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THE FISHES OF THE CANADIAN WATERS  
OF LAKE ONTARIO

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## THE FISHES OF THE CANADIAN WATERS OF LAKE ONTARIO

The following records of fishes from Lake Ontario and some of its tributary streams are largely based on collections made during the summers of 1927 and 1928, when parties from the Fisheries Laboratory were stationed at Port Credit and in the Bay of Quinté region respectively. Included also are unpublished records from the diary of the late C. W. Nash, now in the Royal Ontario Museum of Zoology. The records for the Humber and Don rivers are based on collections made by E. B. S. Logier of the Royal Ontario Museum of Zoology and H. C. White.

In addition to the actual records of occurrence, we have included such life history observations as seemed worth recording. In connection with spawning dates at Port Credit in 1927, it should be mentioned that May and June of that year were cooler than usual, which delayed the spawning of many species beyond the usual date.

### HABITAT DESCRIPTIONS

The following account of some of the localities from which collections were made is included as records of the habitats in which the various species were found. The lists of fishes given for the different waters, when not in systematic order, are arranged in the order of abundance in which the various species were taken in our collections in the habitats concerned.

*The Credit river* at Port Credit and for some distance up stream is almost at lake level and therefore quite sluggish. Just within the mouth the shores are sandy, as is also the adjacent lake shore, where we seined on several occasions. There is quite a large bay and backwater beside the river

south of the highway. Here the water for the most part is shallow and closely grown up during the summer with aquatic vegetation. In this place we took the following on June 8 and 9—*Moxostoma rubreques*, *Catostomus commersonii*, *Ameiurus nebulosus*, *Esox lucius*, *Ambloplites rupestris*, *Pomoxis sparoides*, *Helioperca incisor* and *Anguilla rostrata*. About a mile upstream there is a small rapid. Here the bottom is stoney for some distance. In this part of the stream we took on June 28, *Notropis rubellus*, *Notropis cornutus*, *Semotilus atromaculatus*, *Boleosoma nigrum*, *Notropis whipplii*, *Hyborhynchus notatus*, *Ambloplites rupestris*, *Nocomis micropogon*, *Rhinichthys cataractae*, and *Esox lucius*. Other species secured in this locality later were *Noturus flavus*, *Hypentelium nigricans*, *Percina caprodes*, *Catnotus flabellaris*, *Poecilichthys coeruleus*, *Micropterus dolomieu* (1½ in.) and *Notemigonus crysoleucas*.

*Burlington bay* at the extreme western end of the lake is cut off from the main body of Lake Ontario by Burlington beach, a narrow strip of land running completely across the end of the lake. The only connection between the lake and the bay is a narrow ship canal. Most of our seining in the bay was done along its northern shore on the beach of La-Salle Park. In this shallow, well-protected area there is some aquatic vegetation including rushes, and potamogetons with much chara in some places. In this locality we took very large numbers of *Fundulus diaphanus*, *Notropis heterodon*, *Notropis heterolepis*, and *Hyborhynchus notatus* as well as some *Notemigonus crysoleucas*, *Notropis deliciosus*, *Notropis whipplii*, *Boleosoma nigrum*, *Percina caprodes* and one *Schilbeodes gyrinus*. In the same place we took young of the following,—*Notropis hudsonius*, *Notropis atherinoides*, *Cyprinus carpio*, *Catostomus commersonii*, *Eupomotis gibbosus*, *Ambloplites rupestris*, *Aplites salmoides*, and *Semotilus atromaculatus*. Here too we found a number of specimens of *Palaemonetes paludosa* (Gibbes) a crustacean recorded from Florida, vicinity of Chicago and Lake Erie. In a very well protected inlet at the extreme western end of the bay we took a number of small *Pomoxis annularis* and *Helioperca incisor*

as well as *Palaemonetes*. Elsewhere in the bay we took *Umbra limi*, *Rhinichthys atronasmus*, and saw a young gar pike, *Lepisosteus osseus*, about 5 inches in length which we were unable to capture.

*Bronte creek*. In the part of Bronte creek where seining was carried on, deeper pools with sandy bottoms were separated by larger stretches of water a few inches in depth flowing rapidly over gravel and small stones. Here we took, *Notropis rubellus*, *Notropis cornutus*, *Hyborhynchus notatus*, *Nocomis micropogon*, *Boleosoma nigrum*, *Poecilichthys coeruleus*, *Catnotus flabellaris*, *Ambloplites rupestris*, *Micropterus dolomieu* (1½-7 in.) *Hypentelium nigricans* and *Catostomus commersonii*.

*Etobicoke creek*. Collections were made between the highway and the lake, where in summer the stream is small, flowing over and about large flat rocks interspersed with smaller stones and gravel. Deeper pools occur at intervals. In this stream we took *Poecilichthys coeruleus*, *Boleosoma nigrum*, *Notropis cornutus*, *Hyborhynchus notatus*, *Hypentelium nigricans*, *Semotilus atromaculatus*, *Nocomis micropogon*, *Ambloplites rupestris*, *Catostomus commersonii* (1½-3 in.) *Rhinichthys atronasmus*, *Ameiurus nebulosus*, *Pimephales promelas*, *Notropis hudsonius*, *Percina caprodes*, *Eucalia inconstans*, *Gasterosteus aculeatus*.

*Ward's Island, Toronto*. In a quiet lagoon with a dense growth of aquatic plants along its sides we secured *Notemigonus crysoleucas*, *Fundulus diaphanus*, *Ameiurus nebulosus*, *Eupomotis gibbosus*, *Perca flavescens*, *Esox lucius*, *Boleosoma nigrum* and *Eucalia inconstans*.

*Creek at Clarkson*. In a small sluggish stream at Clarkson, A. L. Pritchard and A. M. Hodgetts took *Pimephales promelas*, *Semotilus atromaculatus*, *Catostomus commersonii* (small) *Notropis cornutus*, *Hyborhynchus notatus*, *Rhinichthys atronasmus*, *Poecilichthys coeruleus*, *Eucalia inconstans*, *Clinostomus elongatus*, and *Hybognathus hankinsoni*.

*The Bay of Quinté* is a long narrow bay, about fifty miles in length extending from Bath at the eastern end of Lake Ontario to Trenton. Since the habitats included in it are

so numerous and diverse, we have been unable to investigate all of them thoroughly. Until 1928, profitable fisheries for spawning whitefish and ciscoes (*L. artedi*) were carried on in autumn in the Bay of Quinté up as far as Massassaga Point below Belleville and above the Bay Bridge. In 1928 nets were prohibited above Glenora. During the spawning run of these species, the Ontario Department of Game and Fisheries operated pound nets near Belleville and in Hay Bay. From those set at the former location we procured, *Petromyzon marinus*, *Acipenser fulvescens*, *Lepisosteus osseus*, *Hiodon tergisus*, *Coregonus clupeaformis*, *Leucichthys artedi*, *Oncorhynchus tshawytscha*, *Cristivomer namaycush*, *Catostomus commersonii*, *Moxostoma aureolum*, *Moxostoma anisurum*, *Cyprinus carpio*, *Villarius lacustris*, *Ameiurus nebulosus*, *Esox lucius*, *Esox masquinongy*, *Anguilla rostrata*, *Lepibema chrysops*, *Perca flavescens*, *Stizostedion canadense*, *Stizostedion vitreum*, *Aplites salmoides*, *Pomoxis sparoides*, *Eupomotis gibbosus*, *Ambloplites rupestris*, *Aplodinotus grunniens*, and *Lota maculosa*. In winter in the bay, pike-perch are taken through the ice on lines. In the early spring the chief fishing is done with hoop nets and yields pike, perch and catfish. Later in the year night-lines are set for eels. In early summer, large numbers of carp are taken in seines in the muddy and reedy bays.

*Prinyer's cove* is typical of the numerous smaller secondary bays. At its head a small weed-choked creek enters. The shores of the more open part of the cove are for the most part clean and gravelly but towards the head there are extensive reed beds. In the creek the following were taken: *Notropis heterodon*, *Notropis bifrenatus*, *Notemigonus crysoleucas*, *Hyborhynchus notatus*, *Ameiurus nebulosus*, *Umbra limi*, *Esox lucius*, *Aplites salmoides*, *Eupomotis gibbosus*, and *Ambloplites rupestris*. At the head of the cove in the reeds, but not in the creek, we took *Notropis hudsonius*, *Notemigonus crysoleucas*, *Hyborhynchus notatus*, *Esox lucius*, *Anguilla rostrata*, *Fundulus diaphanus*, *Perca flavescens*, *Ambloplites rupestris* and *Eucalia inconstans*. In this location also we took young whitefish (*C. clupeaformis*) and cisco (*L. artedi*). In the

more open water of the cove, toward the mouth and in the centre we procured, *Pomolobus pseudoharengus*, *Rhinichthys cataractae*, *Notropis deliciosus*, *Notropis hudsonius*, *Notropis atherinoides*, *Hyborhynchus notatus*, *Anguilla rostrata*, *Percopsis omiscomaycus*, *Perca flavescens*, *Boleosoma nigrum*, *Catnotus flabellaris*, *Cottus cognatus* and *Pungitius pungitius*.

*Muskeg lake* near Waupoos, Prince Edward county. This small lake is situated in a depression in the central part of Pleasant Point, Prince Edward county. Over most of its area it is only a few inches deep but in places there are deeper holes. It is spring fed and surrounded by a considerable area of quaking bog. In it we took *Pfrille neogaeus*, *Chrosomus erythrogaster*, *Pimephales promelas*, *Umbra limi*, *Poecilichthys exilis*, and *Eucalia inconstans*.

*Consecon lake*. This is a large deep lake in the southwest end of Prince Edward county. Its shores are sandy and are sparsely covered with aquatic vegetation. A few seine hauls yielded *Esox lucius*, *Perca flavescens*, *Percina caprodes*, *Eupomotis gibbosus*, and *Aplites salmoides*. Local residents report ciscoes of a large size in the lake presumably, *L. artedi*. In the winter the lake supports a profitable hoop-net fishery dependent largely on catfish and pike.

*Lake Ontario*. The results of our gill net settings in the open lake are too extensive to be reported here in detail. A list of the species found in the open waters with notes on their habitats and abundance can be readily prepared by reference to the annotated list to follow.

WATER TEMPERATURES

The following water temperatures were obtained during the summer of 1927 in the western end of lake Ontario:

OPEN LAKE			
Date and Time	Depth	Distance from Shore	Temp. Cent.
June 6, 9.35 a.m.	Surface	1 mile off Port Credit	7
" 10, 10.00 a.m.	"	1/3 " " " "	7
" 10.15 a.m.	"	1 " " " "	7
" 10.20 a.m.	30 yards	1 " " " "	5
July 8,	Surface	1/4 " " Toronto island	13.5
" "	"	3 " " " "	13.5
" 12,	"	1/4 " " Port Credit	15.8
" "	5 feet	" " " " "	15.5
" "	10 "	" " " " "	14.8
" "	16 "	" " " " "	13.2
" "	20 "	" " " " "	12.7
" "	30 " (bottom)	" " " " "	11.9
" 18,	Surface	18 mls. SE by E Port Credit	13.2
Aug. 20,	"	8 1/3 " " off "	17.5
	5 yards	" " " " "	17.2
	11 "	" " " " "	17.1
	13 "	" " " " "	13.7
	16 "	" " " " "	8.3
	21 "	" " " " "	6.8
	31 "	" " " " "	5.2
	51 "	" " " " "	4.2
	92 "	" " " " "	4.0
	102 " (bottom)	" " " " "	4.0

CREDIT RIVER, NEAR MOUTH

June 6, 9.05 a.m.	13.5°C	June 13, 2.30 p.m.	23
" 7, 4.05 p.m.	17	" 30, 10.00 a.m.	23
" 8, 3.15 p.m.	18.5	July 13, 4.40 p.m.	25.5
" 11, 1.30 p.m.	23	" 19, 8.45 p.m.	23.4

BURLINGTON BAY

July 25,	surface	1/4 mile off La Salle Park	20°C
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Following are temperatures obtained in the eastern end of the lake during 1928.

OFF BIG ISLAND		
Date	Depth	Temperature centigrade
Apr. 7	surface	2.7
" 11	"	3.97
	5 feet	3.97
	10 " (bottom)	3.97
" 23	surface	4.7
	11 feet (bottom)	4.54
May 3	surface near shore	9.5
" 5	" 200 ft. from shore	8.5
	"	10.7
PRINVER'S COVE		
May 16	surface	10.1
	9 feet	8.21
	23 "	7.26
	30 "	6.68
" 24	surface	13.3
	36 feet (bottom)	5.9
" 31	surface	12.4
	15 feet	11.0
	34 "	9.7
June 9	surface	11.7
	1 foot	11.6
	15 feet	10.6
" 16	surface	13.3
	15 feet	12.5
" 26	surface	16.2
	14 feet	15.5
	28 " (bottom)	14.5

Bay of Quinté 1/4 mile north of south shore of Adolphus Reach, 1/2 mile east of Cressy Dock, Aug. 31.

surface	19.0°C
100 ft.	10.2
120 ft. (bottom)	9.7

## ANNOTATED LIST

In the following account of the species of fish taken in the Lake Ontario drainage references to subspecific differences have been largely omitted, that phase of the subject having been considered by Hubbs (1929).

*PETROMYZON MARINUS* Linn

## LAKE LAMPREY

This lamprey is common in Lake Ontario and undoubtedly causes considerable injury to the fishes of the lake. Most of the lake trout taken in the fishermen's nets at Port Credit bore many lamprey marks, some specimens having as many as fourteen such marks. It was unusual however to find a trout into which a lamprey had penetrated beneath the skin. In the diary of C. W. Nash is this note under date of Mar. 16, 1899, "Saw another lake trout washed up today evidently killed by a lamprey. I must have found a dozen this winter along the beach [East Toronto] killed in this manner. This is the first season I have noticed them."

Nash (1891) also records that pike in Toronto bay suffered terribly from the attacks of lampreys, "Many fine fish are to be seen floating about the bay killed in this fashion, and very few are caught that do not show marks of having suffered from a more or less prolonged visit of this wretched parasite, two or three holes being found in some cases. Black bass and suckers are served the same way."

Whitefish are also attacked and we have seen a number of specimens of this species which had been so severely injured by lampreys that it is almost certain they would have died had they not been taken in the nets. Northern suckers and ling sometimes bear lamprey marks, and ciscoes are not unusually taken with small lampreys attached to them.

In *Forest and Stream*, Oct. 4, 1888, appeared a note by "H.F.H., Ontario" in which it is mentioned that lamprey attached themselves to the rudder of a yacht in Lake Ontario, and Mr. Nash has told us of having lampreys attach them-

selves to boats that he was rowing. A number of the swimmers competing in a twenty-one mile race in Lake Ontario in August 1927 had lampreys attach themselves to them.

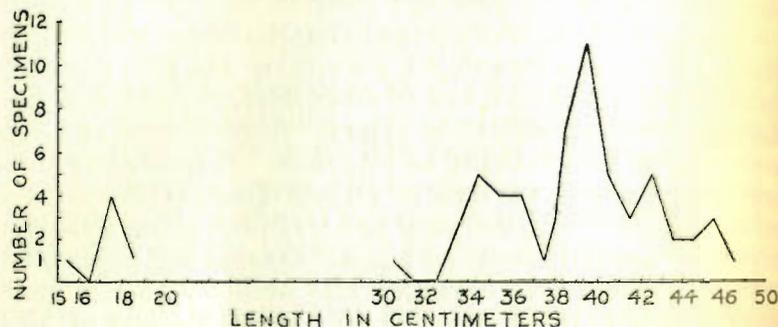
Coventry (1922) has given an account of the breeding habits of this species in the Humber river. On May 6, 1921 it was reported by fishermen that an occasional lamprey had been taken in the Humber attached to suckers. On May 20 they were found in hundreds clinging to rocks just below a waterfall a few hundred yards below the bridge at Lambton Mills. None was seen in the river below the falls except in its immediate vicinity, and it was therefore concluded that the upstream migration had ended. Neither were any seen spawning or nest building at this time. A number of dead ones were found in the river at various distances downstream below the falls. Whether they had died during their upstream migration or after spawning was not determined, although it seemed unlikely that spawning had occurred at this time. Spawning in that year took place towards the end of May and during early June. In the Credit river in 1927, W. E. Ricker saw two lampreys together in a nest on June 28, and a single one in another nest on the same day.

The average length and the range in lengths of ten specimens of each sex taken from the Humber river on May 27, 1921 was as follows,—males, average 367 mm. range 325 to 434 mm.; females, average 368 mm., range 292 to 421 mm.

The largest specimen we have seen from the lake was 470 mm. (18½ inches) in length. A specimen 139 mm. (5½ inches) long was taken by H. J. Dignan on Aug. 18, 1927, in quiet water in a large bay of the Credit river at Port Credit, *i.e.* near the mouth of the river. It seemed likely that this specimen was migrating from the stream to the lake.

The accompanying graph indicates the size frequency of a lot of 64 lampreys collected for us off Port Credit during the autumn of 1928 by Joyce Brothers. The smallest specimens in this collection are six which measure 154, 170, 173, 174, 176, and 187 mm. respectively. These were all taken

in deep water attached to ciscoes. We conclude that these specimens were in their first year in the lake having migrated thither during the summer of 1928. As to the ages and the number of age groups represented by the other specimens it is perhaps unsafe to draw any conclusions in view of the comparatively small number of specimens represented, but the indications are that the peak between 34 and 35 cm. represent



Graph illustrating the size frequency of a lot of 64 lampreys taken in Lake Ontario off Port Credit in the autumn of 1928

specimens in their second year in the lake and the peak between 39 and 42 cm. those in their third year in the lake. It is probable that the other two peaks would disappear were more specimens represented. In fact it is quite possible that we are dealing with only one age group, viz., those in their second year in the lake.

*ENTOSPHEMUS APPENDIX* (DeKay)

BROOK LAMPREY

This lamprey spawns in the Don river; specimens taken there May 7, 1913, May 1914 and May 7, 1918 by Dr. A. G. Huntsman and E. B. S. Logier are in our collection. Nash's diary records that on May 3, 1913 he took two brook lampreys in a pool below York Mills. There were about a dozen of them on the stones close together. A few specimens have been taken in the Humber,—one a ripe male at the Old Mill by E. H. Bensley.

*ACIPENSER FULVESCENS* Rafinesque

LAKE STURGEON

The average catch of sturgeon in Lake Ontario for the past five years (1923-27) was 5,600 pounds. Most of the catch is taken in the eastern end of the lake, but even here the species is quite rare.

*LEPISOSTEUS OSSEUS* (Linn.)

LONG-NOSED GAR PIKE

The gar pike occurs in the Bay of Quinté and in Burlington bay.

*AMIA CALVA* Linn.

BOWFIN

Although less common than formerly this species is still found in well protected shallow water such as the Bay of Quinté, Burlington bay and in the neighbourhood of Toronto island.

*HIODON TERGISUS* LeSueur

MOONEYE

The mooneye is commonly taken in the Bay of Quinté.

*POMOLOBUS PSEUDOHARENGUS* (Wilson)

ALEWIFE

The alewife is common throughout the lake.

*ALOSA SAPIDISSIMA* (Wilson)

SHAD

In the summer of 1924 the late C. W. Nash obtained two specimens of shad taken in Lake Ontario off the mouth of

the Niagara river. These specimens were examined by Prof. Dymond. They were the first Mr. Nash had seen from Lake Ontario.

*DOROSOMA CEPEDIANUM* (LeSueur)

GIZZARD SHAD

In his unpublished notes Nash says with reference to this species, "Received one from fisherman of Toronto island which he had taken in his net set in Lake Ontario". This is probably the basis of his statement (1913) "taken in Lake Ontario, but very rare".

*PROSOPIUM QUADRILATERALE* (Richardson)

FROST-FISH; ROUND WHITEFISH

This species was taken in considerable numbers in gill nets at depth of 50 feet off Port Credit, Sept. 29, 1926. Also taken but in fewer numbers Sept. 24, 1926, 125 feet; June 6, 1927, 36 feet; June 22, 100 feet; Aug. 11, 18 feet; July 27, 1928, 100 feet. Also commonly taken in Adolphus Reach, Bay of Quinté. Largest specimen 15½ in.

*COREGONUS CLUPEIFORMIS* (Mitchill)

COMMON WHITEFISH

The whitefish is now scarce in the western end of the lake but is found more plentifully in shallower water of the eastern end. There is a large spawning migration into the Bay of Quinté in the fall. The average annual catch for the past five years (1923-27) was 2,094,000 pounds.

*LEUCICHTHYS ARTEDI* (LeSueur)

LAKE HERRING

The herring is still common in the eastern end of the lake, where a large spawning migration takes place into the Bay of Quinté in the fall; scarce in the western end.

*LEUCICHTHYS REIGHARDI* Koelz

REIGHARD CISCO

This cisco is quite common in water of medium depth.

*LEUCICHTHYS HOYI* (Gill)

BLOATER

This species is common in deep water.

*LEUCICHTHYS KIYI* Koelz

KIYI

This species is quite common in very deep water.

*ONCORHYNCHUS TSCHAWYTSCHA* (Walbaum)

SPRING, KING, TYEE, CHINOOK OR QUINNAT SALMON

This species of Pacific salmon has been planted in Lake Ontario on several occasions. Wilmot in 1877 records the capture in Lake Ontario of a California salmon 18 inches long weighing 5 pounds which he thought was one of a lot turned out of his hatchery at Newcastle in the spring of 1874. Prince (1900) says in this connection "In October, 1873, 20,000 quinnat or spring salmon eggs were generously donated to the Newcastle Hatchery by Prof. Spencer Baird; they hatched out in December, and were planted in April following. In 1874 a second lot was sent, and in Oct., 1875, a third consignment of 80,000 (of which half were sent to Tadoussac Hatchery), and in 1876 a further batch of 40,000 and in November a further shipment of 80,000."

In 1878, Robson, recorded the capture on July 13 of that year of 23 salmon, 2 of which were the quinnat salmon, one a grilse of 4 pounds, the other "a well-grown, well-fed male fish of 14½ pounds, 2 feet 8¾ inches."

J. A. Rodd, Superintendent of Fish Culture, Fisheries Branch, Department of Marine and Fisheries, Ottawa, has kindly supplied us with statistics as to the planting of Pacific salmon in Lake Ontario. He states that the early reports

regarding the distribution of Pacific salmon in Lake Ontario from 1878 to 1881 do not state definitely that it was the spring salmon that was introduced, but the general inference is to that effect. The later distributions, however, from 1919 to 1925 were the true spring of the Pacific. The distributions and the points of distribution were as follows,—

	1878	1879	1880	1881		
Barber's creek	1,000	.....	50,000	40,000		
Grafton creek	1,000	.....	.....	.....		
Ontario lake	.....	.....	10,000	.....		
Saugeen river	5,000	500	.....	.....		
Trent river	1,000	200	.....	.....		
Wilmot's creek	26,500	1,000	.....	.....		
	1919	1920	1921	1922	1923	1924
Clark's creek						
(Bay of Quinte)	.....	125,350	99,570	95,480	30,780	31,762*
Credit river	100,000	211,200	.....	47,450	80,000	20,000
Lynes creek	99,500	.....	.....	.....	.....	.....
Lynn river	100,000	135,000	.....	.....	.....	.....
Napanee river	.....	.....	.....	.....	20,000	15,000
Wilmot creek	75,000	87,000	.....	47,450	.....	.....
Twelve Mile creek	.....	.....	.....	.....	20,000	30,000
Colonial creek	.....	.....	.....	.....	.....	.....
(at Newcastle)	.....	.....	.....	.....	.....	30,000
Souche creek	.....	.....	.....	.....	.....	.....
(at Bowmanville)	.....	.....	.....	.....	.....	30,000

\*No. 3 fingerlings.

Specimens up to 18 pounds in weight have been caught in recent years. They are occasionally taken in the fishermen's nets but are seen in largest numbers in the autumn when they run up some of the streams probably in response to their spawning instincts. Whether any young have been produced from specimens developing in the lake is not known.

### *SALMO SALAR* Linn.

#### ATLANTIC SALMON

The Atlantic salmon, once abundant in the lake, is now extinct there.

### *CRISTIVOMER NAMAYCUSH* (Walbaum)

#### LAKE TROUT

The average annual catch of lake trout in Lake Ontario for the five year period, 1923 to 1927 inclusive was 851,000 pounds.

Eleven specimens 5 to 6 inches in length were taken off Prince Edward county in a 1½ inch gill net in 150 feet of water July 4, 1928. Another small specimen 8½ inches long was taken in 100 feet of water off Port Credit June 22, 1927. One of the largest specimens taken in recent years off Port Credit was caught Aug. 22, 1927. It was a male 38 inches long weighing 32 pounds.

### *SALVELINUS FONTINALIS* (Mitchill)

#### SPECKLED TROUT

The speckled trout is still common in the Credit river, especially above its forks and in the headwaters of most other streams flowing into Lake Ontario from the north. We took a small specimen in a spring creek near Clarkson on Aug. 14, 1927.

### *CATOSTOMUS COMMERSONII* (Lacépède)

#### COMMON SUCKER

The common sucker was taken in gill nets off Port Credit out to a depth of 50 feet; the young are common in most of the streams flowing into the lake; also common in the Bay of Quinté.

### *CATOSTOMUS CATOSTOMUS* (Forster)

#### NORTHERN OR LONG-NOSED SUCKER

This species was not taken very commonly in our gill nets off Port Credit; one specimen on each of following dates and at depths indicated,—Sept. 24, 1926, 50 feet; June 8, 1927, 12 feet, male with tubercles on anal and caudal fins; Aug. 11, 1927, 18 feet. Young 2¾ to 4¼ inches long taken in mouth

of Credit river July 12, 1927. Our collection also contains a specimen taken in deep water off Brighton, Aug. 10, 1924; another was taken off the Main Duck islands July 8, 1928.

*HYPENTELIUM NIGRICANS* (LeSueur)

HOG SUCKER

This sucker was taken by us most commonly over gravelly or stony bottom,—in the Credit and Humber rivers and Bronte and Etobicoke creeks.

*MOXOSTOMA RUBREQUES* Hubbs

COMMON RED-HORSE

(*Moxostoma aureolum* of Jordan and Evermann and most subsequent lists.)

Specimens which Dr. Hubbs has described as paratypes of this species were taken in the Credit river at Port Credit on Oct. 22, 1925 (2); June 8, 1927; June 15, 1927 (3).

This species is said to have reached a very large size formerly; the late Mr. Louis Joyce told us that he had taken specimens up to 13 pounds in weight, while Mr. Arthur Riggs of Bronte says he has seen one that weighed 16 pounds.

*MOXOSTOMA AUREOLUM* (LeSueur)

SHORT-HEADED RED-HORSE

(*Moxostoma breviceps* of Jordan and Evermann and many subsequent lists.)

We have specimens from Port Credit, the Bay of Quinté and Beaver lake, near Napanee, Ontario.

*MOXOSTOMA ANISURUM* (Rafinesque)

WHITE-NOSED RED-HORSE

We have 6 specimens of this species all taken in the Bay of Quinté, 4 on Oct. 31, 1925 and 2 in the fall of 1926.

*CYPRINUS CARPIO* Linn.

CARP

When we began our observations at Port Credit on June 4, 1927, carp were seen splashing about among the weeds in a shallow backwater of the Credit river. A female taken on that date had not yet spawned. It was 24½ inches long, weighed 10 pounds 12 ounces, and we estimated it to contain 660,000 eggs. After that date the weather turned cooler and no more splashing was seen until June 30, when we succeeded in taking four males, all ripe.

Young, one inch long were taken off La Salle Park in Burlington bay on July 25, 1927. The species is common in the Bay of Quinté. Nash, in his diary, recorded under date of Oct. 5, 1899, "The shallow places in Ashbridge's marsh under the black rushes are full of carp and have been for some days."

The average annual catch for each of the past five years (1923-27) was 32,000 pounds, most of which was taken in the Bay of Quinté region.

*CARASSIUS AURATUS* (Linn.)

GOLDFISH

The late C. W. Nash is authority for the statement that goldfish occur in the Don river within the city of Toronto, and in Ashbridge's bay.

*COUESIUS PLUMBEUS* (Agassiz)

LAKE CHUB

The lake chub was taken in gill nets off Port Credit from the surface to a depth of 36 feet, in June and July 1927. Ripe females were taken June 6 and July 21, 1927. Two specimens were taken in a gill net off Consecan, Prince Edward county, in 100 feet of water, July 26, 1928.

*NOCOMIS MICROPOGON* (Cope)

## RIVER CHUB

This species is fairly common in the Credit river, especially where there is some current. It is also taken in the Humber and in Etobicoke and Bronte creeks.

*RHINICHTHYS ATRONASUS* (Mitchill)

## BLACK-NOSED DACE

The black-nosed dace was taken less commonly than the next species. It was taken in the creek at Clarkson, near the mouth of Credit river, in the Humber river, in the Don river at Oriole north York, in Burlington bay and in Etobicoke creek. Nash's diary records it from Highland creek.

*RHINICHTHYS CATARACTAE* (Cuvier and Valenciennes)

## LONG-NOSED DACE

The long-nosed dace was taken quite commonly, especially in fairly rapid water in the Credit and Humber rivers; also on exposed beaches in the lake at Lorne Park, Port Credit, and Prince Edward county. Ripe males and females were taken in the mouth of the Credit river, July 16, 1927.

*SEMOTILUS ATROMACULATUS* (Mitchill)

## HORNED DACE

The horned dace was common in streams,—Credit, Etobicoke, Humber, and Don rivers and creek at Clarkson; taken also in Burlington bay off LaSalle Park.

*PFRILLE NEOGAEUS* (Cope)

## FINE-SCALED DACE

This species was taken in a small muskeg lake near Waupoos, Prince Edward county, July 18, 1928. Taken

also in this lake were *Chrosomus erythrogaster*, *Pimephales promelas*, *Poecilichthys exilis*, *Umbra limi*, and *Eucalia inconstans*.

*CHROSOMUS ERYTHROGASTER* Rafinesque

## RED-BELLIED DACE

Specimens were taken by H. C. White in the Don river, May 1, 1926; by Alfred Wilkes in a stream flowing into the Humber river at Weston; and by J. L. Hart in the small muskeg lake near Waupoos, Prince Edward county, July 18, 1928.

*CLINOSTOMUS ELONGATUS* (Kirtland)

## RED-SIDED DACE

This minnow was taken in the Humber and Don rivers, in Etobicoke creek and creek at Clarkson. Nash records in his diary that he found many in very high colour in the Don at York Mills, May 3, 1913.

*NOTROPIS HETERODON* (Cope)

## BLACK-NOSED SHINER

More than five hundred specimens were taken off LaSalle Park, Burlington bay July 25, 1927 and a few in creek entering Prinyer's cove, Prince Edward county. May 25, 1928.

*NOTROPIS BIFRENATUS* (Cope)

## BRIDLED SHINER

This shiner was taken only in a creek entering Prinyer's cove, Prince Edward county, May 25, 1928.

*NOTROPIS HETEROLEPIS* Eigenmann and Eigenmann

## MUSKOKA MINNOW

More than two hundred specimens were taken off LaSalle Park, Burlington bay, July 25, 1927; also taken in Bronte creek.

*NOTROPIS DELICIOSUS* (Girard)

STRAW-COLOURED MINNOW

This minnow was common off LaSalle Park, Burlington bay; occasional specimens taken in the Credit and Humber rivers and in Prinyer's cove, Prince Edward county; specimens containing ripe or nearly ripe eggs, June 21, 1927.

*NOTROPIS HUDSONIUS* (Clinton)

SPOT-TAILED MINNOW

The spot-tailed minnow was very common in protected bays and within the mouths of rivers. A few specimens were taken in 1¼ inch gill net at depths of 15 to 20 feet in the lake.

*NOTROPIS WHIPPLII* (Girard)

SILVER-FIN

More than two hundred specimens of this minnow were taken off LaSalle Park in Burlington bay, July 25, 1927; also taken in swift water in Credit river, near mouth of Credit river, in the Humber river, Bronte creek and in beach pool at Waupoos, Prince Edward county.

*NOTROPIS ATHERINOIDES* Rafinesque

LAKE SHINER

This species occurs more commonly in the lake than in streams; taken more often in beach seining in the lake at night (9-11 P.M.).

*NOTROPIS RUBELLUS* (Agassiz)

ROSY-FACED MINNOW

More than three hundred specimens were taken in swift water above and below rapids in Credit river; also taken in riffles in the Humber river and Bronte creek.

*NOTROPIS CORNUTUS* (Mitchill)

COMMON SHINER

The common shiner was very common in streams; a few were taken in the lake.

*HYBOGNATHUS HANKINSONI* Hubbs

SILVERY MINNOW

One specimen (paratype) taken by A. L. Pritchard and A. M. Hodgetts in creek at Clarkson, August 14, 1927.

*NOTEMIGONUS CRYSOLEUCAS* (Mitchill)

GOLDEN SHINER

This species was common in well protected, weed-choked waters such as parts of Burlington bay and Prinyer's cove; also taken in Credit and Humber rivers, in a lagoon at Ward's island off Toronto, and in Grenadier Pond, Toronto.

*HYBORHYNCHUS NOTATUS* (Rafinesque)

BLUNT-NOSED MINNOW

More than five hundred were taken off LaSalle Park in Burlington bay, July 26, 1927; also taken in Credit river both in swift water and in more sluggish portions; in Humber river and in Bronte and Etobicoke creeks and in a small creek at Clarkson; in Prinyer's cove and in stream flowing into it; a few taken on beach just outside mouth of Credit river. Specimens containing ripe or nearly ripe eggs were taken June 21, 1927.

*PIMEPHALES PROMELAS* Rafinesque

FAT-HEAD MINNOW

This species was of comparatively rare occurrence. It was one of the commonest species in the creek at Clarkson; also taken in Etobicoke creek, and in the small muskeg lake near Waupoos, Prince Edward county.

*VILLARIUS LACUSTRIS* (Walbaum)

## GREAT LAKE CATFISH

The Great Lake catfish is sometimes taken in commercial nets in Bay of Quinté, but is not common; a specimen in our collection was taken there, in the fall of 1926.

*AMEIURUS NEBULOSUS* (Le Sueur)

## BROWN BULLHEAD

This is the only species of *Ameiurus* which we have taken in the Lake Ontario drainage; specimens from Credit river, Etobicoke creek, Humber and Don rivers, off Ward's island and in Grenadier Pond, Toronto, Brighton bay, Bay of Quinté, Napanee river and Duck island. Nash in his diary records that, on July 13, 1906, he found large broods of young catfish close to the shores of the lagoons of Toronto island. The parent fish had apparently left the young before that date. On July 7 he had seen many broods of little ones, in nearly all cases accompanied by one of the parents.

*NOTURUS FLAVUS* Rafinesque

## STONE CAT

The stone cat was taken in swift water in Credit river Aug. 3, 1927, and in seine haul on beach of lake at Port Credit, 10 p.m. Aug. 3, 1927, also in Burlington bay.

*SCHILBEODES GYRINUS* (Mitchill)

## TADPOLE CAT

Specimens were taken in a backwater of the Credit river and at Belleville.

*UMBRA LIMI* (Kirtland)

## MUD MINNOW

The mud minnow was taken in Burlington bay, Prinyer's cove and in the lake near Waupoos, Prince Edward county.

"June 18, 1906. Took many from among the weeds in Moira lake near Madoc" (Nash's diary).

The largest specimen we have seen was taken by R. V. Lindsay in a beach pool near the outlet of Grenadier Pond, Toronto, towards the end of April, 1929. It measured 4 15/16 inches.

*ESOX LUCIUS* Linn.

## PIKE

Quite a number of pike were taken in Credit river in trap net in June, 1927; also taken in the lake, in Burlington bay, off Ward's island, Toronto, and throughout the Bay of Quinté. Young of sizes indicated were taken as follows,—one specimen one inch in length, Prinyer's cove, May 23, 1928; 29 specimens 1½ to 2¼ inches long, sluggish creek entering Prinyer's cove, June 13, 1928; one 2½ inches long near mouth of Credit river, June 9, 1927; one 3 3/8 inches long, below rapids in Credit river, June 28, 1927; two 4¾ and 5½ inches respectively near mouth of Credit river, June 28, 1927; one 3¼ inches, Burlington bay, August 22.

Nash (1891) speaks of the sport to be had in fishing for pike in Toronto bay at that time. The largest specimen he saw taken that year weighed 12½ pounds.

The commercial catch of this species in Lake Ontario averaged 202,000 pounds for each of the past five years (1923-27).

*ESOX MASQUINONGY* (Mitchill)

## MASKINONGE

The maskinonge occurs in the Bay of Quinté; a specimen in our collection 50 inches long was taken there. Also found throughout Trent river and Kawartha lakes system, and among the Thousand Islands.

*ANGUILLA ROSTRATA* (Le Sueur)

## EEL

The eel is an important commercial species in the Bay of Quinté region; the average catch per year for the past five years (1923-27) was 129,000 pounds; specimens also from Credit river and Brighton bay.

*FUNDULUS DIAPHANUS MENONA* (Jordan and Copeland)

## KILLIFISH

We have taken this species only in well-protected waters such as Burlington bay, lagoons of Toronto island, and Prinyer's cove; in these localities it is very abundant.

*PERCOPSIS OMISCOMAYCUS* (Walbaum)

## TROUT-PERCH

The trout-perch was taken rather commonly in the lake off Port Credit and off Prince Edward county. We secured twenty-four specimens chiefly ripe males on the beach in turbid water just outside mouth of Credit river, July 29, 1927, and forty-nine ripe specimens of both sexes at night (10 p.m.) in the seine in the same situation, August 3, 1927; also taken commonly in night seining off Prince Edward county, June 20-26, 1928. Specimens were also obtained at following depths in the lake,—off Prince Edward county 1927, 17 feet June 20, 200 feet June 27, 80 feet July 3, 150 feet July 4, 80-100 feet July 5, 20-40 feet July 12 and 19, 50 feet and 100 feet July 26, and 120 feet July 27.

*LEPIBEMA CHRYSOPS* (Rafinesque)

## WHITE BASS

We have specimens from the Bay of Quinté taken October 31, 1925 and autumn of 1926. In his diary Nash says, "I have

taken it in abundance near the mouth of the Niagara river and occasionally in Toronto bay and Burlington bay. About Sept. 1, 1916, I saw over a dozen netted in one haul from the top of Blockhouse bay near the lighthouse, Toronto island."

*PERCA FLAVESCENS* Mitchell

## PERCH

The perch is much more common in the Bay of Quinté than in the western end of the lake; for instance, a string of gill nets made up of fifty yards of each of following sizes,— $1\frac{1}{4}$ ,  $1\frac{1}{2}$ , 2,  $2\frac{1}{4}$ ,  $2\frac{1}{2}$ ,  $2\frac{3}{4}$ , 3,  $3\frac{1}{2}$ , and 4 inch, took 87 at a depth of 30 feet on May 9, and 155 at a depth of 20 feet on June 20 in the Bay of Quinté, while the same string of nets took only 1 specimen at a depth of 36 feet on June 6, off Port Credit. These results we believe indicate the approximate abundance of the species in the two areas.

Perch were abundant in Ashbridge's bay, Toronto in earlier times. Nash in his diary records capturing the following numbers on the dates indicated in 1891, Jan. 5, 20; Jan. 6, 51; Jan. 8, 32; Jan. 9, 6; Jan. 10, 3; Feb. 13, 60; Feb. 21, 52; Mar. 6, 10; Mar. 11, 35; Apr. 23, 9 (all had spawned on the latter date). In 1901, on various dates in May and June he caught a few at Centre island; in every case his catch consisted entirely of ripe males. The latest date was June 7 when 10 were taken. On Sept. 30, 1905, he caught 50 at Centre island, the total weight of which was 16 pounds.

The average catch of perch for each of the past five years (1923-27) in Lake Ontario was 93,000 pounds.

*STIZOSTEDION CANADENSE* (Smith)

## SAUGER

The sauger is rare in Lake Ontario; two specimens were taken off Port Credit in June, 1927, from 275 and 350 feet respectively; Mr. Hart also took one in the Bay of Quinté.

*STIZOSTEDION VITREUM* (Mitchill)

## YELLOW PICKEREL

The pickerel is almost entirely confined to the eastern end of the lake. The commercial catch for the past five years (1923-27) averaged 92,000 pounds per year, but has shown a rapid decrease from 167,000 pounds in 1923 to 40,000 in 1928.

That this species was formerly common in Burlington bay is indicated by a statement made by Mr. Frederick Corey of Burlington beach before the Dominion Fisheries Commission in December, 1892. He said, "We used to catch 1,000 pickerel (in a seine) in one day, in 1840, in the bay, but there are none now, only a few sand pickerel." He indicated that they were always caught at the spawning season in the bay at the time of which he spoke.

*STIZOSTEDION GLAUCUM* Hubbs

## BLUE PICKEREL

Mr. Hart has taken specimens of the blue pickerel from the Bay of Quinté. That the fishermen recognize the presence of this form in Lake Ontario is indicated by the fact that the Department of Game and Fisheries list the catch for blue pickerel separately from that for the yellow pickerel, the average yearly catch of the former for the period 1923-1927 inclusive being 25,000 pounds.

Speaking before the Dominion Fisheries Commission in December, 1892, Mr. Frederick Corey of Burlington beach said, "I have seen 50 years ago, in March, catch 50 to 200 and 300 in one haul and there would be some of them as blue as ever they could be, and others yellow, but I did not see any difference in the flavour of the fish; they were just the same, only one blue and the other yellow. We caught another pickerel we called sand, about one pound."

The blue pickerel is reported to have attained a weight of 6 pounds in the Bay of Quinté in earlier times.

*PERCINA CAPRODES* (Rafinesque)

## LOG PERCH

The log perch was taken just outside and just within mouth of Credit river and in swift water farther up; also in Etobicoke creek, Humber river, Burlington bay, and Consecun lake and other localities in the Bay of Quinté region.

*BOLEOSOMA NIGRUM* (Rafinesque)

## JOHNNY DARTER

This is the commonest darter of the region from which our collections were made. It is common on the sandy beach around the mouth of the Credit river, and in the swift water farther up; also taken off Ward's island, Toronto, in Etobicoke creek, Humber and Don rivers, Burlington bay off LaSalle Park, and at various places off Prince Edward county. Several specimens were taken in the trawl, some at a depth of 80 feet. Specimens distended with ripe or nearly ripe eggs, were secured, June 21, 1927.

*POECILICHTHYS EXILIS* (Girard)

## IOWA DARTER

One specimen was taken from small muskeg lake near Waupoos, Prince Edward county, July 18, 1928.

*POECILICHTHYS COERULEUS* (Storer)

## RAINBOW DARTER

This darter was not nearly so common as *Boleosoma* but more common than the following species. It was taken in Credit and Humber rivers, Etobicoke and Bronte creeks and creek at Clarkson. "Took several in the upper Don at York Mills, July 10, 1910" (Nash Diary).

*CATONOTUS FLABELLARIIS* (Rafinesque)

FAN-TAIL DARTER

This species was often found associated with the preceding, but was less common and more restricted in its distribution in the area investigated; taken in Credit river, Bronte creek, in a protected bay of the lake at Lorne Park and in Prinyer's cove.

*MICROPERCA PUNCTULATA* Putnam

LEAST DARTER

A specimen of the least darter was taken in the Credit river, August 21, 1927.

*MICROPTERUS DOLOMIEU* Lacépède

SMALL-MOUTH BLACK BASS

Specimens were taken in the Credit river and in Bronte creek. Young, presumably of the year, of sizes indicated were taken on following dates,—Credit river July 29, 1 inch; Credit river, Aug. 3, 1 3/8-1 5/8 inches; Bronte creek Aug. 17, 1 1/2-2 inches.

*APLITES SALMOIDES* (Lacépède)

LARGE-MOUTH BLACK BASS

We took specimens in Burlington bay, Consecon lake, Prinyer's cove, and in other localities in the Bay of Quinté.

Following are entries from the diary of C. W. Nash:  
 "May 6, 1877. A large number in the cove behind Prince's Island, Dundas Marsh. Some of large size.  
 "Mar. 11, 1891. Saw one taken with hook and line through the ice on Ashbridge's bay—the first this season.  
 "Oct. 5, 1899. Saw a lot of small black bass (large-mouth) caught in a net in Ashbridge's bay.  
 "Sept. 27, 1901. Young large-mouth black bass of this and last year very abundant on the shallows in Toronto bay.

*HELIOPERCA INCISOR* (Cuvier and Valenciennes)

BLUE-GILL

This species was taken in shallow water among aquatic vegetation in Credit river, June 9, 1927, also in Grenadier pond, Toronto, Beaver lake near Napanee, and in the Bay of Quinté.

*POMOXIS ANNULARIS* Rafinesque

CRAPPIE

Small specimens (1 1/4 inches long) which Dr. Hubbs identified as belonging to this species were taken in a sluggish creek flowing into the extreme northwestern end of Burlington bay.

*POMOXIS SPAROIDES* (Lacépède)

CALICO BASS

A ripe female 6 3/4 inches long was taken among aquatic vegetation in Credit river, June 8, 1927; fairly common in the Bay of Quinté.

Under various dates from 1891 to 1905, Nash records the taking of "speckled bass" at Ashbridge's bay and Toronto island. On March 28, 1891, he says they "bit ravenously at young gaspereau today. One man caught 27 and another 22 through the ice on Ashbridge's bay," and on August 18, 1899, "At Centre island, caught about 25 speckled bass. These fish are becoming established in Toronto bay and have disappeared from Ashbridge's bay. Two years ago we caught a single one near Ward's island the first I ever saw in Toronto bay, last year a few were caught there and this year a good many have been taken." On May 24, 1877, he records that he caught 19 in "old channel, Dundas Marsh. All had spawn or milt."