Gibson Lake

(Gibson Geographic Township)

Synoptic Trapnet Survey Report, Summer, 2001

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Executive Summary:

During the summer of 2001 a synoptic trapnet survey was conducted on Gibson Lake. The primarily purpose was to assess the status of the walleye and smallmouth bass populations and secondarily that of other species in the near-shore fish community. We routinely make comparisons with a 1968 trapnet survey conducted Gibson Lake, and use this as a 'benchmark' with which to note many recent changes in the fish community.

We present a "hypothetical" report card on the fish community of Gibson Lake and accord it a passing grade of C+. Walleye, northern pike and largemouth bass abundance is "average" relative to similar surveys conducted on other Parry Sound Area lakes. Smallmouth bass abundance is "above average" and black crappie is highly abundant in the lake – seemingly to the detriment of walleye. Walleye abundance and productivity have diminished considerably from that observed in 1968, but that of smallmouth bass has increased dramatically. Although Gibson Lake is a very productive lake, an 'above average' proportion of fish productivity is directed towards coarse fish species.

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1.0 Introduction:

Gibson Lake is a medium size (263.7 hectares; 651.3 acres) (OMNR, 1975) lake located in the Geographic Township of Gibson, forming part of the Municipality of the Township of Georgian Bay. The lake is quite long and narrow on a northeast – southwest axis. It is distinctly divided into two basins separated by a narrow constriction located approximately in the middle of the lake (Figure 1). The lake primarily receives runoff from the relatively small Gibson River watershed and a small amount from Hungry Creek, an outlet of Six-Mile Lake to the south. Water exits the lake via the Gibson River en route to near-by Georgian Bay to the west.

Gibson Lake is largely surrounded by private land. The majority of the eastern shoreline forms a portion of the current boundary of the Wahta Mohawk Reserve. The shoreline is relatively heavily developed with one public access point in the southwest corner or the lake. When the Ministry of Natural Resources conducted an Aquatic Habitat Inventory Survey (Lake Survey) on the lake in 1975, there were 166 cottages on the lake. Undoubtedly that number has increased considerably to present day.

As is typical of Canadian Shield lakes, Gibson Lake is mildly acidic (surface pH 6.8; OMNR, 2001). Also typical, it has low buffering capacity with alkalinity of 13.7 mg./l (OMNR, 1975) making it sensitive to acidification. Watercolour is yellow-brown with low light transparency (secchi reading 2.0 metres, OMNR, 2001). Total Dissolved Solids readings are moderate – 32 ppm (OMNR, 1975). Chlorophyll a concentrations were high at 4.7 μg. / litre in 1979 (MOE, 1979). The lake is best described as mesotrophic – having moderate levels of nutrient enrichment. These conditions are optimal for walleye. It has a maximum depth of approximately 14.3 metres (46.9 feet) and a mean depth of 7.6 metres (24.9 feet) (OMNR, 1975).

The first biological survey of the lake was conducted in 1958 by the then Department of Lands and Forests (predecessor of the Ministry of Natural Resources). "Pike, pickerel (walleye) and bass" (presumably largemouth) were listed as game species present and providing good fishing. Gillnets captured a large number of lake herring (cisco) as well as yellow perch and common white sucker.

In May of 1968, a survey using a combination of 6' and 8' trapnets was conducted on the lake, seemingly with the intention of monitoring the walleye population. The walleye population looked very healthy at the time with 373 walleye being captured in 38 overnight sets with an abundance of small walleye in the catch (Hogg, 1968). This survey further added brown bullhead, redhorse sucker, pumpkinseed, rock bass, channel catfish, burbot and smallmouth bass as fish species present in the lake. We use the 1968 trapnet survey extensively as a 'benchmark' for comparison with this synoptic trapnet survey.

In 1975 a standard *Aquatic Habitat Inventory Survey* (commonly called a 'Lake Survey') was conducted on the lake providing much of the baseline water quality and lake characteristic data listed above. Fish collection in minnow traps resulted in johnny darter and log perch being documented as additional species present.

The stocking record for Gibson Lake commenced in 1944 with the planting of walleye eyed-eggs. Similar plantings occurred in 1950 and 1956. Although we have no means of confirming it, these were probably supplementary planting to an indigenous population and not introductory plantings. Smallmouth bass fingerlings were planted in 1950, '56, ' 58, '64 and '68. We are unaware if these were introductory or supplementary plantings.

Although Ministry files indicate that black crappie is now present in the lake, the date of this unauthorized introduction is unknown. Certainly this species was not present in the lake when the 1968 survey was conducted. Likewise, a 1978 netting project to collect fish for contaminant analysis failed to capture any crappie. Our survey represents the first conclusive documentation of black crappie in the lake, but obviously they have been well established for several years.

Mercury levels are relatively high in game fish present in Gibson Lake and anglers should consult the "Guide to Eating Ontario Sport Fish" before consumption. This is from naturally occurring background mercury present in the watershed and not from man-made sources.

The purpose of this survey was primarily to monitor the status of the walleye and smallmouth bass populations as well as the near-shore fish community in Gibson Lake.

2.0 Methods:

Synoptic surveys are intended to provide a 'snapshot in time' of the status of the fish community and individual populations that comprise it. We used 8' trapnets due to the non-lethal nature of the gear and it's proven effectiveness at capturing walleye and smallmouth bass – which were the particular species of interest in this survey. Results must be viewed in light of 'species selectivity' of the gear. This is further discussed in the *Results and Discussion* section of the report.

Due to severe limitations that the gear imposes on set location, netting sites were not pre-determined. Site selection was at the discretion of the field crew. However, site selection was based on the following guidelines:

- The site had to be suitable for the net to fish effectively. (Consequently – factors such as: contours of the lake bottom, absence of obstructions, depth, sufficient lead length, etc. were to be considered.)
- Nets were to fish all habitat types in approximate proportion to their abundance on the lake in order that the catch would reflect the 'whole lake' as accurately as possible.
- Nets were to be set far enough apart such that they were not competing with each other.
- Nets were to be approximately randomly distributed throughout the study area.

Due to inconsistencies in methodology, we did not attempt to duplicate 8' trapnet sites fished in 1968.

We completed 15 over-night, trapnet sets that met the above guidelines. Nets set locations are indicated in Figure 1. It is apparent in Figure 1 that there is an absence of trapnet sets in the north basin and on the east shore of the lake. This was due to shallow and inappropriate conditions that precluded 8' trapnet sets being set in this vicinity of the lake.

Field operations were conducted from September 4th to 13th, 2001.

In this report the unit of effort is recorded as a "net set" – and approximates a set of 24 hours duration. Nets were relocated daily.

Complete catch enumeration was conducted for all sets (Appendix A).

Biosampling data collection for all game fish included total length, fork length and round weight determination (Appendix B – F). Scale samples were also collected for age determination of walleye (Appendix B). For non-game fish, round weights were recorded in order that *total weight captured* and *mean weight* for non-game fish species could be determined (Appendix A).

Age determination for walleye was by the scale reading method. As there were no *known-age* walleye in Gibson Lake – we had no method of validating the accuracy of our scale aging. Campbell and Babaluk (1979) concluded that scale aging consistently underestimate the true age of walleye – particularly in older age classes. The reader should bear in mind, that our mean age determination (Appendix B) may underestimate the true mean age of walleye that we sampled.

Relative Abundance Analysis and Comparison with other Surveys:

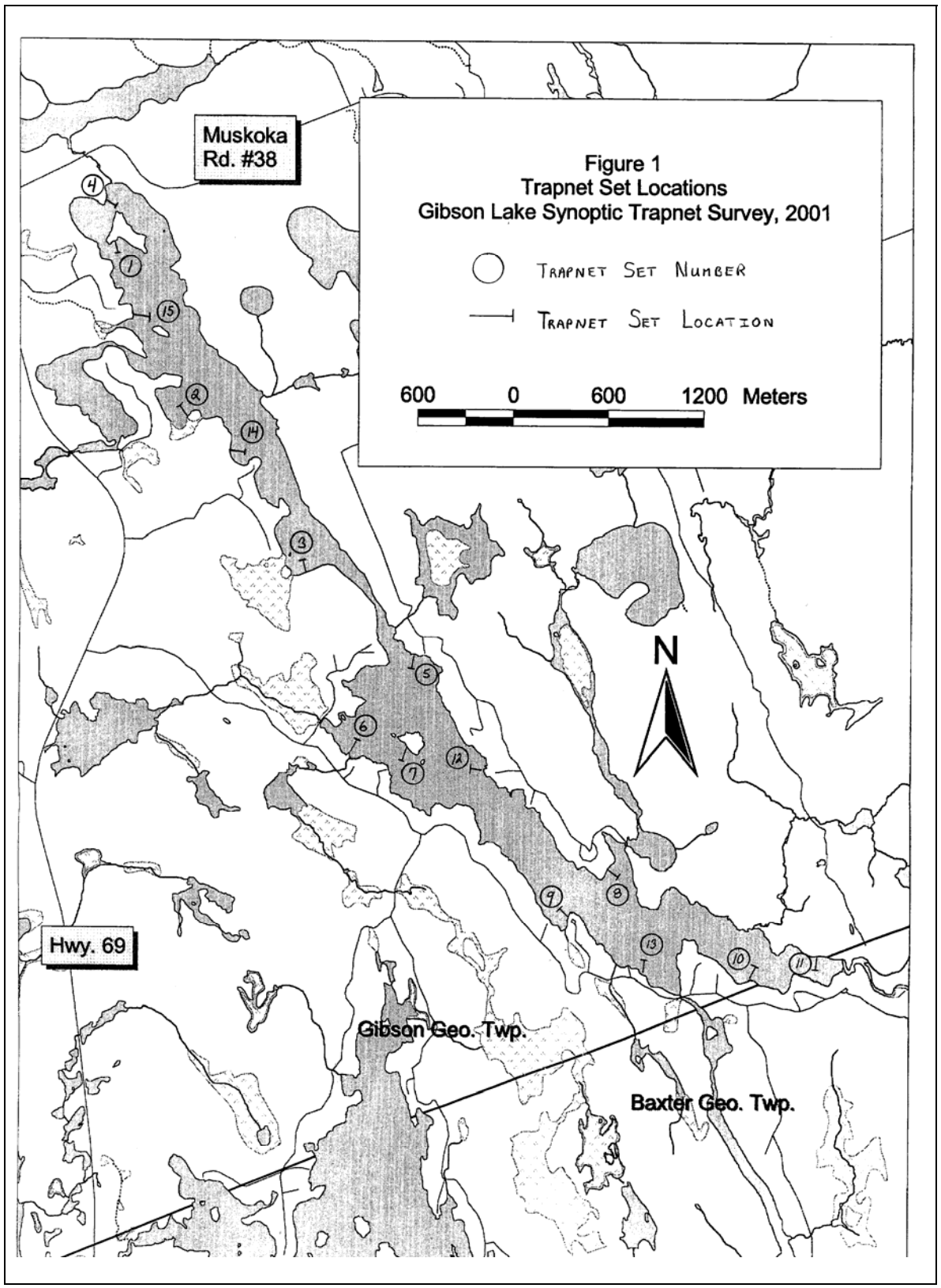
Since 1982, the Ministry of Natural Resources has conducted over 30 synoptic trapnet surveys on various lakes throughout the Parry Sound Area. The primary focus of these investigations has been to assess the status of walleye and smallmouth bass populations and secondarily those of other species in the near-shore fish community.

We use two indices to indicate the status of a particular fish species in the lake community. These are 1) the catch rate or *Catch-Per-Unit-Effort by number (CPUE-no)* and 2) the *Catch-Per-Unit Effort by weight (CPUE-wt).* We use both statistics in conjunction with one another because independently they can be misleading. (For instance: A high *CPUE-wt* could be the result of a small number of very large fish being caught or a large number of very small fish being caught. This is clarified when we consider the *CUE-no.)*

We call these "*indices of relative abundance*" because they do not specifically tell us the size of a population. Rather the *CPUE* statistics for a particular species generated on one lake is compared "relative" to that generated on a number of other lakes. Hence the abundance of a fish species on one lake is based on its position relative to a host of other lakes similarly surveyed.

We use size and age distribution data of various game fish species to help give us some insight regarding reproductive, recruitment and mortality rates. We acknowledge that we do not know actual reproductive, recruitment or mortality rates. We simply draw inferences about these rates based on the abundance of size and age classes.

The reader will note that when we make species specific comparisons with previous surveys, the number of reference surveys vary. This is because we only make comparisons with previous surveys that caught the same species. For example, we have 22 previous synoptic trapnet surveys that caught northern pike, 16 that caught largemouth bass, 4 that caught black crappie. Also, surveys conducted prior to 1994 did not calculate Catch-Per-Unit-Effort by weight (*CPUE-wt*), and we therefor did not make any comparisons with these surveys when talking about this statistic.


Muskoka
Rd. #38
Figure 1
Trapnet Set Locations
Gibson Lake Synoptic Trapnet Survey, 2001
Trapnet Set Number
Trapnet Set Location
600 0 600 1200 Meters
N
Hwy. 69
Gibson Geo. Twp.
Baxter Geo. Twp.

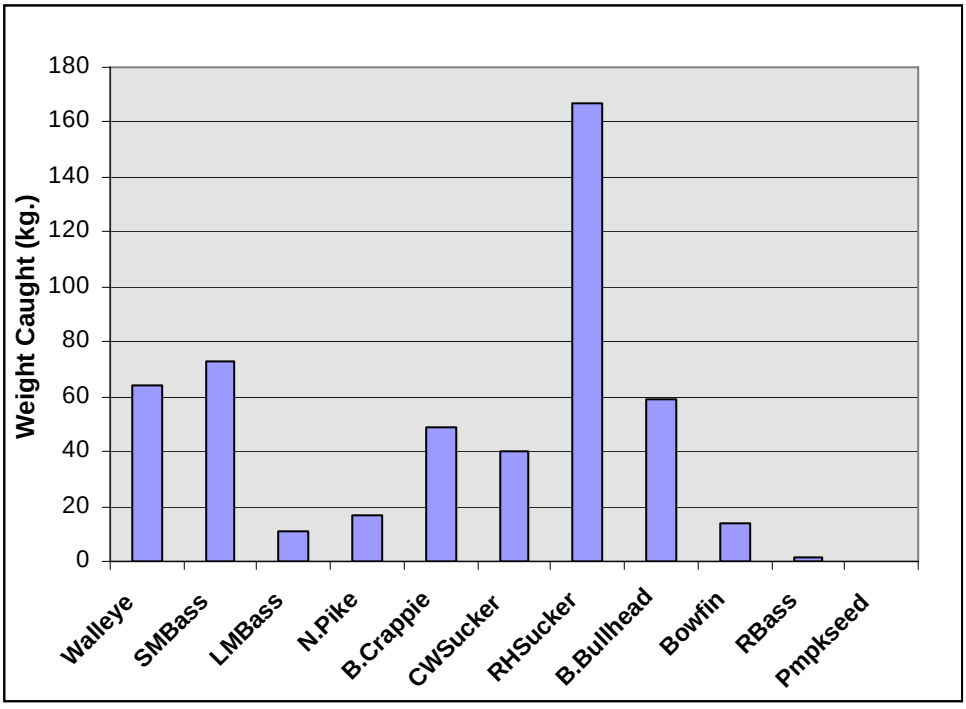
3.0 Results and Discussion

3.1 Catch Composition and Productivity

A grand total of 494.526 kilograms of fish, comprising 11 different species was caught in 15 over-night trapnet sets (Appendix A). The *Catch-Per-Unit-Effort by weight* (*CPUE-wt*) was 32.968 kilograms / net set (Appendix A). Relative to 16 synoptic trapnet surveys recently conducted (since 1994) in the Parry Sound Area, this index of productivity ranks 2nd and well above the average of 17.741 kg. / net set. Although this is a very positive index of fish productivity, more than 1/3rd of this productivity is attributable to the redhorse sucker population in the lake.

Game fish (walleye, smallmouth bass, largemouth bass, northern pike and black crappie) comprised 43.1% of the total biomass of fish captured. Coarse fish (common white sucker, redhorse sucker, brown bullhead and bowfin) comprised 56.6% and pan fish (rock bass and pumpkinseed) comprised less than 1%. Clearly, coarse fish are very abundant in Gibson Lake. The average percent of coarse fish caught in the above mentioned 16 synoptic trapnet surveys is 34.5%. Again, this high representation of coarse fish on Gibson Lake is largely attributable to the redhorse sucker population. Walleye comprised 12.9% of the total catch weight, well below the average of 24.8% for the above mentioned surveys.

Figure 2. Catch composition (by weight) for the Gibson Lake synoptic trapnet survey, Summer 2001.

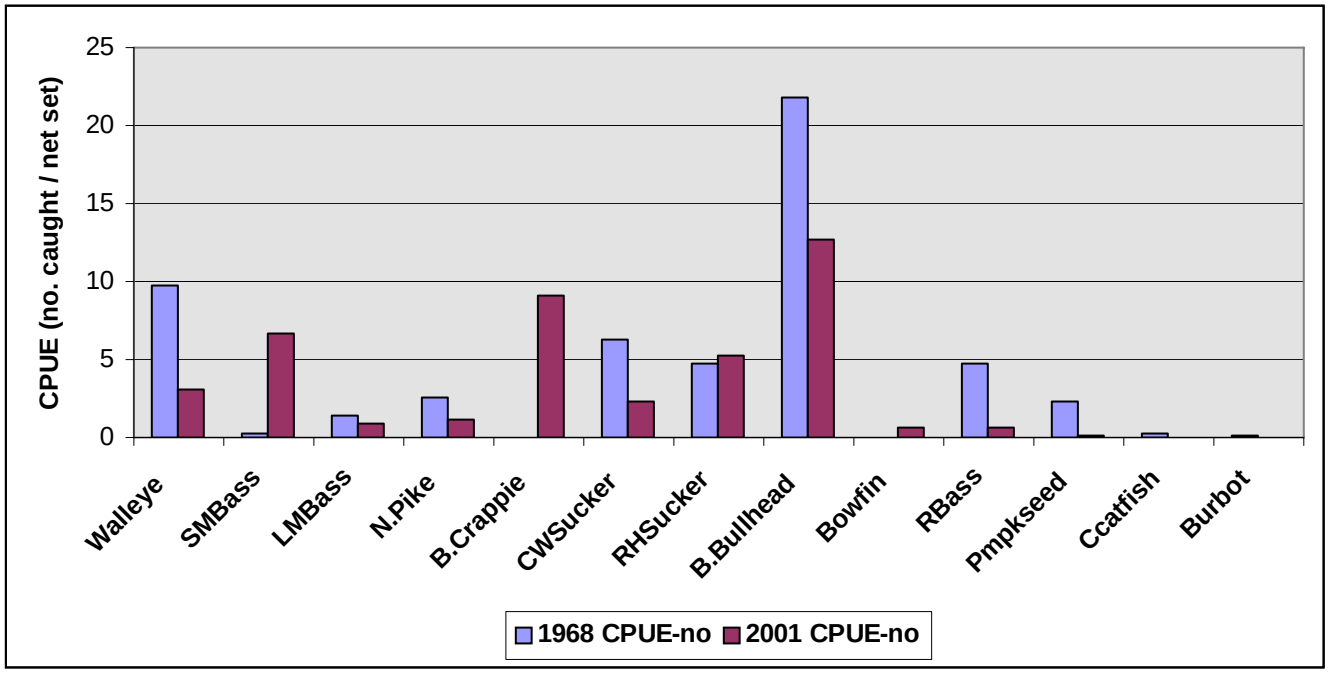


(For specific data values see Appendix A)

We dearly wanted to make fish community comparisons with the 1968 trapnets survey conducted on Gibson Lake (Hogg, 1968). Direct comparisons are not possible however. Hogg used a substantially different survey methodology than we did. He used both 6 and 8' trapnets and the nets were not moved daily. Furthermore, his analysis precludes us separating out what portion of the non-games species came from which size net. Also, he did not provide weights for fish captured. Nonetheless, there are some obvious observations regarding community composition from his catch data.

In 38 overnight trapnet sets of fishing effort in the 1968 survey, the catch consisted of 830 brown bullhead, 373 walleye, 238 white sucker, 175 redhorse sucker, 178 rock bass, 100 northern pike, 89 pumpkinseed, 54 largemouth bass, 8 channel catfish and 3 burbot (Hogg, 1968). Acknowledging that *Catch-Per-Unit-Effort by number* (*CPUE-no*) for individual species are not directly comparable between surveys, there are nonetheless some interesting comparisons of a general nature.

Figure 3. Comparison of CPUE-no between the 1968 trapnets survey and the 2001 synoptic survey conducted on Gibson Lake.



Between studies, walleye abundance appears to be down considerably, but smallmouth bass is way up. Largemouth bass and northern pike abundance is approximately the same. Black crappie was not even present in the lake in 1968, but now comprise a significant portion of the catch. Common white sucker abundance appears to have decreased; redhorse sucker abundance is essentially unchanged. Brown bullhead, rock bass and pumpkinseed abundance appears to have diminished considerably, but this observation may largely be due to 6' trapnets used in 1968 that are more likely to capture these species. No bowfin was captured in the 1968 survey but 10 were caught in this survey, and we failed to capture any channel catfish or burbot that were previously caught in '68. It is also very interesting that neither of these surveys caught any yellow perch that were reported as abundant in the 1958 lake survey (OMNR, 1958).

We consider the apparent decrease in walleye abundance, the apparent increase in smallmouth bass abundance and the introduction of black crappie into the lake to be the most significant changes in the fish community. The decreasing production of walleye is probably related to the introduction of black crappie due to predation and competition between these species (Kerr & Grant, 2000). The apparent disappearance, or at least very low abundance of yellow perch may also be impacting walleye as they are a primary forage species for walleye. Although there are some interesting anomalies between surveys with respect to the catch of bowfin, channel catfish and burbot, the abundance of these species is low and consequently not particularly significant with respect to impacts on the fish community.

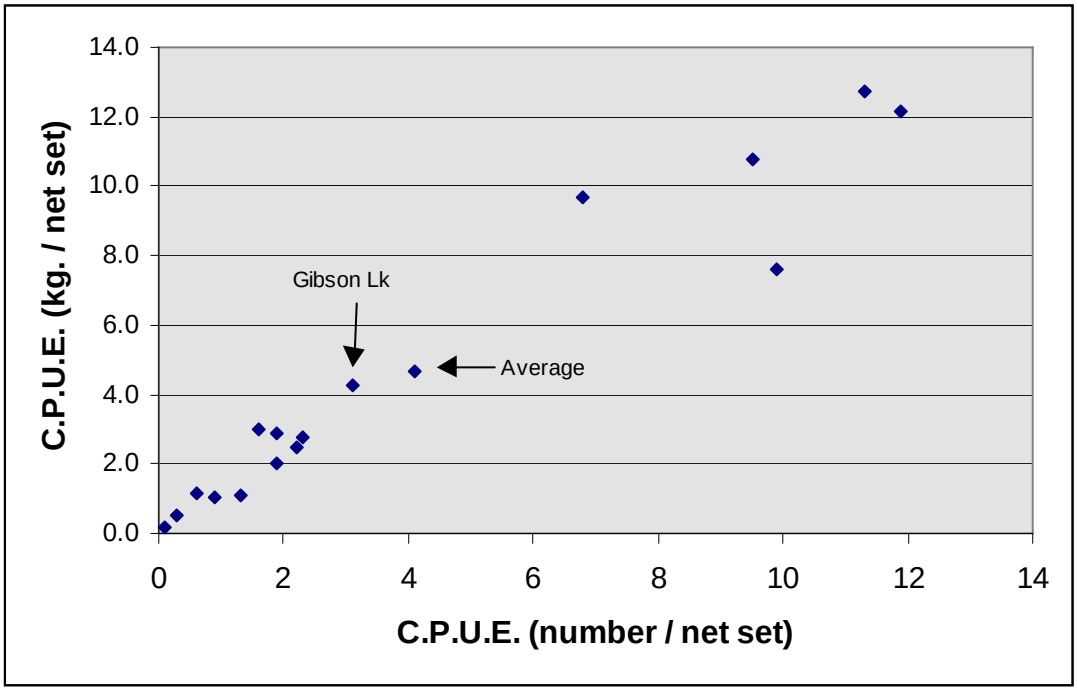
The diversity of fish species in Gibson Lake is high with 11 different species being caught in this survey. The average number of species caught in the 16 recent (since 1994) synoptic trapnet surveys conducted in the Parry Sound Area is 8.2.

3.2 Walleye

In 15 overnight, 8' trapnet sets, our walleye *CPUE-no* was 3.1 walleye / net set (standard error 0.77) (Appendix A). Relative to 16 recently completed (since 1994) synoptic trapnet surveys conducted in the Parry Sound Area, Gibson Lake ranks slightly below the average of 4.1 walleye / net set.

Our walleye *CPUE-wt* was 4.265 kg. / net set (Appendix A), again just below the average of 4.649 for 16 recent synoptic trapnet surveys.

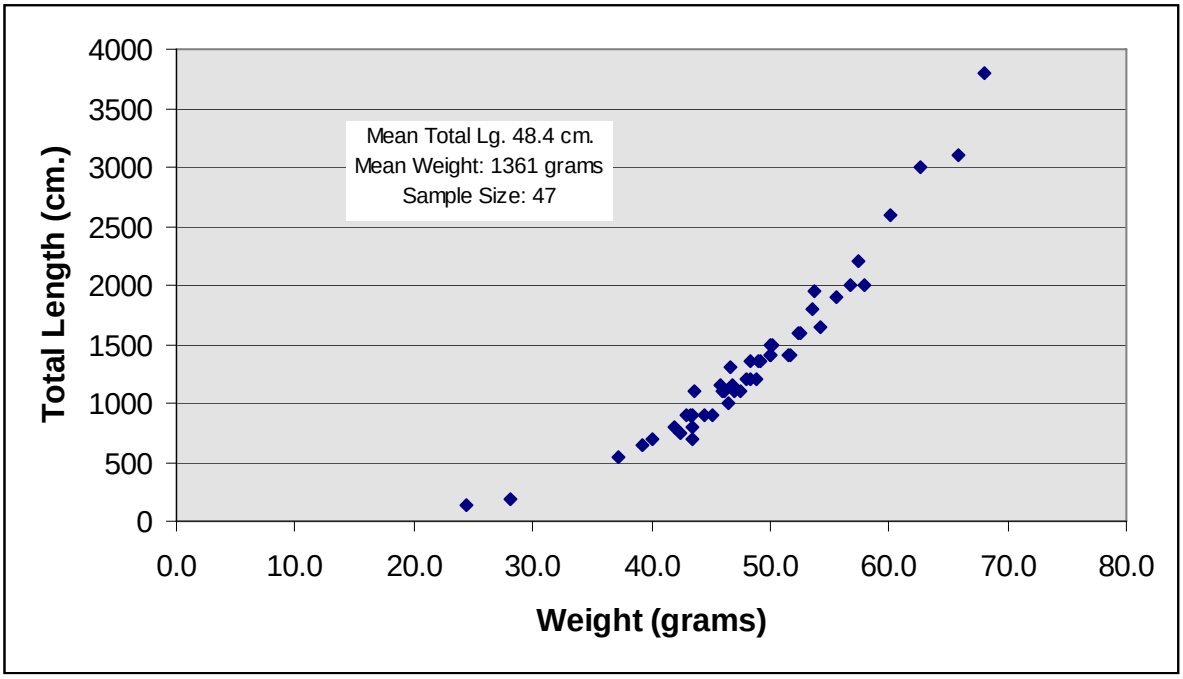
Figure 4. Walleye *CPUE-no* versus walleye *CPUE-wt* for 16 synoptic trapnet surveys recently conducted (since 1994) in the Parry Sound Area.



Considering catch variation inherent in the fishing gear, we consider the abundance of walleye present in Gibson Lake to be "average" for that observed in recent synoptic trapnet surveys. However, we also re-worked the catch data available in the 1968 trapnet survey report for Gibson Lake (Hogg, 1968) and determined that the *CPUE-no* for 8' trapnets in this survey was 10.2 walleye / net set (standard error 1.92). **Clearly, walleye abundance has diminished considerably in the intervening years.**

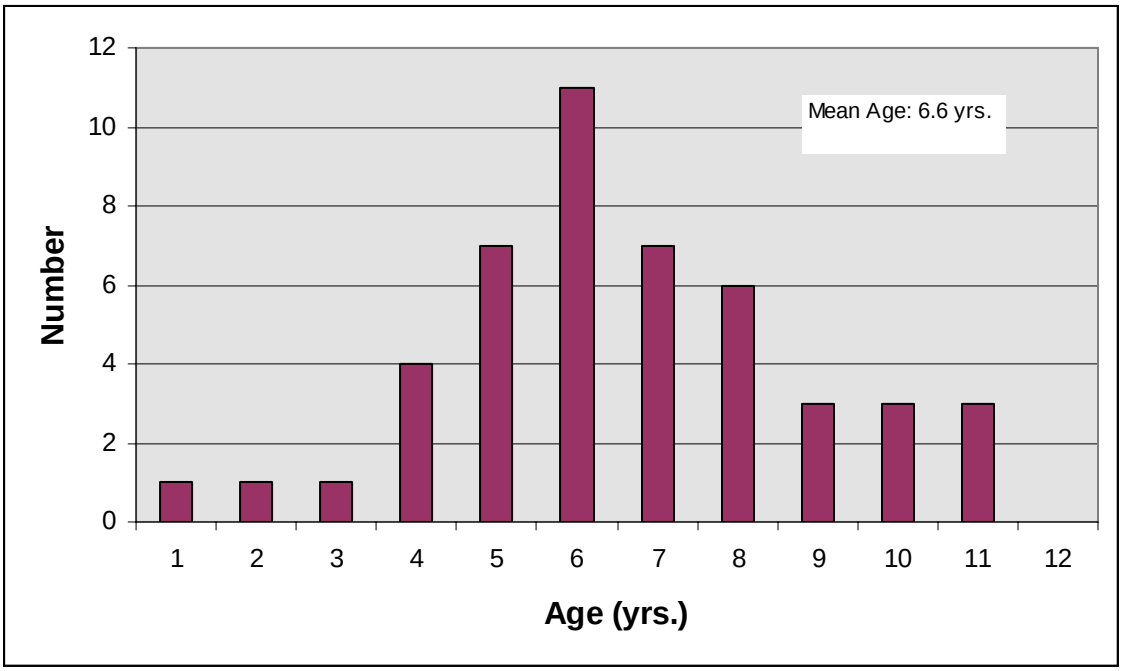
We sampled all 47 walleye captured in this survey and determined that the mean total length was 48.4 cm. and mean weight 1361 grams (Figure 5 and Appendix B).

Figure 5. Size distribution of walleye sampled from Gibson Lake, summer 2001.



Mean age of our walleye catch was 6.6 years (Appendix B). The age class distribution of our walleye samples is highly unusual (Figure 6). Normally, most fish populations have the greatest abundance in the most recent year classes that then diminish successively until fish die from old age. (For example: there are more 1 year old fish than 2 year olds; more 2 than 3, more 3 than 4, etceteras.) However, walleye only become fully vulnerable to 8' trapnetting gear once they reach 4 years of age. Consequently, year classes younger than this are not represented in the catch relative to their actual abundance in the fish population. A typical walleye age class structure is one in which there is increasing representatives in the 1 to 3 year age classes, then the largest number of fish in the 4-year age classes, then a continuous decline in each successively older age class.

Figure 6. Gibson Lake walleye age class structure, summer 2001.



We interpret the above age class structure as indicating that the 4 and 5-year age classes appear to be weak. Even age class 3, although not fully vulnerable to the gear also appears quite weak. We wonder to what extent the recently poor levels of reproduction and recruitment may be symptomatic of a chronic problem in this regard. Admittedly however, age classes 6 and up appear stronger and mortality in these older age classes does not appear to be unduly high. Perhaps the weak 1998, '97 and '96 year classes (age 3, 4 and 5) are due to widespread natural factors (such as environmental conditions) and recent poor reproduction is not a cause for alarm. Walleye typically exhibit a "boom – bust" reproductive strategy in which several successively poor year classes (bust) are interspersed with the occasional strong year class (boom). We doubt however that this is the case as synoptic trapnet surveys recently conducted on Bear Lake (McIntyre, 2001), Giroux Lake (McIntyre 2001a - in preparation) and Cecebe Lake (McIntyre, 2000) all show these year classes to be of good strength.

We also note that the 1968 survey on Gibson Lake indicated an abundance of small walleye (Hogg. 1968). Over 70% of the 373 walleye caught in that survey were less than 41 cm. in total length. Clearly, at that time reproductive and recruitment levels for walleye were much better than those exhibited in our survey.

We characterize the current walleye population as exhibiting low to moderate levels of productivity and moderate levels of adult mortality. The population is probably quite healthy and stable, but at a much lower level than what is desired. The introduction of black crappie is undoubtedly contributing to the suppression of walleye, but to what extent is a matter of speculation. Unfortunately we have no information pertaining to the sport fishery and what impact it is having on the walleye population.

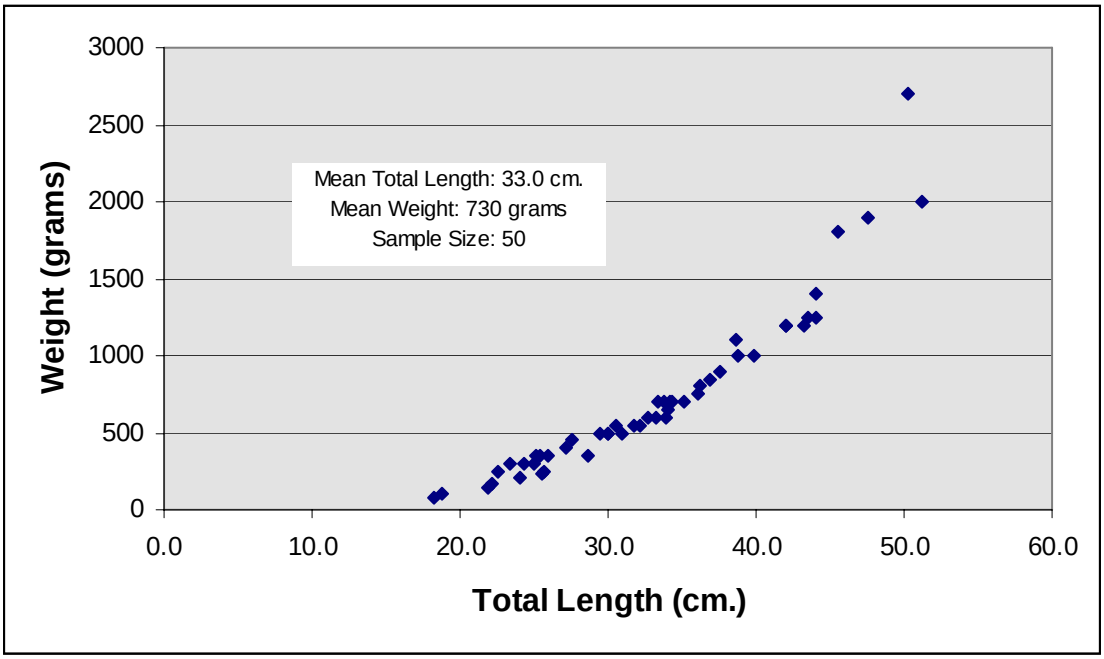
3.3 Smallmouth Bass:

Our *CPUE-no* for smallmouth bass was 6.7 bass / net set (standard error 1.8) (Appendix A). Relative to 24 historic synoptic trapnet surveys that have been conducted in the Parry Sound Area since 1986, this is slightly better than the average of 5.0 bass / net set for these surveys.

Our *CPUE-wt* for smallmouth was 4.866 kg. / net set (standard error 0.675) (Appendix A). Relative to 15 recently completed synoptic trapnet surveys for which this statistic is available, this is slightly better than the average of 3.433 kg. / net set.

We re-analyzed the catch data from the 1968 trapnet survey on Gibson Lake (Hogg, 1968) and calculated the smallmouth bass *CPUE-no* for 8' trapnets to be 0.0 bass / net set (smallmouth were only caught in 6' trapnets in the '68 survey). **Although the abundance of smallmouth bass is currently only marginally better than the average for Parry Sound Area lakes, it is significantly better than that which was observed in the 1968 survey on Gibson Lake.**

Figure 7. Size distribution of smallmouth bass caught in Gibson Lake from the synoptic trapnet survey conducted during the summer of 2001.



We randomly sampled 50 of the 100 smallmouth bass that were captured during the survey. Mean total length was 33.0 cm. (13 inches) and mean weight was 730 grams (1.6 pounds) (Appendix C).

The observed size distribution (Figure 7) indicates good levels of recruitment to the adult population with a moderate mortality rate. We consider the smallmouth bass population of Gibson Lake to be quite healthy, productive and sustainable. Relative to the 1968 survey, this is one of the 'bright spots' that we see in this survey.

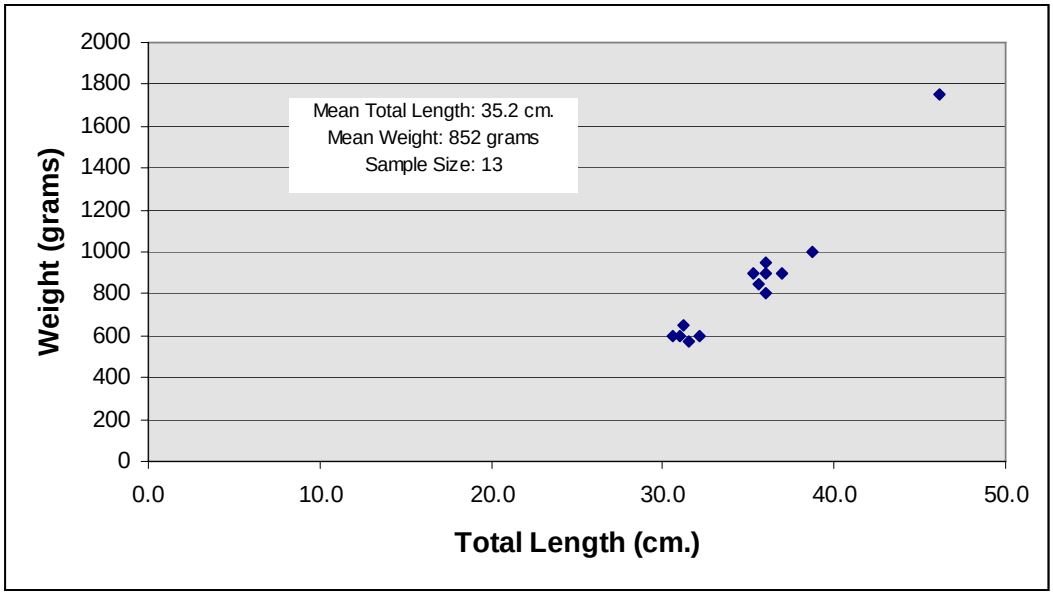
3.4 Largemouth Bass:

Indices of abundance for largemouth bass must be viewed in light of the fact that this species is typically under represented in the catch from 8' trapnets relative to its abundance in the lake. Largemouth bass inhabit warm, shallow water areas that are usually very close to shore. Because the "capture portion" (i.e. the crib) of an 8' trapnet is usually located 100 – 150' offshore, largemouth bass are not particularly vulnerable to the gear. Hence, this lack of vulnerability and the resulting low catch rate for this species makes it more difficult to ascertain what constitutes a high or low abundance.

Our largemouth bass *CPUE-no* was 0.9 fish / net set (standard error 0.36) (Appendix A). Relative to 16 other historic (since 1986) synoptic trapnet surveys conducted in the Parry Sound Area that have captured largemouth, this approximately equivalent to the average of 1.1 for these surveys.

We also re-analyzed the catch data from the 1968 survey (Hogg, 1968) and calculated a *CPUE-no* of 1.1 largemouth bass / 8' trapnet set (standard error 0.45). This is essentially the same as we observed and we conclude that the abundance largemouth bass today is approximately equivalent to that observed in 1968.

Figure 8. Size class distribution of largemouth bass captured in Gibson Lake from a synoptic trapnet survey conducted during the summer of 2001.



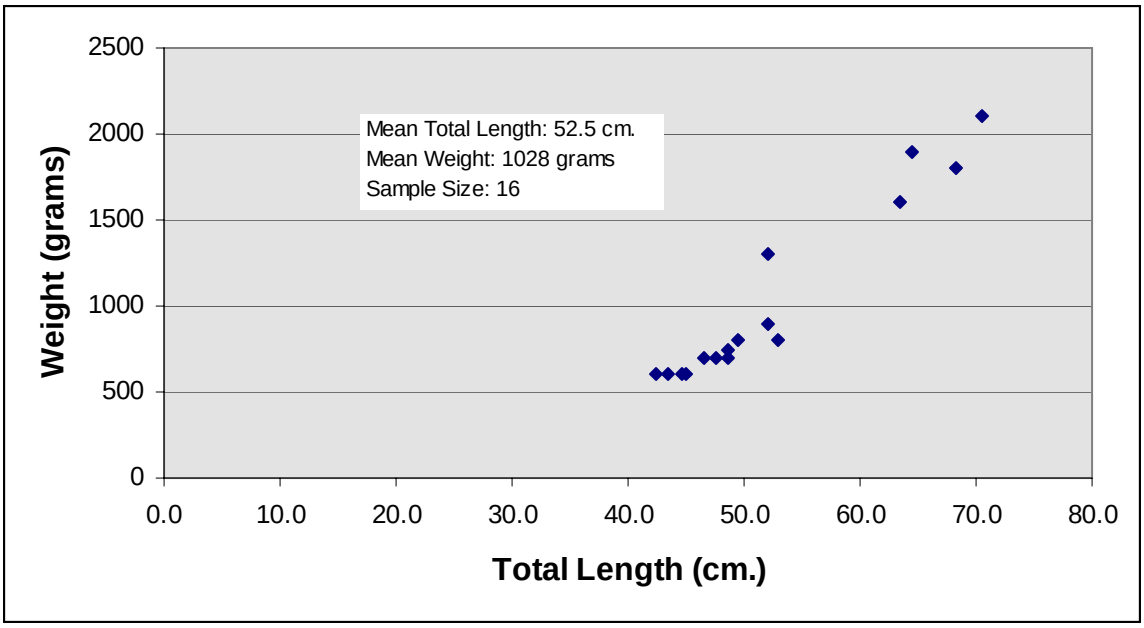
We sampled all 13 largemouth bass captured and determined a mean total length of 35.2 cm. and a mean weight of 852 grams (Appendix D). This is a large mean size and we caught no largemouth smaller than 30 cm. in total length. Although this observation might tend to raise alarm that there are few small-size largemouth bass in the lake due to reproductive failure, we very much doubt this is the case. We suspect the absence of juvenile largemouth bass is due to the size selectivity of the net. Juvenile largemouth bass probably inhabit near-shore waters and are not vulnerable to the fishing gear.

3.5 Northern Pike:

As with largemouth bass, indices of abundance for northern pike must be viewed in light of the fact that this species is also under represented in the catch relative to its abundance in the lake. Northern pike are "ambush feeders" that wait for their prey to come to them. Because trapnets rely on fish to actively swim into them, more sedentary species such as pike are not as vulnerable to the gear. Due to low catch rate for this species, it is more difficult to ascertain what constitutes a high or low abundance.

Our northern pike *CPUE-no* was 1.1 fish / net set (standard error 0.32) (Appendix A). This is almost identical to the 1.2 average for 22 synoptic trapnet surveys conducted in the Parry Sound Area since 1986 that contain this species. We also re-analyzed the northern pike catch data from the 1968 survey (Hogg, 1968) and calculated a *CPUE-no* of 1.7 pike / net set (standard error 0.35). Pike abundance appears to have diminished somewhat from that observed in 1968.

Figure 9. Size class distribution of northern pike in Gibson Lake from a synoptic trapnet survey conducted during the summer of 2001.



We sampled all 16 northern pike captured in this survey and calculated a mean total length of 52.5 cm. (20.7 inches) and a mean weight of 1028 grams (2.3 pounds) (Figure 9 and Appendix E). As with largemouth bass, juvenile pike usually inhabit shallow, near-shore areas and are not vulnerable to 8' trapnets.

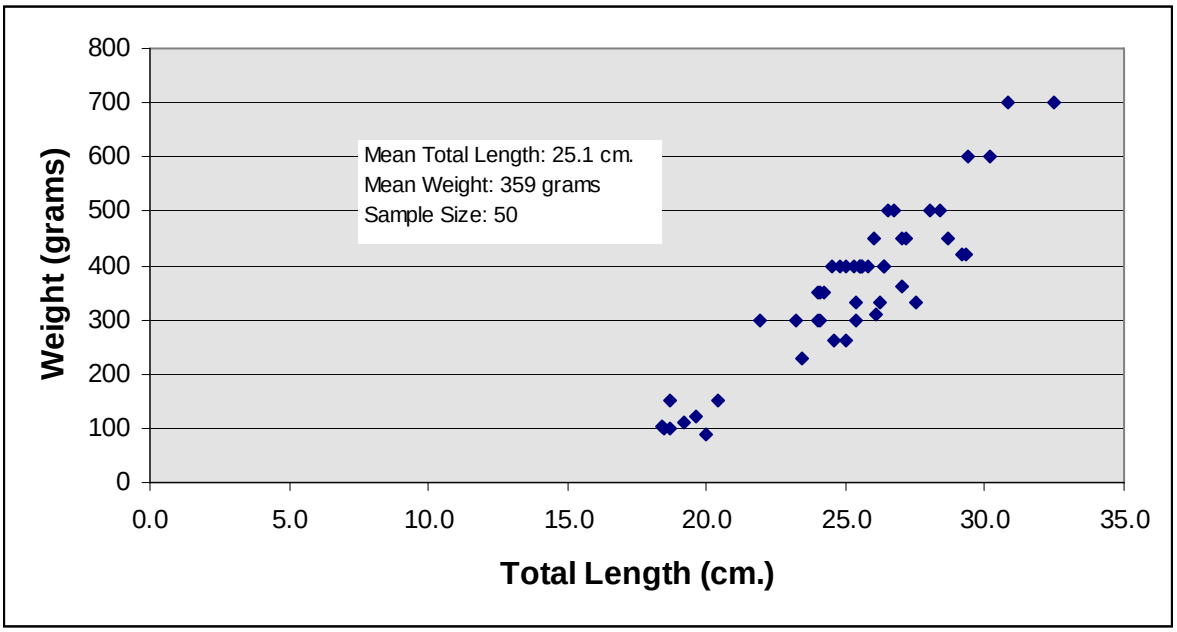
We make the general comment that pike abundance on Gibson Lake is 'average' for similarly surveyed lakes in the Parry Sound Area containing this species. Pike abundance appears to have diminished somewhat on Gibson Lake since 1968, but the population is currently healthy and sustainable.

3.6 Black Crappie:

By virtue of the large population of crappie present, this introduced species has probably been in Gibson Lake for many years. The Ministry is unsure of when the unauthorized introduction of this species occurred.

Our black crappie *CPUE-no* was 9.1 fish / net set (standard error 2.09) (Appendix A). Black crappie is not abundant in the Parry Sound Area lakes and we only have three other lakes in our synoptic trapnet survey database that has caught this species. Average black crappie *CPUE-no* for these three lakes is 2.5 crappie / net set. Notwithstanding the paucity of comparative data, we are confident that the abundance of black crappie in Gibson Lake is among the highest in the Parry Sound Area.

Figure 10. Size distribution of black crappie in Gibson Lake from a synoptic trapnet survey conducted during the summer of 2001.



We randomly sampled 50 of the 136 black captured in this survey and calculated a mean total length of 25.1 cm. (9.8 inches) and mean weight of 359 grams (0.8 pounds) (Appendix F).

The size class distribution (Figure 10) of crappie sampled shows a wide dispersion of size classes indicating good reproductive and recruitment levels and moderate mortality in the adult population. We conclude that the crappie population is quite healthy in Gibson Lake. There is undoubtedly competition and predation between this species and walleye. It is for this reason that the Ministry does not authorize the planting of black crappie in waters containing walleye or connecting waters containing walleye.

3.7 Other Species:

For non-game species (common white sucker, redhorse sucker, brown bullhead, bowfin, rock bass and pumpkinseed) we computed mean weights (Appendix A). This statistic was then used to compute total catch weight for these species (Appendix A).

3.7.1 Redhorse Sucker

Most noteworthy among non-game species was the redhorse sucker. Our *CPUE-no* for this species was 5.3 fish / net set (standard error 1.02) (Appendix A). This is a remarkably high index of abundance for this species. We only have three other surveys in our synoptic trapnetting database that has captured redhorse sucker, all of which have a *CPUE-no* of 0.6 or less. The mean weight of redhorse suckers that we caught was quite large – 2108 grams (4.6 pounds) (Appendix A). Their large size in combination with relatively high abundance resulted in redhorse sucker constituting a whopping 33.7% of the total biomass of fish caught. The next highest species was walleye at 12.9%.

We were unable to re-analyze the 1968 survey data to compute a *CPUE-no* for this species because the catch of coarse fish was not separated according to net size in this survey report. However, if we combine the 6' and 8' trapnet data from this survey the redhorse *CPUE-no* is still high at 4.7 fish / net set (Hogg, 1968). Our *CPUE-no* of 5.3 is probably not a significant change from that observed in 1968. Undoubtedly, redhorse sucker abundance in Gibson Lake was very high in 1968 and remains so today.

Redhorse suckers feed on invertebrates that they suck up from the bottom (Scott & Crossman, 1973). As sub adults they are probably preyed upon by a variety of pisciverous feeding species. They probably do not have any detrimental impact on game species in the fish community.

3.7.2 Common White Sucker:

The abundance of common white sucker in Gibson Lake is (*CPUE-no* – 2.3) equivalent to the average observed in 22 similar synoptic trapnet surveys *(CPUE-no* – 2.7) conducted in the Parry Sound Area since 1986.

Again, we couldn't determine a *CPUE-no* for this species for 8' trapnets from the 1968 survey because the data was combined for 6 and 8' trapnets. However, the common white sucker CPUE-no for both size nets combined was 6.3 / net set (Hogg, 1968), considerably higher than that observed in our survey. It appears that common white sucker abundance is much reduced from the 1968 survey.

3.7.3 Rock Bass and Pumpkinseed:

Due to the shallow water, near-shore nature of rock bass and pumpkinseed, these species are not caught in 8' trapnets in proportion to their abundance in the lake. As with largemouth bass and northern pike, their low catch rate in this gear makes interpretation of their abundance very difficult.

We observed a meagre *CPUE-no* of 0.7 for rock bass and 0.1 for pumpkinseed (Appendix A). These are well below the average of 3.0 and 2.0 respectively from 22 synoptic trapnet surveys conducted in the Parry Sound Area since 1986.

In the 1968 trapnet survey, catch data for these species was combined for both 6 and 8' trapnets used in the survey. Their *CPUE-no* was 4.7 for rock bass and 2.3 for pumpkinseed (Hogg, 1968). Even acknowledging that we would expect their catch rate for these species to be higher due to the use of 6' trapnet gear, the difference is so great that there is clear implication that rock bass and pumpkinseed abundance has diminished considerably between surveys. Probably the introduction of black crappie has had a considerable impact on these species.

3.7.4 Bowfin (a.k.a. Dogfish)

We caught 10 bowfin for a *CPUE-no* of 0.7 per net set (standard error 0.25) (Appendix A). Cumulatively, they only comprised 2.74% of the total catch weight of 494.516 kilograms; so they are not a major species in the fish community. What we find interesting though is that this is the first record of the species being in the lake. Unlike black crappie, it is very unlikely that this species found its way into the lake by means of an unauthorized introduction by the public. We are at a loss to explain this development, but speculate that this is a native species that has simply escaped detection by Ministry surveys in the past, - probably due to low abundance. Our data suggests that the abundance of this fish may be increasing however.

The bowfin is considered a voracious, pisciverous predator that competes with and preys upon more valued sport fish species (Scott and Crossman, 1973).

3.7.5 Channel Catfish and Burbot (a.k.a. Ling):

We are somewhat surprised that no channel catfish or ling were caught in this survey, considering that 8 channel catfish and 3 ling were reported captured in the 1968 trapnet survey. These species are quite rare in inland lakes in the Parry Sound Area. In our synoptic trapnet survey data base no ling have ever been caught and channel catfish have only been captured on Six-Mile Lake that flows into Gibson Lake (McIntyre, 1999) and the Pickerel River (Thurston, 1988).

3.8 Results Summary and Fisheries Status Report Card

We present a "hypothetical" report card for Gibson Lake. We caution the reader that the 'grading' is somewhat arbitrary in that we have no specified criteria as to what constitutes an "A" or "D". We do use 'reference values' as indicating "average" conditions where this statistic is available.

We accord the Gibson Lake fishery an over-all grade of C+. Walleye, northern pike and largemouth bass abundance is "average" relative to other lakes similarly surveyed in the Parry Sound Area. Smallmouth bass abundance is "above average" and much improved from 1968 levels. Black crappie is highly abundant. Negative implications of survey results are: 1) the large portion of fish productivity accorded to coarse fish species and 2) the reduction in walleye abundance and productivity from that observed in 1968.

Gibson Lake Fisheries Report Card

Index / Parameter	1968 Survey	2001 Survey	Reference Value (Average)	Grade	Comments / Interpretation
Productivity Overall CPUE-wt	N/A	32.968 kg. / net set	17.741 kg. / net set	B	Excellent productivity
Game fish - % of catch biomass	N/A	43.1 %	62.3 %	D	A high proportion of the total catch biomass is allocated to coarse fish species Below average % of walleye in the catch biomass
Coarse fish - % of catch biomass	N/A	56.6 %	34.5 %		
Walleye - % of catch biomass	N/A	12.9%	24.8 %		
Walleye CPUE-no (no. caught / net set)	10.3	3.1	4.0	C-	Average walleye abundance; but down considerably from 1968 survey
Smallmouth Bass CPUE-no	0.0	6.7	5.0	B+	Above average abundance; great improvement from 1968 survey
Northern Pike CPUE-no	1.7	1.1	1.2	C	Average abundance; down slightly from 1968 survey
Largemouth Bass CPUE-no	1.1	0.9	1.1	C	Average abundance; much the same as 1968 survey
Black Crappie	Not present	9.1	2.5	A+ or F (?)	Abundance high; successful introduction of a new sport fish species; however detrimental impact on walleye
Redhorse Sucker CPUE-no	4.7 *	5.3	0.6	C-	High abundance; impact on game fish probably low
Walleye size distribution (Mean total length)	N/A	48.4 cm.	-	C-	Recent reproduction and recruitment levels poor; adult mortality okay
Walleye Age distribution (Mean Age)	N/A	6.6 yrs.	-		
Smallmouth Bass size distribution (Mean tot. lg.)	N/A	33.0 cm.	-	B	Good reproduction and recruitment; moderate adult mortality

Overall Grade: C+

Walleye, northern pike and largemouth bass abundance is 'average'. Smallmouth bass – above average and black crappie are highly abundant. Negative aspects: a large portion of productivity is tied up in coarse fish; walleye abundance is much reduced from 1968 levels.

N/A – denotes "Not Available; * - 6' and 8' trapnet data combined

4.0 Acknowledgements:

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Appendix A

Catch Summary for Gibson Lake Synoptic Trapnet Survey – Summer 2001

Net Set No.	Effort Net Nights	Net Depth (m.)	Catch											
			Walleye	S.Mouth Bass	L.Mouth Bass	N.Pike	Black Crappie	C.White Sucker	R.Horse Sucker	Brown Bullhead	Bow-fin	Rock Bass	Pump-kinseed	
1	1	5.6	8	1	0	1	7	5	4	5	0	0	0	
2	1	4.7	5	7	2	1	24	2	5	8	0	1	2	
3	1	5.0	0	2	0	1	5	0	1	0	0	0	0	
4	1	2.8	0	0	2	1	12	4	13	0	1	0	0	
5	1	4.6	3	11	0	1	6	4	2	7	0	3	0	
6	1	3.7	0	0	0	0	1	0	0	0	0	1	0	
7	1	3.9	8	8	0	0	6	5	10	3	0	0	0	
8	1	4.3	5	16	0	0	1	3	1	8	0	0	0	
9	1	4.3	0	1	0	1	4	1	3	0	0	0	0	
10	1	3.8	0	11	1	1	23	2	10	8	2	1	0	
11	1	5.0	7	24	5	5	16	2	5	126	3	0	0	
12	1	4.4	3	5	0	1	0	2	2	1	0	0	0	
13	1	3.8	1	0	0	0	1	0	9	1	1	1	0	
14	1	4.3	3	13	1	2	19	4	6	17	1	3	0	
15	1	4.9	4	1	2	1	11	1	8	6	2	0	0	Grand Totals
Total Catch by species			47	100	13	16	136	35	79	190	10	10	2	638
CPUE (no.)			3.1	6.7	0.9	1.1	9.1	2.3	5.3	12.7	0.7	0.7	0.1	
Standard Error of CPUE			0.768	1.853	0.363	0.316	2.092	0.454	1.021	8.186	0.252	0.270	0.133	
Media n			3	5	0	1	6	2	5	5	0	0	0	
Standard Deviation			2.973	7.178	1.407	1.223	8.102	1.759	3.955	31.703	0.976	1.047	0.516	
Sample Variance			8.838	51.524	1.981	1.495	65.638	3.095	15.638	1005.10	0.952	1.095	0.267	
Confidence Level(95.0%)			1.646	3.975	0.779	0.677	4.487	0.974	2.190	17.557	0.540	0.580	0.286	
Count			15	15	15	15	15	15	15	15	15	15	15	
Total Weight (kg.)			63.975	73.000	11.075	16.450	48.824	40.250	166.532	59.280	13.55	1.340	0.24	494.516
Catch Wt. % of total			12.94	14.76	2.24	3.33	9.87	8.14	33.68	11.99	2.74	0.27	0.00	99.96
CUE (wt) (kg./net set)			4.265	4.866	0.738	1.097	3.255	2.683	11.102	3.952	0.903	0.089	0.016	32.966
Mean Weight (grams)			1361	730	852	1028	359	1150	2108	312	1355	134	120	
Sample Size			47	50	13	16	50	33	68	59	9	10	2	

Appendix B

Gibson Lake Walleye Biosampling Data

Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yr.)	Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yr.)
1	44.5	41.7	900	5	8	42.4	39.4	750	4
1	53.5	50.7	1800	8	8	48.0	45.1	1200	6
1	42.9	40.2	900	5	8	43.4	41.0	900	5
1	46.5	43.6	1000	6	8	24.5	23.2	135	2
1	47.0	44.2	1100	6	8	68.0	64.7	3800	11
1	43.5	40.3	800	5	11	50.2	47.3	1500	8
1	37.2	35.2	550	3	11	50.0	46.7	1400	7
1	45.2	42.5	900	5	11	48.8	45.5	1200	6
2	47.5	44.8	1100	6	11	43.3	40.5	900	5
2	55.5	53.0	1900	9	11	56.8	53.3	2000	10
2	51.6	48.7	1400	7	11	40.0	37.8	700	4
2	46.8	43.7	1150	6	11	58.0	55.0	2000	10
2	51.7	48.2	1400	7	12	49.1	46.6	1350	7
2	53.8	50.6	1950	9	12	50.0	47.5	1500	8
2	54.3	51.3	1650	8	12	49.0	46.2	1350	7
2	52.5	50.0	1600	8	13	50.1	46.7	1400	7
7	43.6	41.4	1100	6	14	39.2	36.9	650	4
7	46.1	43.8	1100	6	14	52.4	49.6	1600	8
7	48.3	46.0	1200	6	14	46.0	43.1	1100	6
7	42.0	39.1	800	5	15	28.2	26.8	190	1
7	65.8	63.4	3100	11	15	43.5	40.8	700	4
7	62.6	59.4	3000	11	15	46.6	44.2	1300	7
7	57.4	55.3	2200	9	15	45.8	43.4	1150	6
7	60.1	56.7	2600	10					

Mean	48.4	45.6	1361.2	6.6
Standard Error	1.182	1.141	104.048	0.331
Median	48	45.1	1200	6
Standard Deviation	8.103	7.822	713.320	2.271
Sample Variance	65.663	61.188	508825	5.159
Confidence Level(95.0%)	2.379	2.297	209.438	0.667
Sum			63975	
Count	47	47	47	47

Appendix C
Gibson Lake Smallmouth Bass Biosampling Data

Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
1	35.2	33.0	700	8	27.5	26.0	450
2	32.7	30.9	600	8	22.5	21.2	250
2	18.2	17.0	80	8	25.4	24.0	350
2	26.0	27.4	350	8	33.4	31.4	700
2	21.9	20.9	140	8	33.9	32.0	600
2	43.5	41.1	1250	8	37.5	34.9	900
2	23.4	22.1	300	8	33.8	32.2	700
3	44.0	41.6	1400	8	39.8	37.5	1000
3	42.0	39.5	1200	8	25.5	24.0	240
5	28.6	26.9	350	8	30.0	28.1	500
5	25.7	24.4	250	8	25.0	23.5	300
5	29.5	27.7	500	8	34.2	32.4	700
5	34.3	32.4	700	8	36.1	34.1	750
5	30.5	29.0	550	8	27.2	25.5	400
5	47.6	45.2	1900	8	25.2	23.8	350
5	32.2	30.3	550	8	50.3	47.3	2700
5	24.3	22.8	300	9	38.8	36.5	1000
5	51.2	49.0	2000	10	31.8	30.0	550
5	38.7	36.4	1100	10	34.0	31.9	650
5	24.0	22.6	210	10	44.0	41.8	1250
7	30.0	28.2	500	10	22.2	21.1	170
7	18.8	18.0	100	10	31.0	29.3	500
7	36.9	34.8	850				
7	43.3	40.8	1200				
7	45.6	42.8	1800				
7	42.0	39.8	1200				
7	36.2	34.1	800				
7	33.2	31.0	600				

Mean	33.0	31.2	730
Standard Error	1.158	1.091	75.953
Median	32.95	30.95	600
Standard Deviation	8.191	7.714	537.069
Sample Variance	67.097	59.512	288442
Confidence Level(95.0%)	2.328	2.192	152.633
Sum			36490
Count	50	50	50

Appendix D

Gibson Lake Largemouth Bass Biosampling Data

	Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
	2	38.7	37.3	1000
	2	35.3	34.0	900
	4	35.6	34.3	850
	4	46.1	44.0	1750
	10	36.0	34.5	900
	11	36.0	33.6	800
	11	32.1	31.1	600
	11	30.6	29.4	600
	11	31.0	29.5	600
	11	37.0	35.5	900
	14	31.5	30.0	575
	15	36.0	34.5	950
	15	31.2	30.2	650
Mean		35.2	33.7	852
Standard Error		1.173	1.112	86.067
Median		35.6	34	850
Standard Deviation		4.228	4.009	310.319
Sample Variance		17.873	16.071	96298.077
Confidence Level(95.0%)		2.555	2.423	187.524
Sum				11075
Count		13	13	13

Appendix E

Gibson Lake Northern Pike Biosampling Data

	Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
	1	47.6	44.9	700
	2	49.5	46.4	800
	3	63.5	60.0	1600
	4	42.4	39.9	600
	5	64.5	61.5	1900
	9	45.0	42.3	600
	10	43.5	41.0	600
	11	52.0	49.5	900
	11	70.5	66.2	2100
	11	48.7	45.7	700
	11	46.5	43.4	700
	11	52.0	49.3	1300
	12	68.3	64.3	1800
	14	53.0	50.0	800
	14	44.6	41.6	600
	15	48.7	45.7	750
Mean		52.5	49.5	1028
Standard Error		2.272	2.168	131.654
Median		49.1	46.05	775
Standard Deviation		9.088	8.672	526.615
Sample Variance		82.596	75.199	277322.917
Confidence Level(95.0%)		4.843	4.621	280.613
Sum				16450
Count		16	16	16

Appendix F

Gibson Lake Black Crappie Biosampling Data

Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
32.5	31.2	700	25.6	23.0	400
28.0	27.1	500	24.5	23.4	400
25.5	24.5	400	29.4	28.1	600
24.0	23.0	300	25.6	24.4	400
26.5	25.5	500	26.0	24.6	450
30.2	29.1	600	24.2	23.4	350
23.2	22.4	300	29.3	27.9	420
27.2	26.1	450	29.2	28.4	420
28.4	27.3	500	26.2	25.2	330
19.6	18.6	120	25.4	24.5	330
24.0	22.7	350	27.5	26.3	330
25.3	24.0	400	24.6	23.6	260
20.4	19.6	150	25.4	24.2	300
18.7	17.7	150	25.0	24.0	260
21.9	21.0	300	27.0	25.9	360
26.7	25.9	500	26.1	25.1	310
27.0	25.8	450	23.4	22.5	230
25.5	24.5	400	30.8	29.6	700
18.5	17.7	100	25.5	24.5	400
19.2	18.1	110	26.4	25.0	400
24.8	24.0	400	24.1	23.0	350
26.4	25.2	400	24.1	23.0	300
25.8	24.7	400	18.7	17.8	100
28.7	27.7	450	20.0	19.1	90
25.0	24.0	400	18.4	17.5	105

Mean	25.1	24.0	359
Standard Error	0.467	0.457	20.457
Median	25.5	24.45	400
Standard Deviation	3.303	3.233	144.654
Sample Variance	10.912	10.451	20924.745
Confidence Level(95.0%)	0.939	0.919	41.110
Sum			17925
Count	50	50	50