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a guide to ANGLING

in Algonquin Provincial Park

DEPARTMENT OF LANDS AND FORESTS

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A GUIDE TO ANGLING IN ALGONQUIN PROVINCIAL PARK

This is an outline of fisheries research and management in Algonquin Provincial Park. It is designed to provide the angler with general information concerning some of the basic facts and management problems of the Algonquin Park fisheries.

Disclosed by the creel census technique, information and facts are given for lake trout, speckled trout and smallmouth bass. Included, also, are such biological data as the aging of fish, growth rates, year classes and their effect on fishing, bass production, spawning habits and egg survival.

Following the section on research and fact-finding, the booklet includes a treatment of management and how the facts are used. Under this heading are discussed lake trout, speckled trout and smallmouth bass plantings, the transfer of bass, the introduction of trout hybrids (splake or wendigo) and the study of these new arrivals, and the introduction of forage fish. In addition, there are sections devoted to the alternate lake closure plan to encourage spawning, lake fertilization to increase production and the building of artificial spawning beds.

From this brief outline the angler will gain an appreciation and an interpretation of fisheries research and management problems in the light of his own experience in angling activities.

A GUIDE TO ANGLING

in

ALGONQUIN PROVINCIAL PARK

and to the projects undertaken by the

Division of Research

to improve and perpetuate angling

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Since 1936 fisheries research and management have been going on in Algonquin Park. No doubt many of you who have read this will have had contact with some phase of this fisheries program. Perhaps this contact has been through creel census interviews, perhaps through the alternate closure of lakes.

An overall picture of the different phases of the fisheries program in the Park is presented in the following pages, and shows how each phase aims at the final goal of all of our fisheries work, the wise use of our resources.

There are two important reasons for investigating fisheries problems in the Park. The first aims to solve purely local problems. In addition, the information gained through research and the principles tested in management may be applicable elsewhere in the Province. In fact, Algonquin Park has been selected as an outdoor laboratory for research and a testing ground for management.

You, the angler, have played an important part in this work and the Department of Lands and Forests gratefully acknowledges your co-operation, particularly in the creel census. We sincerely hope our combined efforts will be productive.

Minister of Lands and Forests.

A GUIDE TO ANGLING IN ALGONQUIN PROVINCIAL PARK

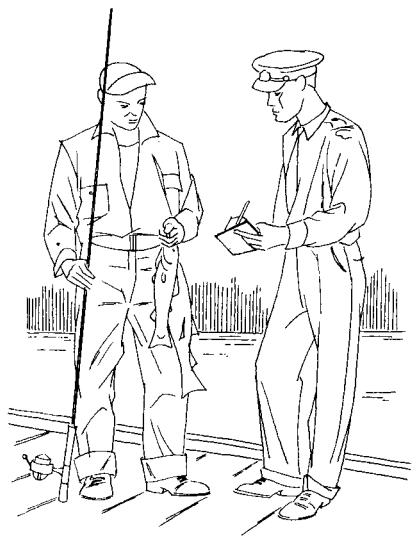
THE CREEL CENSUS

To Obtain the Facts

When a fisheries programme was initiated in Algonquin Park in 1936, there was little or no information about the fisheries of the area. The first task was fact finding. One way of doing this was through a creel census; the collection of information from the anglers' catches. By this means data were obtained on the kinds of fish present in the various lakes, their ease of capture, and their size.

Lake Trout

What information did the creel census give in Algonquin Park? It showed that the lake trout is the commonest species, occurring in all of the larger lakes and in some lakes as small as 50 acres. The quality of angling varies from those lakes where the angler might expect to catch three or four trout per hour to those where he might consider himself fortunate to take one every two hours. In Lake Opeongo, the largest (23 square miles) and most heavily fished lake in the Park, approximately 1000 lake trout are usually taken every year. As an indication of the natural sparsity of lake trout population, it might be pointed out that this represents less than one pound of fish per acre of lake, a normal figure for many Algonquin Lakes. Even a catch of approximately 1000 lake trout in 1953 from the relatively small Happy Isle Lake, gave a production figure of just over one pound per acre.



Catch records also showed that the size composition of the lake trout catches varied considerably in different lakes. In lakes such as Canisbay, Louisa, Source, and Delano, the average length of each year's catch is 14 to 15 inches, and the average weight, two and one-half to three pounds. The most fish are caught in those lakes where the average length of the catch is 16 inches and the trout mature at a small size.

Speckled Trout

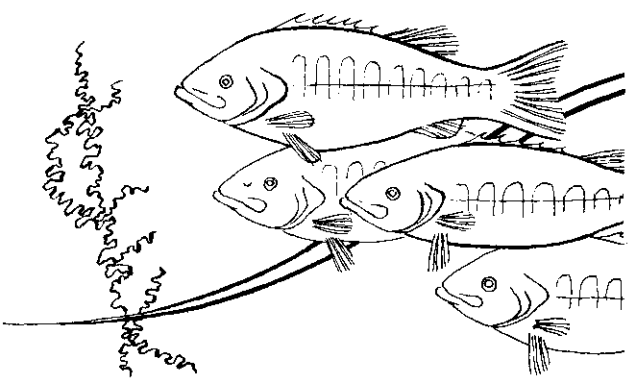
Speckled or brook trout occur in about half as many lakes in the Park as do lake trout. They are confined

largely to lakes, as summer temperatures become too high in most streams. Like the lake trout, in summer they migrate to deeper water, where they are more difficult to catch. Most of the speckled trout fishing is done in May and June. Lakes on the upper Petawawa River system provide the best of the more accessible speckled trout fishing. Butt, Dickson, Redrock, and Proulx are the most popular lakes. The total catch in Dickson Lake may reach 800 in some years, while 350 to 650 speckled trout have been taken from Redrock Lake each alternate year since 1936. Fishing quality varies between one to two trout per hour of fishing for many of these lakes. The average length for the season's catch being 12 to 15 inches, the size range of these fish in lakes exceeds that of most stream trout.

The more accessible of the speckled trout lakes are fished intensively. Tagging experiments have indicated that 75 per cent of the mature stock may be removed from Redrock Lake in a year. As the season advances in these lakes there is a steady decline in the quality of the fishing and the size of the fish caught. In Redrock Lake in 1953 three-quarters of the total catch of 535 speckled trout were taken in the first nine days of the season. Not only does the early worm get the fish; it also gets the biggest.

Bass

The Algonquin Park lakes are typically trout waters, that is, deep and cold. Bass found there are largely the result of introductions. At present, there are about 20 lakes in the southern half of the Park which support bass fisheries. The most important of these is Lake Opeongo, where from 200 to 1500 bass have been taken each year. The quality of fishing in this lake has been indicated by two bass for every three or four hours' fishing time. Bass fishing in most Park lakes yields less than one legal fish for every hour of effort.



BIOLOGICAL DATA

To Interpret the Facts

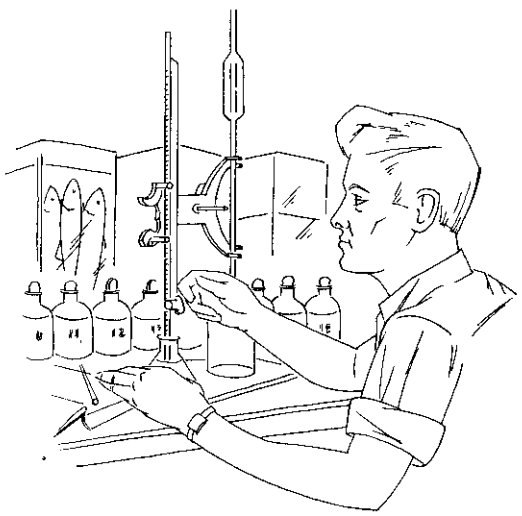
The creel census returns provided some of the 'whats' about the Algonquin Park fisheries, but few of the 'whys'. At the same time as catch statistics were being obtained, however, other information of a more biological nature was collected. Such data as weights, stomach contents, the

scales and the state of the reproductive organs, supplemented the catch records and provided a more complete picture of the fisheries.

Fish Can be Aged

The microscopic examination of a scale reveals concentric rings which are formed as the fish grows. Superficially, the pattern resembles a finger print. Fish grow at different rates in summer and winter, and this is apparent in the scale pattern. As will be seen, such information is particularly valuable to fishery biologists.

Age determinations, for example, provide information on rate of growth. Lake trout grow at different rates in different lakes in the Park, regardless of the size of the lake or its location. In Lake Louisa a seven-year-old lake trout is 14 to 15 inches long, while in Redrock, a lake half the size, a seven-year-old lake trout is 17 to 18 inches long. Similar and even greater contrasts are evident between other Algonquin Park lakes. Here, then, is an explanation of the great variation in the size of lake trout in different lakes as seen in the creel census records. The unhappy angler complaining about all the young fish in his catch is, in reality, catching slow-growing adults.



Available Food Affects Growth of Lake Trout

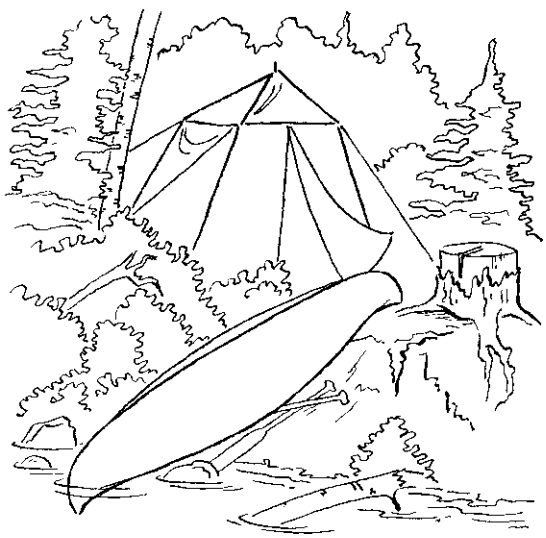
This, however, is still not the root of the matter. Why the difference in growth? To answer this question field parties were set up on two lakes where typically fast growing and slow growing trout occurred. As a result of this investigation it was found that there was an intimate relationship between the depth distribution of the lake trout, their feeding habits and growth. In Lake Louisa, where the trout grow slowly, the lake trout in summer have no available fish food in deep water and are forced to eat microscopic plant and animal organisms called plankton. In Redrock Lake, on the other hand, the lake trout could avail themselves of the perch population during the summer months. As a result there is a faster growth in Redrock Lake and larger fish in the angler's creel.

Lake trout are generally first caught at five years of age although the seven and eight year old fish usually make

up the major part of the catch. The study of the reproductive organs shows that lake trout first mature at five years of age. Due to the difference in growth rates this may be between 10 and 16 inches in length. From this, the difficulty of imposing legal lengths to protect immature stock can be appreciated. The heavy gear used in the summer fishery does, however, regulate the size of lake trout to some extent. A winter fishery, using different methods, takes very much smaller fish. The great popularity of this fishery and the large numbers of small fish that appeared in the winter catches provided a management problem in some of the lakes and that is why winter fishing was stopped in Algonquin Park.

Year Classes Affect Fishing

Another important piece of information gained from age studies is the age composition of the season's catch. Different age groups make up this catch. The fish that are of one age are called a year class and are the product of one year's spawning. A seven-year-old fish, for example, in the 1953 catch was spawned in 1944 and belongs to the 1944 year class.



That there are great variations in the strength of year classes was suspected from the fluctuations in angling quality, even before age studies had been undertaken. Estimates of the size of these year classes have been made by adding up the number of fish in each year class in the total catch each year. If this is done every year, from the time the fish are first large enough to catch until they disappear from the fishery, the total contribution of a year class can be estimated. For example, the 1940, 1941, 1942, 1943 and 1944 year classes in Happy Isle Lake provided 95, 122, 113, 300 and 199 lake trout respectively, while the 1940, 1941, 1942 and 1943 year classes in Merchants Lake provided 105, 116, 322 and 322 trout respectively. It is evident that the 1943 Happy Isle and the 1942 and 1943 Merchants year classes are particularly strong. These have resulted in excellent fishing in these two lakes between 1952 and 1954. In Lake Opeongo, where the most detailed analysis of a lake trout fishery has been made the 1933-36 year class contributions have been between 1,100 and 1,400 fish each. There is no evidence of very strong year classes in Opeongo as in the smaller lakes and the angling quality has not undergone such marked fluctuations.

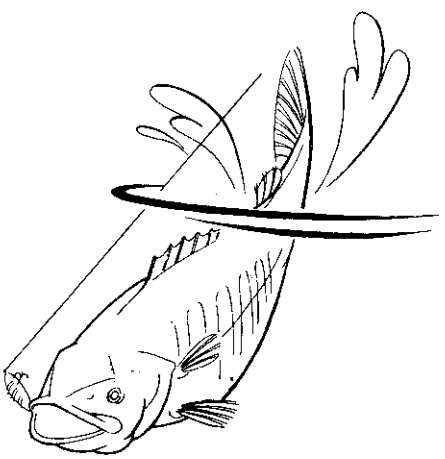
Speckled Trout Growth Also Varies

Similar data have been collected for the speckled trout and there is now a considerably greater fund of knowledge of this species as it occurs in lakes. Growth studies have shown that speckled trout in lakes grow much more rapidly than they do in streams. In Dickson Lake, for example, a two year old fish is between 9 and 12 inches, a three year old a little over 14, and a four year old about 16 inches long. Speckled trout rarely reach six years of age in Algonquin or other Ontario waters.

In most of the Park lakes the speckled trout first enter the fishery at two years of age but the three and four year old fish usually make up the bulk of the catch. They first mature at three years of age at a length of about 13 inches.

Speckled Trout Year Classes

Calculating, as was done for lake trout, the contribution of each year class, the 1944, 1945, 1946 and 1947 year classes in Redrock Lake contributed 350, 569, 185 and 224 trout to the fishery. In Proulx Lake the 1946 and 1947 year classes contributed 112 and 148 fish respectively.



Bass Fisheries Sometimes Collapse

The Algonquin Park bass fisheries have not been studied as fully as have the trout. Cache and Opeongo Lakes have provided the most continuous and complete data. The former has been intensively fished for many years and the bass are heavily exploited as soon as they are of legal length. The quality of the fishing in this lake has, therefore, been closely related to the strength of the year class reaching legal length. In 1946 the year class scheduled to enter the fishery was a failure and the bass fishery in Cache Lake collapsed completely. In Lake Opeongo, on the other hand, fishing pressure has not been as great and many of the bass reaching legal size may survive several years before capture. This has meant a larger average size and more stable fishery since it is dependent on the strength of several rather than one year class. In most of the Park fisheries bass reach catchable size at four years of age.

Bass Production Studied

To shed light on the reasons for the generally low production of bass in the lakes of the Park area an inten-

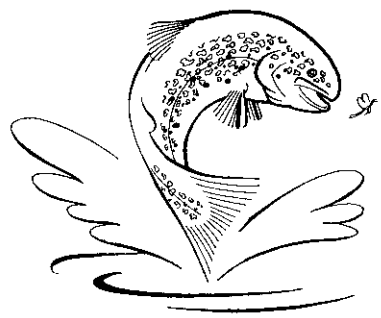
sive study of the population in Lake Opeongo was begun in 1955.

The size of the bass population in this lake was estimated through a tagging and recapture programme and by the analysis of the data collected from the anglers through the creel census. These two estimates showed general agreement and indicated the size of the population vulnerable to the fisherman to be generally 1,000 to 2,500 fish.

Further analysis of the census data showed that there is a strong correlation between year class strength, that is, the number of fish produced from a year's spawning, and air temperatures in the summer of hatching. There is also some correlation between the size of the spawning stock and year class strength.

Present field investigations are attempting to learn how this temperature factor specifically operates in affecting year class strength. Under study are such things as the direct effect of temperature on the eggs, and indirect effects, such as the spread of fungus infection and desertion by the guarding male.

With knowledge of existing meteorological conditions and the size of the spawning stock it may be possible to make rough predictions of year class strength and the numbers of fish that will be available to the angler when the bass enter the fishery in four or five years' time.



Algonquin Park lakes approach the northern limit of the natural bass distribution and it is likely we should expect fluctuations in production due to the relatively low and variable summer temperatures.

Spawning Habits Studied

Research has been carried out on the life histories of the lake trout and speckled trout and there is now a knowledge of such things as the movements, depth distribution, feeding habits, growth, and reproduction of these two species. In recent years most of these studies have been mainly concerned with the reproduction and early life histories of the trouts. These are the critical points in the life history of many fish and it may well be at this time that the success or failure of year classes and of the sports fisheries in Algonquin Park are decided.

Although information regarding the behaviour and habits of the trout at spawning time is of no immediate practical value, these activities are of interest to the

fisherman and may be outlined briefly.

Both lake and speckled trout are fall spawners, the former spawning in late October on exposed rocky shoals in one to eight feet of water. Most of the spawning activity is at night. The speckled trout, on the other hand, spawn several weeks later on sand and gravel beds, one to four feet deep, and where there is usually spring seepage coming in from the bottom. They spawn in the daytime. These differences in the time and place of spawning of the lake and speckled trout explain, in part at least, why the two species have never hybridized in nature. Both species, but particularly the speckled trout, exhibit a definite courtship behaviour. One of the finest sights a fisherman can hope to see is hundreds of two and three pound, brightly coloured speckled trout milling around on a spawning bed on a bright November day. The lake trout broadcast their eggs indiscriminately and these filter among the rocks, while the speckled trout labouriously prepare nests or redds of gravel in which the eggs are deposited and subsequently buried. As an indication of the number of eggs involved, a two pound lake trout produces approximately 2,000 eggs, a four pounder 3,500 eggs and a ten pound fish 6,000 eggs. Eggs of both species slowly develop under the ice, the lake trout hatching in late February or March and those of the speckled trout in February.

Egg Survival Measured

Of more immediate practical value from the viewpoint of management are such things as knowledge of the necessary conditions for successful spawning, predation on eggs and adults, and the egg survival during the long period of incubation.

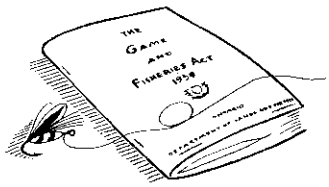
An attempt is being made to estimate the number of male and female speckled trout on the beds of Dickson Lake each year by periodic counts to determine if there is any relationship between size of spawning stock and year class strength. Detailed studies of speckled trout spawning beds in a number of lakes have shown that there is a variation in the seepage on the beds. Seepage water, being warmer than the lake water in winter, speeds up the development of the eggs, but it is also low in oxygen and may retard their development. These variations in the amount of seepage from bed to bed and year to year on one bed may be important to egg survival.

In studying egg density and survival for both trout, various containers have been set out in the beds before spawning and lifted at various times during the incubation period. In one year about 70 per cent of the speckled trout eggs taken from the cylinders buried in Dickson Lake were living at hatching time. As many as 276 lake trout eggs have been taken from a small water pail buried in a lake trout spawning bed. Survival of lake trout eggs in these pails averaged about 50 per cent. It may well be that the

great fluctuations in year class success in the trout populations in many Algonquin Park lakes are determined in this incubation period.

MANAGEMENT

To Use the Facts



In the foregoing pages has been briefly outlined some of what has been learned of the Algonquin Park fisheries. In the following pages there is an attempt to show what has been done with this information.

Success and Failure with Speckled Trout Plantings

In the beginning it was thought that extensive plantings would restore depleted fisheries. Hundreds of thousands of speckled trout were planted in dozens of Algonquin Park lakes. The results were, to say the least, disappointing. During the period when plantings were made and immediately afterwards, there was no appreciable improvement in speckled trout fishing. Since 1946 plantings have been largely confined to lakes where environmental conditions suggested a better chance of survival. Larger fish were also used. Plantings of speckled trout in small lakes of less than 50 acres, where no game fish previously existed, have been particularly successful. Each year a few more of these lakes are stocked after they have first been surveyed as to their suitability for plantings. In lakes where there is good creel census coverage, these fish are marked so that the success of the plantings may be determined. This marking is most often done by clipping off the adipose, the small fatty fin on the back near the tail.

Lake Trout Plantings Being Tested

About the same time creel census returns indicated that lake trout angling had deteriorated in those heavily fished lakes accessible by road and restocking was undertaken. Since 1947, Smoke, Burnt Island, Source, Cache, Two Rivers, Rock and Whitefish Lakes have been planted every other year with two to four thousand fingerling lake trout. Many summer residents in the Park express surprise when learning this, but most of the plantings take place in late October. At this time the trout are larger and the lake waters are uniformly cold. Both of these conditions encourage better survival of the trout.

Lake Opeongo, the most heavily fished lake, receives the most generous plantings. From 10,000 to 44,000 fingerlings and yearling lake trout have been planted there every other year since 1948. A large proportion of these fish have been marked. Up to 1958 less than 25 of these hatchery fish have been caught in Lake Opeongo. New planting tech-

niques are being developed in an attempt to increase the survival of planted lake trout.

Bass Planting and Transfer of Slow Growing Fish

Bass plantings have been from two sources, young hatchery fish and the transfer of adult fish from another lake. The former has been undertaken in Cache, Whitefish, and Polly Lakes, to mention a few.

An interesting and unusual phenomenon, at least in Algonquin Park lakes, occurred in Polly Lake in 1952. Repeated failures on the part of the fishermen to catch any bass prompted an investigation of the lake. From this investigation it was concluded that oxygen deficiencies during the previous winter had become lethal to the bass. This phenomenon is called winter kill and is the first known case of such mortality in the Park. The lake was restocked in the fall but there is no way of knowing whether there may be a recurrence of lethal conditions.

The transfer of adult bass from one lake to another has been undertaken on several occasions. It sometimes happens that, due to overcrowding or other unfavourable conditions, bass may grow very slowly in a particular lake. The fisherman's efforts are rewarded by many fish but these are of small size. It is standard fisheries procedure to transfer adult bass from the crowded lake to another where there may be a scarcity of fish. This step achieves two things; it thins out the denser population, encouraging better growth, and also replenishes the depleted lake. Provoking Lake is a case in point. In this lake bass do not reach legal size until their fifth year, while in most Park lakes they reach 10 inches at three or four years of age. Few legal bass reached the angler's creel in Provoking Lake. Nearly 500 bass were transferred from Provoking Lake to Lake of Two Rivers in 1948. Similar transfers have been made in Cache, Whitefish, and Rock Lakes. In Cache Lake the transferred fish were tagged. Only 17 percent of the tagged fish were recovered by the angler, a disappointingly low survival.

Trout Hybrids Introduced

A recent and spectacular arrival on the fisheries scene has been the hybrid between lake trout and speckled

trout. This glamorous product first received the most graceless of names, 'splake', but has now become the 'Wendigo'. As far back as 1946 this cross was undertaken in western Canada and third generation fish have been produced there. It may be interesting to note that the cross can only be made successfully by using lake trout females and speckled trout males. In the reverse cross the speckled trout egg is too small for the developing embryo.

Plantings of the hybrid trout have been made in a number of Algonquin Park lakes since 1954. Among these are Opeongo, Redrock, Sproule, Brewer and Jack Lakes. These introductions have been particularly successful in the smaller lakes.

The average angler, unless quite observant, may not realize he has caught a hybrid. In appearance the hybrid has some of the characteristics of both parents in varying degrees. The spots are usually pinkish, although many fish have little or no colour. The tail is generally intermediate between the deeply forked tail of the lake trout and the square tail of the speckled trout. They are somewhat heavier for their length than native speckled trout and lake trout, although they are much less stocky than speckled trout planted in the smaller lakes.

An intensive study of their life history and habits has been made. Their depth distribution in lakes in the summer months is similar to that of the speckled trout, that is, they live in the layer of water between the warm surface layer and the deep cold layer. In the smaller lakes this is generally in depths of 20 to 35 feet. Their food habits are similar to those of the speckled trout as they feed extensively on invertebrate forms of crayfish and insects.

One of the most remarkable features of the hybrid is its rapid growth. Hybrids planted as yearlings (about four inches long) in May in Jack Lake had reached lengths of over 12 inches by October of the same year. They averaged one and one-half inches longer compared with speckled trout of the same age that had been planted in the small lakes, four to five inches longer than native speckled trout and five to ten inches longer than lake trout. Hybrid trout plantings in May of 1954 had reached lengths of over 20 inches and weights of nearly five pounds by the spring of 1958.

There has been no indication of successful natural reproductions by the hybrids in Algonquin Park lakes. It is, however, believed that they at least go through the spawning act.

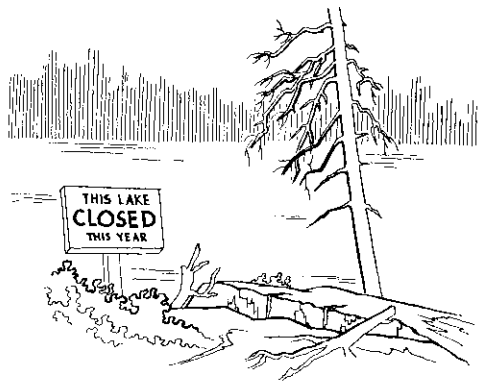
The hybrid trout is an excellent game fish, although here, too, it reveals its split personality. Some fight much more like speckled trout, while others fight deep and doggedly like lake trout. The hybrid has a very marked schooling behaviour and this profoundly affects your fishing luck. Anglers may be rewarded by large catches in a short

period as a school moves into shallow water to feed and then fishing may be unsuccessful for several hours.

Kamloops trout, a close relative of the rainbow, were introduced into Lake of Two Rivers in 1954 and appear to have become established.

Forage Fish Introduced

Plantings of a quite different nature and for different reasons have been made in Smoke and Opeongo Lakes. Cisco, or freshwater herring, were transferred from the St. Mary's River at Huntsville to these lakes as a food for lake trout. This species has become well established in Lake Opeongo and has become one of the most important items in the lake trout diet in this lake.



Alternate Closure Plan to Encourage Spawning

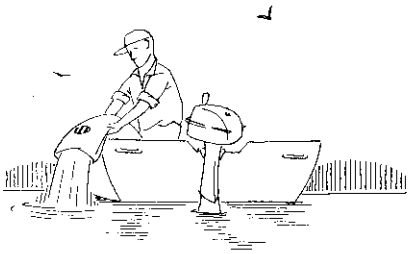
Before the angler can plan a fishing trip to an Algonquin Park lake his first consideration is whether that lake is open or not. Why are some lakes closed every other year? In brief, this is the principle. If a lake is heavily fished year after year it is possible the spawning stock will become so decimated that the future of the fishery is endangered. It will be remembered that 75 percent of the mature speckled trout may be removed from Redrock Lake in some years. Now if, on the other hand, the lake is closed one year, all the fish just too small to catch in the open year can grow, reach maturity, and spawn in the closed year. In other words, by closing a lake in alternate years, a portion of each year class can spawn at least once. Perpetuity of the fishery seems assured. In theory, at least, this practice should be beneficial to speckled trout which grow considerably faster than do lake trout.

On this basis many of the lakes in the Park were closed each year. The preliminary appraisal of the closure plan is not too encouraging as year class contributions from the closed years for lake trout do not appear to be any greater than those in the open. In other words, the number of spawning fish does not appear to be a critical factor in year class strength and your fishing luck. Similarly with the speckled trout, year class strength does not appear to be stronger in closed years than in open years.

It has not been possible, however, to compare a series of speckled trout lakes on the closure system with a

series that has not been closed. No accurate analysis of the closure plan, as it affects speckled trout fishing, is possible without such a comparison. The fact that the quality of the fishing in lakes such as Redrock and Proulx has remained at a high level in spite of the intensive fishing may indicate that the alternate closure is effective in an, as yet, unknown manner. Most certainly the closure has put considerably larger fish in the angler's creel than would have been the case if the lakes had been fished in consecutive years.

In certain years, for experimental purposes, some lakes are closed to fishing. These change occasionally, and anglers are advised to check each year for the latest lake closure information.



Lake Fertilization to Increase Production

Fundamentally, many of the lakes in our rocky north are relatively barren and unproductive. As such, their fish-carrying capacity must be limited. Is it possible to increase the productivity of these lakes and, in turn, the numbers of fish, by the addition of fertilizers? To investigate this problem on an experimental basis a series of test lakes in Algonquin Park were enriched by commercial fertilizer in the years 1947 to 1950.

Fertilization should work in the following manner. First, the addition of the basic nutrients should increase the production of the microscopic plants of algae, called phytoplankton, which, in turn, is utilized by minute creatures called zooplankton. Striking proof of the effect of fertilization at these levels is the green blooms which cover the lake after fertilization. The increased plankton production, in turn, encourages increased production of bottom-living insect forms and small fish which use these minute organisms as food supply. In turn, larger forage fish, and finally, the game fish themselves react to the fertilization. It is apparent that the fertilizer is reaching the fish through this chain of events in some of the test lakes as there has been an increase in growth and numbers, particularly of the perch and suckers. Lake trout in one fertilized lake showed increased growth, although they appeared to be less abundant.

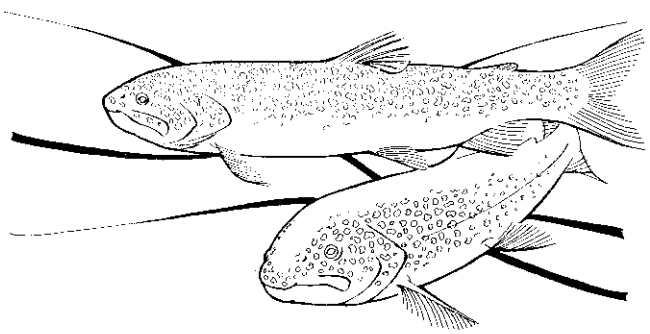
Unfortunately, there may be undesirable effects of fertilization. By encouraging the production of plant and animal organisms in some of the lakes there has been a sharp decrease in the amount of oxygen in the deeper waters. It appears, from this experiment, that some modifications of the fertilization scheme may be desirable in order to minimize the effect of oxygen depletion and channel increa-

sed productivity into game fish. Possibly it will be most useful when used in conjunction with other management techniques.

Artificial Spawning Beds Built

Artificial spawning beds for trout may be useful in certain situations. Many of the small speckled trout lakes have to be regularly restocked as there are no spawning areas in them at present.

Some lake trout lakes in the headwaters of the Madawaska River drainage are subject to water level drawdowns in the fall for hydro purposes. This may expose large areas of potential spawning beds or expose the eggs if it occurs after spawning. Three large spawning areas were built in deeper waters in Shirley Lake in 1955 to offset the effect of drawdowns.



The number of spawning fish in one of these areas was increased from 10 or 15 to over 100 but the other two areas have not, as yet, been used. Attempts have been made to attract the lake trout to the unused beds by such means as penning ripe fish over them, transferring rock from areas where spawning has occurred, stripping the fish over the beds and blocking off the area presently being used. These efforts have been unsuccessful.

In the belief that a homing behaviour at spawning time might deter lake trout from availing themselves of new areas, a study was made of this in Lake Louisa in southern Algonquin Park. Nearly 300 lake trout were tagged with variously coloured tags on different spawning beds. In the clear waters of this lake and at the two to five foot depths, where most of the trout spawn in Lake Louisa, these tags could be readily identified as to colour from surface observations. Over the two year span of the study it was found that individual lake trout returned to the same spawning bed each night during a spawning run in one year, and also in consecutive years. All but 5 of 89 tagged fish had returned to the same area where they had been initially tagged, even though many of these spawning areas were only a few hundred yards apart.

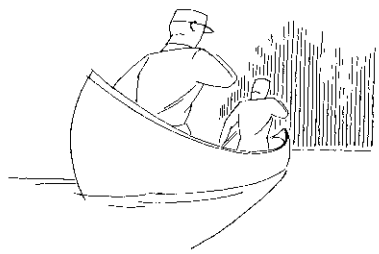
In an attempt to initiate a homing behaviour on the unused spawning beds in Shirley Lake, eyed eggs were planted in these areas. It will be a matter of five or six

years before it will be known if this will be successful.

IN CONCLUSION

This has been an outline of fisheries research and management in Algonquin Park. Not touched on here is a great deal of fundamental research which has been, and is being carried out. Much of this, although eventually directed at the final goal of conserving our fishery resources, does not directly affect the Algonquin Park angler in his everyday activities.

Research has provided the basic facts which the administrator requires for management. That the management of the Park fisheries has had only moderate success to date is perhaps because not enough of these fundamental facts have been discovered. As has been previously observed, however, management, because of the exigencies of time, must often proceed via short cuts and on a trial and error basis.



CHECK-LIST OF THE FISHES OF ALGONQUIN PROVINCIAL PARK

This list includes all the fishes which have been recorded and substantiated with specimens from Algonquin Provincial Park. The scientific names have been supplied because of the variation in common names depending upon the locality. The order and names follow the Check-List of Freshwater Fishes of Canada (Scott, 1958). Species marked "I" have been introduced; "N" indicates species which have been recorded for the northern portion of the Park; and "R" indicates species which have not yet been recorded but which include the Park within their geographic distribution.

STURGEON FAMILY

Lake Sturgeon R	Acipenser fulvescens

SALMON FAMILY

Atlantic Salmon I	Salmo salar
Brown Trout I	Salmo trutta
Rainbow Trout I	Salmo gairdneri
Brook or Speckled Trout	Salvelinus fontinalis
Lake Trout	Salvelinus namaycush
Splake I	S. fontinalis x S. namaycush

WHITEFISH FAMILY

Round Whitefish	Prosopium cylindraceum
Lake Whitefish	Coregonus clupeaformis
Lake Herring	Leucichthys artedii

PIKE FAMILY

Northern Pike R	Esox lucius
Muskellunge N	Esox masquinongy

MUDMINNOW FAMILY

Central Mudminnow R	Umbra limi

SUCKER FAMILY

Northern Redhorse N	Moxostoma aureolum
White Sucker	Catostomus commersoni
Longnose Sucker	Catostomus catostomus

MINNOW FAMILY

Golden Shiner	Notemigonus crysoleucas
Creek Chub	Semotilus atromaculatus
Fallfish N	Semotilus corporalis
Northern Pearl Dace	Margariscus margarita nachtriebi
Northern Redbelly Dace	Chrosomus eos
Finescale Dace	Pfrille neogaea
Lake Chub	Couesius plumbeus
Longnose Dace R	Rhinichthys cataractae

MINNOW FAMILY - (Cont'd.)

Emerald Shiner R	Notropis atherinoides
Common Shiner	Notropis cornutus
Blacknose Shiner	Notropis heterolepis
Spottail Shiner R	Notropis hudsonius
Rosyface Shiner R	Notropis rubellus
Mimic Shiner R	Notropis volucellus
Brassy Minnow	Hybognathus hankinsoni
Fathead Minnow	Pimephales promelas

CATFISH FAMILY

Brown Bullhead	Ictalurus nebulosus
Channel Catfish N	Ictalurus punctatus

FRESHWATER EEL FAMILY

American Eel	Anguilla rostrata

COD FAMILY

Burbot	Lota lota

TROUTPERCH FAMILY

Trout-perch R	Percopsis omiscomaycus

SUNFISH FAMILY

Smallmouth Bass	Micropterus dolomieui
Pumpkinseed	Lepomis gibbosus
Rock Bass N	Ambloplites rupestris

PERCH FAMILY

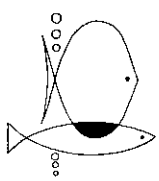
Yellow Walleye N	Stizostedion vitreum
Sauger R	Stizostedion canadense
Yellow Perch	Perca flavescens
Logperch N	Percina caprodes
Johnny Darter	Etheostoma nigrum
Iowa Darter	Etheostoma exile

SCULPIN FAMILY

Slimy Sculpin	Cottus cognatus

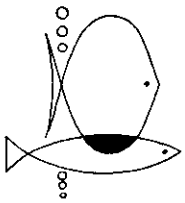
STICKLEBACK FAMILY

Ninespine Stickleback	Pungitius pungitius
Brook Stickleback	Eucalia inconstans



WHERE TO FIND THEM

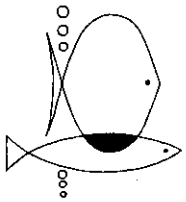
IN ALGONQUIN PARK



WHERE TO FIND THEM

IN ALGONQUIN PARK

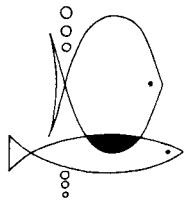
LAKE	*Lake Trout*	*Brook or Speckled Trout*	*Splake or Wendigo*	*Kamloops Trout*	*Smallmouth Bass*	*Pike*
Alluring	●	●				
Amable du Fond R.	●	●				
Animoosh		●				
Aura Lee	●	●				
Aylen R.		●				
Barron		●				
Basin						●
Big Crow	●	●				
Biggar	●	●				
Big Porcupine	●	●				
Big Trout	●					
Billy		●				
Black Bear	●					
Blue	●					
Bonnechere	●	●				
Boot	●	●				
Booth	●	●			●	
Brewer	●		●			
Bruce	●					
Brule	●					
Bug		●				
Burnt Island	●					
Burntroot	●					
Butt	●	●				
Cache	●				●	
Calumet	●					
Canisbay	●				●	



WHERE TO FIND THEM

IN ALGONQUIN PARK

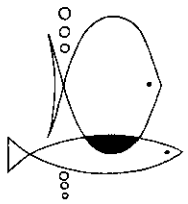
LAKE	*Lake Trout*	*Brook or Speckled Trout*	*Splake or Wendigo*	*Kamloops Trout*	*Smallmouth Bass*	*Pike*
Canoe	●				●	
Carl Wilson	●	●				
Casey		●				
Cat		●				
Catfish	●	●				
Cauchon	●	●				
Cedar	●	●				
Charles		●				
Chicaree	●					
Clarke		●			●	
Club		●				
Clydegale		●				
Coon	●					
Costello	●					
Cradle	●					
Crotch	●					
Crow R.		●				
Cuckoo		●				
Daisy	●	●				
David		●				
Delano	●					
Dickson	●	●				
Drummer		●				
Erables	●					
Eustache		●				
Found		●				
Fraser	●					



WHERE TO FIND THEM

IN ALGONQUIN PARK

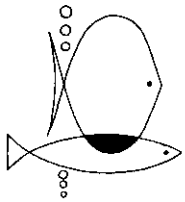
LAKE	*Lake Trout*	*Brook or Speckled Trout*	*Splake or Wendigo*	*Kamloops Trout*	*Smallmouth Bass*	*Pike*
Galeairy	●	●		●	●	
Gilmour	●	●				
Glacier		●				
Godda	●	●				
Gordon					●	
Grand					●	
Grant					●	
Grape					●	
Hambone	●	●				
Happy Isle	●					
Harness	●					
Head	●					
Heron					●	
Hilliard	●					
Hiram	●					
Hogan	●	●				
Iris	●	●				
Jack			●			
Joe	●				●	
Kakasamic		●				
Karkishoo		●				
Kearney	●					
Kenneth	●					
Kioshkokwi	●	●				
Lamuir	●					
Lavague		●				
Lavieille	●	●				



WHERE TO FIND THEM

IN ALGONQUIN PARK

LAKE	*Lake Trout*	*Brook or Speckled Trout*	*Splake or Wendigo*	*Kamloops Trout*	*Smallmouth Bass*	*Pike*
Lawrence	●					
Linda	●				●	
Little Cauchon	●	●				
Little Coon	●	●				
Little Crooked	●	●				
Little Crow	●	●				
Little Dickson	●	●				
Little Doe	●					
Little Island	●	●				
Little McCauley		●				
Little Madawaska R.						
Little Otterslide	●					
Little Trout	●	●				
Longer	●	●				
Lorne	●	●				
Louisa	●					
Loxely		●				
Luckless		●				
Lynx	●	●				
MacIntosh	●	●				
Maple	●					
McCarthy Cr.		●				
McCauley	●					
McCauley Cr.		●				
McCraney	●					
McSorely		●				
Menona		●				

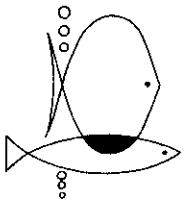


WHERE TO FIND THEM

IN ALGONQUIN PARK

LAKE	*Lake Trout*	*Brook or Speckled Trout*	*Splake or Wendigo*	*Kamloops Trout*	*Smallmouth Bass*	*Pike*
Merchant	●	●				
Mink	●	●				
Misty	●	●				
Mouse	●	●				
Mud Cr.		●				
Mykiss		●				
Namegas	●	●				
Nenemoosha		●				
Nepawin		●				
North Branch		●				
North Grace	●	●				
North Madawaska R.		●		●		
Opeongo	●				●	
Oram		●				
Otterslide	●					
Owl	●					
Oxtongue R.		●				
Peck		●				
Pen	●	●				
Perley	●					
* Petawawa R.		●			●	
Pinetree	●					
Polly					●	
Potter	●	●				
Proulx	●	●				
Provoking					●	
Queer		●				

* *Pickerel, Muskellunge*

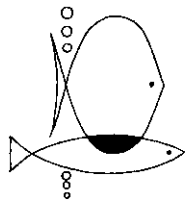


WHERE TO FIND THEM

IN ALGONQUIN PARK

LAKE	*Lake Trout*	*Brook or Speckled Trout*	*Splake or Wendigo*	*Kamloops Trout*	*Smallmouth Bass*	*Pike*
Rabbittail	●					
Rabbittail Cr.					●	
* Radiant	●	●				
Ragged	●	●			●	
Rain	●				●	
Rainbow		●				
Raja	●					
Raven	●					
Ravenau		●				
Redrock	●	●				
Rock	●				●	
Rod and Gun		●				
Rosebary	●					
Rouge		●				
Round Island	●					
St. Andrews	●					
Sawyer		●				
Scott	●	●				
Shall					●	
Shippagew	●					
Shirley	●					
Shirley Cr.		●				
Smoke	●				●	
Source	●					
Speckled Trout					●	
Sproule			●			
Sunbeam	●					

* *Pickerel*



WHERE TO FIND THEM

IN ALGONQUIN PARK

LAKE	*Lake Trout*	*Brook or Speckled Trout*	*Splake or Wendigo*	*Kamloops Trout*	*Smallmouth Bass*	*Pike*
Swan	●					
Sylvia (N)		●				
Sylvia (S)	●					
Tanamakoon	●				●	
Three Mile	●	●				
Tim	●					
Tim R.		●				
Timber Wolf	●					
Two Rivers	●			●	●	
Waskigomog	●	●				
Wendigoes	●	●				
Westward	●	●				
Whiskey Jack	●					
White Birch	●	●				
White Fish	●				●	
White Gull	●					
White Partridge	●					
White Partridge Cr.		●				
Wilkes	●	●				
Wilkins	●					
Wright	●					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