCHESTER COUNTY

Stewiacke River, 5 mi. above  
Stewiacke: 1 VII 1951

CUMBERLAND COUNTY

Halfway River, West Lake, 1 mi.  
S. of Newville: 1 VII 1951  
River Hebert at Halfway River: 11 VII 1953  
River Hebert, 3 mi. below Halfway  
River, West Lake: 4 VII 1954

RICHMOND COUNTY

Shaw Lake, Isle Madame: 30 X 1969

VICTORIA COUNTY

N. E. Margaree River System: 5 VII 1952

INVERNESS COUNTY

McIntyre Lake, 8 mi. ENE of  
Port Hawkesbury: 4 VII 1952  
McIntyre Lake, 8 mi. ENE of  
Port Hawkesbury: 30 X 1969

NEW BRUNSWICK

Petitcodiac River, R. Glade  
Westmorland County: 3 VII 1951  
Lake Utopia, Charlotte County: summer 1967  
Kennebecasis River, Norton,  
King's County: 3 VII 1951  
Canaan River, 9 mi. W. of Havelock,  
Queen's County: 16 VII 1948  
Grand Lake, Jemeg, Queen's County: 9 VII 1969  
Nashwaak River, Penniac, York County: 5 VII 1948  
Pokiok River, 1/2 mi. below George  
Lake, York County: 3 VII 1951  
Aroostook River Mouth, Aroostook,  
Victoria County: 5 VII 1948  
Plaster Rock, Victoria County: no date

Subfamily ANODONTINAE

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*Alasmidonta undulata* (Say)

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HANTS COUNTY

Kennetcook River, 3 mi. above  
 Clarksville: 5 VII 1954  
 Rawdon River, S. end of  
 Grand Lake: 15 IV 1902

HALIFAX COUNTY

Shubenacadie River, Enfield: 15 VII 1948  
 Musquodoboit River, 2 mi. above  
 Musquodoboit Harbour: 7 VII 1954  
 Fish Lake, 2 mi. S. of Waverley: 13 VII 1954  
 Gay's River: 13 VII 1954  
 Outlet, Fish Lake, at Route 2,  
 2 mi. S. of Waverley: 13 VII 1954

CUMBERLAND COUNTY

River Hebert, 3 mi. below  
 Halfway R., West Lake: 4 VII 1954

NEW BRUNSWICK

North R., 4 mi. N. W. of Salisbury,  
 Westmorland County: 30 VI 1946  
 Petitcodiac River, R. Glade,  
 Westmorland County: 3 VII 1951  
 Nashwaak River, Penniac,  
 York County: 5 VII 1948  
 Aroostook River mouth, Aroostook,  
 Victoria County: 5 VII 1948

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*Alasmidonta varicosa* (Lamarck)

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GUYSBOROUGH COUNTY

St. Mary's River, Sherbrooke: - VII 1946

NEW BRUNSWICK

Petitcodiac River, 2 mi. above  
 Salisbury, Westmorland County: 3 VII 1951  
 Renous River, Renous,  
 Northumberland County: 6 VII 1948

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*Alasmidonta heterodon* (Lea)

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NEW BRUNSWICK

North River, 5 mi. NW of  
Salisbury, Westmorland County: 16 VII 1948

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*Anodonta implicata* Say

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KINGS COUNTY

Gaspereau River, 1/2 mi. above  
Whiterock Mills: 6 VII 1952  
Gaspereaux Lake, Welton: 23 X 1968  
South end of Gaspereau Lake,  
Forest Home: 17 X 1969

HANTS COUNTY

Little Lake of Shubenacadie,  
Grand Lake: 8 XI 1970

HALIFAX COUNTY

Shubenacadie River, Enfield: 15 VII 1948  
Musquodoboit River, 2 mi. above  
Musquodoboit Harbour: 7 VII 1954  
Lake William at outlet, Waverley: 13 VII 1954  
Fish Lake, its outlet, 2 mi.  
S. of Waverley: 13 VII 1954

ANTIGONISH COUNTY

Lochaber Lake (by route 7), Antigonish: 17 VI 1969

CAPE BRETON COUNTY

Grand Mira River, 30 mi. S. of  
Sydney: 4 VII 1952  
McMullin Lake, 3 mi. above  
Victoria Bridge: 4 VII 1952

INVERNESS COUNTY

McIntyre Lake, 5 mi. NE of  
Port Hawkesbury: 30 X 1969

NEW BRUNSWICK

Branch of Denny Stream at dam,  
Route 3, 1 1/2 mi. N. W. Moores  
Mill, Charlotte County: 3 VII 1953  
St. John River, at small creek  
next below longs Creek,  
Kingsclear, York County: 3 VII 1951

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*Anodonta cataracta* (including subspecies *cataracta* Say and *fragilis* Lamarck)

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DIGBY COUNTY

Lake, Sissaboo River system,  
13 mi. SW of Bear River: 6 VII 1953  
Cupits lake, Hectanooga: 6 VII 1953

SHELBURNE COUNTY

Horseshoe Lake: no date

YARMOUTH COUNTY

Killam Lake, 3 1/2 mi., N. E.  
of Port Maitland: 6 VII 1953

KINGS COUNTY

Cornwallis River, 1 1/4 mi. above  
Waterville: 9 VII 1953

LUNENBURG COUNTY

Lake Lawson, New Ross: 18 VI 1969

HANTS COUNTY

Uniacke Lake: 24 VII 1968

HALIFAX COUNTY

DeSaid Lake, 2 mi. N. of  
Eastern Passage: 13 VII 1948  
Lake William at outlet, Waverley; 13 VII 1954  
Outlet of Fish Lake, at Route 2,  
2 mi. S. of Waverley: 13 VII 1954  
Rocky Lake, 5 mi. N. E. of Bedford: 13 VII 1954  
Lower Egmont Lake, at outlet,  
Lake Egmont: 13 VII 1954  
Fish Lake, 2 mi. S. of Waverley: 13 VII 1954  
Brine Lake, 1 mi. S. of  
French Village: 9 VII 1954  
Long Lake, at Narrows, 3 mi. N. W.  
of Preston: 14 VII 1954

HALIFAX COUNTY

Fish Lake , 2 mi. S. of Waverley: 13 VII 1954  
Brine Lake, near Hubbards: 25 VI 1950, 23 VII 1950  
Petpeswick Lake, near Musquodoboit Harbor: 5 VII 1969

GUYSBOROUGH COUNTY

Pond, 1 mi. W. of Mulgrave: 5 VII 1952

PICTOU COUNTY

Grant's Lake: no date, - - 1946, 10 VI 1946

COLCHESTER COUNTY

Baird Brook, Crowe Mills: 11 VII 1953

CUMBERLAND COUNTY

Blair Lake: 23 VIII 1950  
Halfway River West Lake (Fullerton Lake), 1 mi. S. of Newville: 1 VII 1951  
River Hebert, Halfway River West: 11 VII 1953

RICHMOND COUNTY

Loch Lomond, Middle Lake at passage to Lower Lake: 4 VII 1952

VICTORIA COUNTY

Pond on branch N. E. Margaree River Route 19, on county line, 2 mi. N. W. of Finlayson: 5 VII 1952

INVERNESS COUNTY

McIntyre Lake, 8 mi. ENE of Port Hawkesbury: 4 VII 1952  
Pond on Northeast Margaree River, Route 19, 7 mi. SW of Northeast Margaree: 4 VII 1952

NEW BRUNSWICK

North River, 5 mi. N.W. of Salisbury, Westmorland County: 16 VII 1948  
Price's Brook, 6 mi. N. of Havelock, Westmorland County: 16 VII 1948  
Pollett River, 2 mi. E-SE of River Glade, Westmorland County: 1 V 1949  
Branch, Denny Stream, 5 mi. SW of Lawrence Station, Charlotte County: 3 VII 1954

NEW BRUNSWICK

Lake Utopia, Charlotte County: summer 1967  
Pokiok River, 1/2 mi. below George  
Lake, Prince William,  
York County: 3 VII 1951  
Cranberry Lake, York County: 9 VII 1969  
Baker Lake, Madawaska County: 4 VII 1948

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*Anodonta (grandis ? Say)*

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COLCHESTER COUNTY

Debert Camp: - VIII 1961

NEW YORK

Sphaerium Brook, McLean Res.,  
Tompkins County: 4 V 1961

Subfamily *LAMPSILINAE*

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*Lampsilis ochracea Say*

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NEW BRUNSWICK

St. John River, 4 mi. W. of  
Jemseg; St. John County: 16 VII 1954  
Cranberry Lake, Harvey Sta.,  
York County: 9 VII 1969

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*Lampsilis radiata (including subspecies *siliquoidea* Barnes & *radiata* Gmelin)*

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HALIFAX COUNTY

Musquodoboit Harbour, 2.1 mi.  
below Crawford Bridge: 8 VII 1954  
Lower Egmont Lake at outlet,  
Lake Egmont: 13 VII 1954

PICTOU COUNTY

Chance Harbour: no date

CUMBERLAND COUNTY

Hebert River at Halfway River W: 11 VII 1953, 4 VII 1954

RICHMOND COUNTY

Potty Lake, Isle Madame: 13 X 1969

NEW BRUNSWICK

Lake Utopia, Charlotte County: summer 1967

Kennebecasis Bay, Nauwigewaulk,

King's County: 3 VII 1952

Grand Lake, Jemseg., Queen's County: 9 VII 1969

Canaan River, 9 mi. N. W. of

Havelock, Queen's County: 16 VII 1948

Forbes Lake, Northumberland County: no date

Plaster Rock, Victoria County: no date

NEW YORK

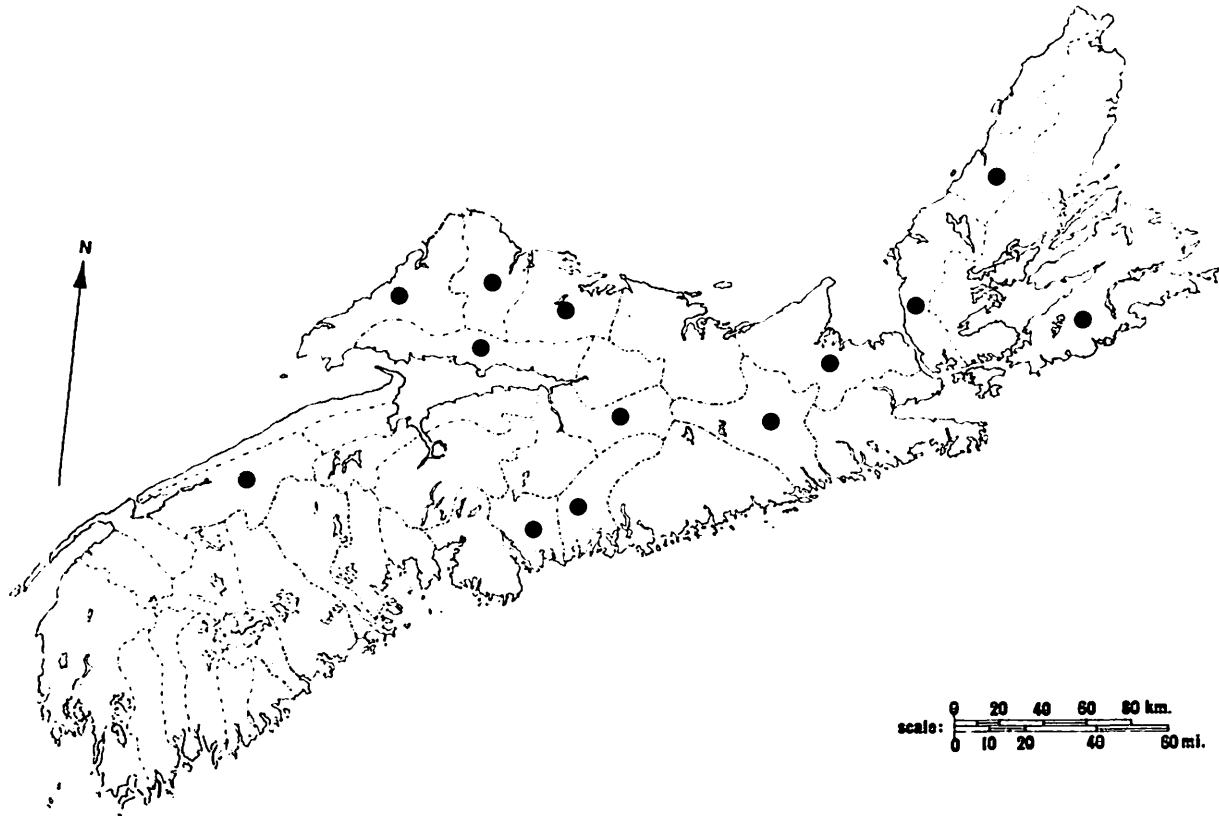
Oneida Lake: 20 V 1961



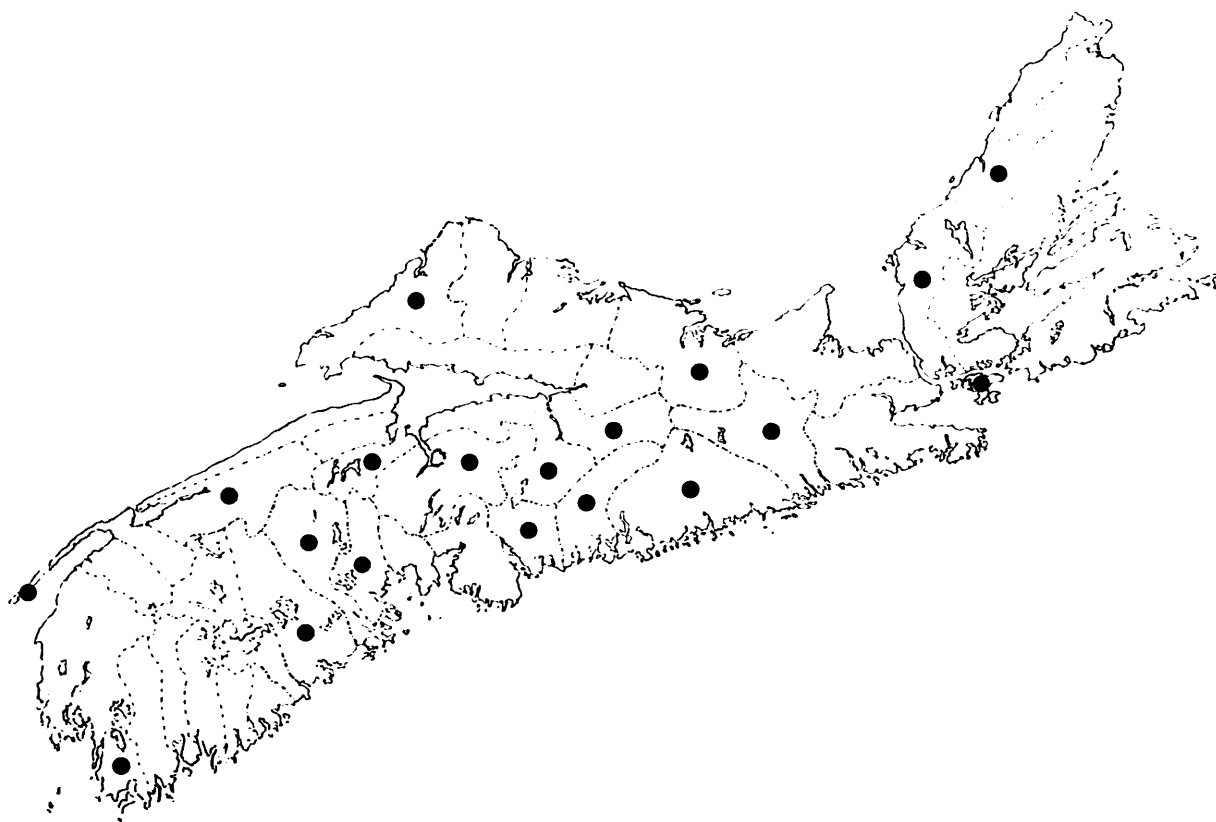
Table 1.

## Summary of collections from each county in Nova Scotia and New Brunswick

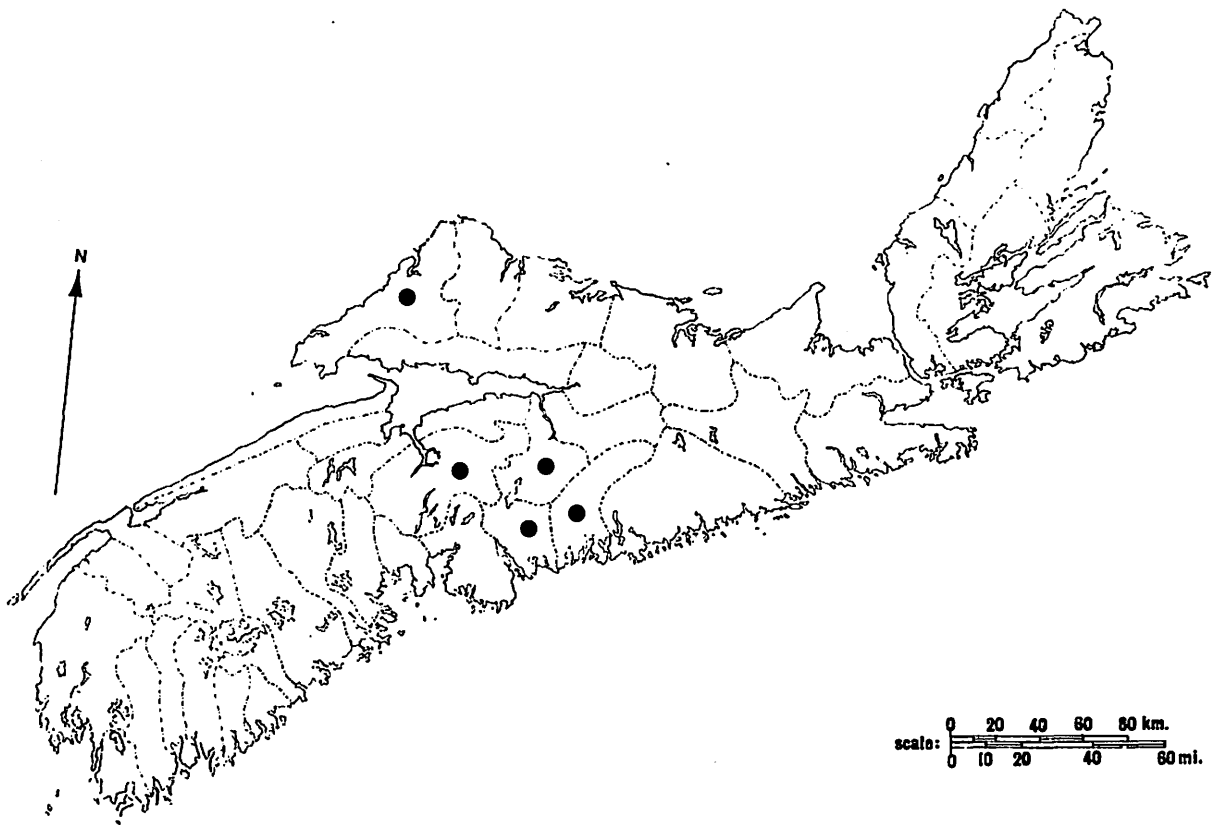
Nova Scotia	<i>Margaritifera margaritifera</i>	<i>Elliptio complanatus</i>	<i>Alasmidonta undulata</i>	<i>Alasmidonta varicosa</i>	<i>Anodonta implicata</i>	<i>Anodonta cataracta</i>	<i>Lampsilis grandis</i>	<i>Lampsilis radiata</i>
Digby	0	3	0	0	0	2	0	0
Yarmouth	0	2	0	0	0	1	0	0
Shelburne	0	1	0	0	0	1	0	0
Annapolis	1	2	0	1	0	0	0	0
Kings	0	1	0	0	3	1	0	0
Queens	0	1	0	0	0	0	0	0
Lunenburg	0	2	0	0	0	1	0	0
Hants	0	2	1	0	1	0	0	0
Halifax	5	14	3	0	4	10	0	2
Guysborough	1	1	0	1	0	1	0	0
Antigonish	2	1	0	0	1	0	0	0
Pictou	1	5	0	0	0	1+1	0	2
Colchester	4	2	0	0	0	1	1	0
Cumberland	2	3	1	0	0	2	0	2
Richmond	2	2	0	0	0	3	0	1
Cape Breton	0	0	0	0	2	0	0	0
Victoria	0	1	0	0	0	1	0	0
Inverness	3	3	0	0	1	2	0	0
New Brunswick	<i>Margaritifera margaritifera</i>	<i>Elliptio complanatus</i>	<i>Alasmidonta undulata</i>	<i>Alasmidonta varicosa</i>	<i>Anodonta implicata</i>	<i>Anodonta cataracta</i>	<i>Lampsilis ochracea</i>	<i>Lampsilis radiata</i>
Westmoreland	3	1	2	1	0	3	0	0
Kent	0	0	0	0	0	0	0	0
Northumberland	2	0	0	1	0	0	0	0
Gloucester	0	0	0	0	0	0	0	0
Restigouche	0	0	0	0	0	0	0	0
Albert	2	0	0	0	0	0	0	0
Saint John	0	0	0	0	0	0	0	0
Charlotte	0	1	0	0	1	2	0	1
King's	3	1	0	0	0	0	0	1
Queen's								
Salisbury	0	0	0	0	0	0	0	0
York	0	2	1	0	0	2	1	0
Carleton	0	0	0	0	0	0	0	0
Victoria	0	1	0	0	0	0	0	0
Madawaska	0	0	0	0	0	1	0	0



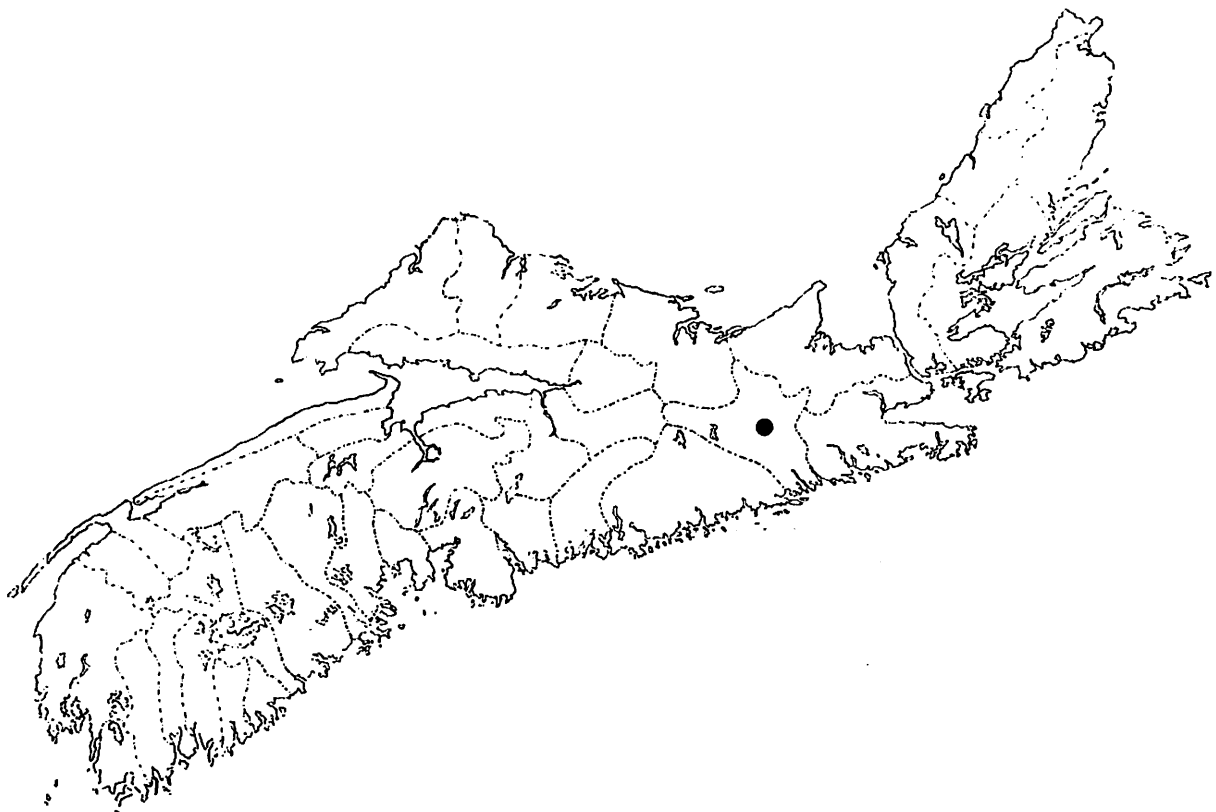
*Elliptio complanatus*



*Alasmidonta undulata*



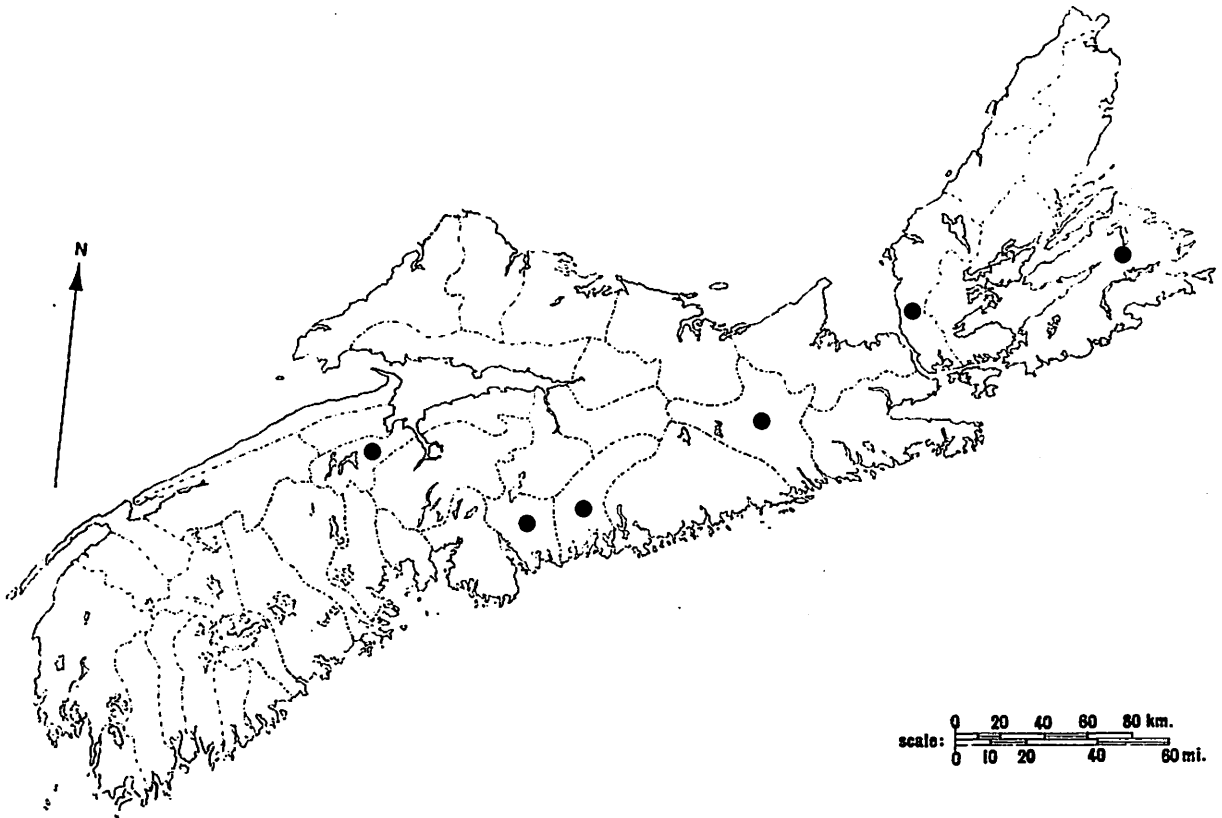
*Alasmidonta varicosa*



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*Anodonta implicata*

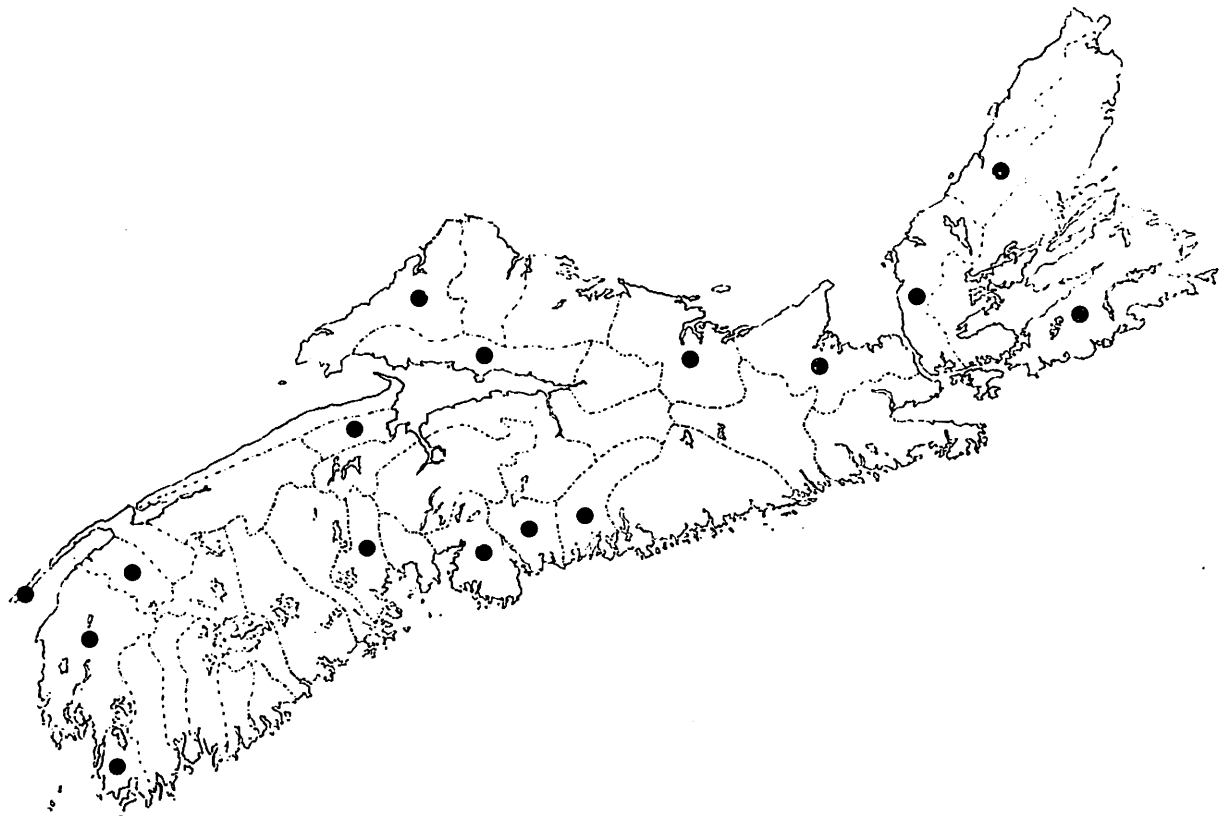
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*Anodonta cataracta*

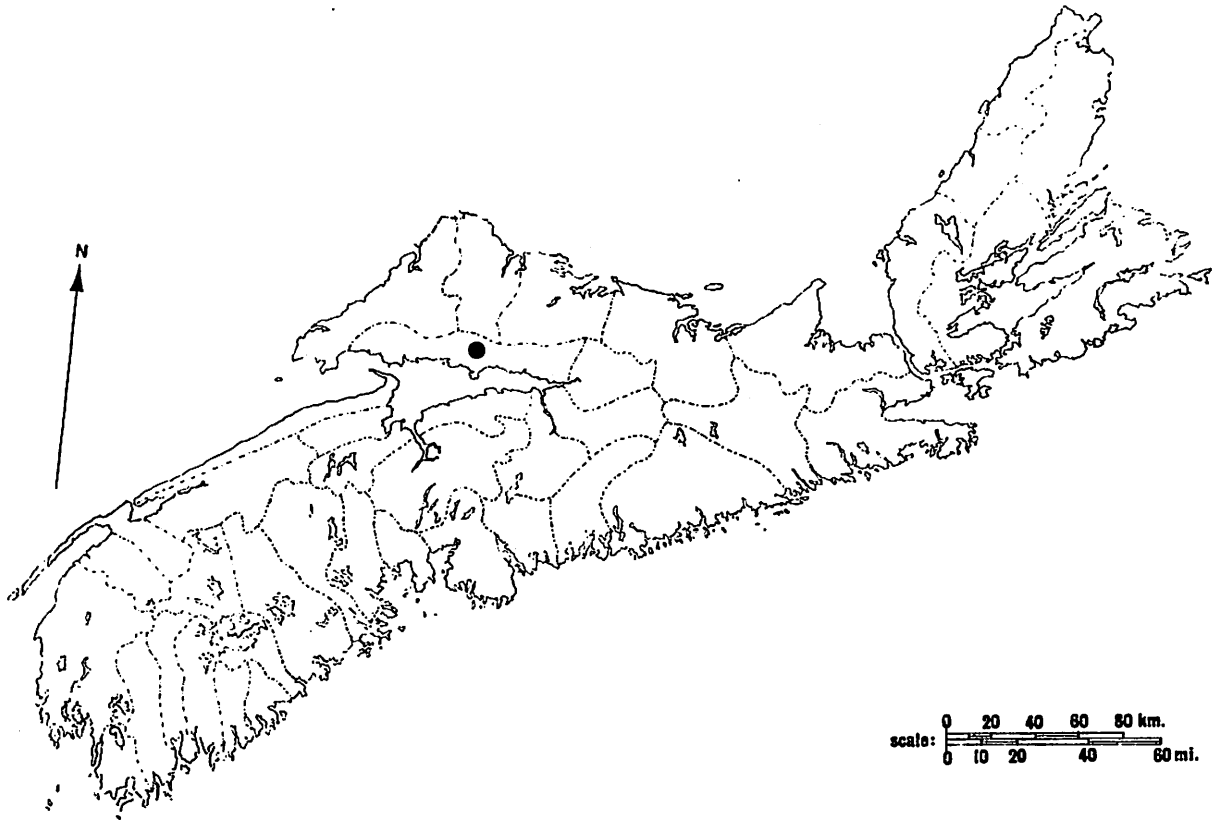
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*Lampsilis grandis*

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*Lampsilis radiata*

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