

A person is seen from the back, wearing a dark jacket, holding a fishing rod. The background shows a body of water at sunset, with the sun low on the horizon and its light reflecting on the water. The sky is a mix of orange, yellow, and grey.

Cedar Lake 2008 Creel Census

**GREENBUSH & OSCODA TOWNSHIPS, ALCONA & IOSCO
COUNTIES, MICHIGAN**

**Prepared for:
Cedar Lake Improvement Board**

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INTRODUCTION

Cedar Lake lies within two counties in the Michigan's Lower Peninsula. The lake is situated in southeast corner of Alcona County and the northeast corner of Iosco County (Figures 1a & b). The Cedar Lake Improvement Board contracted with Aquest Corporation to conduct a creel census

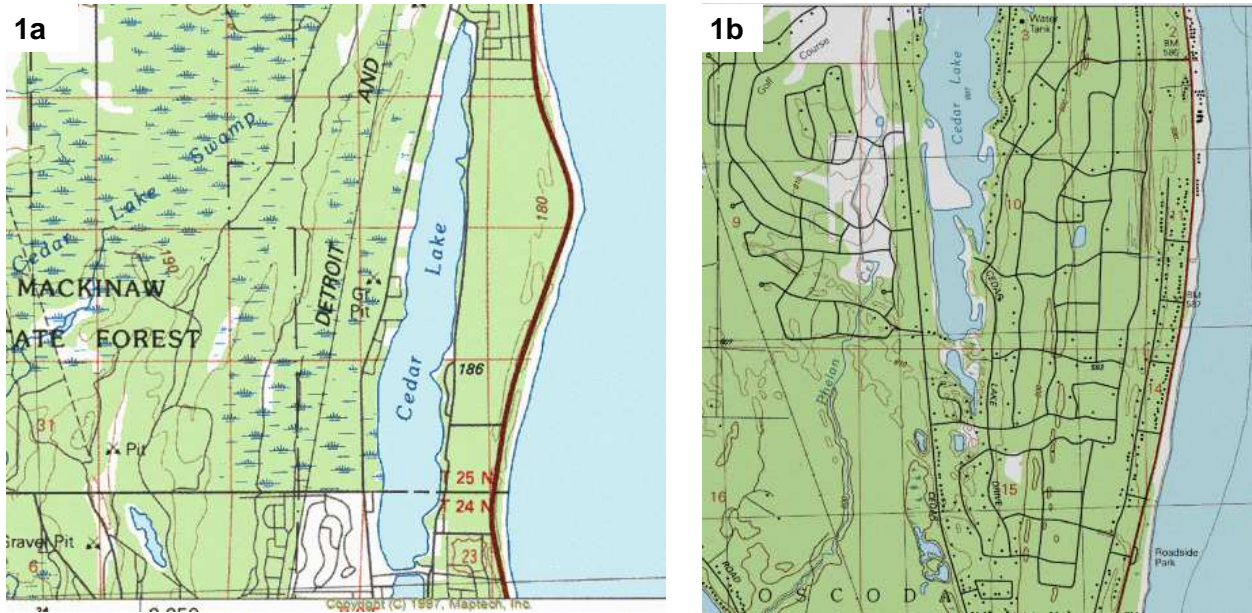


Figure 1a and b. Cedar Lake, Alcona County (T25N, R9E, Sections 15, 22, 27 and 34) and Iosco County, (T25N, R9E, Sections 3 and 10) Michigan.

(survey of anglers) to understand how anglers utilize the fishery. Subsequently, Aquest Corp contracted with Superior Environmental & Aquatic Services LLC to conduct the creel census. This creel census survey report was prepared to include data summary and recommendations. The Cedar Lake Improvement Board funded this creel survey.

PURPOSE AND METHODS

A major objective in the management of a recreational fishery is to provide anglers with positive recreational experiences and maintain a diverse and viable fishery. The best way to understand the recreational use is to interview anglers by way of a creel survey. SEAS designed and implemented a creel survey to estimate targeted species, total catch, total harvest, the total number of anglers using the fishery, the effort (time) needed to catch each fish species and annual harvest. The creel survey required a total of 475 hours of effort to conduct 232 angler interviews.

TABLE 1
 2008 Cedar Lake Creel Census Clerk Shifts

	SHIFT	
	Early	Late
June	0700 h – 1330 h	1300 h – 2000 h
July	0700 h – 1330 h	1300 h – 2000 h
August	0700 h – 1330 h	1300 h – 2000 h
September	0700 h – 1330 h	1300 h – 2000 h
October	0700 h – 1330 h	1300 h – 2000 h

SEAS used a roving access survey model as the basis for data collection and analysis. Fishing boats and anglers were counted and interviewed during fishing trips and/or as they completed their fishing

trips and exited the lake. Data was entered by hand into a creel census clerk interview form (Appendix **) Each week, randomly-selected weekdays, both weekend days, and all holidays are sampled. Two shifts, early or late, were randomly selected each scheduled workday. Cedar Lake was divided into six survey stations that served as starting locations for clerks to begin counts (Figure 2, right). Two counts were made per scheduled workday and counts were made approximately 1-hour apart (e.g., 0800h and 0900 h). Starting count time and location was randomly selected. In addition, interview forms were supplied to resorts and private residences for voluntary completion because anglers fishing from these locations are not readily accessible for interviewing (Appendix **). SEAS biologist conducted statistical analysis to determine if the mean angler effort for roving and completed survey groups was significantly different. Results of unpaired t-test indicate that there was no significant difference in angler effort between the two survey groups ($p=0.086$). Based on the statistical tests data from both survey groups were combined and assessed as one sample (See below, right).

RESULTS

The results are a compilation of data from 232 surveys records of angler activity including all trips for all days at all stations within Cedar Lake. The following acronyms for fish species were used in charts and figures including:

All	All Species
BG	Bluegill Sunfish
CC	Channel Catfish
BC	Black Crappie
LMB	Largemouth Bass
NP	Northern Pike
RB	Rock Bass
SMB	Smallmouth Bass
SF	Sunfish (pumpkinseed, green, longear and warmouth sunfish species)
WE	Walleye
YP	Yellow Perch

All chart and graph data displayed as percent composition by number as data regarding length and weight of catch was not recorded.

Angler Effort

Most anglers fished in groups of two (mean = 1.65 anglers per trip). Cedar lake experienced nearly four (mean = 3.6) fishing trips per day and trips averaged 1.86 hours which amounted to 11.2 hours per day or 0.01 hours per acre per day. Anglers spent an estimated 1,636.6 hours fishing on Cedar Lake from June through October.

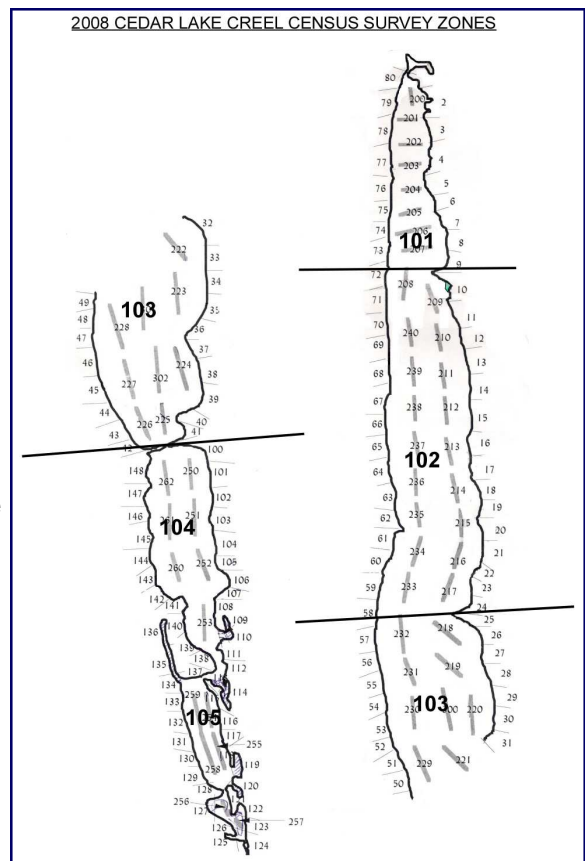


Figure 2. Cedar Lake creel census survey stations for angler counts.

Statistical Analysis

Results of Unpaired t-tests comparing means of angler effort for Roving trip and Completed trip surveys.

Confidence interval:

The mean of Completed trip minus Roving trip equals 0.575
95% confidence interval of this difference: From -0.084 to 1.234

Intermediate values used in calculations:

$t = 1.7259$
 $df = 139$
standard error of difference = 0.333

P value and statistical significance:

The two-tailed P value equals 0.0866.

Roughly 53% of angling effort took place north of the causeway in the “north end” of Cedar Lake in Survey zones 102 and 103. Survey zones 102, 103 and 105 experienced the majority of fishing pressure (Figure 3).

Table 1

Estimates of total number of species caught, released and harvested by anglers, Cedar Lake, Alcona and Iosco Counties, 2008.

Species	Estimated Catch	Estimated Release	Estimated Harvest
BG	2450	2204	247
BC	24	22	2
LMB	106	105	1
NP	313	291	22
RB	53	53	0
SMB	260	225	35
SF	106	98	8
WE	467	345	122
YP	313	254	59
Total	4092	3596	495

Anglers effort was greatest in June and July (Figure 4). August and October experienced the least amount angler effort.

Angler Catch

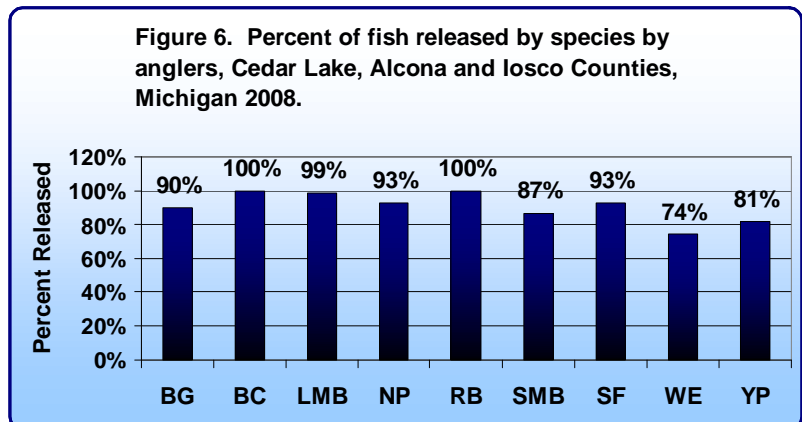
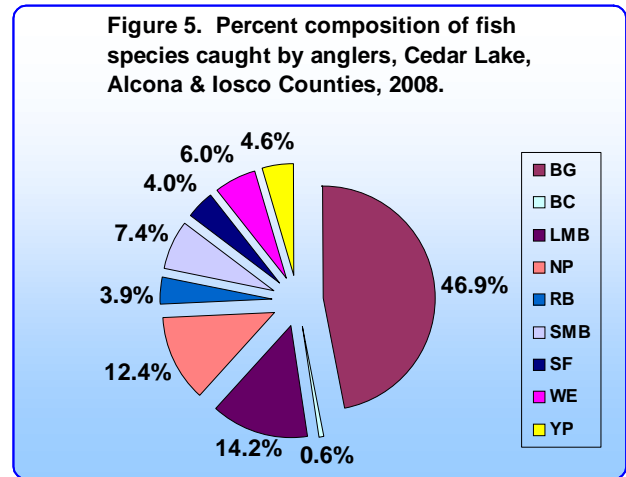
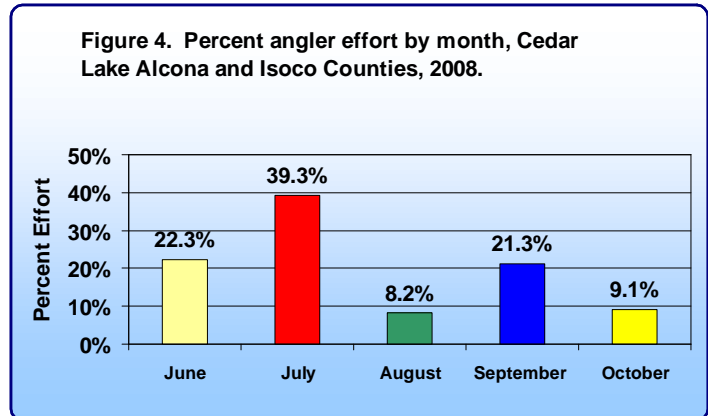
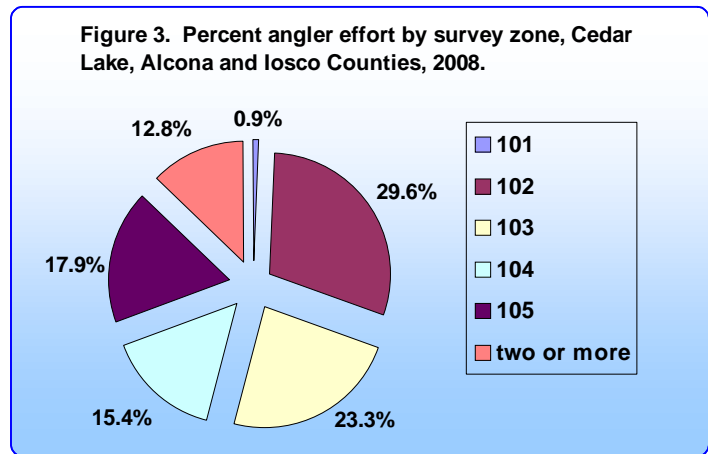
Anglers caught on average 2.5 fish per hour or 28.0 per day. Anglers caught an estimated 4092.0 fish from June through October (Table 1). Bluegill sunfish, largemouth bass and northern pike comprised nearly three quarters (73.5%) of fish caught during the survey (Figure 5).

Angler Harvest

Anglers harvested an estimated 495 fish during the survey (Table 1). Anglers kept or harvested on average only 9% of all fish species caught combined, in other words, anglers released 9 out of every 10 fish caught. Among all fish species captured, yellow perch, walleye and smallmouth bass were kept most often (Figure 6).

Angler Preference

Angling selectivity for fish species was somewhat evenly distributed among possible categories (Figure 7). Most anglers preferred all species (22.6%)



and/or largemouth and smallmouth bass (20.9% and 16.7% respectively) as primary angling targets. Walleye and northern pike were also commonly selected as targeted fish species.

CONCLUSIONS

Overall Assessment

Cedar Lake is a bass / bluegill fishery with the potential to support additional fishing experiences for coolwater species such as walleye and northern pike. Cedar Lake supports an underutilized sport fishery. Anglers who have learned how to fish the lake hold the fishery of Cedar Lake in high regard, in contrast, anglers who are not familiar with where and how to fish the lake somewhat less satisfied with the fishing



experienced. The largest impediment to angling success on Cedar Lake is the size of the lake itself. At over 1100 acres it can be difficult to determine where to fish. In addition, much of the lake is shallow with only a few areas over ten feet deep. Structure in the form of vegetation though prevalent in many areas, may hold few fish. Fish tend to congregate in certain areas within the lake and thus angling success can be highly variable depending on the location. To successfully fish this lake requires knowledge of subtle changes in depth and bottom substrate, spawning areas and angling methods i.e., trolling, spin casting, jigging, lure and bait selection and where fish are at certain times of the year. This can be

accomplished by increasing the time spent angling or tagging along with the more experienced anglers on the lake. We observed that the most experienced and successful anglers “worked” the lake moving to various locations within the fishery survey zones but ultimately preferring certain areas within the lake upon which they were familiar.

Good Catch Rates

Data indicates that fish are easily caught and angling pressure is low. In general, anglers who had fished for at least one hour caught two fish. In comparison, anglers on Fletcher Floodwaters caught three fish per hour in 1997. Fletcher floodwater is a lake that is highly regarded for the quality of the fishing experience and quantity and above average size of several different species. Cedar Lake in comparison is not as productive in terms of fish per acre does not

command the fishing pressure of a Fletcher Floodwater, but the catch rate is comparable to what is considered one of the top fisheries in the State.

Figure 7. Percent composition of fish species targeted by anglers, Cedar Lake, Alcona and Iosco Counties, 2008.

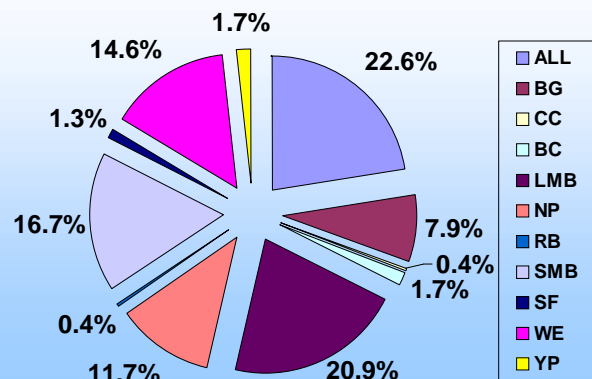


TABLE 2

Estimated catch per hour from creel census data for various lakes.

Lake	County	Year	Estimated Mean Catch Rate (Fish per Hour)
*Beaver Lake	Alger	1998	0.8
Cedar Lake	Alcona and Iosco	2008	2.5
*Fletcher Floodwater	Alpena and Montmorency	1997	3.0
*Sessions lake	Ionia	1997	1.0
*Silver Lake	Oceana	1997	0.6

* Appendices MDNR Creel Sampling Methods

Catch and Release

Anglers practice catch and release which provided continued opportunity for strong populations of largemouth and smallmouth bass and northern pike. A Master Angler Award smallmouth bass was recorded during the survey and several other bass that would easily qualify for such an award were caught during the survey. All fish were released.

Recently installed spawning benches have been added to enhance and support bass spawning success. Unfortunately this exposes these fish to angling during attempts during nest creation and guarding. When a bass is on a nest it is very aggressive and easily caught. When an adult bass on a nest is removed by an angler it can experience total loss of eggs and fry, to predation by other fish, by the time it is returned to the water. Therefore, it is strongly encouraged that nesting bass be left alone to complete spawning and rearing of fry.

Panfish Harvest

Most anglers returned bluegill and other sunfish because they considered them to be too small. Bluegill and other sunfish species and yellow perch are often called panfish and are targeted for harvest as they are highly desirable table fare. These fish made up a large portion of the catch and were expected to be harvested at a higher rate. This was true for yellow perch but not bluegill sunfish. For bluegill, the established minimum stock size (size at which a fish can be caught) is 3-inches, the quality stock size is 6-inches, preferred stock size is 8-inches, memorable stock size is 10-inches, and trophy stock size is 12-inches. Anglers tend to harvest sunfish which are 6 inches or greater. A detailed survey of sunfish populations would be needed to calculate the percentage of stock size categories for the fish population of Cedar Lake, but based on the angler harvest it is doubtful that a stock size above the minimum stock size is present in significant quantity.

Anglers caught and harvested large yellow perch in zones 102 and 105. Yellow perch do not appear to be numerous but they are large. Predation pressure from northern pike and walleye may limit recruitment.

Walleye Rising

Anglers are now beginning to target and catch legal walleye. Many anglers have noticed an increase in size and catch rate indicating that past plantings are beginning to contribute to the sport fishery. There were many reports of anglers catching walleye of several different sizes. This may be the result of prior plantings or a sign of natural recruitment by the walleye population of Cedar Lake. Large walleye were observed in high concentration over the gravel shoal at the mouth of Sherman Creek, during the northern pike spawning migration study. This area appears to support the stream flow and bottom substrate necessary for walleye spawning habitat. Future study would be needed to confirm and quantify utilization.

Channel Catfish Underutilized?

Although large channel catfish have been observed during the creel survey and critical fishery habitat surveys and record of a 2001 Master Angler Award for a 28 inch channel catfish exists, this species is rarely targeted or caught in Cedar Lake. This may be due to low population and hence low occurrence in catch or angler selection of angling methods (for pike, bass, and walleye) which are not conducive to the catch of channel catfish. Channel catfish feed on the bottom, are more active from dusk to dawn and are easily caught with live bait, chicken livers, shrimp or prepared baits fished on the bottom. This species could provide another recreational angling opportunity with the appropriate angler education and management.

Northern Pike

Northern pike were caught consistently throughout the year and are targeted by anglers that fish Cedar Lake. Numbers of pike are adequate and appear to provide satisfactory angling experiences.

Anglers consistently report that the pike tended to be “skinny” and on the “small side”. This is likely a result of elevated temperatures that increase metabolism to a point which causes the pike to feed aggressively but does not provide optimum temperature for increased girth. Water temperature data collected by Russ Anton of the Cedar Lake Board found midsummer temperatures in the deepest part of the lake to exceed the optimum range of habitat suitability for northern pike. It may be that future augmentation of Cedar Lake with cooler water from groundwater sources may moderate temperatures at certain locations within the lake to the benefit of the pike fishery.

RECOMMENDATIONS

- Present Status:** Good recreational fishery for bass and walleye are increasing in number. Bluegill sunfish appear to be small. Large channel catfish and walleye are caught on occasion. Fishing pressure and harvest is low and catch rates are good.
- Suggested Goal:** **A recreational fishery providing trophy fishing for bass, channel catfish and walleye with larger panfish as a increasing percentage of overall fish population.**
- Objective 1:** **Conduct fish population assessment.**
Strategy: Conduct fish population assessment using gill nets, trap nets, seines and electro fishing units to characterize fish population. Conduct analysis of fish scales and spines to assess age and growth.
- Success:** Fish population survey and report of findings completed.
- Objective 2** **Provide habitat enhancement for walleye and channel catfish and document use.**
Strategy: Assess potential walleye spawning area at the mouth of Sherman Creek. Enhance and increase walleye spawning habitat if found to be viable. Provide fallen logs and woody structure for channel catfish spawning habitat.
- Success:** Verified by documentation of use or capture of young of year and juveniles. Increased angling success.
- Objective 3** **Maintain or increase size and number of adult bass**
Strategy: Implement a creel limit of 3 fish over 14 inches and release of all bass over 18 inches. Add and monitor spawning habitat. Discourage angling for bass on nests.
- Success:** Increased in angler perception and respect of adult bass population and increased catch rate of Master Angler Award sized bass.
- Objective 4** **Re-assess recreational angling benefits and potential for stocking Redear sunfish to establish an increased fishery. Increase bluegill spawning Habitat**
Strategy: Conduct literature research into the success of established Redear sunfish populations north of Bay City (such as Lost Lake Woods Club, Alcona County). either via roving angler interviews or voluntary mail to determine catch rates, fishing pressure and angler use. Increase the size of sunfish spawning habitat in documented critical spawning areas to increase recruitment.

Success:

Prepare a habitat suitability report and delivered in a report of findings with recommendation for or against planting Redear sunfish. Increase bluegill spawning habitat in historic spawning areas by 50% in five years.



APPENDIX 1

Creel Census Survey Summary Card

Creel Census Survey Forms

2008 CEDAR LAKE CREEL CENSUS SUMMARY CARD

Site: Cedar Lake

Year: 2008

County: Alcona and Iosco

Location: T25N, R9E, Sections 15, 22, 27 and 34

Survey period: June 2 through October 17

Daily period: Early Shift, Late Shift (Varies)

Survey Design: Roving-Access

Count method: Roving, fishing boats, shore anglers

Interview type: Voluntary, access, party, boating anglers, shore anglers, harvest.

Effort estimation: See Appendix 1 of Lockwood et al. (1999)

Catch estimation: See Appendix 1 of Lockwood et al. (1999)

Clerk: SEAS LLC clerk, full time

Survey purpose: Characterize general effort and catch aspects of the fishery

LAKE Cedar Lake

DATE _____

Angler ID _____
Last 4 Digits of Phone Number or Boat Hull Number

Station No. _____

Survey Type

Access
 Complete Trip

Roving
 Incomplete Trip

Number of Boats

Number of Anglers

Time of Interview _____ AM/PM

Time Started Fishing _____ AM/PM

Time Ended Fishing _____ AM/PM

Target Fish Species (*check all that apply*):

- | | | | |
|-----------------|--------------------------|-----------------|--------------------------|
| All Species | <input type="checkbox"/> | Rock Bass | <input type="checkbox"/> |
| Bluegill | <input type="checkbox"/> | Smallmouth Bass | <input type="checkbox"/> |
| Channel Catfish | <input type="checkbox"/> | Sunfish | <input type="checkbox"/> |
| Crappies | <input type="checkbox"/> | Walleye | <input type="checkbox"/> |
| Largemouth Bass | <input type="checkbox"/> | Yellow Perch | <input type="checkbox"/> |
| Northern Pike | <input type="checkbox"/> | | |

Number of Fish Species Caught / Kept (*write in number*):

- | | | | |
|-----------------|----------------------|-----------------|----------------------|
| Bluegill | <input type="text"/> | Rock Bass | <input type="text"/> |
| Channel Catfish | <input type="text"/> | Smallmouth Bass | <input type="text"/> |
| Crappies | <input type="text"/> | Sunfish | <input type="text"/> |
| Largemouth Bass | <input type="text"/> | Walleye | <input type="text"/> |
| Northern Pike | <input type="text"/> | Yellow Perch | <input type="text"/> |

2008 CEDAR LAKE CREEL CENSUS

VOLUNTEER HOME OWNER CREEL CENSUS FORM

Please complete all six sections of the form. Your participation is greatly appreciated. Happy fishing!

Lake Name: Cedar Lake

1 Angler ID: _____
Last 4 Digits of Phone Number

2 Date: _____

3 Time Begin Fishing Trip: _____ AM
 _____ PM

4 Time Ending Fishing Trip: _____ AM
 _____ PM

5 Target Fish Species (*check all that apply*):

- | | | | |
|-----------------|--------------------------|-----------------|--------------------------|
| All Species | <input type="checkbox"/> | Rock Bass | <input type="checkbox"/> |
| Bluegill | <input type="checkbox"/> | Smallmouth Bass | <input type="checkbox"/> |
| Channel Catfish | <input type="checkbox"/> | Sunfish | <input type="checkbox"/> |
| Crappies | <input type="checkbox"/> | Walleye | <input type="checkbox"/> |
| Largemouth Bass | <input type="checkbox"/> | Yellow Perch | <input type="checkbox"/> |
| Northern Pike | <input type="checkbox"/> | | |

6 Number of Fish Species Caught and Kept (*write in number*):

- | | | | |
|-----------------|---|-----------------|---|
| Bluegill | <input style="width: 40px; height: 20px;" type="text" value="/"/> | Rock Bass | <input style="width: 40px; height: 20px;" type="text" value="/"/> |
| Channel Catfish | <input style="width: 40px; height: 20px;" type="text" value="/"/> | Smallmouth Bass | <input style="width: 40px; height: 20px;" type="text" value="/"/> |
| Crappies | <input style="width: 40px; height: 20px;" type="text" value="/"/> | Sunfish | <input style="width: 40px; height: 20px;" type="text" value="/"/> |
| Largemouth Bass | <input style="width: 40px; height: 20px;" type="text" value="/"/> | Walleye | <input style="width: 40px; height: 20px;" type="text" value="/"/> |
| Northern Pike | <input style="width: 40px; height: 20px;" type="text" value="/"/> | Yellow Perch | <input style="width: 40px; height: 20px;" type="text" value="/"/> |
| Other | <input style="width: 40px; height: 20px;" type="text" value="/"/> | | |