Fishing
in the Bay of Quinte

DEPARTMENT OF LANDS AND FORESTS

HON. A. KELSO ROBERTS, Q.C.
Minister

F. A. MacDOUGALL
Deputy Minister
Glenora Fisheries Station as seen from the Bay of Quinte.

Raising a Lands and Forests trapnet in a tagging operation. When unwanted species are trapped, they are enumerated and released.
Fishing
in the Bay of Quinte

by W. J. CHRISTIE
TWEED FOREST DISTRICT

DEPARTMENT OF LANDS AND FORESTS

HON. A. KELSO ROBERTS, Q.C.
Minister

F. A. MacDOUGALL
Deputy Minister
BOTH commercial and sports fishing are familiar aspects of life on and around the Bay of Quinte. The commercial fishing industry dates back more than a century in these waters. The sports fishing, although of more recent origin, has risen to considerable importance.

The Trent, Moira and Napanee watersheds all bring nutrients to the Bay, and the rich surrounding lands also contribute to a high fertility which permits an annual harvest of about 19 pounds of fish per acre per year. Today, this area forms a mecca for anglers from many parts of Canada and the United States.

The Bay of Quinte fishery resource, for administrative convenience, is considered under two broad classifications, the Sports Fishery and the Commercial Fishery. From the point of view of the management of the fish stocks, of course, such a distinction is seldom useful because the main stress must be on broad utilization over all species to give the maximum continuing yield. The distinction is in some ways unnecessarily emphasized in expressions of the views of the sport and commercial fishing groups, themselves. Differences in opinion have been found to be largely the result of misunderstanding, and it is in the hope of promoting better understanding that this booklet is presented.

The species of common interest to the two groups are actually rather limited. The catch of the sport fishery exclusively includes such species as black (smallmouth and largemouth) bass, pike and maskinonge. The exclusive catch of the commercial fishery consists of whitefish, bullheads, carp, eels and channel catfish.

Fish taken by both sports and commercial fishermen consist of sunfish, bluegills, rock bass, perch, smelt and pickerel (walleye). Anglers may take any of the commercial species by hook and line, but many of these do not lend themselves well to the sport.

The problems of the joint use of the pickerel (walleye) are being dealt with on the basis of currently available biological information. A committee has been created with representatives from the Quinte Isle Tourist Association, the Eastern Ontario Fisherman's Association, the various interested local Rod and Gun Clubs, and the Department of Lands and Forests. This group convenes annually to examine the progress of the research and provide continuing assessment of the status of the fish stocks and their management. The meetings of the committee have been very fruitful. The preparation of this booklet, for example, was undertaken at the behest of the committee. The free exchange of views between the various groups represented has been particularly valuable in improving understanding. The representation on the committee is shown on the inside back cover.

RESEARCH

The Department of Lands and Forests has had a research program underway on certain Lake Ontario fish species of commercial importance for a number of years. In 1957, this program was extended to include a study of the Bay of Quinte yellow pickerel.

The Glenora Fisheries Station, as this research unit is called, is located five miles east of Picton in the old Glenora Hatchery building. It is manned by a fisheries biologist and a small, permanent staff of technicians.

A very important part of the pickerel program is the creel census. This includes daily contacts with Bay of Quinte anglers throughout the fishing season by teams of university student assistants. The data they collect measure the changes in the pickerel catch and fishing success, and they provide important information on the variations in the size and age composition of the catch. Periodic checks on the fish composing the commercial catch are also made.
Creei census. Anglers are interviewed on the water and asked for particulars of fishing technique and success. Each fish is measured and examined. A sample of scales is taken to determine the age of the fish.

A typical Bay of Quinte scene: trolling for pickerel (walleye) in Pleasant Bay.
Large numbers of pickerel have been tagged each year since the inception of the program, and the distribution of the recaptures by both anglers and commercial fishermen has provided considerable information on the migratory habits of the fish.

The age of many species of fish, including the pickerel, can be determined by examination of concentric rings on the scales. The collection, and subsequent microscopic examination of pickerel scale samples, figure prominently in the research program and provide vital information concerning the rate of growth and the relative sizes of the annual broods of pickerel.

The results of the work to date have been useful in management considerations. The 1961 extension of the angling season, in particular, was based on the findings of the investigation. The study was programmed to cover a ten-year period, however, to permit study of the life cycles of pickerel broods produced under a broad range of conditions. It can be hoped, therefore, that the project has much yet to contribute to our understanding of pickerel.

**THE PICKEREL FISHERY**

The pickerel (walleye) is an important species in both commercial and sport fishing. For the anglers, it is the principal game species; anglers fish mainly by trolling and devote in excess of 100,000 man-hours per year to their sport. Angling effort reaches a peak during the vacation season but, during the years studied, the best fishing period has always been in May. In fact, prior to the new opening date, it was estimated that the last two weeks in May contributed fully 25 per cent, on the average, of the entire season's catch! More older fish are included in the catch at this time, and the tagging has indicated that many of the pickerel go to Lake Ontario during the summer months. Most of the fish taken during the summer by anglers are two- or three-year-olds.

The commercial fishery for pickerel in the Bay of Quinte is restricted to the fall periods. The limitations on the type of gear used maintain a large average size in the catch. For the five years, 1957 through 1961, it was estimated that on the average the anglers caught 32 per cent and the commercial fishermen 68 per cent of the annual pickerel harvest which ranged between roughly 53 and 77 thousand fish per year. The data indicate a rather low cropping rate in the total, however, and the general conclusion has been that the commercial fishery acts to crop off numerous old fish which would otherwise only die from natural causes. It is felt that at the present abundance levels, at least, the stock could be fished harder by both agencies, and it was with this in mind that the angling season was extended by two weeks at the beginning, in 1961.

Many interesting biological facts concerning the Bay of Quinte yellow pickerel have been accumulated during the course of this study. For example, the rate of growth is one of the fastest on record in North American fisheries literature. At mid-season, two-year-old fish (in their third season) average about 12 inches in (fork) length. The age-three average is about 16 inches; age-four, 18 inches; and age-five, about 20½ inches. The maximum age recorded was 19 years, and the greatest length among fish examined, 30 inches, so it can be seen that (as with most kinds of fish) the annual size gains diminish with increasing age.

Male pickerel reach sexual maturity in the spring at age three and the females at age four. A female fish produces an average of 26,000 eggs per pound. There is a considerable range of variation, of course, and the highest egg count ever recorded was in excess of 400,000 eggs from one fish. Studies elsewhere have shown that at spawning most of the pickerel eggs are fertilized, but clearly the fraction surviving to become catchable-size fish is always very small.

The fast rate of growth is attributed to an almost exclusive diet of alewife, or shad. These are the little silvery fish which often die in enormous numbers in the spring, to
Clearing the hoopnet. Game fish are returned to the water alive and unharmed.

Each fish tag has a serial number which is recorded with the size and age of the fish at time of tagging. Recaptures of tagged fish provide information on migrations and harvesting rate.
wash up on the shores of Lake Ontario. They have a high nutritive value, are highly abundant and act as a supplement to the natural fertility of the Bay waters in that most of their own feeding is apparently done in Lake Ontario proper.

**ANGLING FOR OTHER SPECIES**

Bait casting with spinning tackle is the most common fishing method for game fish other than pickerel. The whole gamut of techniques from still fishing to fly casting is covered, of course, and the types of bait in use are equally variable.

The northern pike at one time was not held in high esteem locally as a game fish. Our American neighbours have prized the pike for a long time in their own waters, and the ever-growing numbers of U.S. visitors to the area is to no insignificant degree related to the large size and ready availability of these great game fish. As in other localities, pike favour the shallow weedy areas and are abundant in such places as Muscote Bay, inner Hay Bay and various other cove and marsh areas in the Bay of Quinte. In this respect, it should also be mentioned that the inland lakes and Lake Ontario bays of Prince Edward County also provide excellent pike fishing.

The pike populations have shown considerable year-to-year variation but, on the whole, appear to be maintaining attractive angling quality.

The black bass play a lesser role in the general angling picture for the Bay waters (not so in the adjacent waters of the lake proper). Both largemouth and smallmouth bass are present as fairly stable localized stocks which continue to provide sport for the anglers who know the “spots”.

Maskinonge were, apparently, very abundant in Bay of Quinte waters in earlier times. At present, however, the fishery is a

*A hoopnet. Note how close it is to the shore.*
COMMON FISHES OF

- Smallmouth Bass
- Largemouth Bass
- Black Crappie
- Pumpkinseed
- Drum
- Rock Bass
- Mud Minnow
- White Bass
- White Perch
- Whitefish
- Cisco

- Whitefish
- Cisco
THE BAY OF QUINTE

Maskinonge and Walleye

Northern Pike and Yellow Perch

Chain Pickerel and Bluegill

Gar and Gizzard Shad

American Eel and Bowfin

Sea Lamprey and Carp
small one. One fairly restricted area produces nearly all the "lunge each year and then, generally, only during the mid-August to mid-September period. Patience (and preferably a good guide) is most rewarding in this case because the fish are always giants, averaging well over 30 pounds!

The ever-popular panfish, including perch, crappies, three kinds of sunfish, and rock bass, are readily available and always a great favourite of the junior anglers (the old folks are permitted to catch them also, of course). The favourite "fishing-hole" may be any bridge, pier or grassy bank along the shores of the Bay, and the gamey and tasty little fish can usually be expected to co-operate.

**WHITE PERCH**

A recent arrival to the waters, and now by far the most abundant fish in the Bay, is the white perch (*Roccus americanus*). Called silver bass by many people who mistake them for the closely related white bass (*Roccus chrysops*) of our waters, the white perch are distinctive in having a uniform brassy colour (horizontal stripes are indistinct), a distinctly purple-coloured underjaw which meets flush with the upper jaw, and a membrane connection between the
Gilnets: the principal gear of commercial fishermen on Lake Ontario and the Bay of Quinte. The larger tugs are more common on the open lake.
two dorsal fins. The white bass differs in all these respects, having horizontal black stripes and a white under-jaw which projects beyond the upper and separate dorsal fins.

White perch are native to the northeastern United States; they invaded Lake Ontario in the early 1950’s. Possibly because of competition with the many other kinds of fish (yellow perch, sunfish) which occupy the same habitat and depend on the same kinds of food in the Bay of Quinte, the white perch has until only recently shown no signs of becoming an attractively large game or commercial fish. They are enormously abundant, however, and it is hoped that the large commercial catches of one-half to one-pound fish in the early months of 1963 will prove to be the beginning of a trend towards greater usefulness for this very tasty and gamy fish.

THE COMMERCIAL FISHERY

Economic considerations dictate that fishing on a commercial basis be highly selective for those species of fish which can legally be taken and for which a market can be found. This selectivity is practised with great skill by expert fishermen who rely on a background of knowledge of the habits of fish which has been accumulating for generations. Basically, it involves knowing the appropriate type of fishing gear to use and where and when to set it out. The following brief account describes the major types of gear now in use in our waters. For a fuller education in these matters, and a truly exciting experience, it is suggested that the reader endeavor to meet a commercial fisherman and accompany him on a trip to his nets!

HOOPNETS

The hoopnet is a specialized form of fish trap. It consists of a fence of coarse netting called “the leader” which is usually attached to the shore and to the trap about 100 feet offshore. The leader intercepts fish swimming parallel to the shore and directs them out to the trap. Attached to the mouth of the trap, a pair of short walls of netting called “wings” each make a 45° angle with the leader to head off any fish which attempt to swim around the net. The trap, itself, consists of netting stretched over a series of wooden hoops. Inside, a complex system of funnels of netting is set up in such a way as to encourage the fish to work their way progressively towards the back of the net and discourage their finding their way back out.

The end of the net, called the “pot” or “retainer”, is lifted into the boat when the fisherman visits his net, and the perfectly healthy (if somewhat confused) fish are removed by the release of a drawstring. Hoop nets can be identified by (a) stakes (usually three) surrounding the trap; (b) the row of floats which keep the leader netting upright; and (c) the general nearness to shore. Be alert for these signs in the early and late parts of the season and save your shear pins and the fisherman’s expensive net!

The species marketed by the hoopnet fishery are bullheads, rock bass, sunfish, white perch, eels and other so-called “coarse” fish. The selection properties of these nets depend on two factors:

(a) The size of the meshes in the nets permit undersized fish to swim through unimpeded;

(b) The nets are set inshore and in locations not likely to produce large quantities of unusable fish.

Pike and bass are the only game species encountered often in these nets, and they are simply sorted from the rest of the catch by the fisherman and returned alive to the water. Undesirable fish, like the garpike and bowfin which cannot be marketed, are destroyed.

The hoopnet fishery is a highly valuable one and contributes the largest part of the annual commercial poundage which is nearly one million pounds. In addition to the restrictions on the taking of game fish, and limitations on the individual size and number of units of gear permitted, at present the hoopnet fishery is also required
Photomicrograph of a scale taken from a 12-inch, two-year-old walleye in the Bay of Quinte. Note the two interruptions in the pattern of ridges on the scale surface; these indicate two winters when no growth took place. The outermost band shows the growth between May and August when the fish was caught.
to suspend operations during the period, May 15th through September 21st, each year.

**GILLNETS**

Unlike the hoopnet, which is an impounding gear, the gillnet catches and holds the individual fish. In operation, it resembles a fence anywhere from six to twelve feet in height, stretched along the bottom. It consists of very fine (nowadays nylon) thread woven into netting. The netting is supported by a cord bearing floats along the top, and held in place by lead weights on the bottom. The length of netting is held by an anchor at each end, and the position of the net is marked by buoys at either end. The selection for species of fish is by the size of the mesh and the location of the set. Fish are captured when they attempt to swim through the hard-to-see netting. If their girth is larger than the perimeter of the mesh they are stopped and in their struggles to get free they are usually further entangled.

The traditional gillnet fishery dates back to the fishing privileges of the United Empire Loyalists who first settled the shores of the Bay of Quinte. It is primarily concerned with whitefish and pickerel and is operative north of the Glenora Ferry only between October 1st and December 31st. The smallest mesh permitted has a 9-inch perimeter. Certain spawning and fish nursery areas are closed to these operations but, in general, the distribution of the netting activities is broad, through the fall of the year. The amount of net each individual is permitted to fish is small, but a great many people are involved in this fishery.

During the overlapping of the angling and netting seasons, anglers should be on the lookout for the net buoys. The nets are most often set in deep water where they are a hazard only to the trolling lures; but, in certain locations, they are set on the shoals near shore and, in some cases, are shallow enough to tangle outboard motor propellers. Always look for the two buoys and, if close to shore, give them a wide berth. If offshore, do not troll between them; if you are passing close on an offshore buoy, it is always wise to go by downwind of it because its cord may be near the surface for a short distance upwind.

For some years, there was an active gillnet fishery for smelt in the early springtime. This fishery used very small mesh gillnets (approximately three-inch perimeter) to catch the smelt close to shore. Like the sport fishery, the commercial operations had their beginnings when the newly established smelt became abundant after World War II. Unfortunately, the Bay runs of smelt dwindled in the latter half of the 1950 decade, and both fisheries are now virtually extinct.

Another relative newcomer to the commercial fishing scene is the carp gillnet fishery. This fishery is only closed between June 15th and October 1st above Glenora, and the nets are the ones most frequently seen by anglers. The general safety precautions (pointed out with respect to whitefish nets) are also applicable during this longer overlapping period. These gillnets are of large mesh (16-inch perimeter) and constructed of much coarser twine to hold the vigorous carp. The nets, of course, are only effective for carp, and this fishery has proven quite a lucrative way of utilizing a previously undesirable fish. So successful has this fishing been on all accounts, in fact, that the fishermen have now been permitted to extend their operations inland, to the lakes of the Kawarthas.

**OTHER KINDS OF FISHING GEAR**

The gear which is probably the most frequently encountered by anglers (and often mistaken for illegal gillnets) is the set line. This usually consists of a long weighted cord which has hooks attached to it at intervals by long strings. The hooks are baited with pieces of fish or worms, and the catch is virtually restricted to eels and the large channel catfish. This selectivity appears to result from the large size of the hooks used and the general location of the gear in the deeper channels on mud bottom. The ends of the set line are attached to
buoys and, in general, the angler or boater is not troubled by this equipment if he keeps in mind the precaution regarding passing near a buoy on the downwind side.

The only other fishing gear of note used in the Bay is the well-known beach seine. This is used for carp and bullheads (but it is only occasionally employed) in situations where a smooth bottom and the proper concentration of fish can be located.

A FINAL WORD

Change seems to be one of the fundamental facts of aquatic life. Conditions in the surroundings of the fish are in constant flux, and fish abundance and distribution vary in response. While for any given spawning, most species have enough eggs available to vastly over-populate the waters, obviously only a small fraction of these can survive to become adult fish. However, the fraction can and does vary as much as one hundred-fold between one brood and the next in some of our important species, and this can only be attributed to the random effects of environmental variations. Sometimes the basic variations originate with the climatic cycles, and several consecutive poor-year broods can occur to spoil the fishing for several years.

The other fish species must also be considered part of the environment because fish compete within a limited environmental capacity for space and food. Sometimes a given change, acting to depress one species, has the opposite effect on another, and, once having gained the advantage, it is in a better position to hold it. Thus, the depression in abundance of the first species can be extended for a long period. The invasion of the white perch occurred naturally as an extension of the range of that fish, but its present dominance over native species with similar habits may be having profound effects on the composition of the fish society.

Added to these natural effects, we have the great, and not always beneficial, effects of mankind on the fish stocks. We have brought new species of fish like the carp and smelt into the waters. We have fished selectively for certain species, almost surely upsetting the normal “balance of power” within the waters. Most importantly, we have changed and are continuing to change the characteristics of the water in both obvious and subtle ways. Aside from the local toxic effects of pollution by our communities, the waters are becoming richer as a result of our increasing population density. The silt load coming into the waters has increased as more trees have been taken from the land, and this not only changes the character of the bottom but also (along with algae, etc.) induces a slow but steady rise in the average water temperatures.

All these effects, natural and unnatural, long-term and short-term, add up to a rather complex picture of a dynamic community of fish species, all varying in abundance. With our present knowledge of the processes involved, the wisest approach to the best use of the Bay of Quinte fishery resource must be, first of all, the recognition of the basic fact of natural population change. Secondly, the fishery must be a broadly based operation (whether it be sporting or commercial) prepared to exploit and utilize the less-favoured species in times of temporary depression of the more prized stocks. It is the belief of the Department of Lands and Forests that, with such a basis of understanding, the fisheries of the Bay of Quinte can continue to operate harmoniously and with good prospects for continuing success in the future.
## THE BAY OF QUINTE FISH MANAGEMENT ADVISORY COMMITTEE

<table>
<thead>
<tr>
<th>Agency</th>
<th>Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quinte Isle Tourist Association</td>
<td>MR. P. HAWLEY, Sillsville</td>
</tr>
<tr>
<td></td>
<td>MR. A. OWENS, Demorestville</td>
</tr>
<tr>
<td>Eastern Ontario Fisherman's Assoc.</td>
<td>MR. A. COOPER, Picton</td>
</tr>
<tr>
<td></td>
<td>MR. G. QUICK, Brighton</td>
</tr>
<tr>
<td>Area Sportsman's Groups</td>
<td>MR. D. McKINNON, Belleville Rod &amp; Gun</td>
</tr>
<tr>
<td></td>
<td>MR. J. COOK, Napanee Dist. Rod &amp; Gun</td>
</tr>
<tr>
<td>Ontario Department of Lands and Forests</td>
<td>J. M. TAYLOR (discussion leader), District Forester, Tweed</td>
</tr>
<tr>
<td></td>
<td>R. E. WHITFIELD, Fish and Wildlife Supervisor, Tweed</td>
</tr>
<tr>
<td></td>
<td>W. J. CHRISTIE, Biologist-in-charge, Glenora Fisheries Station</td>
</tr>
<tr>
<td>Ex Officio</td>
<td>MR. S. RANKIN, E.O.F.A.</td>
</tr>
<tr>
<td></td>
<td>MR. W. SMITH, Q.I.T.A.</td>
</tr>
<tr>
<td></td>
<td>MR. J. O'DETTE, Ontario Fed. Anglers and Hunters</td>
</tr>
</tbody>
</table>