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Ministry of Natural Resources

Wahwashkesh Lake
Synoptic Trapnet Survey Report
Summer, 2002

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Summary:

During the summer of 2002, a synoptic trapnet survey (STNS) was conducted on Wahwashkesh Lake to assess the status of the near-shore fish community and in particular the walleye and smallmouth bass populations therein.

We compared results with other lakes similarly and recently (since 1994) surveyed in the Parry Sound Area. 'Over-all fish productivity' as measured by *Catch-Per-Unit-Effort (by weight)* (*CUE-wt*) for all species combined was below the Area average. Indices of abundance and population status for walleye, smallmouth bass and northern pike populations indicate these populations are "approximately average" for the Parry Sound Area.

Perhaps more revealing were comparisons made with the last trapnet survey conducted on Wahwashkesh Lake in 1987. Indices indicate walleye abundance has decreased significantly, smallmouth bass have decreased somewhat and northern pike have increased significantly between surveys.

This survey confirmed the recent introduction of black crappie in Wahwashkesh Lake. Although crappie is a much sought after game fish, we consider its introduction a negative development. We anticipate the population will expand considerably throughout the lake in future years negatively impacting a number of near-shore fish populations including walleye.

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1.0 Introduction

Wahwashkesh Lake - also known as "Big Deer Lake", is the largest lake in the Parry sound Area at 1,720 hectares (4,250 acres) (OMNR, 1973). The lake is comprised of two distinct basins. The north basin is known as "the Top Lake" and the south basin as "the Big Lake". A narrow central portion of the lake locally known as "the Middle Lake" connects these basins. The lake is part of the Magnetawan River watershed that has its origin just inside the western boundary of Algonquin Park. The lake is located almost entirely in the Geographic Township of McKenzie, now part of the Municipality of Whitestone.

The lake is readily accessible by road with two public and two commercial access points. It is moderately developed with over 250 cottages. Due to the presence of a narrow gorge at the Magnetawan River outlet in the northwest corner, the lake is subject to extreme annual water level fluctuation of up to 15 feet. This gorge (known as Canal Rapids) acts as a 'bottle-neck' in the springtime. In the summer, a decrepit and ineffective old logging dam just up-stream of Canal rapids, allows the lake to seek its natural low water level. A replacement, cement wier was constructed in 2002 that will now maintain minimum water levels during low water periods.

The lake has a highly varied fish community consisting of lake trout, lake whitefish, lake herring (cisco), walleye, smallmouth and largemouth bass, northern pike, yellow perch, pumpkinseed, smelt, rock bass, burbot, common white sucker, brown bullhead and various cyprinid species (minnows) (OMNR, 1973 and McIntyre, 1998). This survey constitutes the first confirmed observation of black crappie, evidently recently introduced in the lake. We anticipate a considerable population expansion for this species throughout the lake in the immediate future.

With moderate nutrient levels (spring phosphorus 9 µg/l (MOE, 1981) and chlorophyll a 2.5 – 5 µg/l; MOE, 1975) and low light transparency (secchi 3.5 m; MNR, 2000), the lake has an abundance of ideal habitat for warm and cool water fish species, particularly walleye. Various creel surveys conducted on the lake in recent decades (McIntyre, 2000; McIntyre, 1997; OMNR, 1993; Black, 1987; MacMillan, 1987 and Thurston, 1981) indicate that walleye is the premier 'species of interest' to anglers on Wahwashkesh Lake.

Status of the lake trout population has been recently investigated (McIntyre, 2000a; McIntyre 2000b; McIntyre, 2000c; McIntyre, 1998), but assessment of the near-shore fish community was last conducted in 1987 (Boudreau and Thurston; 1988). At that time, status of the walleye and smallmouth bass populations were found to be in very good condition.

The purpose of this survey was to assess the current status of the near-shore fish community – particularly walleye and smallmouth bass, relative to other lakes similarly surveyed in the Parry Sound Area, as well as comparing its current status to that observed in 1987.

In response to reports of dwindling lake trout stocks, the lake was closed to winter angling in 1982. Although this regulation was intended to protect the remnant lake trout stock, by virtue of its non-discriminate nature it also afforded additional protection to other fish species that are typically caught by ice fishermen (walleye, pike, perch, whitefish, burbot). Walleye fishing regulations are currently undergoing an intensive review by the Southcentral Region of the Ministry of Natural Resources with the future possibility of having a winter fishery for walleye

on Wahwashkesh Lake. It is intended that the results of this survey will assist in evaluating whether or not the walleye population can withstand additional fishing pressure.

2.0 Methods:

Synoptic surveys are intended to provide a 'snapshot in time' of the status of the near-shore 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.

Comment re "Species Selectivity":

We intend that our nets will act like "random predators", being set throughout the lake in all types of habitat such that the catch gives an over-all, generalized representation of the fish community. In actuality – this seldom if ever happens. Relative to smaller size trapnets, 8' nets fish in deeper water and result in a higher catch of walleye and smallmouth bass. Conversely, they grossly under-represent species such as rock bass, pumpkinseed and yellow perch that occupy shallow-water. Furthermore, species such as largemouth bass, black crappie and brown bullhead are usually very abundant in localized habitats and "random searching" for them reflects this – a series of 'nil' catches followed by the occasional set in the right habitat that catches a large number. Esocid species such as northern pike are under-represented in the catch relative to their true abundance also. Trapnets work well for species that actively search for prey such as walleye and smallmouth bass and therefore are more likely to 'contact' the net. Pike are "ambush feeders" waiting for prey to come to them and therefor less likely to 'contact' the net.

Not only is there "species selectivity" with respect to which fish are vulnerable to 8' trapnets, but there is also size selectivity within species. Walleye, smallmouth bass and northern pike young-of-the-year, yearling and two-year olds are seldom caught in the net, yet we know they are the most abundant age classes in the population.

Notwithstanding the fact that these biases exist, we account for them by trying to remain consistent in how we assess individual populations and fish communities. We use the same nets on comparison lakes such that the netting biases are consistently applied to all lakes. In actuality, we are not truly comparing the **fish communities** of lakes, but rather the **catch results** – acknowledging that those results are not representative of the abundance of individual species within them. Consequently, our survey design is intended to give a measure of species abundance in the catch – "relative" to what has been observed on a number of similarly surveyed lakes.

Normally we conduct Synoptic Trapnet Surveys (STNS) by approximately trying to get an even dispersion of trapnets throughout the lake. In so doing, we attempt to sample the various habitats in proportion to their presence on the lake. In this survey however, we wanted to compare results from this survey to one that was conducted on Wahwashkesh Lake in 1987.

In 1987, 8' trapnets were set at 23 different sites. We duplicated the netting location for 19 of these sites. For the other 4 sites, we deemed the indicated netting location to be unsuitable (due

to depth) for 8' trapnets and relocated these sets as close as possible to the indicated location. We also inadvertently duplicated one 6' netting site from the 1987 survey (our set #1), but the location was suitable for an 8' net so we included it in our data analysis. We also added an additional 9 netting sites to our survey – 2 located in the "Middle Lake" and 7 in "the Big Lake". These sets were added to give a more even distribution of net sets throughout the lake. In 1987, 16 of the 23 sites (70%) were in "The Top Lake". We now have a distribution of 17 (51%) in "the Top Lake", 5 (15%) in "the Middle Lake" and 11 (33%) in "the Big Lake".

The selection of additional netting sites was at the discretion of the field crew with 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.

Net set locations are indicated in Figure 1.

Field operations were conducted from July 15th to August 1st, 2002. The 1987 survey was conducted from July 28th to August 19th, 1987.

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 consisting of total length, fork length and round weight determination was conducted for all game fish (Appendix B – E). Scale samples were also collected for age determination of walleye (Appendix B). For non-game fish, round weights were recorded (Appendix G) 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 Wahwashkesh 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 40 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 compare results from this survey, only with those surveys conducted since 1994. There are two reasons for this:

1) We are comparing results taken more closely in time to one another and therefore more likely to reflect the 'current status' of these fish communities, and
2) The field methodology has been more consistently applied since 1994 when the current "synoptic trapnet survey" (STNS) design was commenced.

We do however make direct comparison of select data between this survey and the one conducted on Wahwashkesh Lake in 1987.

We use two indices to indicate the abundance 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)*. This is the number of a particular species caught per overnight, 8' trapnet set.
2) The *Catch-Per-Unit Effort by weight (CPUE-wt).* This is the weight (kilograms) of a particular species caught per overnight, 8' trapnet set.

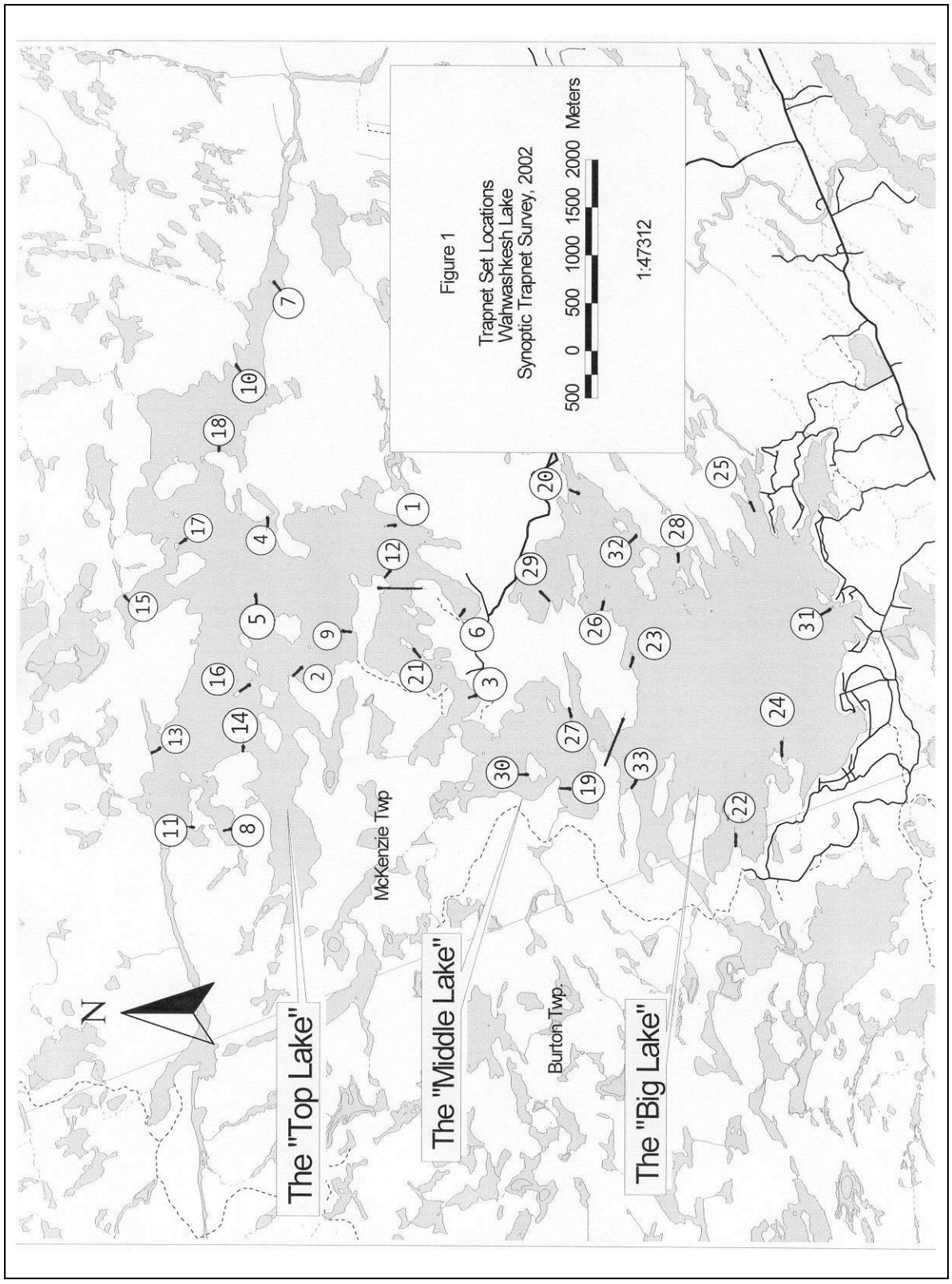
We use both statistics in conjunction with one another because independently they can be misleading. (For instance: A high *CPUE-wt* could be the result of a small number of very large fish being caught or a large number of very small fish being caught. This is clarified when we also consider the *CUE-no.)*

We call these "*indices of relative abundance*". 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.

We initially analyzed our catch data according to area: Area #1 – the "Top Lake", Area #2 – the "Middle Lake" and Area #3 – the "Big Lake" (Appendix A-2). Due to the inherent high variability in the catch, there was no significant difference ($P > .05$) in the catch for any of the species caught between the three areas. Consequently, it was statistically valid to pool the catch results from all three areas and to consider the catch data as being homogeneous throughout the lake.


Figure 1
Trapnet Set Locations
Wahwashkesh Lake
Synoptic Trapnet Survey, 2002
500 0 500 1000 1500 2000 Meters
1:47312
N
The "Top Lake"
The "Middle Lake"
The "Big Lake"
McKenzie Twp
Burton Twp.

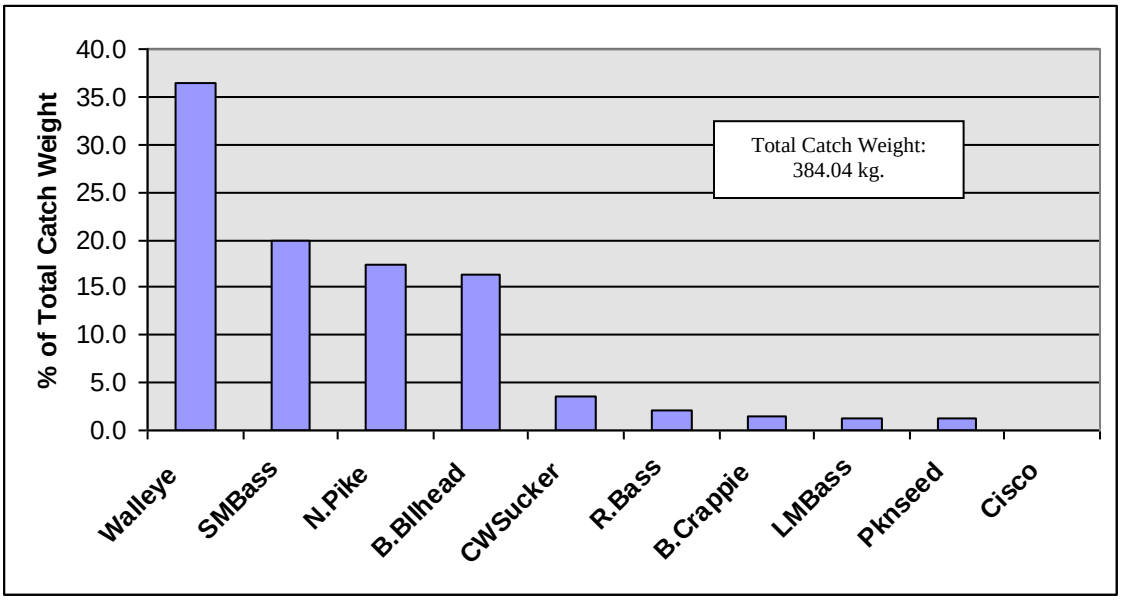
3.0 Results:

3.1 Catch Composition and Productivity

The catch from 33 trapnet sets consisted of: 153 brown bullhead, 131 smallmouth bass, 101 walleye, 80 rock bass, 44 northern pike, 21 pumpkinseed, 16 black crappie, 11 common white sucker, 6 largemouth bass and 4 cisco (Appendix A).

Total catch weight of the ten different species listed above was 384.04 kilograms. Walleye, smallmouth bass, northern pike and brown bullhead comprised 36.4, 20.0, 17.5 and 16.33% of the total catch weight respectively (Figure 2).

Figure 2. Catch composition by weight for the Wahwashkesh Lake synoptic trapnet survey conducted during the summer of 2002.



Note: See Appendix A for catch weight data for individual species.

We compared the overall *Catch-Per-Unit-Effort by weight (CUE-wt)* (i.e. the 'average' weight of all fish caught per net set) for Wahwashkesh Lake with 18 other Parry Sound Area lakes similarly surveyed since 1994 (Appendix J). Overall *CUE-wt* for Wahwashkesh Lake was 11.637 kg of fish caught per net set. This ranks 13th out of the 19 in our comparison lakes database and well below the mean of 16.585 kg. / net set for all surveys combined (Appendix J). We consider this to indicate the productivity of Wahwashkesh Lake (as measured by *CUE-wt* for all species combined) is "below average" relative to other Parry Sound Area lakes similarly surveyed.

Game fish (walleye, black crappie, small and largemouth bass and northern pike) comprised 76.5% of the total catch weight of 384.04 kilograms (Figure 1 and Appendix J). This *"% of*

game fish" is above the average of 63.5% for our comparison lakes data set and is indicative of a balanced near-shore fish community dominated by game-fish species.

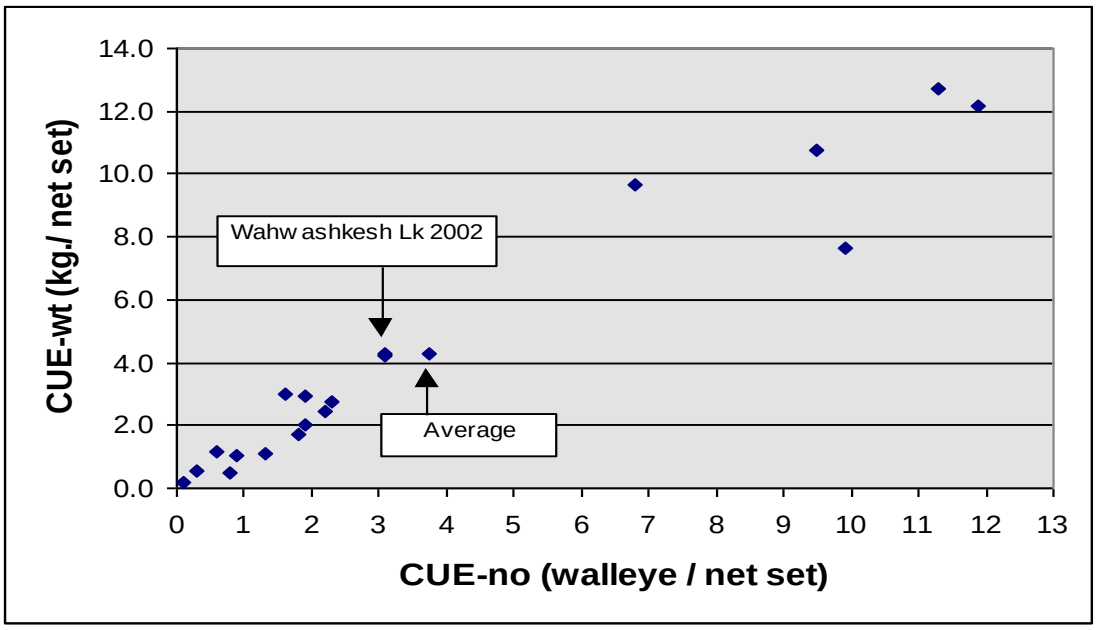
We caution readers that the proportion of game and non-game fish in the catch is not directly representative of their abundance in the fish community. Due to gear selectivity, the weight of game fish in the catch is very much over-representative of their biomass in the fish community. See "Methods" also for discussion of this topic.

3.2 Walleye:

A total of 101 walleye were captured in 33 over-night trapnet sets for *a Catch-Per-Unit-Effort by number (CUE-no)* of 3.1 walleye per net set (Standard Error 0.6) (Appendix A). We also analyzed catch data by area (i.e. Area 1 – 'Top Lake'; Area 2 – 'Middle Lake' and Area 3 – 'Big Lake') and determined the walleye *CUE-no.* to be 2.9, 4.8 and 2.3 walleye per net set respectively (Appendix A.1). These means are not significantly different ($p<0.05$) and we consider the distribution of walleye to be largely homogenous throughout the lake.

For the entire lake, the walleye *CUE-no* of 3.1 is slightly lower than the average of 3.8 for our comparison lakes data set (Appendix H). We also calculated a mean walleye *CUE by weight* and determined this to be 4.236 kg of walleye caught per net set – very close to the comparison lakes data set average of 4.252 (Appendix I). We interpret this to indicate that walleye abundance on Wahwashkesh Lake is "approximately average" relative to similarly surveyed Parry Sound Area lakes.

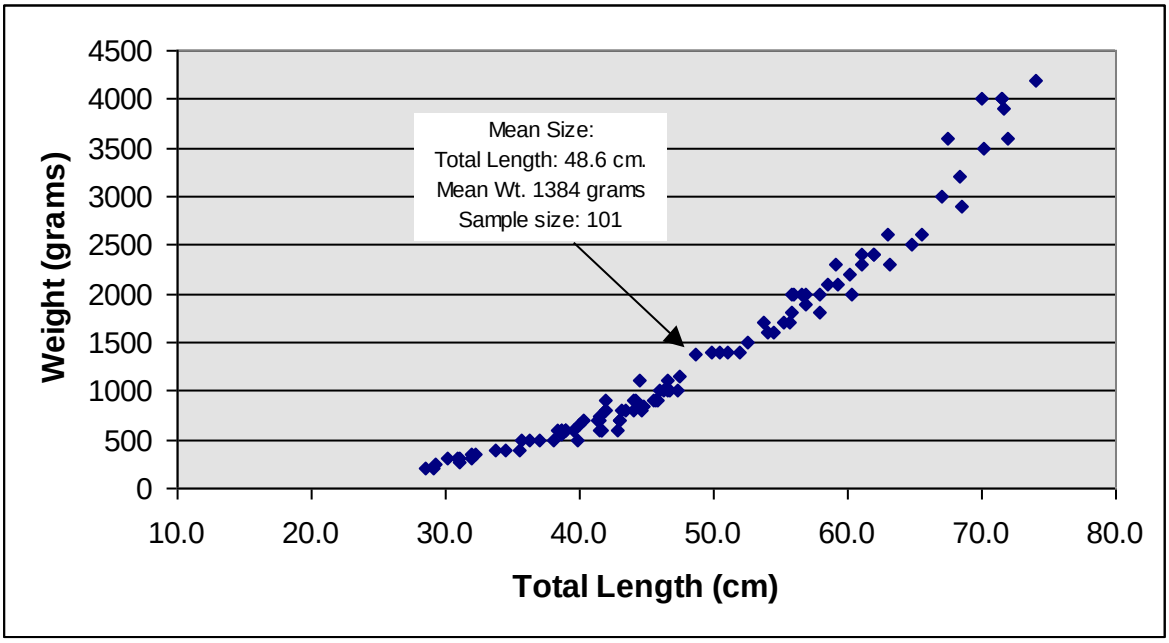
Figure 3. Walleye indices of abundance (*CUE-no* vs. *CUE-wt*) for 19 lakes recently surveyed (since 1994) in the Parry Sound Area.



We re-analyzed the catch data from the 1987 Wahwashkesh Lake trapnet survey (Boudreau and Thurston, 1988) to make it consistent with the methodology used in this survey. Only data from 8' trapnets were used – of which there were 23 sets. Some of these sets were fished repetitively (i.e. more than one night), in which case only data from the initial net set (i.e. the first over-night set) were used. We calculated the walleye *CUE-no* to be **7.9 walleye per net set in 1987** (Appendix A-3). We then recalculated our *CUE-no* from this survey using only sets that were duplicates of those used in the above 1987 calculation. Our *CUE-no* for these 23 sets was **2.7 walleye per net set** (Appendix A-3). We found a statistically significant difference between these two means at the 95% level of confidence using the "t-test". It would appear walleye abundance has significantly decreased between the 1987 and 2002 trapnet surveys on Wahwashkesh Lake.

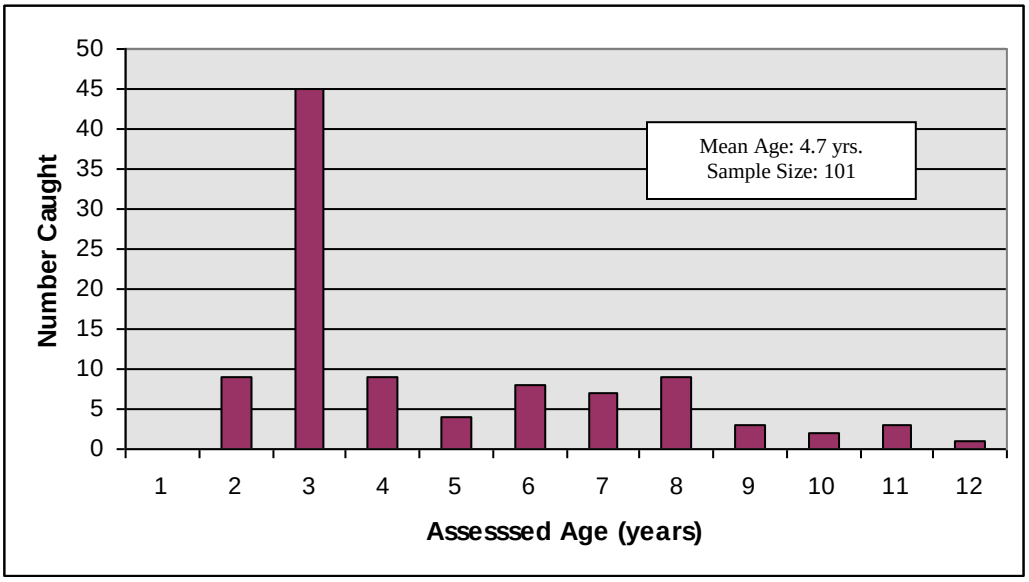
Our walleye sample had a wide distribution of size classes (Figure 4). From a sample of 101 walleye caught, mean total length was 48.6 cm. (18¼ inches) and mean weight of 1,384 grams (approximately 3 pounds) (Appendix B).

Figure 4. Size class distribution (round wt. vs. total length) of walleye sampled from Wahwashkesh Lake Synoptic Trapnet Survey, summer 2002.



The mean age of walleye we sampled was 4.7 years (Appendix B). It appears that the strength of the walleye population is largely being borne by the 1999-year class (age 3 walleye) that accounted for almost 50% of the walleye caught (Figure 5).

Figure 5. Walleye age class distribution, Wahwashkesh Lake Synoptic Trapnet Survey, 2002.



This age class distribution represents very strong recruitment of the 1999-class, and perhaps is indicative of a strong 2000-year class (age 2 walleye). Age 2 walleye are not fully vulnerable to the gear and are under-represented in the catch relative to their abundance in the population. We were rather surprised with several seeming weak year-classes prior to 1999 (age 4 and greater). To what extent these weak year-classes can be attributed to high mortality (including angling) or natural year-class strength variation is unknown. Mean age of walleye caught in our survey was 4.7 years (Appendix B). In the 1987 survey, mean age was 5.1 years (Boudreau & Thurston, 1988). Post-maturity year class strength was more uniform in the 1987 survey with 35% of the catch being represented by 4-year old walleye and a more even distribution of older age classes.

We express concern that there are a number of indicators (decreasing relative abundance index, decreasing mean age, high post-maturation mortality, increased recruitment), which when viewed cumulatively – are indicative of a stressed walleye population.

3.3 Smallmouth Bass:

Smallmouth bass *CUE-no* was 4.0 bass per net set (standard error 1.1) (Appendix A). Relative to 17 other synoptic trapnet surveys in our comparison lake data set, this is slightly below the

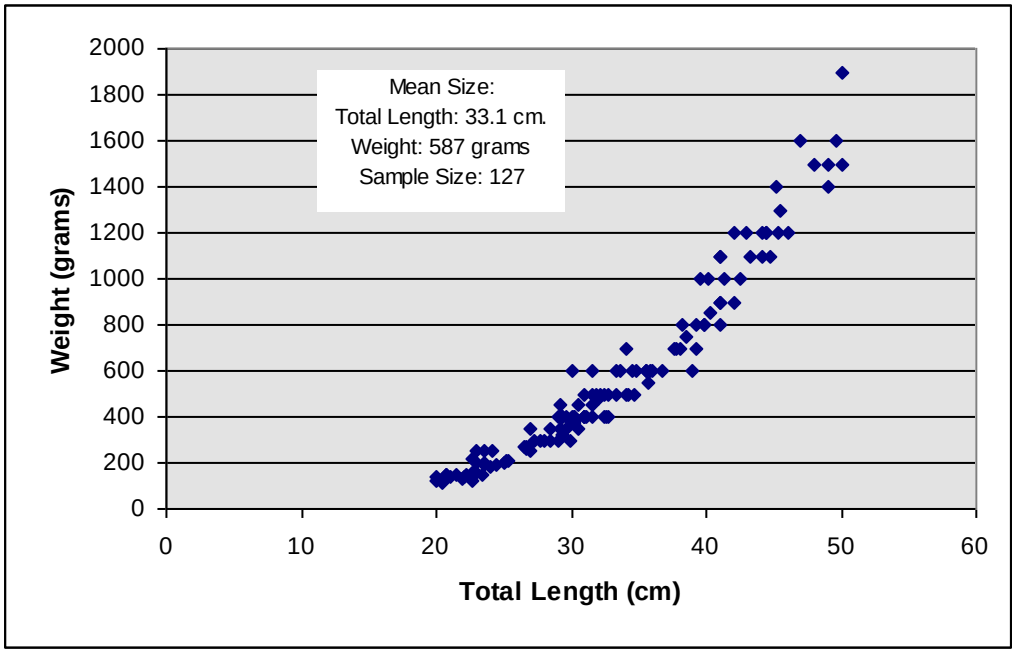
average of 5.3 bass per net set (Appendix H). (Note: Sample size has decreased to 17 because one comparison lake did not capture any smallmouth bass.) Spatially, there was no significant difference in smallmouth bass abundance throughout the lake. Smallmouth *CUE-no* was 4.9 in the Top Lake (Area 1), 3.3 in the Middle Lake (Area 2) and 2.9 in the Big Lake (Appendix A-2).

As with walleye, we re-analyzed the catch data for smallmouth bass from the 1987 survey to be comparable with this one (Appendix A.3). Smallmouth bass *CUE-no* was 5.9 in 1987, higher than the 4.0 we observed in this survey. These means are not statistically different at the 95% level of confidence. Notwithstanding the 'non-statistical difference' of these means, we take note that this measure of smallmouth bass abundance has decreased between surveys.

Smallmouth bass *CUE-wt* was 2.330 kg. of bass per net set (Appendix A), below the average of 3.111 kg per net set in our comparison lakes data set (Appendix I).

From a sample of 127 smallmouth bass, mean total length was 33.1 cm. (13") and mean weight 587 grams (1.3 pounds) (Appendix C).

Figure 6. Size distribution of smallmouth bass sampled from the Wahwashkesh Lake synoptic trapnet survey, Summer 2002.



Our sample of smallmouth bass had a good distribution with all size classes being well represented. The high abundance of small fish indicates good recruitment. Likewise, the presence of many large size bass suggests mortality is not excessive and certainly within sustainable levels.

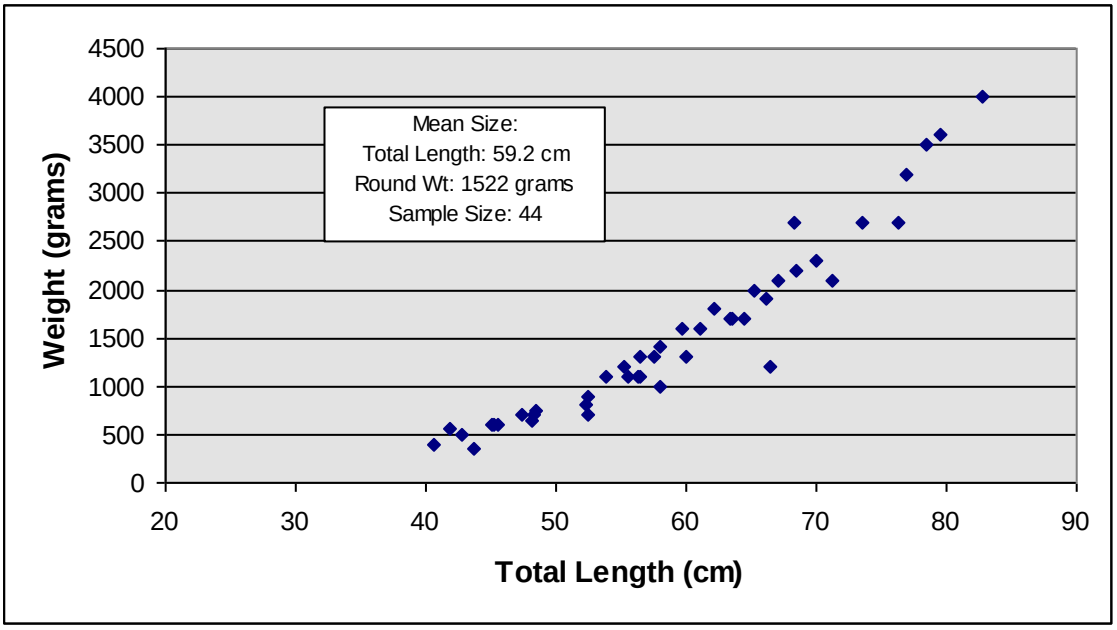
3.3 Northern Pike:

Indices of abundance for northern pike must be viewed in light of the fact that this species is under represented in the catch relative to its abundance in the lake. Due to inherent low catch rate for this species with 8' trapnet gear, it is more difficult to ascertain what constitutes a high or low abundance for this species.

In our survey, northern pike *CUE-no* was 1.3 per net set (standard error 0.5) (Appendix A). This was almost identical to the average of 1.2 for our comparison lakes data set (Appendix H). Likewise, our pike *CUE-wt* was 2.0 kg per net set, essentially the same as the average of 1.9 kg. per net set in our comparison lakes data set (Appendix I). Pike abundance in Wahwashkesh is "average" relative to recent and similarly surveyed lakes in the Parry Sound Area.

Again, we re-analyzed the northern pike catch data from the 1987 survey and determined the *CUE-no* for northern pike to be 0.4 per net set (Appendix A.3). Using only duplicate sets, our pike *CUE-no* was 1.4 (Appendix A-3). We conducted a "t test" at the 95% confidence interval and found these means to be statistically different. It appears northern pike abundance has increase significantly on Wahwashkesh Lake between the 1987 and 2002 trapnet surveys.

Figure 7. Size distribution of northern pike sampled from Wahwashkesh Lake during the summer 2002 synoptic trapnet survey.



All size classes of northern pike are well represented in our catch sample suggesting that both recruitment and mortality rates are well within sustainable levels.

The above indices suggest the pike population of Wahwashkesh Lake is 'quite healthy'.

3.4 Largemouth Bass:

By virtue of their specific habitat preferences, largemouth bass are not widely distributed throughout Wahwashkesh Lake. We only caught 6 for a *CUE-no* of 0.2 per net set (Appendix A). Re-analysis of the catch data from the 1987 survey resulted in a largemouth bass *CUE-no* of 0.2 also (Appendix A.3). There is no apparent change in largemouth bass abundance between surveys.

Biosampling data for these fish is presented in Appendix E.

3.5 Black Crappie:

We captured 16 black crappie – all in net set #25 located in the "Big Lake", close to where the Whitestone River enters Wahwashkesh Lake (Figure 1). Biosampling data for black crappie is shown in Appendix F.

This is the first confirmed siting of black crappie being present in Wahwashkesh Lake. By virtue of the localized nature of the population, we suspect their introduction is a recent development. Although a much desired game fish, black crappie are also competitors with and predators upon early life stages of walleye as well as a variety of other near-shore fish species (Kerr and Grant, 2000). It is anticipated that the abundance of black crappie will escalate throughout Wahwashkesh Lake – at the expense of other game fish including walleye.

3.6 Other Non-game species:

Our 33 over-night trapnet sets captured 153 brown bullhead, 80 rock bass, 21 pumpkinseed, 11 common white sucker and 4 cisco (Appendix A). We computed *CUE-no* for these species (Appendix A) and found them essentially the same as those observed in 1987 (Appendix A.3) with the exception of brown bullhead. Our *CUE-no* was 4.6 per net set compared to 0.2 observed in 1987. It appears that brown bullhead abundance has increased considerably in the time interval between surveys.

The above non-game fish were weighed in order that a mean weight could be determined (Appendix G). Cumulatively, these species comprised 23.5% of the total catch weight of 384.04 kilograms (Appendix A). This is very similar to the 28.7% of the catch weight they comprised in 1987 (Boudreau and Thurston, 1988).

The proportion of game fish (76.5%) and non-game fish (23.5%) in the catch weight indicates a balanced near-shore fish community dominated by desirable game fish. (*We caution readers that the proportion of game and non-game fish in the catch is not directly representative of their abundance in the fish community. Due to gear selectivity, the weight of game fish in the catch is very much over-representative of their biomass in the fish community. See "Methods" also for discussion of this topic*.)

4.0 Summary:

We present the following 'theoretical report card' (Table 1) on the status of various game fish in the near-shore community of Wahwashkesh Lake. Reference values refer to the "average value" in our comparison lakes data set (Appendix H and I).

Table 1. Comparison of fisheries assessment indicators between the 2002 synoptic trapnet survey conducted on Wahwashkesh Lake and other Parry Sound Area Lakes similarly surveyed since 1994.

Fisheries Indicator	2002 STN Survey Observation	Reference Value 'Area Average'	Grade	Comments
Over-all Productivity CUE-wt (all species)	11.637 kg. / net set	16.585 kg. / net set	C-	Somewhat 'below average'
Game fish - % of total catch weight	76.5%	63.5%	B	Above average proportion of game fish in total catch weight
Walleye - % of total catch weight	36.4%	24.6%	B	Above average proportion of walleye in total catch weight
Walleye CUE-no	3.1 walleye / net set	3.8 walleye / net set	C-	'Slightly below average' walleye abundance by number
Walleye CUE-wt	4.236 kg. / net set	4.251 kg. / net set	C	'Average' walleye abundance by weight
Walleye size distribution	Good – all size classes present	-	B	These indicators should point to the same conclusion – but they don't. Perhaps age determination is inaccurate.
Walleye age class distribution	Poor – high recruitment & mortality	-	D	
Smallmouth Bass CUE-no	4.0 bass / net set	5.3 bass / net set	C-	Slightly 'below average'
Smallmouth Bass CUE-wt	2.3 kg. / net set	3.1 kg. / net set	C-	Slightly 'below average'
Smallmouth Bass size distribution	Good – all size classes present	-	C+	Good Recruitment; moderate mortality rate
Northern Pike CUE-no	1.2	1.3	C	'average' abundance by no.
Northern Pike CUE-wt	2.0	1.9	C	'average' abundance by wt.
N. Pike Size distribution	Good – all size classes present	-	C+	Good recruitment; moderate mortality rate
Black Crappie	16 caught	-	D	Although a desirable game fish, the introduction of this species will negatively impact walleye
Relative to other similarly surveyed Area lakes, we accord Wahwashkesh Lake an over-all rating of "C+" or "slightly above average".				

The above 'report card' appraises Wahwashkesh Lake relative to a host of other lakes in the Parry Sound Area on which similar surveys have recently been conducted. We also compared

various fisheries indicators observed on Wahwashkesh in 2002 with those observed in the 1987 survey to get a sense of how the fish community has changed in the intervening years (Table 2.)

Table 2. Comparison of fisheries assessment indicators observed on Wahwashkesh Lake during the 1987 and 2002 synoptic trapnet surveys. *(Note: Data presented is only for 23 duplicate sets fished in both surveys.)*

Indicator	1987 Survey observations	2002 Survey Observations	Grade	Comment
Walleye CUE- no	7.9	2.7	F	Significant decrease in walleye abundance index
Walleye – Mean Age	5.1 yrs.	4.7 yrs.	D	In 2002 – higher recruitment, higher adult mortality
Smallmouth Bass CUE-no	5.9	4.0	C-	Slight decrease in smallmouth bass abundance index
Northern Pike CUE-no	0.4	1.4	B (or D?)	Significant increase in abundance of northern pike. Whether one considers this a positive or negative development largely depends on one's 'appreciation' of the species.
Black Crappie	Not present	Present and likely to expand considerably	D	This species will negatively impact existing game fish – particularly walleye.
Walleye abundance has decreased significantly between surveys and the current population is exhibiting symptoms of stress – high recruitment, high adult mortality and decreasing mean age. Smallmouth abundance is down somewhat and northern pike abundance has increased significantly. We consider the above change between surveys to represent an over-all negative development with respect to the game fish in Wahwashkesh Lake. **Fish Community change rating: D**				

We are dismayed to conclude that the near-shore fish community of Wahwashkesh Lake has deteriorated from a "well above average" status in 1987 to one of "average" in 2002.

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Appendix A.1
Trapnet Catch Summary for Wahwashkesh Lake, STNS Summer 2002

	Catch (number)										
Set Number	Walleye	Black Crappie	Sm. Mth Bass	Lg. Mouth Bass	Rock Bass	Pumpk-seed	Northern Pike	Brown Bullhead	Common W. Sukr	Cisco	
1	7	0	5	0	1	0	0	0	0	0	
2	4	0	3	0	14	0	1	0	0	0	
3	0	0	1	0	0	0	1	0	0	0	
4	5	0	8	0	2	0	2	4	0	0	
5	1	0	0	0	2	0	0	0	0	0	
6	2	0	0	0	0	0	1	9	0	0	
7	4	0	13	2	4	0	1	5	0	0	
8	3	0	1	0	1	0	0	0	1	4	
9	1	0	0	0	0	0	1	0	0	0	
10	2	0	32	0	0	10	3	18	0	0	
11	5	0	1	0	2	0	2	0	0	0	
12	2	0	0	0	0	0	2	0	0	0	
13	2	0	0	1	0	0	0	0	0	0	
14	3	0	0	0	4	0	3	0	0	0	
15	2	0	5	0	1	0	4	0	8	0	
16	0	0	1	0	1	0	0	0	0	0	
17	4	0	6	0	1	0	1	38	1	0	
18	2	0	4	0	3	2	5	11	0	0	
19	0	0	0	0	0	0	1	0	0	0	
20	6	0	5	0	8	3	0	20	0	0	
21	3	0	0	0	0	6	1	16	0	0	
22	2	0	1	0	0	0	0	0	0	0	
23	0	0	10	0	2	0	1	2	0	0	
24	4	0	2	0	0	0	0	0	0	0	
25	1	16	0	0	0	0	3	24	1	0	
26	0	0	0	0	0	0	2	0	0	0	
27	6	0	11	1	4	0	0	0	0	0	
28	3	0	3	0	6	0	1	1	0	0	
29	0	0	1	0	0	0	1	0	0	0	
30	18	0	8	1	14	0	3	4	0	0	
31	8	0	4	0	7	0	3	0	0	0	
32	0	0	0	0	0	0	0	1	0	0	
33	1	0	6	1	3	0	1	0	0	0	
											Total
Catch Total (number)	101	16	131	6	80	21	44	153	11	4	567
CUE (no. / net set)	3.1	0.5	4.0	0.2	2.4	0.6	1.3	4.6	0.3	0.1	17.2
Standard Error of Mean	0.601	0.485	1.079	0.081	0.641	0.358	0.229	1.556	0.245	0.121	
Confidence Level(95.0%)	1.225	0.988	2.197	0.165	1.306	0.730	0.466	3.169	0.499	0.247	
Standard Deviation	3.455	2.785	6.197	0.465	3.683	2.059	1.315	8.937	1.407	0.696	
Sample Variance	11.934	7.758	38.405	0.216	13.564	4.239	1.729	79.864	1.979	0.485	
Median	2	0	1	0	1	0	1	0	0	0	
Total Catch Wt. (kg.)	139.81	5.28	76.90	4.90	8.00	4.45	67.01	62.73	14.03	0.96	384.07
% of Total Catch Wt.	36.40	1.37	20.00	1.28	2.01	1.16	17.45	16.33	3.65	0.01	99.66
CUE (wt) (kg./net set)	4.236	0.160	2.330	0.148	0.242	0.135	2.031	1.901	0.425	0.029	11.637
Mean Weight (grams)	1384	330	587	817	100	212	1523	410	1275	240	
	Walleye	**Black Crappie**	**Sm. Mth Bass**	**Lg. Mouth Bass**	**Rock Bass**	**Pumpk-seed**	**Northern Pike**	**Brown Bullhead**	**Common W. Sukr**	**Cisco**	

Appendix A.2
Trapnet Catch Summary by Area for Wahwashkesh Lake, STNS Summer 2002

Set Number	Walleye	Black Crappie	Sm. Mth Bass	Lg. Mouth Bass	Rock Bass	Pumpk-seed	Northern Pike	Brown Bullhead	Common W. Sukr	Cisco
Area #1 - "The Top Lake"										
1	7	0	5	0	1	0	0	0	0	0
2	4	0	3	0	14	0	1	0	0	0
4	5	0	8	0	2	0	2	4	0	0
5	1	0	0	0	2	0	0	0	0	0
7	4	0	13	2	4	0	1	5	0	0
8	3	0	1	0	1	0	0	0	1	4
9	1	0	0	0	0	0	1	0	0	0
10	2	0	32	0	0	10	3	18	0	0
11	5	0	1	0	2	0	2	0	0	0
12	2	0	0	0	0	0	2	0	0	0
13	2	0	0	1	0	0	0	0	0	0
14	3	0	0	0	4	0	3	0	0	0
15	2	0	5	0	1	0	4	0	8	0
16	0	0	1	0	1	0	0	0	0	0
17	4	0	6	0	1	0	1	38	1	0
18	2	0	4	0	3	2	5	11	0	0
Mean (Area 1)	2.9	0.0	4.9	0.2	2.3	0.8	1.6	4.8	0.6	0.3
Standard Error	0.452	0.000	2.022	0.136	0.849	0.629	0.387	2.557	0.499	0.250
Standard Deviation	1.806	0.000	8.087	0.544	3.396	2.517	1.548	10.227	1.996	1.000
Confidence Level(95.0%)	0.962	0.000	4.309	0.290	1.810	1.341	0.825	5.450	1.064	0.533
Sum	47	0	79	3	36	12	25	76	10	4
Count	16	16	16	16	16	16	16	16	16	16
Area #2 - "The Middle Lake"										
3	0	0	1	0	0	0	1	0	0	0
6	2	0	0	0	0	0	1	9	0	0
19	0	0	0	0	0	0	1	0	0	0
21	3	0	0	0	0	6	1	16	0	0
27	6	0	11	1	4	0	0	0	0	0
30	18	0	8	1	14	0	3	4	0	0
Mean (Area 2)	4.8	0.0	3.3	0.3	3.0	1.0	1.2	4.8	0.0	0.0
Standard Error	2.786	0.000	1.994	0.211	2.295	1.000	0.401	2.664	0.000	0.000
Standard Deviation	6.824	0.000	4.885	0.516	5.621	2.449	0.983	6.524	0.000	0.000
Confidence Level(95.0%)	7.161	0.000	5.127	0.542	5.899	2.571	1.032	6.847	0.000	0.000
Sum	29	0	20	2	18	6	7	29	0	0
Count	6	6	6	6	6	6	6	6	6	6
Area #3 - "The Big Lake"										
20	6	0	5	0	8	3	0	20	0	0
22	2	0	1	0	0	0	0	0	0	0
23	0	0	10	0	2	0	1	2	0	0
24	4	0	2	0	0	0	0	0	0	0
25	1	16	0	0	0	0	3	24	1	0
26	0	0	0	0	0	0	2	0	0	0
28	3	0	3	0	6	0	1	1	0	0
29	0	0	1	0	0	0	1	0	0	0
31	8	0	4	0	7	0	3	0	0	0
32	0	0	0	0	0	0	0	1	0	0
33	1	0	6	1	3	0	1	0	0	0
Mean (Area 3)	2.3	1.5	2.9	0.1	2.4	0.3	1.1	4.4	0.1	0.0
Standard Error	0.821	1.455	0.948	0.091	0.956	0.273	0.343	2.650	0.091	0.000
Standard Deviation	2.724	4.824	3.145	0.302	3.171	0.905	1.136	8.789	0.302	0.000
Confidence Level(95.0%)	1.830	3.241	2.113	0.203	2.130	0.608	0.763	5.905	0.203	0.000
Sum	25	16	32	1	26	3	12	48	1	0
Count	11	11	11	11	11	11	11	11	11	11

Appendix A.3
Comparative Catch Data from 1987 Trapnet Survey and 2002 STNS - Wahwashkesh Lake

8' Trapnet Results - Wahwashkesh Lake 1987 - Initial Trapnet Sets Only

Set No	Wal	B.Crap.	SMB	LMB	Rbass	Pksd	Npike	Bbull	Wsuckr	Cisco	LkwFsh	Burbot	All
1	20		26	0	12	0	0	0	0		0	0	
2	0		2	0	0	0	1	0	1		0	0	South
3	3		9	0	0	0	0	0	0		0	0	Basin
5	0		0	0	0	0	0	1	0		0	0	
8	11		3	0	1	0	0	0	0		0	0	
14	1		1	0	0	0	0	0	0		0	0	
15	7		14	0	3	0	0	0	1		0	0	
16	20		14	0	0	0	0	0	0		0	0	
19	0		5	0	2	0	1	0	3		0	0	
20	2		0	0	0	0	3	0	8		5	0	
21	3		3	0	0	0	1	0	0		0	0	
22	1		0	0	0	0	0	0	1		0	3	
25	9		2	0	1	0	0	0	0		0	0	North
26	42		17	0	0	0	0	0	1		0	0	Basin
27	6		0	0	0	0	0	0	0		0	0	
30	10		10	0	3	4	0	0	0		0	0	
31	33		4	4	0	0	0	0	0		0	0	
32	0		0	0	0	0	1	0	2		0	0	
33	2		0	0	0	0	0	0	9		0	1	
36	6		20	0	6	3	0	0	0		0	0	
37	0		2	0	1	4	1	0	0		0	0	
38	2		2	0	6	4	1	3	0		0	0	
39	3		2	0	1	0	0	2	9		0	0	
C.U.E. (Mean)	7.9		5.9	0.2	1.6	0.7	0.4	0.3	1.5		0.2	0.2	18.7
Standard Error	2.307		1.549	0.174	0.606	0.305	0.151	0.157	0.612		0.217	0.142	
Confidence Level(95.0%)	4.784		3.212	0.361	1.256	0.634	0.312	0.325	1.270		0.451	0.295	
Median	3		2	0	0	0	0	0	0		0	0	
Standard Deviation	11.063		7.428	0.834	2.905	1.465	0.722	0.752	2.937		1.043	0.664	
Sum	181		136	4	36	15	9	6	35		5	4	
Count	23		23	23	23	23	23	23	23		23	23	

8' Trapnet Results - 2002 Duplicate Net Sets (numbers in brackets refers to 1987 set number)

22 (1)	2	0	1	0	0	0	0	0	0	0		
31 (2)	8	0	4	0	7	0	3	0	0	0		South
19 (3)	0	0	0	0	0	0	1	0	0	0		Basin
33 (5)	1	0	6	1	3	0	1	0	0	0		
20 (8)	6	0	5	0	8	3	0	20	0	0		
16 (14)	0	0	1	0	1	0	0	0	0	0		
11 (15)	5	0	1	0	2	0	2	0	0	0		
13 (16)	2	0	0	1	0	0	0	0	0	0		
2 (19)	4	0	3	0	14	0	1	0	0	0		
8 (20)	3	0	1	0	1	0	0	0	1	4		
5 (21)	1	0	0	0	2	0	0	0	0	0		
14 (22)	3	0	0	0	4	0	3	0	0	0		North
15 (25)	2	0	5	0	1	0	4	0	8	0		Basin
17 (26)	4	0	6	0	1	0	1	38	1	0		
4 (27)	5	0	8	0	2	0	2	4	0	0		
10 (30)	2	0	32	0	0	10	3	18	0	0		
18 (31)	2	0	4	0	3	2	5	11	0	0		
7 (32)	4	0	13	2	4	0	1	5	0	0		
9 (33)	1	0	0	0	0	0	1	0	0	0		
12 (36)	2	0	0	0	0	0	2	0	0	0		
21 (37)	3	0	0	0	0	6	1	16	0	0		
3 (38)	0	0	1	0	0	0	1	0	0	0		
6 (39)	2	0	0	0	0	0	1	9	0	0		
C.U.E. (Mean)	2.7	0.0	4.0	0.2	2.3	0.9	1.4	5.3	0.4	0.2		17.3
Standard Error	0.419	0.000	1.451	0.102	0.707	0.507	0.287	2.003	0.349	0.174		
Confidence Level(95.0%)	0.869	0.000	3.009	0.212	1.466	1.050	0.595	4.154	0.724	0.361		
Median	2	0	1	0	1	0	1	0	0	0		
Standard Deviation	2.010	0.000	6.958	0.491	3.390	2.429	1.376	9.607	1.674	0.834		
Sum	62	0	91	4	53	21	33	121	10	4		
Count	23	23	23	23	23	23	23	23	23	23		

Appendix B

Walleye Biosampling Data – Wahwashkesh Lake Summer 2002 STNS

Summary:	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yrs.)
Mean	48.6	45.8	1384.3	4.7
Standard Error	1.190	1.149	102.839	0.250
Confidence Level(95.0%)	2.361	2.279	204.031	0.497
Standard Deviation	11.962	11.543	1033.523	2.517
Sum			139810	
Median	45.6	42.8	900	3
Count	101	101	101	101

Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yrs.)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yrs.)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yrs.)
71.7	68.7	3900	9	38.6	36.1	550	3	42.9	40.5	600	3
70.0	65.6	4000	10	44.8	41.6	850	3	46.5	44.0	1100	3
43.5	40.6	800	4	38.6	36.3	600	3	44.6	42.0	850	3
43.2	40.5	800	4	30.2	27.4	300	2	35.6	33.6	500	2
39.0	36.6	600	3	57.9	55.0	1800	8	46.0	44.0	1000	3
71.5	68.5	4000	11	39.0	36.4	600	3	41.5	39.5	750	3
56.5	53.5	2000	5	39.0	36.3	600	4	39.5	37.0	600	3
38.6	36.6	600	4	31.0	29.0	300	2	42.0	39.3	800	3
29.2	27.3	250	2	42.0	40.5	900	3	56.8	53.5	2000	5
35.5	33.0	400	3	62.0	58.5	2400	7	67.0	63.5	3000	8
41.4	38.8	700	3	61.0	57.6	2400	7	56.0	52.5	2000	7
37.0	34.9	500	3	29.1	27.2	200	2	38.0	35.5	500	3
41.5	39.3	600	3	55.7	52.3	1700	7	57.9	54.3	2000	6
28.5	26.5	200	2	63.2	59.5	2300	8	68.3	65.3	3200	8
30.9	28.8	300	2	45.8	43.1	900	3	68.5	65.0	2900	11
74.0	70.0	4200	11	58.5	56.0	2100	7	46.3	44.0	1000	3
62.0	59.0	2400	8	36.3	34.0	500	3	42.0	39.5	800	3
41.6	39.1	600	3	44.1	41.2	800	3	43.0	40.7	700	3
40.3	37.5	700	3	47.5	44.6	1150	4	56.8	53.6	1900	5
32.0	30.2	300	3	60.3	56.3	2000	6	54.5	51.5	1600	7
32.3	30.0	350	3	50.4	47.7	1400	4	44.5	41.7	1100	3
33.7	31.7	400	2	49.8	47.2	1400	4	59.3	56.8	2100	6
32.0	29.4	350	3	60.2	57.6	2200	6	45.6	42.5	900	3
65.5	62.0	2600	8	59.1	56.1	2300	7	44.6	42.1	800	3

continued …

Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yrs.)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yrs.)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Age (yrs.)
40.0	37.7	650	3	64.8	61.4	2500	8	71.5	68.5	4000	12
46.7	44.0	1000	3	45.5	42.8	900	3	55.8	52.8	2000	6
41.6	39.5	600	3	63.0	60.0	2600	8	46.6	43.6	1000	3
47.3	44.6	1000	3	51.0	48.3	1400	4	61.0	58.5	2300	8
55.8	52.5	1800	6	54.0	51.5	1600	6	67.5	64.0	3600	9
38.3	36.0	600	3	44.2	41.9	900	3	72.0	68.4	3600	9
31.0	28.6	260	3	43.0	40.5	700	3	34.5	32.3	400	2
55.2	51.7	1700	6	53.8	50.2	1700	4	52.0	49.2	1400	5
70.1	66.5	3500	10	44.0	41.5	900	3	52.5	49.2	1500	4
39.8	37.0	500	3	41.5	39.2	700	3				

Appendix C
Smallmouth Bass Biosampling Data – Wahwashkesh Lake Summer 2002 STNS

	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
Mean	33.1	31.1	587.165
Standard Error	0.701	0.660	35.316
Confidence Level(95.0%)	1.387	1.305	69.889
Standard Deviation	7.897	7.434	397.991
Sum			74570
Count	127	127	127

Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
21.5	20.3	150	22.6	21.5	160	26.6	24.3	270
25.0	23.3	200	29.0	27.5	400	30.2	28.2	380
38.0	35.6	700	21.0	20.0	140	30.2	28.2	370
32.0	30.3	475	20.7	19.5	150	22.2	21.0	150
30.5	28.6	450	27.0	25.2	250	41.0	38.3	900
29.2	27.5	350	26.7	25.4	260	24.0	22.5	180
31.1	29.1	400	20.0	18.4	140	24.5	23.0	190
35.5	33.2	600	29.3	27.5	320	25.2	24.2	210
29.3	27.6	400	33.3	31.3	500	36.8	34.4	600
28.5	26.8	300	50.0	47.3	1500	39.0	29.2	600
30.0	28.3	400	43.0	40.5	1200	29.2	27.3	450
25.3	23.7	210	32.8	30.8	500	23.4	22.0	150

continued …

Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
33.4	31.5	600	31.5	29.8	500	41.0	38.2	800
30.2	28.3	400	29.3	27.7	400	22.9	21.8	160
42.5	40.2	1000	33.7	32.0	600	20.4	19.3	110
31.0	29.1	500	20.8	20.2	150	21.9	21.0	130
31.6	29.8	600	41.0	38.5	900	23.6	22.8	190
41.3	38.8	1000	32.8	31.5	400	26.5	25.0	270
27.0	25.6	350	48.0	45.3	1500	31.8	30.1	500
38.5	36.6	750	45.2	43.0	1400	32.5	30.0	500
30.5	28.8	350	42.0	39.4	1200	44.7	42.3	1100
44.2	40.7	1200	44.2	42.0	1100	29.6	28.0	350
43.2	40.5	1100	45.5	42.9	1300	34.6	32.8	500
40.3	37.2	850	41.0	38.3	1100	22.7	21.7	220
36.0	34.2	600	34.0	32.3	700	27.2	25.8	300
23.5	22.2	250	50.0	46.6	1900	44.5	41.7	1200
23.6	22.3	200	27.7	26.4	300	39.2	37.0	700
37.8	36.2	700	49.7	48.2	1600	40.2	38.5	1000
49.1	46.7	1400	20.0	19.0	120	39.8	38.0	800
41.0	39.4	1100	35.7	33.8	550	30.0	28.3	600
39.8	38.5	800	23.0	21.4	200	39.6	36.5	1000
22.6	21.6	125	29.1	27.2	300	23.0	21.5	250
34.2	32.2	500	39.2	37.0	800	47.0	44.4	1600
38.2	36.2	800	29.6	27.4	400	29.3	27.5	400
42.0	39.5	900	34.8	32.6	600	24.1	22.6	250
31.0	29.2	400	45.4	43.1	1200	37.6	35.3	700
28.0	26.3	300	34.5	32.4	600	29.9	28.0	300
49.0	45.5	1500	32.1	30.4	500	22.1	21.1	140
35.5	33.4	600	30.9	28.4	400	31.5	29.5	400
32.5	30.8	400	31.0	29.0	400	31.5	29.5	450
44.4	42.1	1200	35.9	33.7	600	32.6	30.8	400
34.0	31.9	500	28.5	26.8	350	46.1	43.0	1200
30.2	28.5	400						

Appendix D

Northern Pike Biosampling Data – Wahwashkesh Lake Summer 2002 STNS

	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
Mean	59.2	56.0	1522.727
Standard Error	1.676	1.588	138.813
Confidence Level(95.0%)	3.381	3.202	279.944
Standard Deviation	11.119	10.531	920.784
Sum			67000
Count	44	44	44

Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
68.3	64.7	2700	56.5	53.0	1300
41.8	40.0	550	45.2	42.5	600
60.0	56.6	1300	66.1	62.5	1900
45.6	43.3	600	66.5	63.0	1200
48.5	45.5	750	40.6	38.0	400
64.5	61.2	1700	53.8	50.0	1100
48.2	45.7	650	82.7	78.0	4000
76.9	73.0	3200	42.7	40.0	500
61.0	57.8	1600	43.7	41.0	350
58.0	54.8	1400	68.5	64.8	2200
79.5	74.5	3600	63.4	60.1	1700
56.5	53.3	1100	45.0	42.1	600
55.3	52.5	1200	78.5	74.0	3500
63.5	60.0	1700	48.3	47.0	700
58.0	55.5	1000	65.3	61.8	2000
52.5	49.5	900	73.5	70.0	2700
55.5	52.2	1100	57.5	54.4	1300
47.4	44.5	700	52.5	49.2	700
52.3	49.9	800	70.0	66.1	2300
56.3	53.5	1100	67.1	62.6	2100
76.3	72.0	2700	59.7	56.1	1600
62.2	59.3	1800	71.2	67.7	2100

Appendix E

Largemouth Bass Biosampling Data – Wahwashkesh Lake Summer 2002 STNS

	Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
	7	37.5	36	900
	7	35.6	34.2	700
	13	28.6	27.4	450
	27	40.6	39.2	900
	30	39.2	37.6	1200
	33	34.5	33.3	750
Mean		36.0	34.6	816.667
Standard Error		1.740	1.691	102.198
Confidence Level(95.0%)		4.473	4.347	262.708
Standard Deviation		4.262	4.143	250.333
Sum				4900
Count		6	6	6

Appendix F

Black Crappie Biosampling Data- Wahwashkesh Lake Summer 2002 STNS

	Set No.	Total Lg. (cm.)	Fork Lg. (cm.)	Weight (grams)
	25	30.3	29.3	500
	25	30.6	29.1	500
	25	22.7	21.8	250
	25	23.9	22.9	300
	25	24.6	23.7	300
	25	25.1	24.3	250
	25	29.5	28.5	550
	25	24.6	23.7	250
	25	24.1	23.4	200
	25	24.3	23.5	150
	25	26.6	25.7	400
	25	20.6	20.0	130
	25	33.6	32.6	700
	25	22.4	21.5	150
	25	25.0	24.4	350
	25	25.3	24.4	300
Mean		25.8	24.9	330
Standard Error		0.865	0.834	40.415
Confidence Level (95.0%)		1.844	1.778	86.142
Median		24.8	24	300
Standard Deviation		3.461	3.337	161.658
Sum				5280
Count		16	16	16

Appendix G

Fish Weight for Non-Game Species – Wahwashkesh Lake Summer 2002 STNS

	Rock Bass	Pumpkin-seed	Brown Bullhead	Cisco	Common Wt. Sucker
	1 @ 70 grams	1 @ 200 grams	4 @ 1025 grams	2 @ 480 grams	1 @ 1700 grams
	7 @ 600	7 @ 1400	9 @ 4800		3 @ 600
	4 @ 240	3 @ 430	5 @ 900		4 @ 7500
	3 @ 240	1 @ 50	12 @ 3770		1 @ 2150
	1 @ 270	2 @ 250	6 @ 3300		1 @ 800
	2 @ 150	2 @ 400	10 @ 6900		
	2 @ 80	6 @ 1100	10 @ 5800		
	3 @ 245		11 @ 5900		
	4 @ 335		11 @ 4100		
	3 @ 520		20 @ 7600		
	3 @ 280		16 @ 5800		
	5 @ 675		2 @ 420		
	2 @ 200		24 @ 6500		
	4 @ 440		1 @ 750		
	6 @ 510		4 @ 990		
	7 @ 650				
	8 @ 970				
No. Caught	68	18	143	2	10
Weight	6775	3830	58555	480	12750
Mean Wt.	99.6	212.7	409.5	240.0	1275.0

Appendix H.

Comparison Data Set of Species *CUE-no*

Note: Units are fish per net set.

Survey and Year	Walleye	S.Mouth Bass	N.Pike	C.White Sucker	Brown Bullhead	Y.Perch	R.Bass
Bear Lake (2001)	9.9	1.6	2.6	2.1	4.5		2.6
Bolger L. (1999)	9.5	9.5	0.7	0.1	1		3.1
Buck Lake (2002)	1.8	1.3	0.9				
Cecebe Lk. (2000)	11.9	5.2	2.5	3.4	6.4		2.3
Crane Lk (1997)	1.6	7.1	0.1				0.7
Doe Lk. (1998)	11.3	13	0.7	4.5	3.9		17.8
Dollar's Lake (2000)	1.3	3.1	0.8	2.4	23.8	0.8	1.2
Gibson Lake (2001)	3.1	6.7	1	2.3	12.7		0.7
Giroux Lake (2001)	6.8	1.8	2.1	3.5	3.7	0.1	0.3
Harris Lk. (1994)	1.9	1.1	0.7	7.8	1.8	0	1
Isabella Lake (1997)	0.3	7	1.2	5.1	1.5		5.7
Kashegaba L. (1999)	0.9	10.9	0.7	0	1.9		10.3
McDougall L. (2000)	2.2	1.5	1.3	1.5	1.6		0.4
Moffat Lake (2002)	0.8	0.4	1.6	5.7	1.7	0.1	0.1
Pakeshkag Lk (2001)	0.1		2	1.8	13.5	0.1	0.8
Poverty Bay (1999)	2.3	12.1	0.3	7	3.8		2.4
S. Mag. R. (1994)	1.9	2.3	0.7	2.6	1.5	0	1.3
Six-Mile L. (1999)	0.6	5.9	0.8	1.7	9.4		2
Wahwashkesh L. (02)	3.1	4	1.3	0.3	4.6		2.4
Mean	3.8	5.3	1.2	3	5.7	0.2	3.1
Standard Error	0.908	0.95	0.161	0.56	1.464	0.125	1.038
Median	1.9	4.6	0.9	2.38	3.8	0.1	1.65
Standard Deviation	3.96	4.032	0.7	2.309	6.037	0.306	4.405
Count	19	18	19	17	17	6	18
Confidence Level(95.0%)	1.908	2.005	0.337	1.187	3.104	0.321	2.191

Appendix I

Comparison Data Base of *CUE-wt*

Note: Units are kg. per net set.

Survey and year	Walleye	S.M. Bass	Northern Pike	C.W. Sucker	Brown Bullhead	Rock Bass	Yellow Perch	All
Bear Lake (2001)	7.619	1.268	3.547	1.443	2.609	0.383		16.896
Bolger Lake (1999)	10.790	4.250	1.290	0.030	0.270	0.220		16.930
Buck Lk (2002)	1.694	1.542	1.663					5.452
Cecebe Lake (2000)	12.154	4.700	3.990	3.636	4.727	0.254		30.661
Crane Lk. 1997)	2.986	2.443	0.136			0.064		9.362
Doe Lake (1998)	12.727	11.115	0.954	5.573	1.521	1.530		35.756
Dollar's Lake (2000)	1.112	1.503	1.621	2.869	8.479	0.136		21.610
Harris Lake (1994)	2.909	0.722	0.752	7.783	0.481	0.184		13.460
Gibson Lake (2001)	4.265	4.866	1.097	2.683	3.952	0.089		32.966
Giroux Lake (2001)	9.670	2.010	1.600	4.490	1.020	0.020	0.010	18.820
Isabella Lk. (1997)	0.530	4.203	3.630	5.895	0.415	0.620		15.343
Kashegaba Lk. (1999)	1.060	4.880	1.340		0.530	0.740		9.210
McDougall Lk. (2000)	2.460	0.961	1.948	2.358	0.685	0.028		10.061
Moffat Lk. (2002)	0.467	0.628	3.578	8.610	0.900	0.000	0.000	14.183
Pakeshkag Lk. (2001)	0.167		3.508	0.892	2.375	0.061	0.008	7.025
Six Mile Lake (1999)	1.145	3.242	1.133	2.350	2.538	0.211		23.227
S. Mag. R (1994)	2.035	1.355	1.067	3.708	0.214	0.137		8.970
Poverty Bay (1999)	2.757	3.976	0.164	3.150	0.920	0.113		14.049
Wahwashkeksh (2002)	4.236	2.330	2.031	0.425	1.901	0.242		11.637
Mean	4.252	3.111	1.845	3.493	1.973	0.280	0.006	16.613
Standard Error	0.956	0.590	0.279	0.619	0.516	0.087	0.003	2.008
Median	2.757	2.387	1.600	3.010	1.020	0.161	0.008	14.183
Standard Deviation	4.167	2.501	1.216	2.475	2.128	0.370	0.005	8.753
Count	19	18	19	16	17	18	3	19
Confidence Level(95.0%)	2.009	1.244	0.586	1.319	1.094	0.184	0.013	4.219

Appendix J

Comparison Data Set Ranking *CUE-wt* for all species combined and % of total catch weight by game and non-game fish species.

Note: Units for CUE-wt for all Species Combined is kg per net set

Survey & year	Rank	**CUE wt All Species**	N = (no. sets)	% of total catch weight			
				Game fish	Coarse fish	Pan fish	Walleye
Doe Lake (1998)	1	35.756	33	69.4	19.8	10.8	35.6
Gibson Lake (2001)	2	32.966	15	43.1	56.6	0.3	12.9
Cecebe Lake (2000)	3	30.661	11	68.1	27.2	4.7	39.6
Six Mile Lake (1999)	4	23.227	29	40.7	56.1	3.1	4.9
Dollar's Lake (2000)	5	21.610	24	32.3	66.5	1.2	5.1
Giroux Lake (2001)	6	18.820	12	70.5	29.3	0.2	51.3
Bolger Lake (1999)	7	16.930	17	96.6	1.8	1.5	63.5
Bear Lake (2001)	8	16.896	17	73.4	23.9	2.3	45.1
Isabella Lk. (1997)	9	15.343	10	54.5	41.1	4.4	3.5
Moffat Lake (2020)	10	14.183	12	32.9	67.0	0.0	3.3
Poverty Bay (1999)	11	14.049	7	69.5	29.0	1.5	20.7
Harris Lake (1994)	12	13.460	31	36.1	61.3	2.5	21.6
Wahwashkesh (2002)	13	11.637	33	76.5	20.0	3.2	36.4
McDougall Lk. (2000)	14	10.061	13	56.1	43.5	0.3	24.4
Crane Lk. 1997)	15	9.362	18	100.0	0.0	0.0	31.9
Kashegaba Lk. (1999)	16	9.210	15	84.2	5.8	9.2	11.5
S. Magnetawan R (1994)	17	8.970	49	50.5	43.5	5.3	22.6
Pakeshkag Lk. (2001)	18	7.027	12	52.3	46.5	1.1	2.4
Buck Lake (2002)	19	5.452	12	100.0	0.0	0.0	31.1
Mean		16.585	19.5	63.5	33.6	2.7	24.6
Standard Error		2.011	2.489	5.021	5.133	0.704	4.091
Median		14.18	15	68.1	29.26	1.5	22.6
Count		19	19	19	19	19	19