

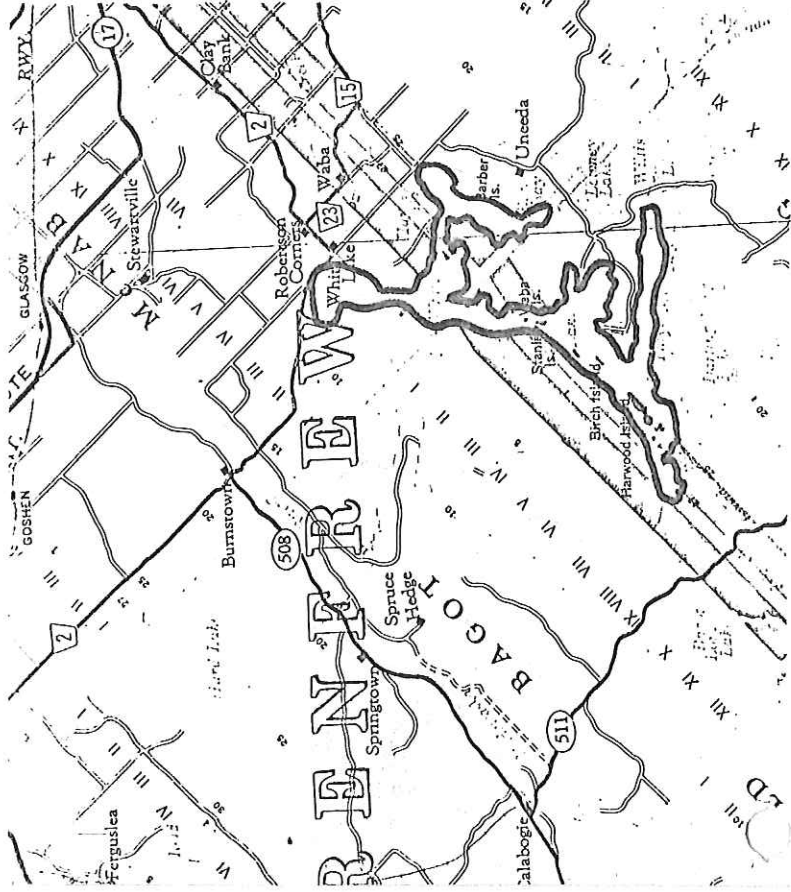
WHITE LAKE MANAGEMENT PLAN

SUMMARY -

White Lake has major economic potential in a "depressed" area, as a resource base for trapping, frogging and most importantly, tourism. Tourism in a rural area relies heavily upon angling quality. Angling in turn has deteriorated on White Lake as a result of heavy harvests, heavy tourist development, increasing cottage development and siltation of spawning beds. If both, water management and development remain unchecked, the fishery will develop into a panfish/bass/pike fishery, which is of small interest to tourists, will cause an economic loss for the area, and will result in sub-optimal use of the lake. If the lake is to be rehabilitated, water quality must be improved, concurrent to a build-up of pickerel stocks. During the process of rehabilitation, further increases of stresses must be curtailed.

The three main lake user groups have formed a joint committee, and are actively co-operating with District staff to rebuild the lake. This includes a revised water management programme, coupled with a pickerel restocking programme, with a cost of \$4,000/year to the private sector.

The rehabilitation programme is scheduled to last 10 years, ie. 1977-1986. An intermediate assessment is scheduled for 1980. To avoid jeopardizing the rehabilitation programme a temporary freeze on all development would be essential. This includes tourist camp expansion, cottage construction, severances, sub-divisions and tent and trailer parks, as well as the creation or expansion of public access points.



WHITE LAKE

Latitude 45° 18' N.

Longitude 76° 31' W.

Township - Bagot, McNab,
Pakenham & Darling

ORIGIN OF NAME

In 1862, this lake was recorded as Waba Lake. In the Johnston Royal Atlas dated 1869, it was shown as Wabak or White Lake. The origin of these names is unknown.

LAKE CHARACTERISTICS

During the 19th century, a dam was built of Waba Creek to facilitate driving of logs, and to store water for the operation of a sawmill. The resulting water body is the present lake.

The lake is a long sprawling body of water of 5,608 acres, and it is 530 feet above sea level. It has an irregular and rocky shoreline (Shoreline development factor of 5.73) of about 61 miles. Much of the lake is moderately shallow. The littoral zone, occupies 90.3% of the lake. The water is hard (total alkalinity, 110 p.p.m.), chemically fertile (TDS, 130 p.p.m.) and usually displays algal blooms at some time during the summer months (eg. high of 14 µgm./liter of Chlorophyll a in August/73 "Levels between 10 and 15 µgm./

[Michaski et al, 1972 p.16]). A profusion of aquatic macrophytes exist along the shoreline and especially throughout the shallow bays. Because of its long expanse and heavy wave action, no thermocline develops in the lake, except in the small area which is 30 feet deep. Typical summer water temperatures are above 24°C (75°F) and often approach 26°C (80°F).

FISHING

Angling success for yellow pickerel is very poor, northern pike fishing is fair. Largemouth bass fishing is considered good. Panfish angling is excellent.

The original native species composition of White Lake is unknown. Artificial management aids are on record from 1903 and 1904 when smallmouth bass were stocked. Pickerel stocking is recorded from 1921 onward. From the late twenties to the early sixties, White Lake enjoyed the reputation of an excellent yellow pickerel fishery. Largemouth bass were introduced in 1957. By 1969, a failure in the recruitment of yellow pickerel became evident. A comparison of lake survey data from 1959 and 1969 indicates that the niche vacated by yellow pickerel has been filled by largemouth bass. A drastic decline of the yellow pickerel population became evident in the early 1970's.

FISH SPECIES PRESENT

Northern pike, yellow pickerel, smallmouth bass, largemouth bass, maskinonge (stocked for the first time in 1968), rock bass, white sucker, bluntnose minnow, creek chub, brown bullhead, yellow perch, pumpkinseed, golden shiner, banded killifish, bluegill, common shiner, blacknose shiner, American eel, fathead minnow, northern redbelly dace, brook stickleback.

WATER REGIME

The lake has a very low flushing rate, which is further impaired by the presence of a dam at the outlet, and is therefore highly susceptible to cultural eutrophication. The extent of the original lake basin, as well as the pre-development lake levels, are unknown. In the 19th century, a dam was built at the outflow, to provide water power for local sawmills. This dam was operated until 1968. During the time of the early dams existence, water levels in White Lake fluctuated frequently, and up to 50 inches. Water level control for sawmilling occasioned sporadic drawdowns, which again served to flush out the lake. Rocky shores and reefs were free of silt. Spawning pickerel utilized many of the shoals as well as two stream spawning beds. In 1968/69, the wooden dam was replaced with a modern structure. At the wish of cottagers, water levels were retained high throughout the summer, to facilitate better boating. Shortly thereafter, a deterioration of lakeshore spawning shoals became noticeable. Silt and algae covered the rocks with an increasing amount of sediments and slime and pickerel recruitment stock became noticeable in trap net catches by it's absence.

SILTATION AND TURBIDITY

White Lake is exceedingly shallow. In consequence, the propeller wash from outboard motors causes extensive, clearly visible roiling of the lake bottom. Displaced silt and detritus settles in muddy bays as well as on sandy and rocky shoals, which are preferred spawning areas for bass and pickerel.

SHORELINE ALTERATIONS

Ribbon development is the exclusive form of cottageing around the lake. This has resulted in the filling in of marshy sections, construction of docks and artificial beaches, and a general disturbance of the littoral zone. Some of this disturbance persists all summer in areas which are used as spawning grounds by bass. Most cottages, as well as tourist camps are equipped with modern plumbing conveniences and septic tanks. Soil erosion, leaching of lawn fertilizers, and nutrient escapement from septic systems contribute to the general nutriment budget of the lake.

WATER QUALITY

No water quality data were recorded by P. Littkeman during his lake survey in 1959. One point-in-time limnological profile, dated August 6th, 1969, at 10:15 a.m. shows unithermal conditions, an oxygen cut-off at the 20 foot level, surface T.D.S. of 130 p.p.m., NO₃ 7.0, SO₄ 11.0, PO₄ 0.03, ^{which} a secchi-disc reading of 10.0 feet. Since that time, readings have been fluctuating.

<u>Year</u>	<u>Secchi Disc</u>
1959	unknown
1969	10.0 feet
1972	(5.25') 1.6 meters
1973	(8.53') 2.6 meters
1974	(9.84') 3.0 meters
1975	(16.40') 3.5 meters
1976	(7.22') 2.2 meters

A "pollution self help programme" instituted by M.O.E. in 1973 resulted in some reduction of E-coli levels.

All data, or lack of data not with-standing reports from long

term lakeshore residents indicate a noticeable increase in turbidity, algae growth, siltation, and growth of aquatic macrophytes.

DEVELOPMENT

65 cottages existed on the lake in 1959. By contrast, a cottage count in 1976 revealed 10 tourist camps with 50 cabins, 412 private cottages, and over 500 tent and trailer sites. In addition, 250 approved sites are awaiting development. This represents a total of 1,362 development unit impacts (autumn 1977, angling capacity calculation). Interest in further shoreline development remains high.

UTILIZATION

The high quality fishery prior to 1969, attracted anglers, cottagers, and tourist outfitters alike. The greatest attraction to anglers was the yellow pickerel fishery. Tourist outfitters state that 30% of their trade is solely dependent on yellow pickerel.

A creel census in 1974 established an angling pressure of 80,000 rod hours. A further creel census in 1977 showed still declining angling quality, coupled with a decrease of angling pressure to 65,000 rod hours. The winter fishery of 1966/67 amounted to 12,000 rod hours, or 20% of the annual pressure (Note, since the average winter angler uses 1.8 lines, the winter fishery produced 6,700 angler hours).

Boating recreation other than angling, amounted to 38% of the use of the lake in the summer of 1977. It follows that angling is the major recreation form on White Lake. A breakdown of angler origin shows that 10% are day trippers, 32% are campers, 14% are cottagers and 45% are guests of tourist camps.

PRODUCTIVITY VS. PRESENT PRODUCTION

White Lake is a productive lake being of shallow depth, and containing fertile waters. Ryder productivity is 6.86 lbs./ac/yr. Optimum sustained yield (O.S.Y.) is considered as 15% below Ryder productivity, or 5.8 lbs./ac/yr. Present annual harvests are as follows:

Yellow Pickerel	0.08/lbs./ac/yr.
S.M. & L.M. Bass	1.14
Northern Pike	1.72
Panfish	<u>3.40</u>
Total: -	6.34

This harvest is greater than the optimal level, but still slightly lower than the maximum sustained yield.

SPECIES COMPOSITION

Under-harvested fish populations in virgin waters are largely composed of mature specimen of the dominant top predator. Juvenile top predators are suppressed and forage fishes as well as pan fish are kept low by predation. With increasing harvests, the number of dominant predators is reduced. The resulting niche is first filled by juveniles of the predator species. Further infilling is being done by various panfish species. A fishery having an excessive number of panfishes is suffering from harvesting stress. Such a situation exists in White Lake. In order to rehabilitate the fishery, a niche has to be created in the panfish populations which must be replaced by sports fishes.

PUBLIC INVOLVEMENT

Tourist outfitters and anglers undertook to assist the Ministry of Natural Resources in an experimental rearing and stocking programme of yellow pickerel fingerlings.

This programme is continuing, at a cost of about \$4,000 per year

to the private sector.

MANAGEMENT GOALS

- To provide the maximal allowable amount of angling opportunity for the three sports fishery sectors, namely local resident day users, guests of tourist camps, and cottagers.
- To provide additional recreational opportunity, such as pleasure boating, water skiing, canoeing etc., to the level where they start inhibiting the sports fishery.
- To produce a healthy environment for amphibians (bullfrogs) and furbearing animals to provide a sustained yield for local trappers.
- To provide for the production and utilization of waterfowl and shorebirds for the purposes of viewing, or hunting.

MANAGEMENT STRATEGIES

- Rehabilitate water quality to facilitate natural reproduction of warm water sports fishes.
- Keep an open book policy with other government agencies, municipal governments, and user groups of the lake, namely tourist outfitters, local anglers, cottagers, trappers and hunters.
- Delay further shoreline development until the water quality and the sports fish populations have been rehabilitated.
- + Allow further development after rehabilitation up to, but not beyond the optimal carrying capacity of the lake (as per M.N.R. Lake planning guidelines, May 1977).
- Allow angling activity up to the optimal sustained yield level.
- Rebalance the gamefish/coarse fish distribution of biomass in favour of sports species.
- Strengthen the yellow pickerel component of the sports species segment of the fishery.

TACTICS

- Manipulate the water outflow to provide a guaranteed downstream supply of 250 c.f.s. at all times, while maintaining high levels throughout the pike-pickerel spawning and hatching period (April 1 to May 31st).
- Institute a gradual lowering of the lake level throughout the summer to improve traditional pickerel spawning beds (see rule curve).
- Establish the fall and winter water level no later than September 15th, and maintain the lake at this level until mid-March, in the interest of fur production (see rule curve).
- Encourage the formation and functioning of a multi user group executive committee, composed of anglers, outfitters, cottagers, and township councillors.
- Request Regional Office to maintain sympathetic liaison with M.N.R. and M.O.H., to forestall an undesirable early build up of additional development.
- Utilize closed season variation orders to effect legislation tailored to local needs.
- Co-operate with the private sector to provide yellow pickerel fingerlings for the purpose of bolstering indigenous spawning stocks until 1980.
- Assess the degree of success in 1979 and 1980, by means of a trapnet survey and creel census.
- Maintain public interest in the programme by annual news releases.
- Adjust seasons, limits, and fishing gear to maintain total harvests within below the O.S.Y. of 5.8 lbs/ac/yr.
- Close the winter fishery for yellow pickerel, and reduce the summer fishery for pickerel to encourage a recovery of this species.

- Investigate the suitability of Raycroft Creek for an artificial pickerel spawning bed.
- If suitable, consider stocking one million EE yellow pickerel into the Raycroft Creek spawning bed for 3 successive years.

FISHERIES FACT SHEET

Data Base - 1974

Lake: White Lake
District: Lanark

Acreage: 5,608

1) Angling Success (1974)

Species	C.U.E.	#Harvested	Average Weight lbs	Calcul. Harvest/ ac/yr.
Yellow Pickerel	.004	320	1.5	.08
Bass (L.M. & S.M.)	.080	6,400	1.0	1.14
Northern Pike	.080	6,400	1.5	1.72
Panfish	.810	64,800	0.3	3.40
	0.970	77,920		6.34

2) Fishing Pressure (1974)

	Total Rod Hrs.	Rod Hrs. per Acre
by Cottagers	20,000	3.57
by Tourist Camps	48,000	8.58
by Day Users	<u>12,000</u>	<u>2.15</u>
	80,000	14.30

3) Productivity (Ryder)

$$2\sqrt{\frac{T}{D}} = 2\sqrt{\frac{130}{11}} = 6.86 \text{ lbs./ac/yr.}$$

Note: 1976/77 winter fishery total 6,600 angler hours
= 11,800 rod hours.

* Lake Development Fisheries Assessment

Region: Eastern District: Lanark County: Renfrew & Lanark

Township: Bagot, McNab, Darling, Pakenham Lake: White Lake

Area (A): 5,608 Mean Depth (D): 11.0 T.D.S.(T): 130.0

Sports Fish: 316, 317, 131, 334 Average Weight of Target

Fish: 1.5 lbs. Productivity(P): $2\sqrt{\frac{T}{D}}$: $S = 2\sqrt{\frac{130}{11}} = 4.6$ sports-

fish/acre/year Average Cottage Angling Pressure Target: (H) 50 hr/

Angling Quality (C) = 0.25 C.U.E.

Individual Cottage Fish Requirement (F_1) = $C \times H = .25 \times 50 = 12.5$ Fi

Individual Cottage Lake Area Requirement (L_1) = $\frac{F_1}{P} = \frac{12.5}{4.6} = 2.71$ Acres

Current Day Use Angling (U)

by Greel Census = 12,000 Angler Hours

Day-Use Fish Requirement (F_2) = $U \times C.U.E. = 12,000 \times .25 = 3,000$ fis

Day-Use Acreage (L_2) = $\frac{F_2}{P} = \frac{3000}{4.6} = 653$ Acres

Waters Available for Cottage Fishery (W) = $A - L_2 = 5,608 - 653 = 4,966$ Acres

Gross Cottageing Capacity (C_1) = $\frac{W}{L_1} = \frac{4955}{2.71} = 1825$ Units

500 Tent & Trailer Sites x Impact Factor 1 = 500 Unit Impacts

412 Private Cottages x Impact Factor 1 = 412 Unit Impacts

50 Commercial Cabins x Impact Factor 4 = 200 Unit Impacts

Total Unit Impacts (U) 1112 Unit Impacts

Net Cottage Capacity(C_2) = $C_1 - U = 1825 - 1112 = 713$ Units

Remarks: In view of present imbalance of gamefish/panfish popula-
tions, further development should be constrained until fishery
is rehabilitated.

Date: December 19, 1977

Evaluator: Hans von Rosen

Objective: To calculate the optimal number of cottages which
can be supported by a lake if an angling fishery is to be maintained

RULE CURVE

WHITE LAKE WATER LEVELS

January	1	2.5
	15	2.5
February	1	2.5
	15	2.5
March	1	2.5
	15	3.5
April	1	4.5
	15	5.2
May	1	5.2
	15	5.0
June	1	4.5 5.0
	15	4.5 4.5
July	1	4.0 4.0
	15	3.5 3.75
August	1	3.5 3.6
	15	3.5 3.5
September	1	3.0
	15	2.5
October	1	2.5
	15	2.5
November	1	2.5
	15	2.5
December	1	2.5
	15	2.5

Note: All levels to be considered within a 6" fluctuation margin

Note: No drawdowns later than September 15th regardless of level attained.

* Boat Limit Assessment

Region: Eastern District: Lanark County: Lanark & Renfrew
Township: Bagot, McNab, Darling, Pakenham Lake: White Lake
Area (A): 5672.4 acres Protection Zone (Z): 1989.2

Existing Cottages (E): 462 units
including commercial cabins, tent & trailer sites
plus 500 tent & trailer sites plus 250 additionally approved
tent & trailer sites

Net acreage (N) = A - Z = 5672.4 - 1989.2 = acres 3683.2

1. Gross Acreage 5672.4 acres

Protective Zone 1989.2 acres

Net usable acreage = 3683.2 acres

2. Instantaneous boat activity = 368 boats

3. Maximum boat capacity = $\frac{100}{15} \times 368 = 2,453$

4. Present density: 412 cottages x 2 boats = 824
500 tent & trailer sites x 1 boat = 500
50 commercial cabins x 1 boat = 50
250 approved future tent &
trailer sites = 250
1624

5. Remaining boat capacity = $\frac{2453}{15}$
829 boats

Note: (a) 829 boats = 414 private cottages or
= 829 tent & trailer sites

(b) In view of the depressed condition of the fishery
further development should be held in abeyance until
the fishery has been rehabilitated.

December 19th, 1977

Hans von Rosen

WHITE LAKE OPERATIONS PLAN 1977/86

Year	Water Level Control	Cost	EE Stocking M.N.R.	Cost	Fgl. Stocking M.N.R.	Cost	Fgl. Stocking Private	Private Costs	Air/Ground Creel	Cost	Trapnet Survey	Cost	Trailer Camps, Cottage Developments, Etc.	* Total Cost M.N.
1977	as per rule curve	\$1,800	nil	-	nil	-	approx. 10,000	\$4,000	yes	\$2,000	nil	-	freeze	\$3,800
1978	"	1,800	nil	-	nil	-	" 15,000	4,500	no	-	no	-	freeze	1,800
1979	"	1,800	nil	-	nil	-	" 15,000	4,500	no	-	yes	2,000	freeze	3,800
1980	"	1,800	1 Mill	\$500	nil	-	" 15,000	4,500	yes	2,000	no	-	freeze	4,300

Assessment of Programme If Unsuccessful - Terminate. If Successful Continued, as Below Reconsider in Light of Survey Data

1981	"	1,800	1 Mill	500	15,000	1,500	" 15,000	4,500	no	-	no	-		3,800
1982	"	1,800	1 Mill	500	15,000	1,500	nil		no	-	no	-		3,800
1983	"	1,800	nil		15,000	1,500	nil		yes	2,000	no	-		5,300
1984	"	1,800	nil		15,000	1,500	nil		no	-	yes	2,000		5,300
1985	"	1,800	nil		15,000	1,500	nil		no	-	no	-		3,300
1986	"	1,800	nil		15,000	1,500	nil		yes	2,000	no	-		5,300

Re-Assess and Develop Plan for 1987 - 96

* Excluding Law Enforcement
Office Overhead
Permanent Staff Mgt. Costs

