

# Lake Erie Fisheries Status and Trends Report 2004

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**Report to the Lake Erie Committee  
Pennsylvania Fish and Boat Commission  
Lake Erie Research Unit  
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Pennsylvania Fish and Boat Commission  
Lake Erie Research Unit

LAKE ERIE FISHERIES STATUS AND TRENDS REPORT  
2004

**Commercial Fishery Summary and Status**

Recommended annual allowable commercial quotas have not been attained in the past decade because of limited effort. Only one licensee is actively fishing commercial trap nets.

Sustained high abundance of the yellow perch population over the past three years has supported a 53% increase in the perch landings above 2003. The 2004 landings are the largest since commercial fishing was restricted to trap nets in 1996. Landings of other species either increased or remained stable from 2003 through 2004, depending upon the course of the markets and of changing abundance.

**Yellow Perch**

Commercial CPE for trap nets has increased noticeably since 2000. Dramatic increases in perch abundance and added experience in use of trap nets were reasons for these elevated CPE's. The foundation of the yellow perch abundance, available to the commercial fishery, continues to be the persistence of the strong 1996, 1998 and moderate 1994 year classes. The unexpected, significant appearance of age 4 perch in commercial catch is without explanation, as it was a weak year class. The mean age in the 2004 catch was 5.9 years is consistent with the ageing structure of the stock. The mean age will decline in 2005 with the recruitment of the strong 2001 cohort of perch. The collective persistence of older perch and mean age in population of about 6 years is evidence of a

sustained higher survival of the fishable perch stock. This is about 64%. Accordingly, the commercial TAC for 2005 is 35,000 pounds, nearly the same as 2004. The reality is that 2005 landings may only be around 25% or less of the TAC, or not even 1% of the perch in Pennsylvania waters.

**Walleye**

The commercial landings of walleye in 2004 were 501 pounds, the high for the period 1996-2004. The 2004 TAC for walleye was 6,000 pounds. What few walleye are landed are considered incidental catches taken in the fall of the year. Despite the low abundance of walleye throughout Lake Erie, catch rates increased in 2004, probably due to the partial recruitment of the 2001-year class. The commercial exploitation of walleye is not expected to be anymore than incidental in 2005.

**Lake Whitefish**

Very few whitefish were reported in commercial landings in 2004, about the same as in the previous years. Declining abundance with sporadically poor year class production leaves the whitefish stocks less dense, exhibiting poor catchability to shallow water trap net fishery.

**Burbot**

2004 burbot landings remain near lowest levels, however, trap net CPE returned to a higher expected value following an unusually low number in 2003. The burbot population probably

has stabilized at a moderately high level over the past few years.

#### White Perch and White Bass

White bass landings have been reported at very low levels since 2001, but trap net CPE's have increased after 2002. Catchability may have changed since there is no evidence in assessment surveys that there has been an improvement in abundance. The 2001-year class may be responsible for pushing up the CPE in 2004.

White perch landings declined drastically subsequent to the change to trap net gear in the mid-1990's. Market opportunities probably have also had an impact on landings. CPE's have increased slightly since 2000 as the population of white perch has responded to slight increases in year class strength since 2000.

#### ***Fish Stock Status and Trends***

Bottom trawl and gillnet assessment index values are derived annually from gear fished at fixed and random survey sites. Index values represented abundance and expressed as mean catch per unit effort. Indices of abundance, year class development and longevity can be tracked over extended periods, producing trends in stock sizes and other aspects of natural history required for fishery management.

#### Yellow Perch

Both gillnet and trawl surveys conducted in 2004 show a perch stock (age 2 and older) at levels of abundance similar to the 1980's. Only the period of the early 1980's exhibited greater perch numbers. This level of abundance is supported by superior size of the 1994, 1996, 1998 and 2001 year classes. A slight reduction in mean age in the survey gear was attributable to the initial

recruitment of many young fish from the 2003 cohort, rather than losses of older fish from the population. Survival of perch age 3 and older remains high, total mortality for the fishable perch stock is estimated at 40% annual rate for the latest period.

#### Walleye

The Pennsylvania walleye population is now recognized as a composite of locally spawned fish and immigrants from both western and eastern basin origins. Tag return data still confirms the long term behavior of some western Lake Erie older females to annually move through central Lake Erie, subsequent to spring spawn, into Pennsylvania and New York waters. As a consequence, the local walleye stock is well structured with many age groups (mean age about 6 years), but will exhibit year-to-year variations in abundance.

There has been a downward trend in abundance since the late 1980's due ostensibly to a protracted persistence of weak year classes and few substantial ones. The fishable walleye population appears to have "bottomed out" in 2002 and the beginning of walleye stock recovery is at hand. This was induced, in part, to a lakewide attempt to reduce annual allowable harvests by 40%, which in Pennsylvania took the form of engaging a regulation which elevated the minimum size limit for walleye from 15 inches to 18 inches, and reducing the daily creel limit from 6 walleye/day to 4 walleye/day. The appearance of two strong year classes has also boosted the abundance of walleye in the age 2 to 4 component of the population.

The catch rate for the Pennsylvania angling fishery for 2003 and 2004 is at or higher than 0.25 walleye/angler hour. The commercial trap net fishery recorded 7.2 lbs walleye/lift in 2004 and

1.5 lbs walleye/lift in 2003. These values are the highest since the close of the gillnet fishery and probably reflect both a reversal of walleye population declines and advancing experience in trap net fishing.

#### Lake Whitefish

Strong whitefish year classes have not been produced in Lake Erie since the 1990's, although the 2003 year cohort, the strongest since 1989, has had good carry through to yearling age. There appears that a larger than expected population of age 2 and older has been found in Pennsylvania waters. It will be interesting to see if this is more than an ephemeral distribution and persists in our waters in 2005.

#### Forage Fish Populations

After reaching an asymptotic population low in Pennsylvania waters, smelt produced a "positive" year class in 2003 which has only shown weak promise as yearlings in 2004. There is more evidence however this year class is more abundant in other waters of eastern Lake Erie and that a 2004 smelt year class is also larger elsewhere than initially detected in Pennsylvania waters. It is still not clear if there is going to be a trend for local smelt population enhancement since their numbers began to collapse in the mid-1990's.

The emerald shiner has shown a modest 2-year run at increases in population density. A very poor showing in assessment surveys in fall 2004, for 2002 and 2003 year classes fosters more doubt in expectations for this specie's recovery. The poor 2004 year class will not help any rehabilitation since the short lifespan of emerald shiners requires adequate annual year class production to sustain population recovery.

Round goby rank as the most abundant forage fish in Pennsylvania waters, either as YOY or yearling and older age groups. Although survey data suggests a decline in their numbers since their peak abundance in 2000, their densities in 2004 were up, near their average for the period 1998 to 2004. Gobies continue to be a major contributor to the diets of all predatory carnivorous fishes, particularly smallmouth bass, yellow perch and drum.

#### Clupeids

Alewife and gizzard shad have not recovered from serious declines observed in the 1990's. Except for the occasional appearance of a moderate year class, recent history suggests both species survive poorly beyond their first year and the populations will show little scope for improvement.

### ***Sport Fishing Summary***

#### Introduction

Comprehensive analysis of the sport fishing in Pennsylvania waters of Lake Erie has been limited. Historical data on angling activity was provided through synoptic creel surveys in 1981 and 1993. An angler diary program has been in place since 1987, and provides long term (18 year) statistics on catch rate, relative use, catch and harvest.

In 1996, the Lake Erie Research Unit (LERU) initiated an annual boat angling creel survey that would provide accurate estimates of the angling activity for the most frequently targeted fish species on the open lake portion of Lake Erie.

Summary information from the Lake Erie Cooperative Angler Log (LECAL) and the Lake Erie Boat Angler Survey (LEBAS) are used in unison to describe the status and trends of the most frequently targeted, caught and

harvested sport fish in Pennsylvania waters of Lake Erie.

### ***Lake Erie Cooperative Angler Log (LECAL)***

#### Materials and Methods

Since 1987, the Lake Erie Cooperative Angler Log program has collected data on the major species targeted, caught and harvested in Pennsylvania waters of Lake Erie, Presque Isle Bay, and tributaries to Lake Erie. The LERU distributes pre-printed fishing diaries to volunteer anglers who are asked to keep accurate records of their fishing activity. Officially recognized charter captains and fishing guides operating in Pennsylvania waters of the Lake Erie drainage are also required to participate. The participants in this program tend to be above average anglers.

This information presently provides the best historical assessment of sport fishing in Pennsylvania waters of Lake Erie. Anglers are required to minimally record the amount of time they fished, the species that they targeted, where they fished, the type of fishing they did (boat, shore, ice, pier), what species they caught and what species they kept. This information is used to calculate relative use, catch rate and harvest rate. Optional information is sometimes included, such as length and weight of fish that they harvest, incidence of sea lamprey wounding and information on tagged or clipped fish.

As with any diary program, the data should be analyzed and interpreted with appropriate caution. There are inherent biases, such as a tendency to provide incomplete trip, catch and harvest information. Additionally, the participants tend to be specialists (avid anglers, stream guides and charter captains), thus increasing the catch rate over the general angling population.

#### Results

In 2004, 21 LECAL participants returned 35 logbooks detailing 439 fishing trips. LECAL anglers targeted yellow perch (34%), walleye (29%), steelhead trout (29%), smallmouth bass (5%), lake trout (3%), largemouth bass (1%) and coho salmon (0.2%).

The most frequently caught species were yellow perch (71%), walleye (8%), steelhead (6%), white perch (4%), black bass (3%), white bass (2%) and lake trout (1%). The most frequently harvested species were yellow perch (81%), walleye (10%), steelhead (5%) and white perch (1%) (Table S-1).

Summary of catch and harvest data as provided through the LECAL showed that boat anglers frequently caught yellow perch, walleye, steelhead, white perch, sheepshead, smallmouth bass, white bass, lake trout, round goby and rock bass. Shore anglers caught mostly steelhead. LECAL anglers reported no pier or ice angling in 2004.

### ***Lake Erie Boat Angling Survey (LEBAS)***

#### Materials and Methods

Beginning in 1996, the LERU initiated an annual creel survey of the open lake waters of Lake Erie. Extensive creel survey analysis in 1993 provided information on the most frequently used launch facilities by anglers fishing the open lake. Sites were selected from the 1993 comprehensive analysis that demonstrated the highest angler effort, catch and harvest of yellow perch and walleye.

A bus route design was employed to estimate the effort, catch and harvest of walleye, yellow perch, smallmouth bass and steelhead trout on the open lake. Based on the 1993 Lake Erie Angler

Survey, the majority of the open lake angling activity directed at percids was concentrated at four public launch sites: Walnut Creek Access Area; North East Access Area; Lampe Marina, and East Avenue boat launch.

The relative survey intensity at each site was weighted based on anticipated use at these sites. A day-type stratification had creel clerks afield two randomly selected weekday days and one randomly selected weekend day each week. Holidays, if occurring on a weekday, were randomly chosen by computer generation and considered a weekend day type. A time of day stratification was used; each day was divided into two sampling periods of 7.5 hours each, one early (7:00) and one late (14:30), so that all daylight hours were surveyed. The night fishery was not sampled.

The 2004 LEBAS began May 1 and was completed on October 31. A route was constructed containing four (Walnut Creek Access Area, Lampe Marina, East Avenue Boat Launch and North East Access Area) heavily used boat angler launch facilities. Routes were followed progressively in a "circular" manner. By this design, a creel clerk was randomly assigned, without replacement, a starting point on the route each survey day. Because of the randomization of the survey design, data obtained by the creel clerks was expected to reflect angling activity throughout all times of the daylight angling day.

First priority for a clerk on-site was angler counts. Boat counts were tallied as a boat crossed the shore/water interface. Exiting and entering boats were counted. This provided an independent estimate of precision (launching boats should equal landing boats). As boats entered or exited the water, they were characterized as

angling or non-angling, based on responses by people on board.

Second priority for clerks on site was angler interviews. Data was obtained from all cooperative anglers, as time would allow. A variety of information was solicited from interviews including: number of rods fished, group size, amount of time spent fishing, species sought (up to 3), the number of species caught and harvested, if the trip had been chartered and the geographic area of species targeted, caught and harvested. If time was available, clerks were responsible for collecting length measurements and scales from creel fish. These biological measurements were used to construct length frequencies, and age composition of the harvest. During 2004, scales were collected from yellow perch (N=191) and walleye (N=14).

For the purposes of the open lake analysis, statistics of interest were sometimes separated by basin (central v. eastern) to better describe the use, catch and harvest of open lake fish stocks. The effort, catch and harvest estimates for yellow perch, walleye, smallmouth bass and steelhead trout were expanded from estimates derived from 2004 LEBAS sites to lake-wide estimates (PA waters) based on the proportion that these sites represented relative to all sites surveyed during the expansive 1993 Lake Erie Angler Survey.

Results:

In 2004, creel clerks collected 786 completed trip interviews from boat anglers landing at Walnut Creek Access Area (500), North East Access Area (164), East Avenue Boat Launch (63) and Lampe Marina (59). The information provided by cooperative anglers, and counts of launching and landing boats at these areas were used

to provide estimates of effort, catch, harvest, angler success, and catch and harvest rates.

Information collected in 2004 showed that boat anglers targeted yellow perch, walleye, smallmouth bass, steelhead, “anything that bites”, lake trout and largemouth bass (Table S-3). Most of the open lake boat effort was directed at yellow perch (61%), walleye (24%), smallmouth bass (9%), and steelhead trout (3%) (Table S-3).

Boat anglers also caught 16 different “species” and harvested 13 different “species” (Table S-4). Most of the catch was comprised of yellow perch (76%), sheepshead (7%), white bass (5%), round goby (4%), smallmouth bass (3%), white perch (2%), walleye (2%) and largemouth bass (1%). Most of the fish harvest was comprised of yellow perch (96%) and walleye (3%). The following sections expand on the key species that make up the core of the fishery use, catch and harvest in Pennsylvania waters of Lake Erie.

### **Walleye**

The quality of the walleye fishery had been on a steady decline since 1998 in response to a declining walleye population. Catch rate dropped precipitously in 1999, and demonstrated a downward trend until 2002. After 2002, the fishery began showing signs of recovery as angler success increased and catch rates improved. A declining trend in targeted effort has not yet reversed itself, but as the walleye fishing improves we expect anglers will begin to expend more effort targeting walleye as good year classes from 2001 and 2003 recruit into the angling fishery.

#### *Walleye Angler Effort:*

For the third consecutive year, walleye failed to attract the majority of the open

lake boat angling effort. The 2004 fishing season marked a new low in walleye angling effort as anglers only directed an estimated 88,446 hours fishing for walleye (Figure S-1). This represented a 44% decrease from 2003 and a 66% decrease from long-term (9 year) average walleye fishing effort. As usual, the majority (82%) of the effort was concentrated in the central basin. LECAL data substantiated this trend and showed that the majority of the walleye fishing was in the nearshore areas between Elk Creek and Walnut Creek (Table S-6). A monthly analysis of walleye fishing effort showed that walleye fishing started in June, peaked in August and continued to attract a moderate number of anglers in September (Figure S-2).

#### *Walleye Catch and Harvest:*

In 2004, walleye anglers caught an estimated 26,375 walleye and harvested 19,969 walleye. This was a 48 % decrease in catch and a 54% decrease in harvest from 2003 catch and harvests. 2003 exhibited a small spike in walleye catch and harvest estimates, but the trend of declining catch and harvest since 1998 is still apparent (Figure S-1).

Coincident with targeted effort, the majority of the catch (88%) and harvest (89%) was in the central basin. The 2004 walleye catch and harvest showed a shift to later in the summer than was typical of most years. Over a third (35%) of the walleye harvest occurred in September.

#### *Walleye Angler Success and Catch Rate:*

Although catch rates from the 2004 LEBAS walleye assessment declined slightly from 2003 (Figure S-3), supporting evidence from the LECAL

suggests that the walleye fishing is improving. A 2004 walleye angler catch rate of 0.22 walleye/line hour from LECAL data increased from 2003, and is approaching the long-term average (18 years) of 0.24 walleye/line hour (Figure S-4). Additionally, the catch rate by LECAL anglers targeting walleye has increased every year since 2001.

The best walleye fishing continues to be in central basin waters; the catch rate was about three times higher in central basin waters than in eastern basin waters (Table S-7). Overall catch rate in 2004 was equal to the long-term average of 0.25 walleye/angler hour, but the 2004 harvest rate of 0.17 walleye/angler hour was below the long-term average of 0.22 walleye/angler hour. The disparity between improvements in catch and harvest rate can be attributed to the increase in minimum size limit from 15 inches to 18 inches in 2004.

### **Smallmouth Bass**

#### *Smallmouth Bass Angler Effort:*

In 2004, anglers spent an estimated 42,100 hours fishing for smallmouth bass in open lake waters of Lake Erie (Table S-5). Smallmouth bass angler effort decreased slightly (15%) from 2003 and was 49% below the average of the last nine years (Figure S-5). Monthly distribution of effort showed a peak in May and declined steadily throughout the summer. Most anglers are targeting smallmouth bass in the spring. In 2004, May and June accounted for 88% of all effort directed at smallmouth bass. Anglers continue to target smallmouth bass almost exclusively in eastern basin waters.

#### *Smallmouth Bass Catch and Harvest:*

Smallmouth catch estimates decreased 45% when compared with the 2003-

angling season, and declined 61% from the nine-year average (Figure S-5). Catch and release fishing continues to dominated the fishery as 98% of the bass that were caught were released. Total lake-wide estimated smallmouth catch in PA waters was 43,814 bass, with an estimated harvest of 907 bass (Table S-5). LECAL anglers also released most (88%) of their smallmouth catch (Table S-1).

Temporal distribution of catch in 2004 showed that May (52%) and June (27%) accounted for most of the smallmouth catch. (Figure S-6). Spatial distribution of smallmouth bass catch as noted by LECAL anglers showed that most of the smallmouth bass catch was by boat anglers fishing the near-shore areas east of Presque Isle Peninsula (Table S-6).

#### *Smallmouth Angler Success and Catch Rate:*

Most anglers targeting smallmouth bass on Lake Erie are successful in catching at least one bass. In 2004, LEBAS anglers were successful on 79% of their trips and LECAL anglers were successful on 92% of their trips. Although the Lake Erie smallmouth bass fishery continues to provide excellent fishing when compared to other smallmouth bass fisheries, catch rate data from both the LEBAS and the LECAL shows that there was a decline in the quality of the smallmouth bass fishery in 2004. The LEBAS data shows the first decline in smallmouth angler catch rate since 1998 (Figure S-7). The LECAL data shows a less promising picture and suggests that the quality of the Lake Erie smallmouth bass fishing has gradually waned since 1998 (Figure S-8).



## **Yellow Perch**

### *Yellow Perch Angler Effort:*

Angler interest in perch fishing has steadily increased since 1998 and for the third consecutive year, perch had exceeded walleye in directed angler effort. Anglers directed an estimated 238,235 hours (59,341 trips) at yellow perch in 2004 (Table S-5). Effort increased about 27% from 2003 estimates and was 130% higher than the average of the last nine years (Figure S-9). Effort steadily increased in June and July, and peaked in August, and decreased slightly in September (Figure S-10). Few anglers targeted perch in October. Almost 3/4 (74%) of the perch angler effort was concentrated in central basin waters, west of Presque Isle Peninsula. Perch also was also a popular target species by LECAL diarists, who recorded 151 boat angler trips targeting yellow perch in 2004.

### *Yellow Perch Catch and Harvest:*

During the 2004 fishing season angler caught an unprecedented number of perch based on creel survey analysis since 1996. Total catch and harvest in open lake waters was estimated at 750,132 perch and 552,052 perch respectively (Table S-5). This represented a 57% increase in catch and a 33% increase in harvest from 2003 estimates. Relative to the average over the last nine years, catch has increased 188% and harvest increased 169% (Figure S-9). About 83% of the total yellow perch catch and 84% of the total harvest was concentrated in central basin waters. Catch and harvest were about evenly distributed between July, August and September (Figure S-10).

### *Yellow Perch Angler Success and Catch Rate:*

Overall, angler catch rates decreased slightly for perch in 2004 based on data collected through the LEBAS, but were still successful on 94% of the trips in which they targeted perch (Figure S-11). By basin, catch rate decreased in the central basin, but increased in the eastern basin from 2003 estimates (Table S-7). LECAL boat anglers targeting yellow perch in 2004 enjoyed a 100% success rate with a catch rate of 5.3 perch/line hour in 2004. This catch rate represented the highest value in the 18 year history of the LECAL program (Figure S-12).

### *Length and Age of Harvested Yellow Perch:*

Anglers creel yellow perch ranging in size from 7 to 14 inches (Figure S-13), with an average length of 10.3 inches, a small increase from 2003 (10.2"). Less than 1% of the yellow perch measured during sport fishing assessment were under the 8-inch minimum size limit. Mortality of yellow perch caught at depths in excess of 50 feet is high, and some anglers feel compelled to count these fish against the creel out of a sense of a conservation ethic rather than an illegal harvest of undersize fish. The LERU will recommend that the PFBC rescind the 8" MSL in 2006 due to the high mortality of caught and released perch.

Sport caught yellow perch ranged in age from 3 to 13 years. The 1998 year class (age 6) dominated the harvest, representing 34% of the total perch harvest (Figure S-14). The 1996 (age 8) year class also continued to be a significant contributor to the overall perch harvest.

## **Steelhead Trout**

### *Stocking*

The steelhead fishery in Pennsylvania is maintained exclusively through tributary stocking programs. 2004 stocking numbers for trout stocked in the Lake Erie drainage are summarized in Table S-11 (PFBC stocking) and Table S-12 (Cooperative Nursery stocking).

Baseline target stocking in Pennsylvania tributaries to Lake Erie is 1 million yearling steelhead per year. This target was met in 2004 when the PFBC stocked 1,074,384 steelhead, and complimented by sportsman's cooperative nursery stocking of 137,167 steelhead, resulting in total stockings of 1,211,551 steelhead yearlings. Steelhead were stocked in 11 Lake Erie tributaries, as well as Presque Isle Bay. Stream/location stocking allocations are based on angler use and public access. Most steelhead are stocked in Elk Creek, Walnut Creek, Twentymile Creek and Trout Run (Figure S-19). A summary of all trout and salmon species stocked by the PFBC since 1987 is shown in Figure S-20.

### *Steelhead Fishery*

Based on a tributary angler survey conducted from October 2003 through April 2004, the vast majority of the steelhead fishing occurs in the tributaries. The results of this shore based analysis are covered in detail under a separate report (Murray and Shields, 2004), but will be cursorily discussed in this report for comparative purposes and referred to as "the 2003-2004 tributary survey". Although the tributary survey included data collected in 2003 and 2004, we consider summary results in their entirety under the cover of the 2004 Lake Erie Status and Trends Report.

### *Steelhead Angler Effort:*

Total effort directed at steelhead trout by shore (847,444 hours) and boat anglers (19,151 hours) was 866,595 hours. Based on these totals, 98% of the effort directed at steelhead trout in Pennsylvania, originates onshore.

After extrapolation into all areas, and all months, total effort estimated through the 2003-2004 tributary survey was 847,444 hours (200,816 trips) by shore anglers. This represented a 200% increase since the last evaluation in 1993. Effort was highest in October and decreased throughout the late fall into winter. Slight increases in effort were noted in March and April. The bulk of the anglers fished for steelhead in the public access areas on Elk Creek, Walnut Creek, Trout Run and Twentymile Creek.

Total boat angler effort directed at steelhead trout was insignificant relative to the angling effort expended by shore anglers, but the LEBAS data shows annual trends that provide valuable insight into Pennsylvania's steelhead fishery. Results from the 2004 LEBAS estimated the open lake steelhead effort by boat anglers at 19,151 hours (Table S-5). This was a 23% increase from 2003 estimates, but a 43% decrease from the nine-year average of 33,329 hours (Figure S-15). In 2004, 76% of the steelhead effort was concentrated in central basin waters, west of Presque Isle Peninsula. Monthly distribution of steelhead boat angler effort was highest in September (47%) and October (36%). The late season peak in steelhead angler effort is typical of anglers intercepting steelhead as they stage for the annual tributary runs (Figure S-16).

### *Steelhead Angler Catch and Harvest:*

Total estimated catch of steelhead by shore anglers (533,873 steelhead) and

boat anglers (4,889 steelhead) was 538,762 steelhead during the previous angling season. Total estimated harvest by shore anglers (126,880 steelhead) and boat anglers (2,657 steelhead) was 126,537 steelhead during the 2004-angling season.

Creel data collected on the streams estimated that anglers caught 533,873 steelhead and harvested 126,880 steelhead. Based on these totals, shore anglers released over 76% of the steelhead that they caught. Anecdotal reports suggest that steelhead that are released are caught by anglers more than once. The relatively high catch and release philosophy among stream anglers suggests that the creel limit of 3 steelhead/day does not warrant more conservative harvest regulations (1 steelhead/day), but still allows the opportunity for modest harvest opportunities for anglers that take fewer steelhead trips per year.

Boat anglers caught an estimated 4,889 steelhead and harvested an estimated 2,657 steelhead, harvesting about 54% of the steelhead that they caught (Table S-5). A monthly distribution of catch and harvest is depicted in Figure S-6, and shows that most of the steelhead are taken later in the season, coinciding with targeted effort. Boat anglers tended to harvest a greater percentage of the steelhead that they caught, but the total harvest by these anglers remains insignificant.

All LECAL participants recorded catching 938 steelhead, and harvesting 534 steelhead, a 57% harvest rate (Table S-1). Those LECAL anglers that fished the tributaries recorded catching 286 steelhead and keeping only 22 steelhead, harvesting only 8% of the steelhead they caught. LECAL boat anglers recorded catching 938 steelhead and keeping 534 steelhead, a harvest rate of 79% (Table S-1). The

higher retention rate of steelhead by LECAL boat anglers is highly influenced by the number of charter boats reporting under this component. Steelhead harvest by the charter fishery is inconsequential to total steelhead harvest too.

#### *Steelhead Angler Success and Catch Rate:*

The overall catch rate calculated from the results of the 2003-2004 tributary survey was 0.63 steelhead/angler hour and about 50% of those anglers indicated that they were successful in landing at least one steelhead. Monthly analysis of catch rate from the 2003-2004 tributary survey shows considerably higher catch rates during the winter and early spring, than during the fall months. Although the fishing does improve over the course of the season, angler avidity probably influences elevated catch rates also.

Steelhead angler catch rate as calculated from LECAL participants fishing the tributaries was 1.00 steelhead/line hour and these anglers were successful about 68% of the time. Higher catch rates from the LECAL data are influenced by the superior angling ability of LECAL participants relative to the anglers interviewed during the tributary creel survey.

Based on the results of the LEBAS data, half of the anglers targeting steelhead were successful in catching at least one steelhead and landed about one steelhead for every 6 angler hours fished ( 0.16 steelhead/angler hour). The 2004 catch rate improved slightly from 2003, when anglers landed a steelhead for every 7.7 hours fished. Table S-7 shows that the catch rate was nearly equal in central (0.156 steelhead/angler hour) and eastern basin waters (0.160 steelhead/angler hour).

Year	Walleye	Smelt	Yellow perch	White sucker	Redhorse	Carp	Catfish	Bullhead	Drum	Burbot	White perch	White bass	Lake whitefish	TOTAL
1990	10,172	193	183,972	4,143	870	0	9	9	24,545	15,482	72,917	6,378	112,892	431,582
1991	10,296	86	159,352	9,211	3,409	10	60	10	13,733	33,382	52,638	895	300,882	584,100
1992	14,548	46	77,267	5,014	2,540	45	52	15	21,866	22,210	25,701	620	205,133	375,057
1993	29,990	11	28,976	10,557	1,105	0	76	16	11,535	4,197	16,879	834	269,080	373,256
1994	28,205	1	58,765	15,945	3,529	0	476	210	25,316	12,059	47,937	686	350,309	543,438
1995	42,138	0	30,754	12,719	1,717	75	351	23	22,774	30,945	32,892	4,461	169,747	348,596
<b>1996</b>	<b>81</b>	<b>0</b>	<b>5,340</b>	<b>4,125</b>	<b>1,580</b>	<b>0</b>	<b>6,848</b>	<b>872</b>	<b>234</b>	<b>2,262</b>	<b>235</b>	<b>96</b>	<b>2</b>	<b>21,771</b>
<b>1997</b>	<b>193</b>	<b>0</b>	<b>7,398</b>	<b>3,223</b>	<b>766</b>	<b>96</b>	<b>3,806</b>	<b>626</b>	<b>1,117</b>	<b>8,910</b>	<b>1,628</b>	<b>386</b>	<b>1,597</b>	<b>29,696</b>
<b>1998</b>	<b>417</b>	<b>0</b>	<b>5,281</b>	<b>3,544</b>	<b>1,283</b>	<b>132</b>	<b>2,125</b>	<b>972</b>	<b>628</b>	<b>8,963</b>	<b>701</b>	<b>113</b>	<b>3,496</b>	<b>27,655</b>
<b>1999</b>	<b>229</b>	<b>-</b>	<b>2,905</b>	<b>1,864</b>	<b>566</b>	<b>-</b>	<b>1,877</b>	<b>619</b>	<b>677</b>	<b>7,943</b>	<b>201</b>	<b>670</b>	<b>670</b>	<b>20,220</b>
<b>2000</b>	<b>183</b>	<b>-</b>	<b>5,950</b>	<b>862</b>	<b>436</b>	<b>-</b>	<b>1,269</b>	<b>861</b>	<b>567</b>	<b>3,529</b>	<b>379</b>	<b>338</b>	<b>-</b>	<b>20,214</b>
<b>2001</b>	<b>73</b>	<b>-</b>	<b>2,702</b>	<b>755</b>	<b>287</b>	<b>-</b>	<b>601</b>	<b>594</b>	<b>381</b>	<b>4,359</b>	<b>427</b>	<b>43</b>	<b>-</b>	<b>10,222</b>
<b>2002</b>	<b>43</b>	<b>-</b>	<b>2,030</b>	<b>508</b>	<b>142</b>	<b>-</b>	<b>452</b>	<b>18</b>	<b>389</b>	<b>5,177</b>	<b>489</b>	<b>19</b>	<b>25</b>	<b>9,292</b>
<b>2003</b>	<b>129</b>	<b>-</b>	<b>5,050</b>	<b>856</b>	<b>467</b>	<b>-</b>	<b>73</b>	<b>30</b>	<b>936</b>	<b>1,821</b>	<b>408</b>	<b>88</b>	<b>93</b>	<b>9,951</b>
<b>2004</b>	<b>501</b>	<b>-</b>	<b>7,753</b>	<b>1,402</b>	<b>348</b>	<b>-</b>	<b>72</b>	<b>286</b>	<b>1,486</b>	<b>2,401</b>	<b>459</b>	<b>110</b>	<b>91</b>	<b>14,909</b>
MEAN	9,147	22	38,900	4,982	1,270	24	1,210	344	8,412	10,909	16,926	1,049	94,268	187,997

**Table C-1:** Annual commercial harvest in pounds, Pennsylvania waters of Lake Erie (Trap net landings in bold).

Month	Walleye	Yellow perch	White sucker	Redhorse	Catfish	Bullhead	Drum	Burbot	White perch	White bass	Lake whitefish	TOTAL
January	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0
April	0	465	30	5	15	0	0	11	25	3	0	554
May	69	956	45	6	28	0	0	8	585	8	0	1,705
June	92	1,125	194	38	6	0	0	43	630	0	65	2,193
July	18	1,085	243	43	40	0	49	167	488	18	15	2,166
August	7	1,447	375	134	95	13	128	599	405	20	0	3,223
September	58	1,676	331	63	57	51	109	363	52	52	8	2,820
October	241	586	76	14	200	8	0	205	98	9	3	1,440
November	16	413	108	45	18	0	0	90	118	0		808
December	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>501</b>	<b>7,753</b>	<b>1,402</b>	<b>348</b>	<b>459</b>	<b>72</b>	<b>286</b>	<b>1,486</b>	<b>2,401</b>	<b>110</b>	<b>91</b>	<b>14,909</b>

**Table C-2:** Monthly commercial landings in pounds, Pennsylvania waters of Lake Erie, 2004.

Year Class	AGE	FREQUENCY	NUMBER	LENGTH	WEIGHT	CPE
2001	3	0.049	416	208	116	5.94
2000	4	0.617	5,264	236	170	75.20
1999	5	0.097	831	250	219	11.87
1998	6	0.422	3,602	260	240	51.46
1997	7	0.065	554	284	344	7.91
1996	8	0.324	2,770	278	329	39.57
1995	9	0.032	277	308	440	3.96
1994	10	0.016	139	309	430	1.99
Mean age:	5.9		13,298			189.97

length in mm, weight in grams

**Table C-3:** Yellow perch commercial 2004 harvest in numbers by year-class.

Year Class	AGE	CPE	Frequency	Average Length (mm)	Average Weight (g)
2003	1	49.08	14.8%	143	32
2002	2	12.99	3.9%	172	70
2001	3	96.71	29.1%	208	117
2000	4	49.08	14.8%	236	176
1999	5	28.87	8.7%	252	221
1998	6	28.87	8.7%	259	243
1997	7	11.55	3.5%	284	343
1996	8	33.20	10.0%	281	320
1995	9	7.22	2.2%	308	441
1994	10	12.99	3.9%	309	430
1993	11	1.33	0.40%	329	543

mean age: 4.3

331.88

CPE in numbers per 1000 gill net feet

Table A1. Yellow perch population year class structure and relative abundance based upon 2004 gill net assessment.

Year Class	AGE	CPE	Frequency	Average Length (mm)	Average Weight (g)
2003	1	8.63	51.9%	128	25
2002	2	0.75	4.5%	186	79
2001	3	2.50	15.0%	199	99
2000	4	1.00	6.0%	233	156
1999	5	0.38	2.3%	214	212
1998	6	2.13	12.8%	237	194
1997	7	0.25	1.5%	253	235
1996	8	0.50	3.0%	231	296
1995	9	0.13	0.8%	272	246
1994	10	0.25	1.5%	326	507
1993	11	0.13	0.8%	279	341

mean age: 2.8

16.63

CPE in numbers per 10 minute tow

Table A2. Yellow perch population year class structure and relative abundance based upon 2004-fall trawl assessment.

Year	Emerald shiner		Spottail shiner		Smelt		Gizzard shad		Alewife		Goby	
	age 0	age 1+	age 0	age 1+	age 0	age 1+	age 0	age 1+	age 0	age 1+	age 0	age 1+
1982	23	7	2	4	3,750	3,062	120	1	2,265	150		
1983	1	15	1	8	448	393	74	30	7	26		
1984	-	1	3	12	9,417	946	22	-	8	-		
1985	18	44	3	12	706	2,400	69	-	8	-		
1986	126	83	-	22	1,342	469	536	-	3	-		
1987	105	38	13	11	382	1,140	1	-	28	40		
1988	35	6	13	15	3,808	823	4	2	16	4		
1989	21	18	1	7	1,700	2,244	4	-	42	3		
1990	131	6	-	1	634	262	17	-	1	3		
1991	1	7	-	9	35	676	3	1	24	3		
1992	78	26	1	1	2,389	258	-	-	51	12		
1993	3	4	6	20	94	256	1	2	1	-		
1994	1	1	-	-	819	11	1	-	-	-		
1995	14	5	4	6	36	144	-	-	-	-		
1996	53	-	-	-	1,412	32	-	-	-	-		
1997	1	5	-	1	3	26	-	-	-	-		
1998	56	4	4	1	80	14	-	-	0	0		
1999	0	0	0	0	6	2	-	-	-	-		
2000	0	-	-	-	23	21	-	-	0	-	393	34
2001	0	0	-	-	89	2	-	-	-	-	813	246
2002	23	24	-	1	60	2	-	-	1	-	94	27
2003	262	72	-	-	161	5	-	-	1	0	85	19
2004	0	0	0	0	8	4	-	-	-	-	309	230
Mean	41	16	2	6	1,191	574	37	2	107	10	339	111

**Table A-3:** Trawl indices of abundance for age 0, yearling and older forage fishes, Pennsylvania waters of Lake Erie.



Year	Yellow perch	White perch	White bass	Whitefish	*
1981	23	0	81	0	
1982	26	3	73	<1	0
1983	<1	13	3	0	0
1984	385	1883	267	0	0
1985	4	54	74	32	7
1986	125	798	165	1	<1
1987	25	115	2	0	<1
1988	40	858	<1	2	2
1989	<1	185	17	5	15
1990	3	537	15	9	9
1991	5	6	<1	0	12
1992	50	352	0	<1	
1993	38	282	23	<1	0
1994	172	28	3	0	0
1995	20	53	2	0	<1
1996	143	138	0	0	0
1997	0	<1	0	0	<1
1998	33	144	9	0	0
1999	8	5	0.2	0	0
2000	5	23	26	0	0
2001	177	152	152	2	0
2002	4	26	0	0	0
2003	304	151	0	1	12.2
2004	1	<1	0	2	
Mean	72.3	280.4	44.6	2.6	3.4

\* Summer, deep water trawl assessment

index values are numbers per 10 minute trawl tow

**Table A-4:** Fall index values for age 0 fish in Pennsylvania waters of Lake Erie.

Year	CPE, number per 10 min. tow		
	0+	1+	2+ and older
1982	0	0	0
1983	0	0	0
1984	0	0	0.1
1985	7.4	4.4	0.6
1986	0.3	1.3	1.1
1987	0.5	2.3	1.5
1988	2.4	0.1	1.3
1989	14.8	3.2	1.5
1990	9	5	5.8
1991	12	1	13
1992	0.3	0	1
1993	0.5	0	0.9
1994	0	0	0
1995	0.1	0	0.6
1996	0	0	0
1997	0	0	0.5
1998	0	0	0
1999	0	0	0.2
2000	0	0	0
2001	0	0	0
2002	0	0	0
2003	12.2	0	0.2
2004	1.9	0.3	1.1

**Table A-5.** Deep-water trawl index of lake whitefish age groups; 1982 - 2004.

Central Basin	Alewife		Gizzard Shad		Lake Whitefish		Round Goby		Smelt		Trout Perch		White Bass		Emerald Shiner		Spottail Shiner		Yellow Perch		White Perch	
	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO
1990	0.0	0.0	40.9	0.6	0.0	0.0			1,128.2	43.1	0.0	64.2	16.6	5.0	365.5	2.8	0.0	18.2	8.6	50.9	1,527.6	42.0
1991																						
1992	174.3	61.1	0.0	0.0	0.0	0.0			8,205.0	540.6	214.1	132.7	0.0	0.4	33.6	240.7	0.0	0.0	124.8	57.5	887.5	61.5
1993																						
1994	0.0	0.0	2.8	0.0	0.0	0.0			952.9	4.4	1.1	7.2	6.6	2.8	0.0	0.6	0.0	0.0	567.4	2.2	76.3	0.0
1995	0.0	0.0	0.0	0.0	0.0	0.0			106.7	506.0	24.9	53.1	4.4	0.0	53.6	17.7	19.9	17.7	52.0	191.9	136.0	1.7
1996	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	5,422.1	29.9	7.1	0.0	0.0	0.0	3.5	0.0	0.0	0.0	354.1	12.4	331.5	1.8
1997	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	10.3	26.5	0.0	8.8	0.0	0.0	0.0	7.4	0.0	0.0	0.0	14.7	0.0	0.0
1998	0.0	0.0	0.0	0.0	0.0	0.0	743.6	113.1	29.9	1.3	23.1	1.0	0.0	0.0	5.8	0.0	0.0	0.4	13.7	2.5	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0	1,114.4	55.3	1.8	0.0	10.0	0.9	0.0	6.0	0.0	0.0	0.7	0.0	7.2	7.9	8.5	1.9
2000	0.0	0.0	0.0	0.0	0.0	0.0	781.1	126.5	15.3	75.8	23.0	11.5	96.4	1.0	0.0	0.0	0.0	0.0	15.7	3.9	75.9	0.6
2001	0.0	0.0	0.0	0.0	0.0	0.0	1,577.8	55.2	377.4	0.0	7.8	0.6	12.1	57.6	8.5	0.0	0.0	0.0	388.4	41.3	26.6	2.4
2002	0.4	1.3	0.0	0.0	0.0	0.0	289.3	238.3	152.9	6.2	45.6	81.2	0.0	0.4	38.1	107.4	0.0	2.2	11.9	37.5	80.7	38.5
2003	0.0	0.5	0.0	0.0	3.2	0.0	75.3	59.1	177.6	22.1	78.0	50.9	0.0	0.0	81.8	217.5	0.0	0.0	788.0	75.6	173.8	28.6
2004	0.0	0.0	0.0	0.0	0.0	0.0	1,011.3	767.0	20.9	9.9	6.7	5.2	0.0	0.0	0.0	0.0	0.0	0.0	2.4	18.3	2.4	6.2
<b>Average 1990 - 2004</b>	<b>13.4</b>	<b>4.8</b>	<b>3.4</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>621.6</b>	<b>157.2</b>	<b>1,277.0</b>	<b>97.4</b>	<b>34.0</b>	<b>32.1</b>	<b>10.5</b>	<b>5.6</b>	<b>45.4</b>	<b>45.7</b>	<b>1.6</b>	<b>3.0</b>	<b>179.5</b>	<b>39.7</b>	<b>255.9</b>	<b>14.2</b>

Eastern Basin	Alewife		Gizzard Shad		Lake Whitefish		Round Goby		Smelt		Trout Perch		White Bass		Emerald Shiner		Spottail Shiner		Yellow Perch		White Perch	
	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO	YOY	YAO
1990	2.7	1.8	0.9	0.0	0.0	0.0			1,731.6	1,053.8	0.0	5.3	46.9	7.1	1.8	39.4	0.0	10.6	0.4	19.0	72.1	43.8
1991	54.0	7.1	8.4	0.9	0.0	0.0			64.2	1,522.8	3.5	14.2	2.2	0.0	3.5	15.9	0.0	12.4	6.2	7.5	10.6	0.4
1992	19.5	31.5	0.0	0.0	0.0	0.0			600.4	513.2	8.7	106.4	0.0	0.0	151.2	17.9	1.8	2.8	45.9	16.6	227.3	10.9
1993	0.6	0.0	0.0	6.1	0.0	0.0			193.6	536.4	18.2	31.5	26.5	17.7	5.5	8.8	12.2	44.2	71.3	14.4	311.9	0.0
1994	0.0	0.0	0.0	0.0	0.0	0.0			2,066.1	54.7	27.7	0.0	19.4	0.0	1.7	48.1	0.0	0.0	9.4	1.1	55.3	0.0
1995	0.0	0.0	0.0	0.0	0.0	0.0			43.5	37.6	5.9	15.5	0.0	0.0	0.7	0.7	2.2	7.4	11.1	19.9	32.4	0.0
1996	0.0	0.0	0.0	0.0	0.0	0.0			130.3	54.1	1.7	1.9	0.0	1.0	132.6	4.3	0.0	0.0	17.9	0.0	16.0	0.0
1997	0.0	0.0	0.0	0.0	0.0	1.5			1.5	85.5	0.0	85.5	0.0	1.5	2.9	10.3	0.0	2.9	0.0	25.1	1.5	1.5
1998	0.7	0.1	0.0	0.0	0.0	0.2	131.4	72.1	641.5	42.2	165.5	16.6	8.0	3.2	108.2	8.6	23.9	10.0	107.2	3.5	281.4	0.4
1999	0.0	0.0	0.0	0.0	0.0	0.0	171.7	11.9	35.6	14.1	0.8	0.6	0.9	9.5	1.4	0.0	0.3	0.3	16.6	110.1	2.4	2.1
2000	0.0	0.0	0.0	0.0	0.0	0.0	1,350.6	27.2	136.1	0.0	9.7	0.0	1.0	0.0	0.0	0.0	0.0	0.0	4.9	0.5	7.8	0.0
2001	0.0	0.0	0.0	0.0	9.2	0.0	2,159.3	1,259.8	34.6	13.9	15.9	11.7	4.6	32.4	0.0	4.6	0.0	0.0	443.8	66.2	677.4	49.5
2002	0.8	4.5	0.8	0.0	0.0	0.0	18.2	25.7	98.0	6.5	0.0	0.0	0.0	0.0	74.4	105.6	0.0	0.8	3.3	16.5	0.0	0.0
2003	2.5	0.0	0.0	0.0	1.8	0.0	323.5	63.8	592.2	32.4	230.6	26.0	0.0	0.6	1,163.4	157.6	0.0	0.0	572.8	40.7	523.9	70.4
2004	0.0	0.0	0.0	0.0	15.0	11.0	560.9	366.6	12.3	12.3	46.2	114.1	0.0	0.8	0.0	0.0	0.0	0.0	5.0	89.0	0.0	0.0
<b>Average 1990 - 2004</b>	<b>5.6</b>	<b>3.1</b>	<b>0.7</b>	<b>0.5</b>	<b>1.9</b>	<b>0.9</b>	<b>673.6</b>	<b>261.0</b>	<b>332.1</b>	<b>209.0</b>	<b>38.2</b>	<b>30.3</b>	<b>4.5</b>	<b>4.8</b>	<b>117.5</b>	<b>27.3</b>	<b>2.9</b>	<b>5.8</b>	<b>94.0</b>	<b>29.4</b>	<b>153.4</b>	<b>9.7</b>

**Table A-6:** Catch per hectare of forage size fishes age 0 and yearling and older (YAO) in Pennsylvania waters of Lake Erie from fall trawl assessment 1990 - 2004.

Species	BOAT		SHORE/WADE		TOTAL	
	Catch	Harvest	Catch	Harvest	Catch	Harvest
Yellow Perch	10,520	8,142	0	0	10,520	8,142
Walleye	1,225	1,056	0	0	1,225	1,056
Steelhead	652	512	286	22	938	534
White Perch	645	140	0	0	645	140
Sheepshead	570	0	0	0	570	0
Smallmouth Bass	498	61	2	0	500	61
White Bass	280	17	0	0	280	17
Lake Trout	96	65	0	0	96	65
Round Goby	64	40	0	0	64	40
Rock Bass	24	4	1	0	25	4
Coho	9	9	5	1	14	10
Largemouth Bass	13	1	0	0	13	1
Channel Catfish	6	5	0	0	6	5
"Sucker"	0	0	4	0	4	0
Brown Trout	2	2	0	0	2	2
Northern Pike	2	0	0	0	2	0
Smolt	0	0	2	0	2	0
Crappie	0	0	2	0	2	0
Chinook	1	1	0	0	1	1

**Table S-1:** Catch and harvest of all species by Lake Erie Cooperative Angler Log participants by fishing trip type for 2004

Statistics		Walleye	Yellow Perch	Smallmouth Bass	Steelhead
<b>Boat</b>					
Trips		126	151	13	48
Catch / line hr		0.218	5.258	0.583	0.220
Lines		6.9	4.2	5.615	8.3
Time (hrs)		6.4	4.4	6.827	6.0
Success (%)		95%	100%	92%	98%
<b>Ice</b>					
Trips		-	-	-	-
Catch / line hr		-	-	-	-
Lines		-	-	-	-
Time (hrs)		-	-	-	-
Success (%)		-	-	-	-
<b>Pier</b>					
Trips		-	-	-	-
Catch / line hr		-	-	-	-
Lines		-	-	-	-
Time (hrs)		-	-	-	-
Success (%)		-	-	-	-
<b>Shore</b>					
Trips		-	-	6	79
Catch / line hr		-	-	0.210	0.996
Lines		-	-	1.2	1.3
Time (hrs)		-	-	2.0	3.4
Success (%)		-	-	33%	68%
<b>Com bined</b>					
Trips		126	151	19	127
Catch / line hr		0.218	5.258	0.465	0.703
Lines		6.9	4.2	4.2	3.9
Time (hrs)		6.4	4.4	5.3	4.3
Success (%)		95%	100%	74%	80%

**Table S-2:** Species specific statistics (number of trips, catch rate, average number of lines, average trip length, and percent of successful trips) by fishing trip type and combined trips, based on information provided through the 2004 Lake Erie Cooperative Angler Log.

	Central Basin	Eastern Basin	Total Open Lake
# of Interviews	544	242	786
Total Effort ( Hours)	191,899	86,347	278,246
Yellow Perch	124,322	44,348	168,670
Walleye	54,422	11,647	66,069
Smallmouth Bass	3,130	21,836	24,965
Steelhead	8,763	2,728	11,491
"Anything That Bites"	1,262	3,191	4,453
Lake Trout	0	2,304	2,304
Largemouth Bass	0	294	294

**Table S-3:** Estimated angler hours directed at various fish species in central basin, eastern basin and total open lake waters of Lake Erie in Pennsylvania by anglers landing at Walnut Creek Access Area, Lampe marina, East Avenue Boat Launch and North East Access Area during 2004.

	Central Basin		East Basin		Total Open Lake	
# of Interviews	544		242		786	
Angler Hours	191,899		86,347		278,246	
	Catch	Harvest	Catch	Harvest	Catch	Harvest
Yellow Perch	567,643	424,615	114,977	83,272	682,620	507,888
Sheepshead	34,784	19	26,911	22	61,695	40
White Bass	34,885	2,280	8,528	396	43,414	2,676
Round Goby	12,762	21	20,551	0	33,313	21
Smallmouth Bass	6,669	158	19,181	395	25,850	553
White Perch	11,231	421	9,352	2,466	20,582	2,887
Walleye	16,442	12,098	2,173	1,481	18,615	13,579
Largemouth Bass	51	0	6,593	56	6,643	56
Steelhead	1,888	1,225	1,046	369	2,933	1,594
Rock Bass	441	67	1,376	0	1,817	67
Lake Trout	35	35	407	311	442	346
Channel Catfish	85	0	141	0	225	0
Carp	31	0	38	0	69	0
Crappie	63	63	0	0	63	63
Coho	52	52	0	0	52	52
Smelt	0	0	48	0	48	0

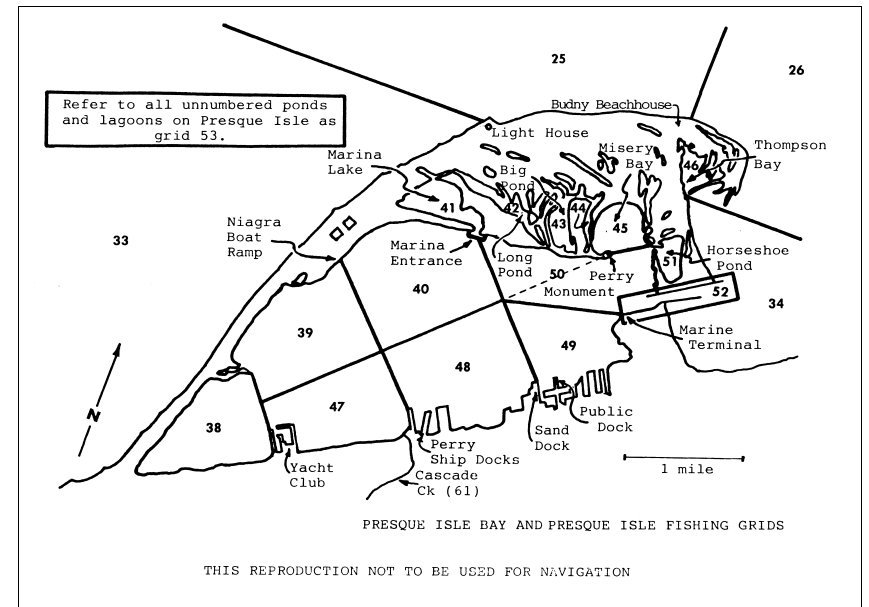
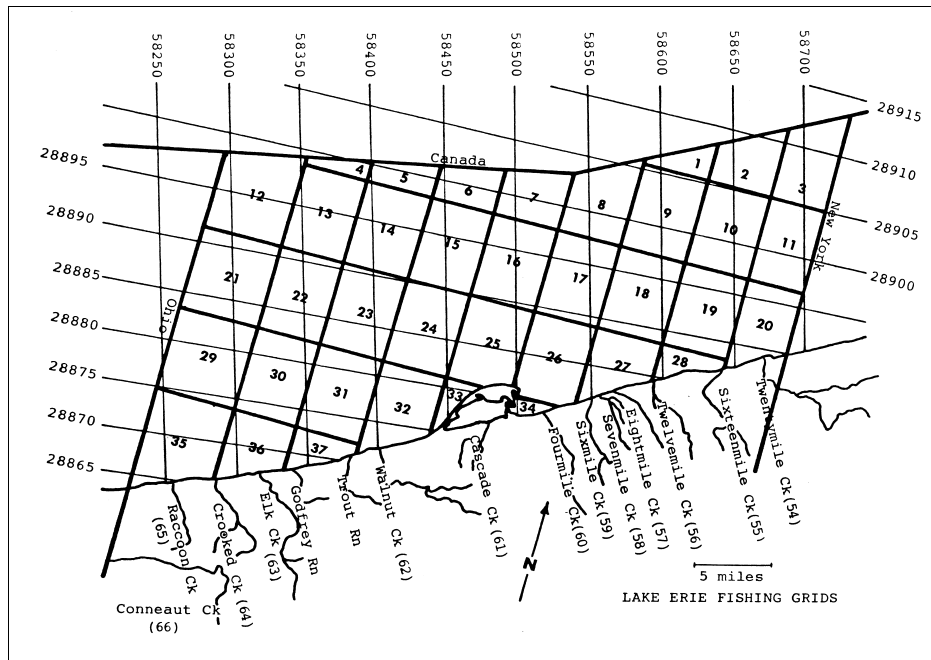
**Table S-4:** Estimated Catch and harvest of various fish species in central basin, eastern basin and total open lake waters of Lake Erie in Pennsylvania by anglers landing at Walnut Creek Access Area, Lampe marina, East Avenue Boat Launch and North East Access Area during 2004.

		Central Basin Waters			Eastern Basin Waters			Total Open Lake Waters		
		Effort	Catch	Harvest	Effort	Catch	Harvest	Effort	Catch	Harvest
<b>Walleye</b>	May	453	0	0	751	32	32	1,204	32	32
	June	11,818	2,130	1,781	4,870	492	445	16,688	2,622	2,226
	July	15,436	2,796	1,889	2,702	380	380	18,138	3,176	2,269
	Aug	26,761	10,538	6,698	3,758	1,393	821	30,519	11,931	7,520
	Sept	15,606	7,716	6,584	3,511	852	452	19,116	8,569	7,036
	Oct	2,781	999	838	0	46	46	2,781	1,046	884
	<b>Total</b>	<b>72,855</b>	<b>24,180</b>	<b>17,791</b>	<b>15,592</b>	<b>3,195</b>	<b>2,177</b>	<b>88,446</b>	<b>27,375</b>	<b>19,969</b>
<b>Smallmouth Bass</b>	May	3,514	4,671	44	21,262	18,102	0	24,776	22,773	44
	June	928	2,595	0	11,469	9,446	478	12,398	12,041	478
	July	487	1,580	124	1,503	791	0	1,990	2,371	124
	Aug	0	1,194	92	1,804	1,894	65	1,804	3,088	156
	Sept	348	1,226	0	236	1,468	105	584	2,694	105
	Oct	0	38	0	548	809	0	548	847	0
	<b>Total</b>	<b>5,278</b>	<b>11,304</b>	<b>259</b>	<b>36,822</b>	<b>32,510</b>	<b>648</b>	<b>42,100</b>	<b>43,814</b>	<b>907</b>
<b>Yellow Perch</b>	May	4,005	6,836	3,592	3,602	13,303	6,227	7,607	20,139	9,819
	June	16,517	51,717	37,132	13,793	15,879	11,180	30,310	67,597	48,311
	July	41,168	165,772	123,749	7,498	24,172	17,847	48,666	189,944	141,597
	Aug	64,140	188,952	147,170	22,133	52,771	37,919	86,272	241,723	185,090
	Sept	44,908	192,822	136,998	13,317	17,904	15,421	58,225	210,727	152,419
	Oct	4,858	17,684	12,897	2,297	2,319	1,919	7,155	20,003	14,816
	<b>Total</b>	<b>175,596</b>	<b>623,783</b>	<b>461,538</b>	<b>62,639</b>	<b>126,348</b>	<b>90,514</b>	<b>238,235</b>	<b>750,132</b>	<b>552,052</b>
<b>Steelhead Trout</b>	May	0	0	0	271	0	0	271	0	0
	June	0	0	0	36	31	0	36	31	0
	July	0	0	0	1,437	363	355	1,437	363	355
	Aug	1,542	350	238	57	473	46	1,599	823	285
	Sept	6,338	1,368	848	2,634	877	214	8,972	2,245	1,062
	Oct	6,725	1,428	955	111	0	0	6,836	1,428	955
	<b>Total</b>	<b>14,605</b>	<b>3,146</b>	<b>2,041</b>	<b>4,546</b>	<b>1,743</b>	<b>615</b>	<b>19,151</b>	<b>4,889</b>	<b>2,657</b>

**Table S-5:** Monthly and total open lake effort (angler hours), catch and harvest for walleye, smallmouth bass, yellow perch and steelhead in central basin, eastern basin and total open lake waters of Lake Erie in Pennsylvania as estimated through the results of the 2004 Lake Erie Boat Angler Survey.

	Grids Producing				
	Greatest Catch	2nd Greatest Catch	3rd Greatest Catch	4th Greatest Catch	5th Greatest Catch
Walleye	37	32	36	6	31
Smallmouth Bass	22	27	28	24	32
Yellow Perch	25	31	24	32	20
Steelhead	63	6	27	37	7
Coho	63	32	27	48	-

**Table S-6:** Grids (areas) producing the greatest catch of walleye, smallmouth bass, yellow perch, steelhead and coho salmon as reported by participants in the 2004 Lake Erie Cooperative Angler Log.





		Central Basin				East Basin				Total Open Lake			
		N	% Success	CUE	HUE	N	% Success	CUE	HUE	N	% Success	CUE	HUE
<b>Walleye</b>	1996	313	69%	0.37	0.30	155	50%	0.15	0.12	468	62%	0.30	0.24
	1997	276	75%	0.37	0.34	138	43%	0.15	0.14	414	64%	0.30	0.27
	1998	367	76%	0.39	0.31	146	51%	0.20	0.16	513	69%	0.35	0.27
	1999	272	72%	0.31	0.29	144	39%	0.13	0.12	416	60%	0.24	0.23
	2000	145	65%	0.31	0.29	101	59%	0.23	0.21	246	63%	0.27	0.26
	2001	147	61%	0.21	0.17	68	50%	0.14	0.13	215	58%	0.19	0.16
	2002	176	64%	0.15	0.15	65	43%	0.09	0.08	241	58%	0.13	0.13
	2003	171	74%	0.31	0.25	54	48%	0.21	0.19	225	68%	0.28	0.24
	2004	166	65%	0.29	0.20	41	34%	0.10	0.07	207	59%	0.25	0.17
<b>Smallmouth Bass</b>	1996	41	85%	1.14	0.07	78	82%	0.87	0.09	119	83%	0.96	0.09
	1997	41	76%	0.85	0.06	79	89%	1.18	0.07	120	84%	1.07	0.07
	1998	18	83%	1.12	0.11	87	84%	1.31	0.04	105	83%	1.27	0.05
	1999	21	52%	0.55	0.02	93	73%	0.58	0.07	114	69%	0.57	0.06
	2000	14	64%	0.25	0.01	49	86%	0.86	0.06	63	81%	0.72	0.05
	2001	14	71%	0.54	0.04	46	78%	1.25	0.00	60	77%	1.08	0.01
	2002	16	81%	1.21	0.08	50	92%	1.36	0.08	66	89%	1.32	0.08
	2003	11	82%	0.93	0.00	48	98%	1.87	0.04	59	95%	1.69	0.04
	2004	11	82%	0.76	0.01	62	79%	0.86	0.01	73	79%	0.84	0.01
<b>Yellow Perch</b>	1996	44	52%	0.99	0.81	33	52%	0.76	0.60	77	52%	0.89	0.72
	1997	54	72%	1.08	0.94	21	72%	1.86	0.98	75	72%	1.30	0.96
	1998	59	69%	1.46	1.40	19	42%	0.74	0.29	78	63%	1.29	1.13
	1999	33	76%	1.75	1.28	16	43%	0.56	0.40	49	65%	1.36	0.99
	2000	33	79%	2.52	1.89	32	78%	2.72	1.68	65	78%	2.62	1.78
	2001	160	95%	4.35	3.76	36	69%	2.60	1.45	196	90%	4.03	3.34
	2002	307	90%	4.29	3.61	100	86%	3.00	2.35	407	89%	3.98	3.30
	2003	267	96%	6.23	5.28	66	88%	2.11	1.94	333	94%	5.42	4.62
	2004	389	97%	5.28	3.94	135	85%	2.58	1.71	524	94%	4.58	3.36
<b>Steelhead Trout</b>	1996	36	17%	0.05	0.03	11	18%	0.02	0.01	47	17%	0.04	0.03
	1997	45	22%	0.03	0.02	4	0%	0.00	0.00	49	20%	0.03	0.02
	1998	52	40%	0.12	0.08	6	33%	0.05	0.05	58	40%	0.11	0.08
	1999	39	44%	0.14	0.14	14	29%	0.07	0.06	53	40%	0.12	0.12
	2000	37	63%	0.58	0.37	3	67%	0.02	0.02	40	62%	0.54	0.34
	2001	18	50%	0.30	0.13	12	42%	0.09	0.05	30	47%	0.22	0.10
	2002	49	57%	0.18	0.12	13	38%	0.02	0.01	62	53%	0.14	0.10
	2003	33	48%	0.13	0.07	5	20%	0.00	0.00	38	45%	0.11	0.06
	2004	42	55%	0.16	0.10	16	38%	0.16	0.05	58	50%	0.16	0.08

**Table S-7:** Number of interviews (N), number of successful trips (% success), catch per angler hour (CUE), and harvest per angler hour (HUE) in central basin, eastern basin and total open lake waters of Lake Erie in Pennsylvania for walleye, smallmouth bass, yellow perch and steelhead for the 1996 – 2004 Lake Erie Boat Angler Surveys.

		Central Basin			East Basin			Total Open Lake		
		Effort (hours)	Catch	Harvest	Effort (hours)	Catch	Harvest	Effort (hours)	Catch	Harvest
<b>Walleye</b>	<b>1996</b>	208,246	86,954	72,040	107,910	21,256	17,047	316,157	108,210	89,087
	<b>1997</b>	241,237	78,259	72,357	147,258	17,394	16,325	388,494	95,653	88,682
	<b>1998</b>	297,680	132,603	105,627	92,067	24,458	19,187	389,747	157,060	124,814
	<b>1999</b>	295,418	79,663	76,512	101,091	12,805	12,526	396,509	92,467	89,038
	<b>2000</b>	140,822	63,670	58,310	103,294	20,740	19,205	244,116	84,410	77,515
	<b>2001</b>	158,025	45,339	40,618	83,221	16,702	12,072	241,246	62,041	52,690
	<b>2002</b>	87,626	17,808	16,979	42,818	5,377	5,102	130,444	23,186	22,081
	<b>2003</b>	110,840	40,885	32,767	48,199	11,403	10,814	159,039	52,289	43,581
	<b>2004</b>	72,855	24,180	17,791	15,592	3,195	2,177	88,446	27,375	19,969
<b>Smallmouth Bass</b>	<b>1996</b>	49,430	81,846	5,561	97,688	159,000	16,002	147,118	240,846	21,562
	<b>1997</b>	45,148	69,079	10,621	106,611	168,455	12,825	151,760	237,534	23,445
	<b>1998</b>	12,054	20,357	2,767	60,480	101,001	4,613	72,534	121,358	7,381
	<b>1999</b>	18,907	20,070	1,091	103,028	74,285	14,195	121,934	94,356	15,285
	<b>2000</b>	19,968	8,649	913	65,906	43,857	4,089	85,874	52,506	5,003
	<b>2001</b>	9,057	9,066	974	33,780	71,331	1,508	42,837	80,397	2,483
	<b>2002</b>	6,279	18,912	1,133	26,189	43,292	1,507	32,468	62,205	2,640
	<b>2003</b>	6,527	8,453	518	42,890	70,547	2,245	49,417	79,000	2,763
	<b>2004</b>	5,278	11,304	259	36,822	32,510	648	42,100	43,814	907
<b>Yellow Perch</b>	<b>1996</b>	18,148	15,284	12,433	10,299	10,546	7,667	28,448	25,830	20,100
	<b>1997</b>	43,377	32,955	28,891	13,744	13,492	5,516	57,121	46,447	34,408
	<b>1998</b>	30,613	37,929	35,174	4,084	4,370	1,779	34,697	42,299	36,953
	<b>1999</b>	28,486	53,804	35,542	13,623	8,564	5,566	42,109	62,368	41,108
	<b>2000</b>	48,561	117,633	80,050	21,146	52,190	32,852	69,707	169,824	112,902
	<b>2001</b>	77,686	240,921	202,913	12,450	30,140	19,093	90,136	271,061	222,006
	<b>2002</b>	123,287	374,252	308,057	61,735	126,775	104,023	185,022	501,027	412,080
	<b>2003</b>	138,721	393,484	336,396	49,048	85,196	77,654	187,770	478,681	414,050
	<b>2004</b>	175,596	623,783	461,538	62,639	126,348	90,514	238,235	750,132	552,052
<b>Steelhead Trout</b>	<b>1996</b>	20,071	951	381	3,826	574	499	23,897	1,525	880
	<b>1997</b>	41,039	2,642	1,721	4,123	110	0	45,163	2,752	1,721
	<b>1998</b>	36,634	6,227	4,348	2,879	947	947	39,513	7,174	5,295
	<b>1999</b>	45,070	8,332	6,306	21,870	1,613	1,095	66,939	9,945	7,401
	<b>2000</b>	27,071	14,368	9,880	1,504	1,301	1,131	28,575	15,669	11,011
	<b>2001</b>	9,382	8,760	4,193	21,989	4,612	2,859	31,371	13,372	7,053
	<b>2002</b>	21,601	7,409	4,552	8,218	1,416	676	29,819	8,825	5,229
	<b>2003</b>	13,079	3,321	1,430	2,456	884	287	15,535	4,205	1,717
	<b>2004</b>	14,605	3,146	2,041	4,546	1,743	615	19,151	4,889	2,657

**Table S-8:** Estimated angler effort (angler hours), catch and harvest in central basin, eastern basin and total open lake waters of Lake Erie in Pennsylvania for walleye, smallmouth bass, yellow perch and steelhead for the 1996 – 2004 Lake Erie Boat Angler Surveys.

Year Class	2001	2000	1999	1998	1997	1996	1995	1994	1992	1991	Total	Mean
Age	3	4	5	6	7	8	9	10	12	13		6.36
CPE	0.21	0.35	0.37	1.15	0.35	0.55	0.14	0.18	0.04	0.02	3.36	
%	6.3%	10.5%	11.1%	34.2%	10.5%	16.3%	4.2%	5.3%	1.1%	0.5%		
N	34,866	58,111	61,016	188,860	58,111	90,072	23,244	29,055	5,811	2,906	552,052	
LENGTH	227	235	252	259	270	276	288	312	308	266		
WEIGHT	155	152	195	214	263	281	330	353	413	265		

Minimum size limit of 8.0 inches ( 203 mm ) in effect  
weight in grams

**Table S- 9:** Yellow perch 2004 sport harvest numbers, year class structure for Lake Erie fishery

Year Class	2001	2000	1999	1998	1997	1996	1990	Total	Mean
Age	3	4	5	6	7	8	14		5.8
%	7.1	21.4	28.6	21.4	7.1	7.1	7.1		
N	1,417	4,273	5,711	4,273	1,417	1,417	1,417	19,969	
LENGTH	463	495	596	583	638	577	756		
WEIGHT	991	1181	2229	1860		1806	4299		

CPE - .17

CPE - number per angler-line hour; harvest rate

Length in mm, Weight in grams

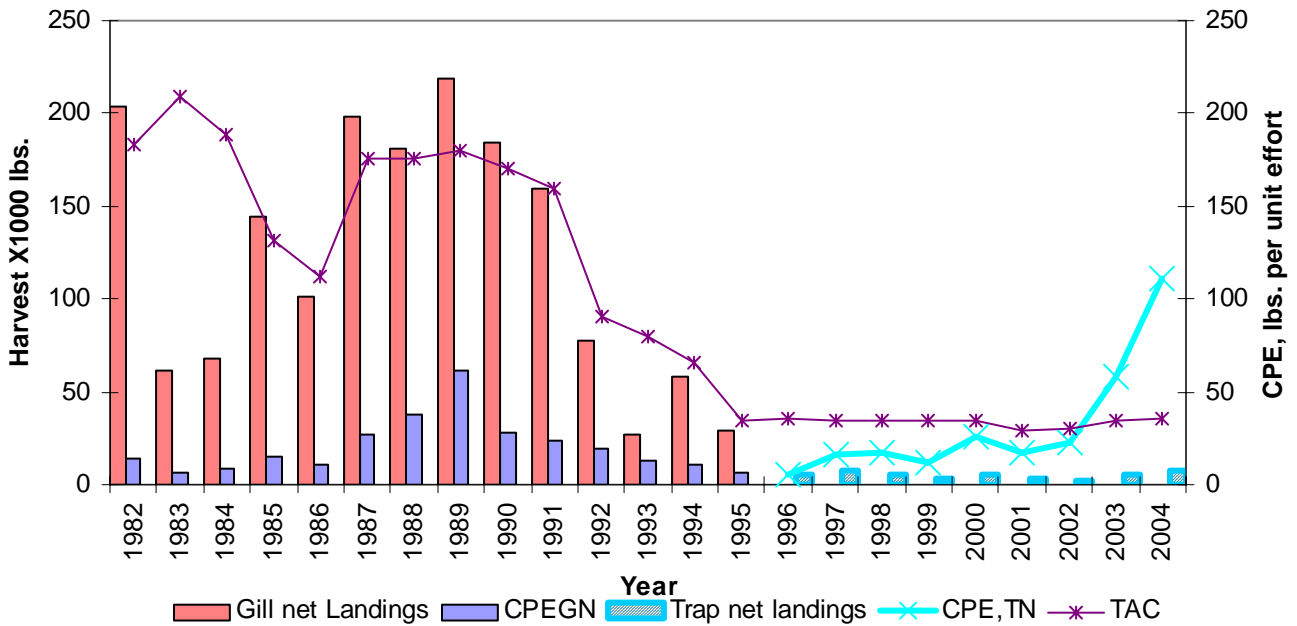
**Table S-10:** 2004 walleye sport harvest numbers, age structure and harvest rates for Pennsylvania waters, Lake Erie.  
(Data for year class distribution restricted by limited samples.)

Hatchery	Species	Stocking Location	Number Stocked
Fairview FCS	Steelhead Trout	Conneaut Creek	75,000
Linesville FCS	Steelhead Trout	Raccoon Creek	48,501
Fairview FCS	Steelhead Trout	Crooked Creek	58,192
Tionesta FCS	Steelhead Trout	Elk Creek	261,900
Fairview FCS	Steelhead Trout	Godfrey Run	38,802
Fairview FCS	Steelhead Trout	Trout Run	84,750
Tionesta FCS	Steelhead Trout	Walnut Creek	222,588
Fairview/Linesville/Tionesta FCS	Steelhead Trout	Presque Isle Bay	56,685
Fairview FCS	Steelhead Trout	Fourmile Creek	14,550
Tionesta FCS	Steelhead Trout	Sevenmile Creek	19,400
Fairview FCS	Steelhead Trout	Twelvemile Creek	38,816
Tionesta FCS	Steelhead Trout	Twentymile Creek	155,200
			1,074,384 Total Steelhead
Corry FCS	Brown Trout	Cascade Creek	1,400
Corry FCS	Brown Trout	Conneaut Creek	2,470
Corry FCS	Brown Trout	Crooked Creek	2,400
Corry FCS	Brown Trout	Elk Creek	14,300
Corry FCS	Brown Trout	Twentymile Creek	3,200
			23,770 Total Brown Trout

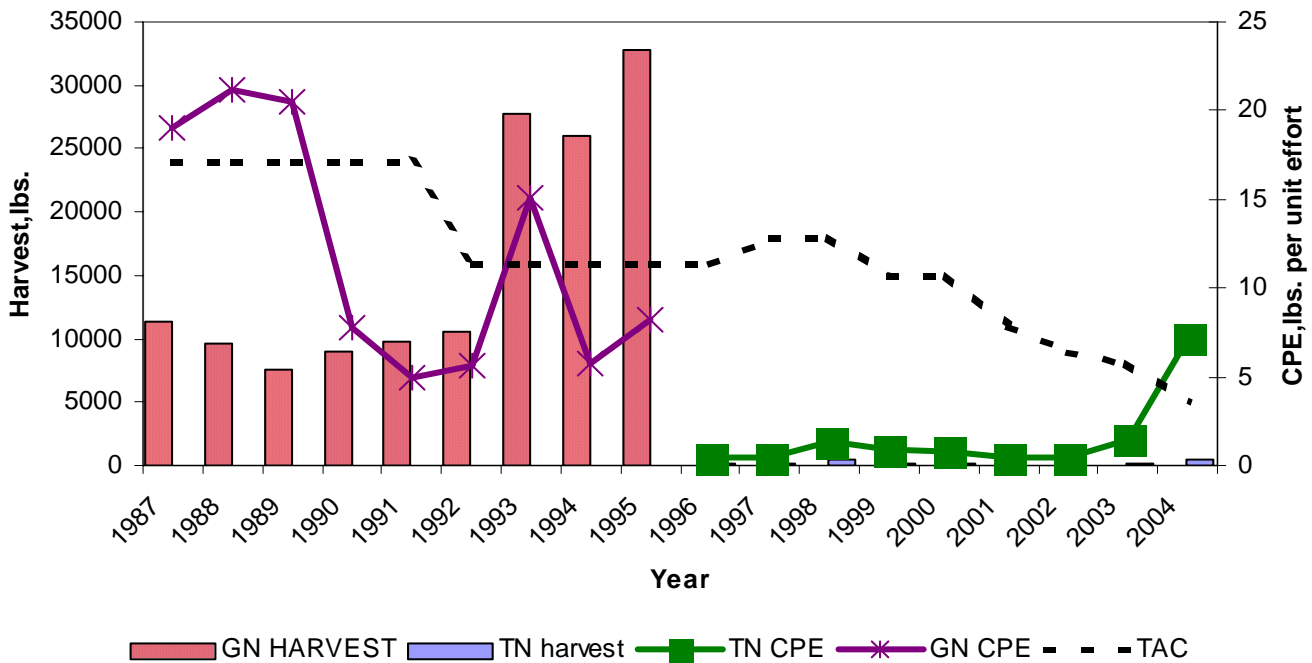
**Table S-11:** Lake Erie drainage Steelhead Trout and Brown Trout stocking numbers in 2004 by Pennsylvania Fish and Boat Commission hatchery, by location.

Cooperative Hatchery	Species/Strain	Stocking Location	Number Stocked
3-C-U	Brook Trout	Godfrey Run	475
3-C-U	Brook Trout	Sevenmile Creek	150
Albion Sportsman's Club	Brook Trout	Elk Creek	200
Albion Sportsman's Club	Brook Trout	Temple Run	8,600
Albion Sportsman's Club	Brook Trout	West Branch of Conneaut Creek	1,950
			<b>11,375 Total Brook Trout</b>
3-C-U	Brown Trout	Lake Erie	13,000
3-C-U	Brown Trout	Walnut Creek	300
Albion Sportsman's Club	Brown Trout	Elk Creek	200
Albion Sportsman's Club	Brown Trout	Little Elk Creek	1,400
Albion Sportsman's Club	Brown Trout	Temple Run	8,205
Albion Sportsman's Club	Brown Trout	West Branch of Conneaut Creek	2,350
Wesleyville Sportsman's Club	Brown Trout	Fourmile Creek	490
Wesleyville Sportsman's Club	Brown Trout	Sevenmile Creek	400
Wesleyville Sportsman's Club	Brown Trout	Twelvemile Creek	235
			<b>26,580 Total Brown Trout</b>
3-C-U	Golden Rainbow Trout	Godfrey Run	15
3-C-U	Golden Rainbow Trout	Sevenmile Creek	10
Wesleyville Sportsman's Club	Golden Rainbow Trout	Fourmile Creek	33
Wesleyville Sportsman's Club	Golden Rainbow Trout	Sevenmile Creek	10
Wesleyville Sportsman's Club	Golden Rainbow Trout	Twelvemile Creek	35
			<b>103 Total Golden Rainbow Trout</b>
Albion Sportsman's Club	Rainbow Trout (Domestic)	Elk Creek	100
Albion Sportsman's Club	Rainbow Trout (Domestic)	Temple Run	450
Albion Sportsman's Club	Rainbow Trout (Domestic)	West Branch of Conneaut Creek	50
			<b>600 Total Rainbow Trout</b>
3-C-U	Steelhead Trout	Elk Creek	11,500
3-C-U	Steelhead Trout	Godfrey Run	56,000
3-C-U	Steelhead Trout	Trout Run	40,000
3-C-U	Steelhead Trout	Walnut Creek	28,000
Wesleyville Sportsman's Club	Steelhead Trout	Fourmile Creek	585
Wesleyville Sportsman's Club	Steelhead Trout	Sevenmile Creek	620
Wesleyville Sportsman's Club	Steelhead Trout	Twelvemile Creek	462
			<b>137,167 Total Steelhead Trout</b>
S.O.N.S.	Walleye Fry	Lake Erie	800,000
S.O.N.S	Yellow Perch Fry	Presque Isle Bay	1,000,000

**Table S-12:** Stocking by Sportsman's Cooperative Nurseries in 2004, by hatchery, by species/strain, by location.



**Figure C-1:** Yellow perch commercial landings 1982 - 2004, Pennsylvania waters of Lake Erie.



**Figure C-2:** Commercial walleye landings 1987 - 2004, Pennsylvania waters of Lake Erie.

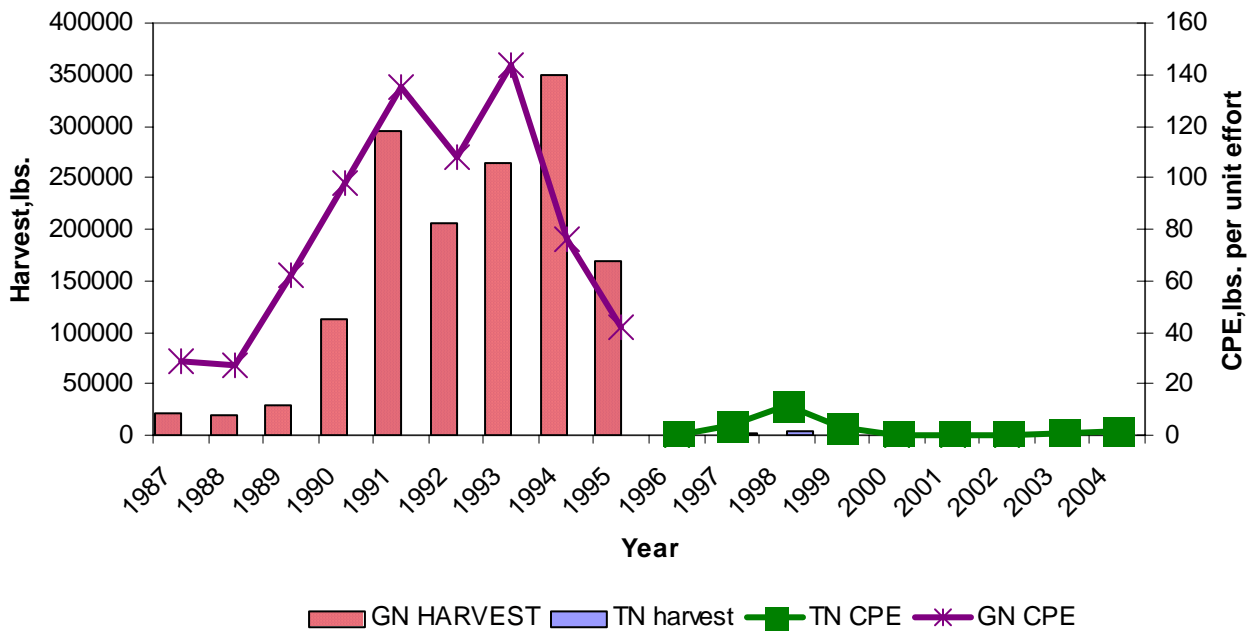


Figure C-3: Commercial whitefish landings 1987 - 2004, Pennsylvania waters of Lake Erie.

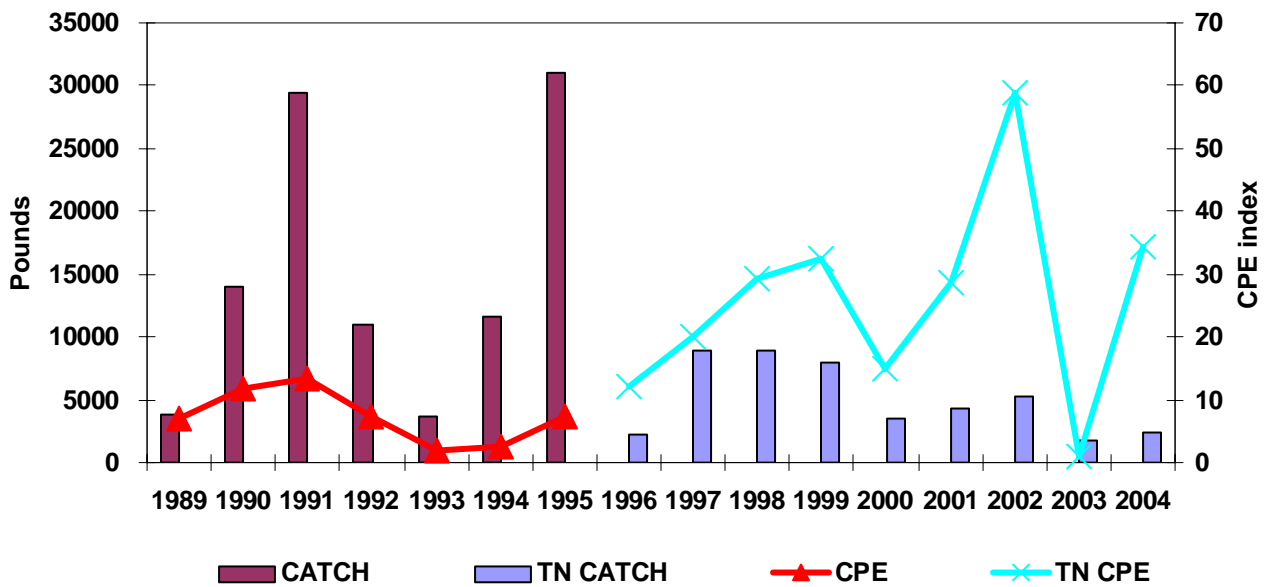


Figure C-4: Commercial burbot landings 1989 - 2004, Pennsylvania waters of Lake Erie.

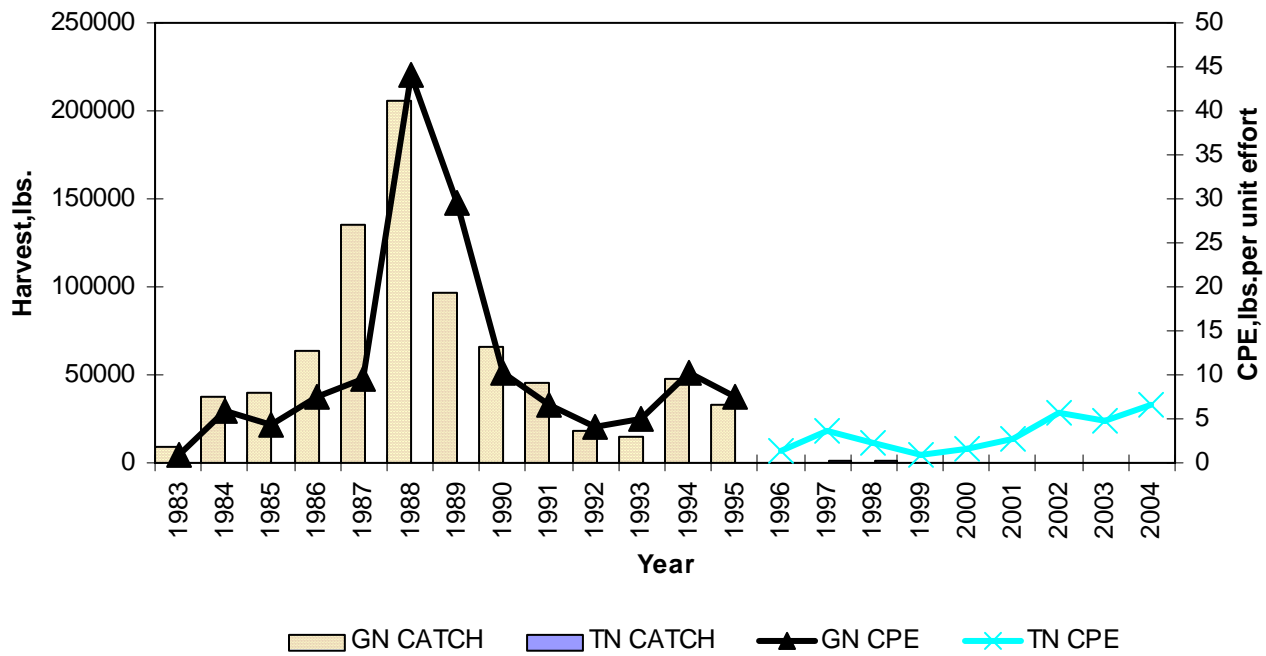


Figure C-5: Commercial white perch landings 1983 – 2004, Pennsylvania waters of Lake Erie.

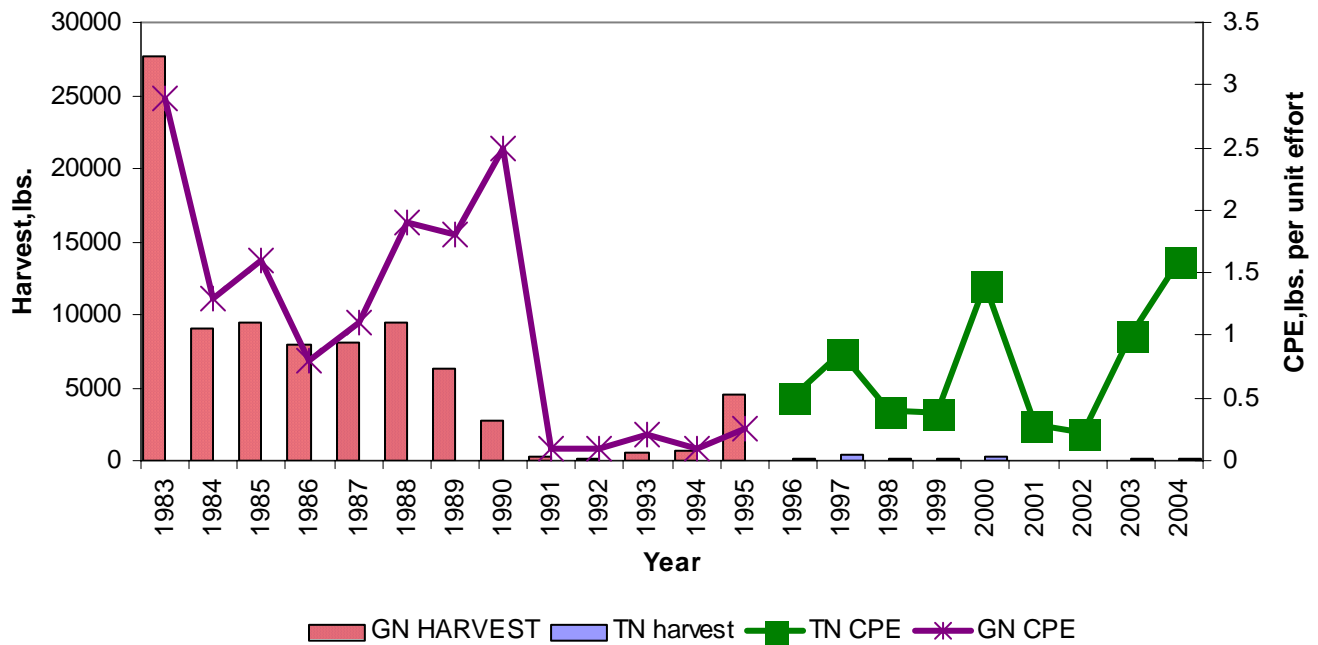


Figure C-6: Commercial white bass landings 1983 – 2004, Pennsylvania waters of Lake Erie.



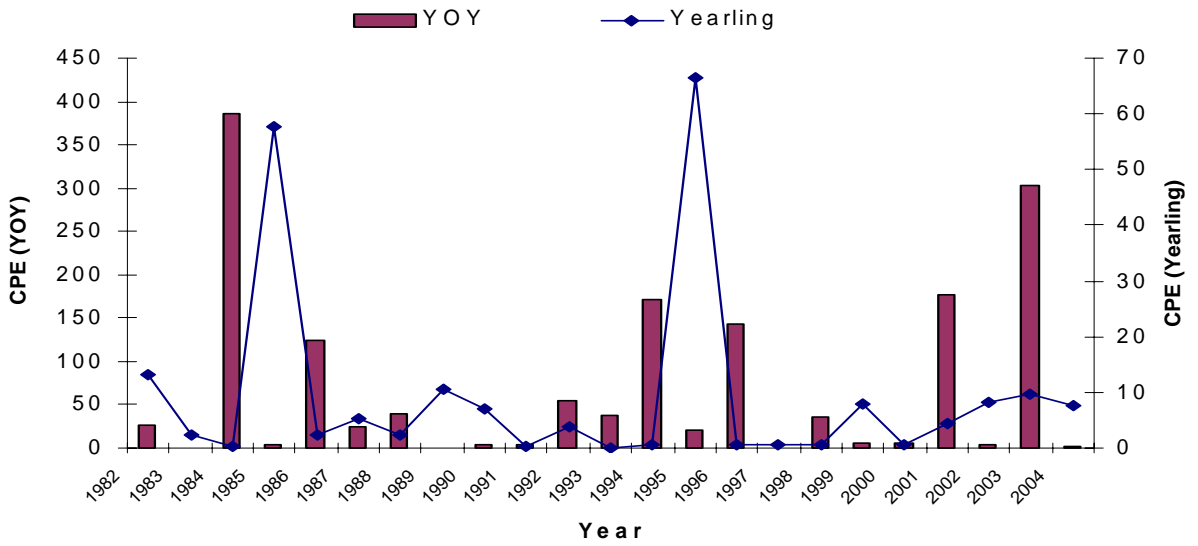


Figure A-1: Yellow Perch fall trawl indices for young-of-the-year (YOY) and yearling age groups.

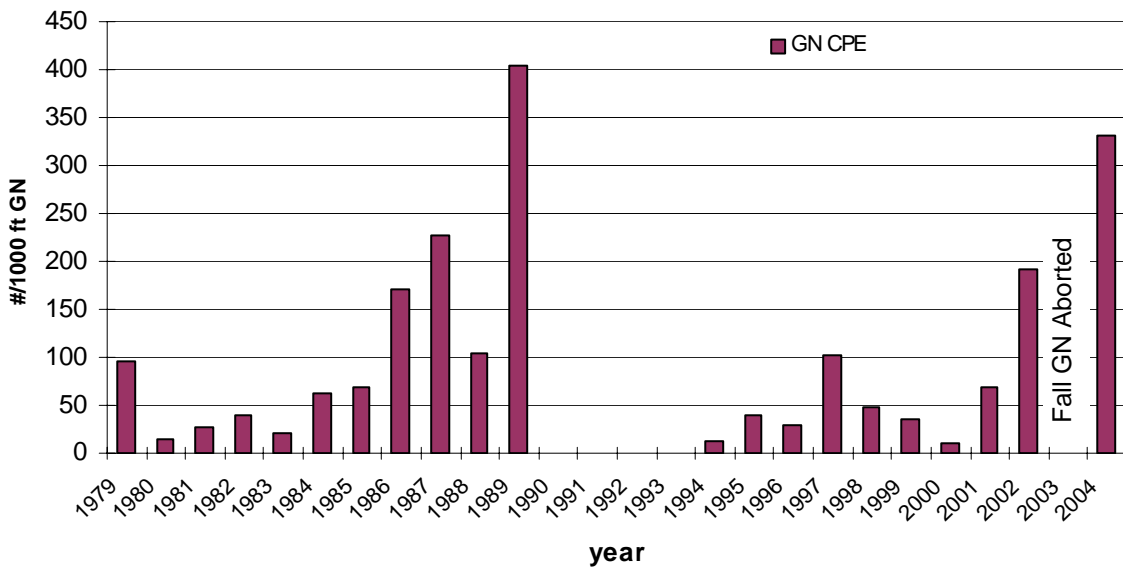
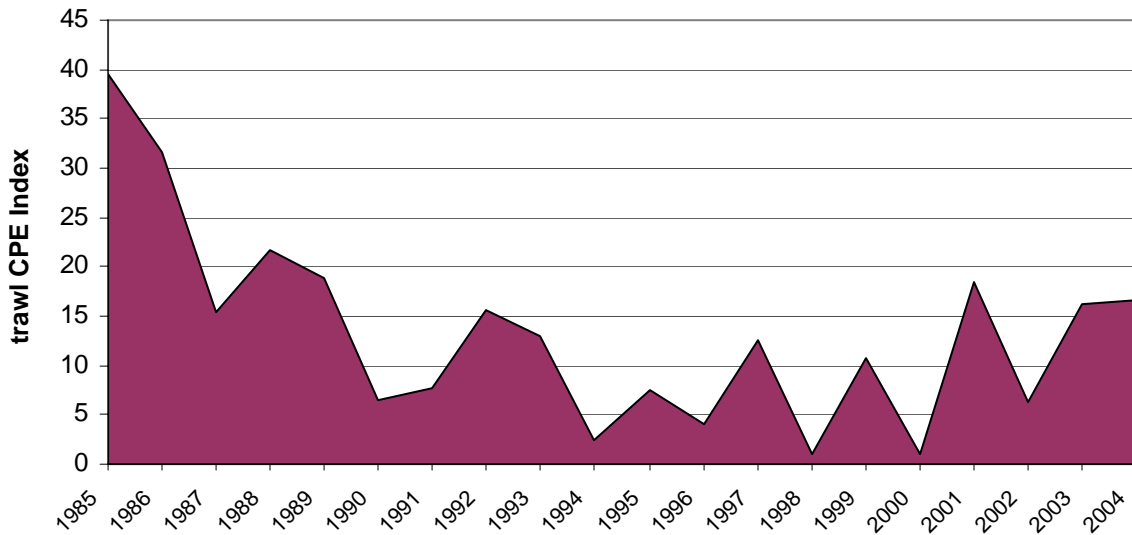


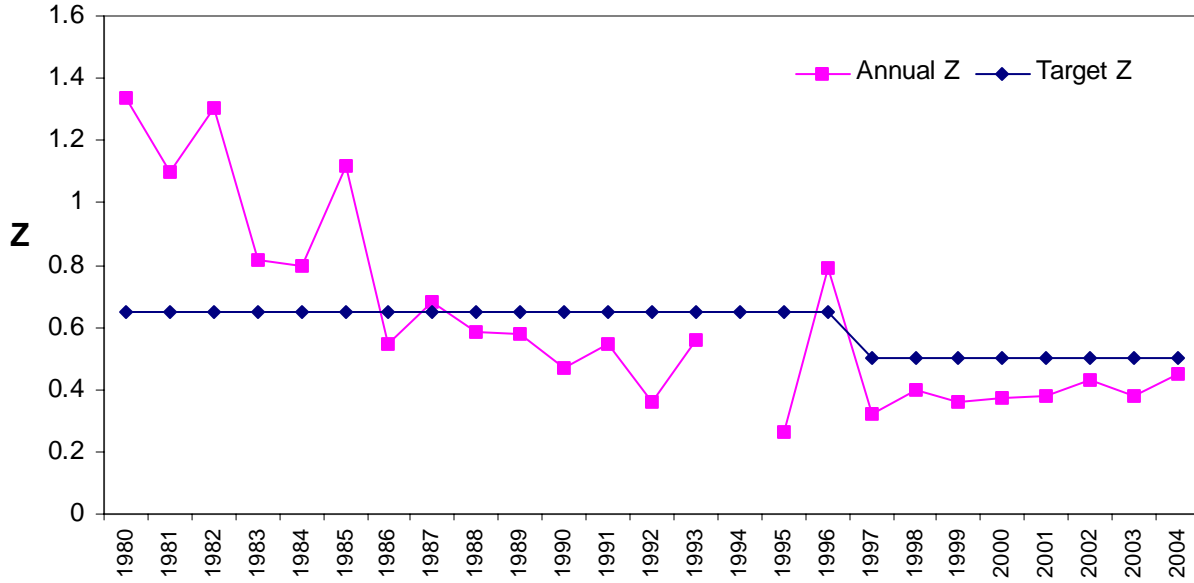
Figure A-2: Yellow perch abundance indices for assessment gill net surveys.

Numbers per ten-minute tow							
Survey year	Age Group						
	2	3	4	5	6	7	8+
1982	16.9	10.6	1.7	0.4	0.0	0.0	0.0
1983	3.7	0.7	0.7	0.2	0.1	0.1	0.0
1984	4.6	5.8	1.5	0.5	0.0	0.0	0.0
1985	1.8	29.2	6.4	0.9	1.4	0.0	0.0
1986	26.7	0.5	2.1	1.0	0.8	0.5	0.0
1987	0.6	12.8	1.6	0.3	0.1	0.0	0.0
1988	4.0	2.9	11.6	1.1	1.6	0.2	0.2
1989	2.9	6.4	1.4	5.8	1.1	0.9	0.2
1990	1.6	0.6	2.3	0.3	1.6	0.1	0.1
1991	0.5	1.5	1.0	4.5	1.1	2.0	0.0
1992	1.4	2.0	3.6	1.7	1.7	1.4	2.2
1993	2.0	4.0	0.0	1.5	2.5	2.5	1.5
1994	0.8	0.1	0.0	0.0	0.0	0.0	0.0
1995	3.6	3.4	1.2	0.2	0.0	0.2	0.4
1996	0.1	0.0	0.5	0.2	0.3	0.2	0.3
1997	0.0	3.5	3.5	2.5	1.5	1.0	0.5
1998	0.1	0.1	0.2	0.4	0.2	0.0	0.1
1999	2.3	2.5	2.4	0.9	0.5	0.2	0.6
2000	0.1	0.1	0.1	0.0	0.0	0.0	0.0
2001	1.2	1.2	5.8	4.0	1.6	1.4	2.5
2002	0.9	1.1	0.7	0.5	0.6	0.0	0.0
2003	5.6	2.5	0.5	0.5	0.5	0.5	0.6
2004	0.8	2.5	1.0	0.4	2.1	0.3	1.0

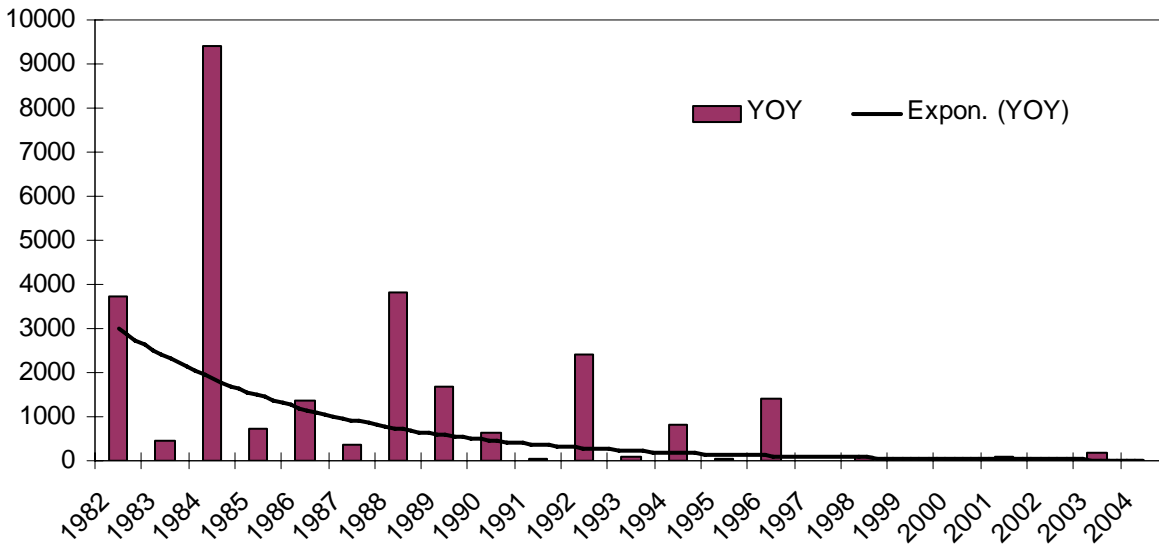
**Table A-7:** Fall trawl Assessment values for Lake Erie yellow perch stock; trawl mean CPE.



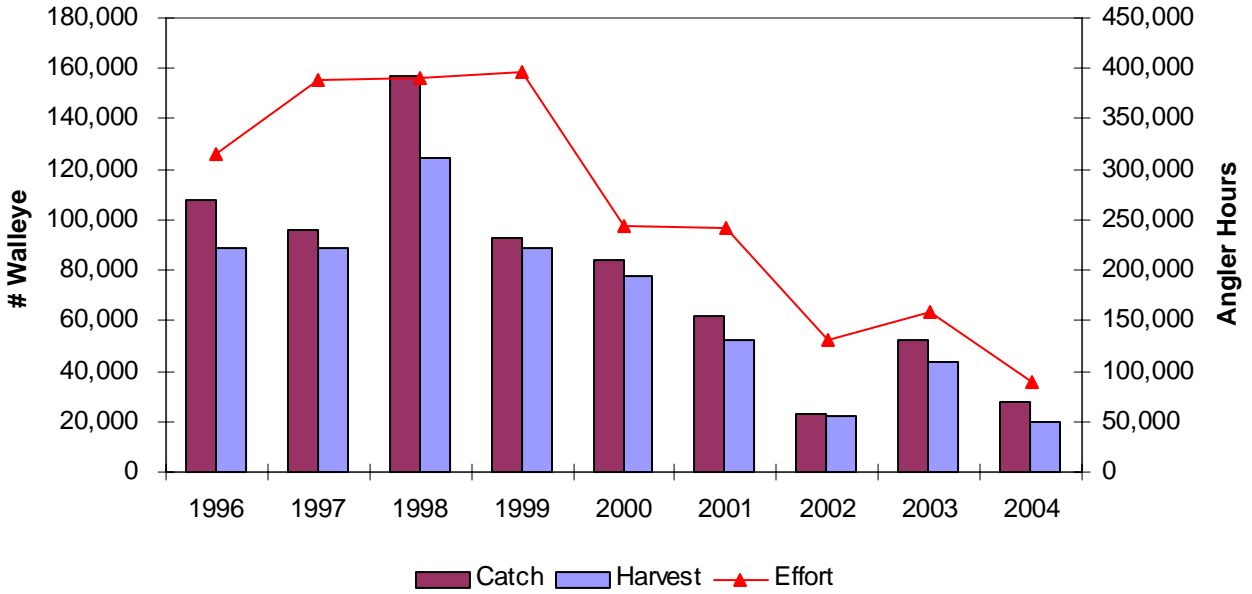
**Figure A-3:** Yellow Perch indices of abundance for age 2 and older fall stock.



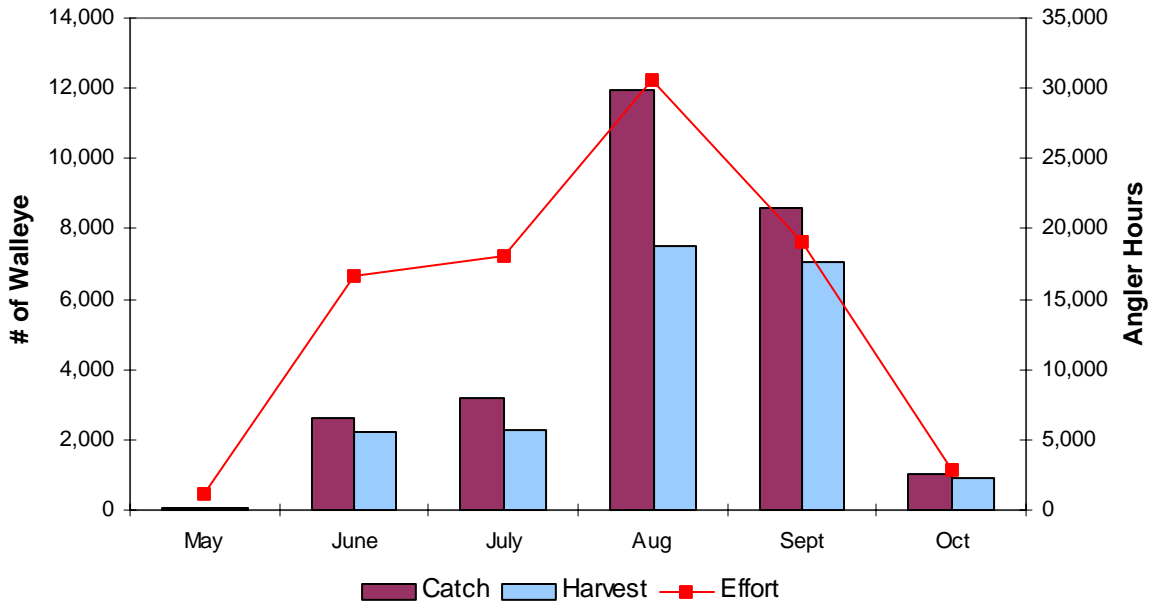
**Figure A-4:** Trends in yellow perch mortality.



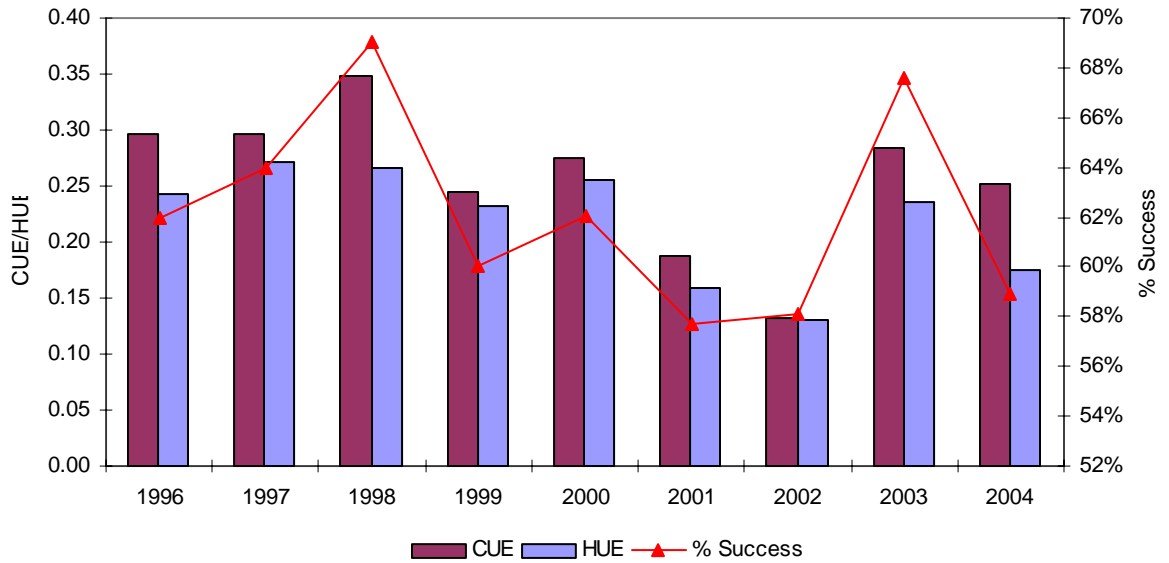
**Figure A-5:** Indices and trends in smelt abundance.



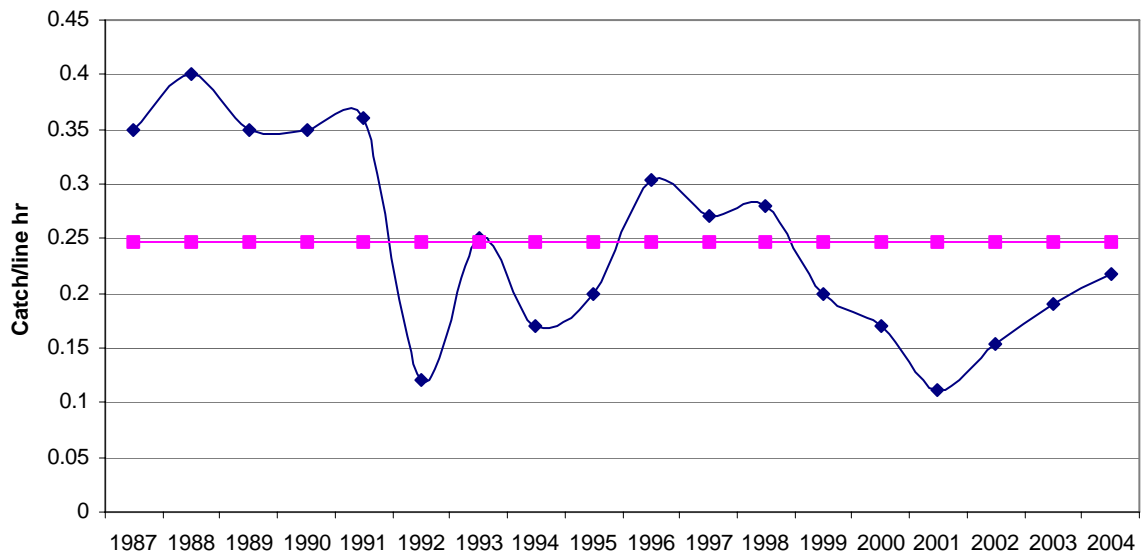
**Figure S-1:** Estimated walleye angler effort (hours), catch and harvest for the 1996 – 2004 Lake Erie Boat Angler Surveys.



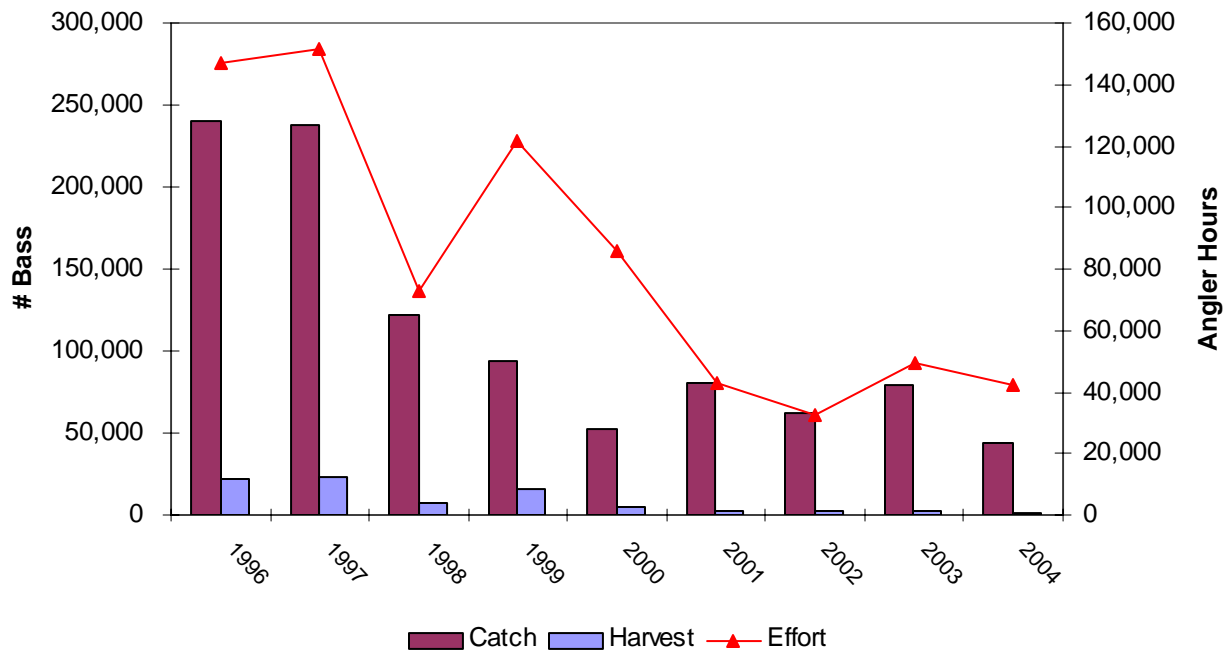
**Figure S-2:** Monthly estimated walleye angler effort (hours), catch and harvest for the 2004 Lake Erie Boat Angler Survey.



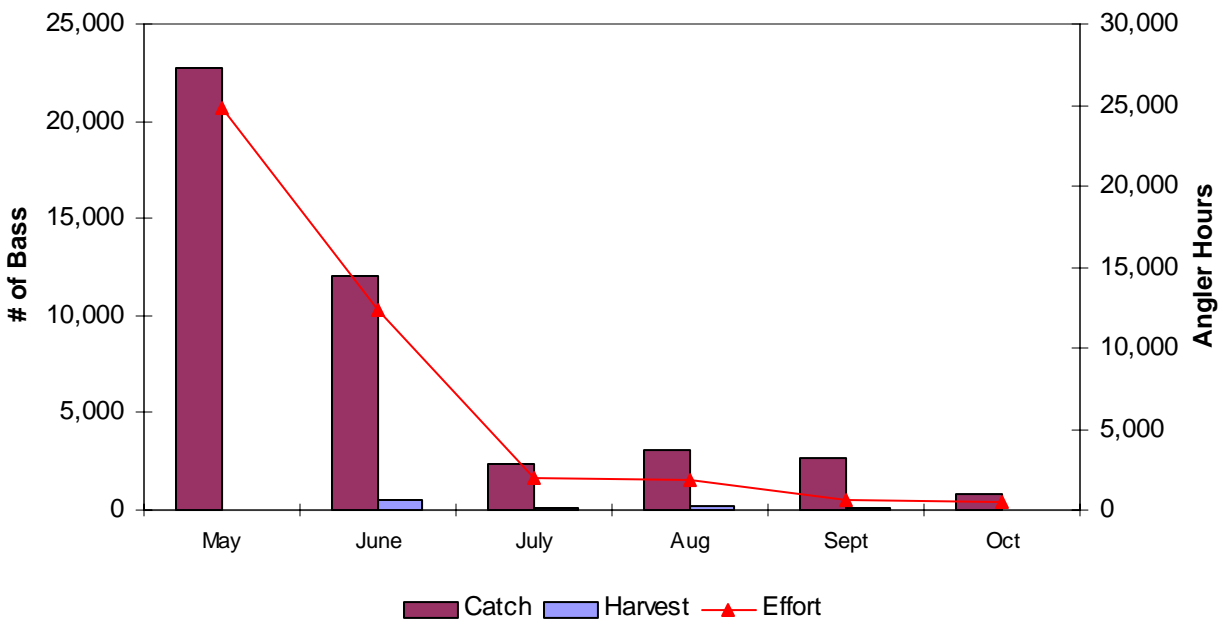
**Figure S-3:** Walleye angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2004 Lake Erie Boat Angler Surveys.



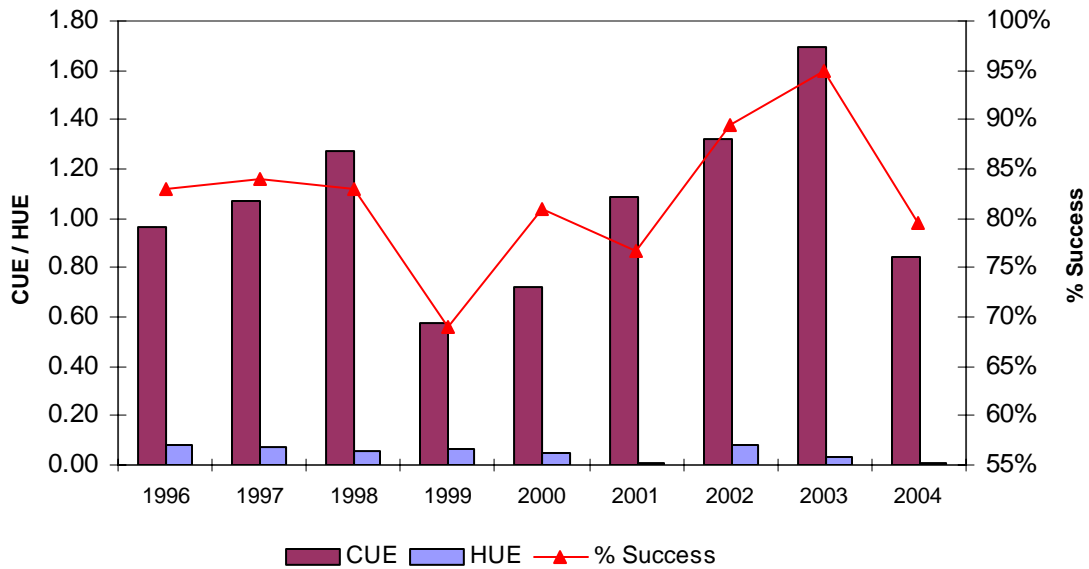
**Figure S-4:** Walleye angler catch per line hour by open lake boat anglers from the Lake Erie Cooperative Angler Log 1987-2004.



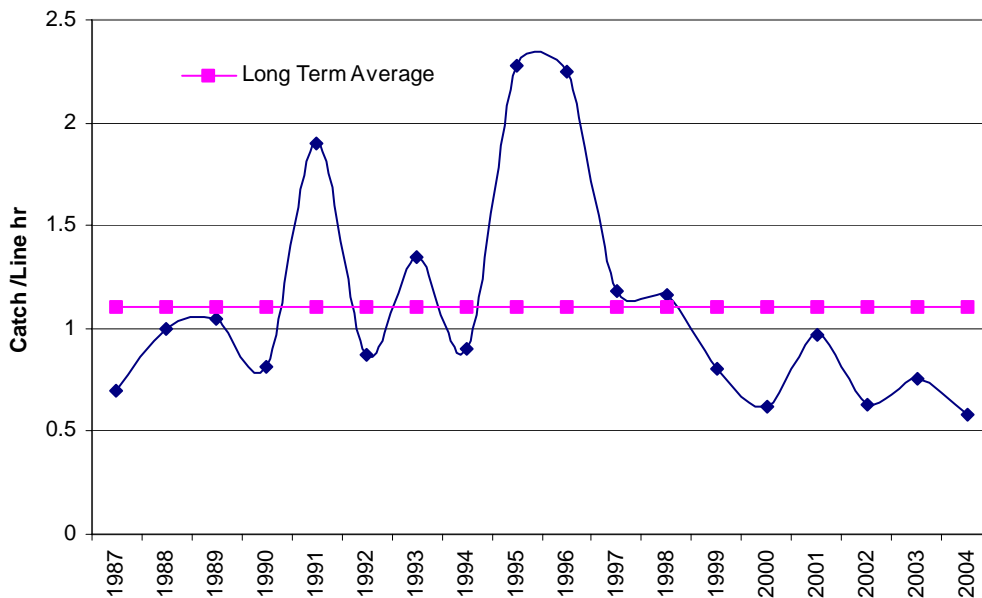
**Figure S-5:** Estimated smallmouth bass angler effort (hours), catch and harvest for the 1996 – 2004 Lake Erie Boat Angler Surveys.



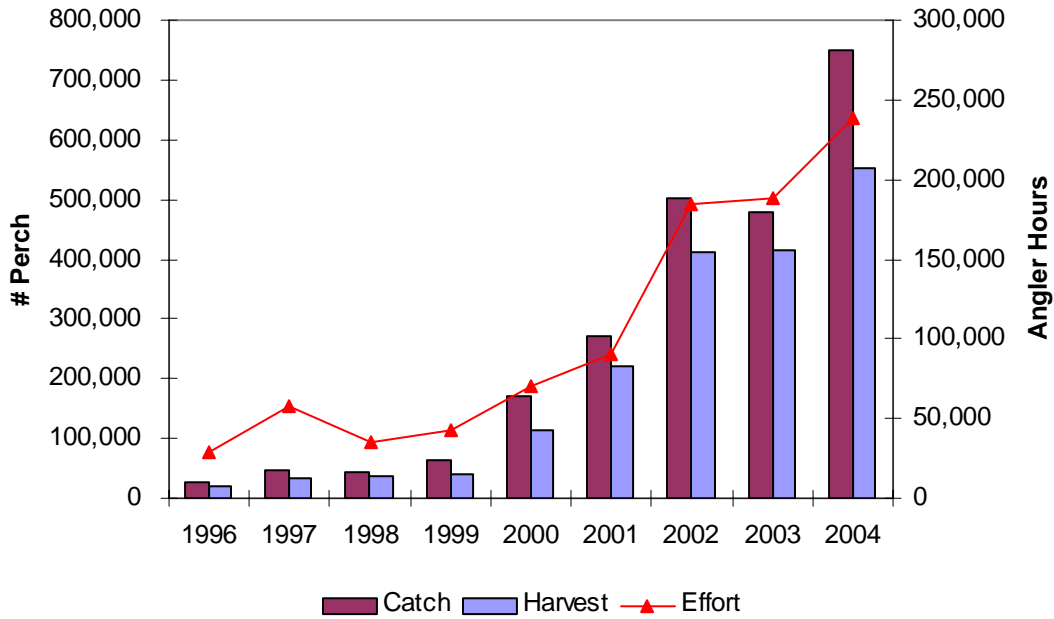
**Figure S6:** Monthly estimated smallmouth bass angler effort, catch and harvest for the 2004 Lake Erie Boat Angler Survey.



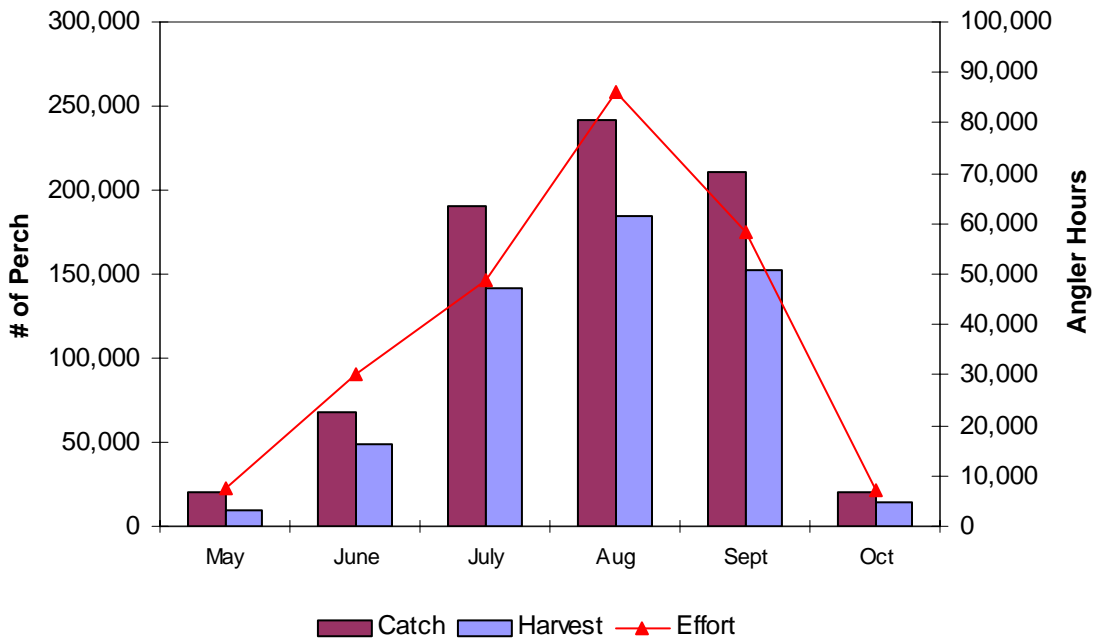
**Figure S-7:** Smallmouth bass angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2004 Lake Erie Boat Angler Surveys.



**Figure S-8:** Smallmouth bass boat angler catch per line hour from 1987 – 2004 and the long-term average from the Lake Erie Cooperative Angler Log.

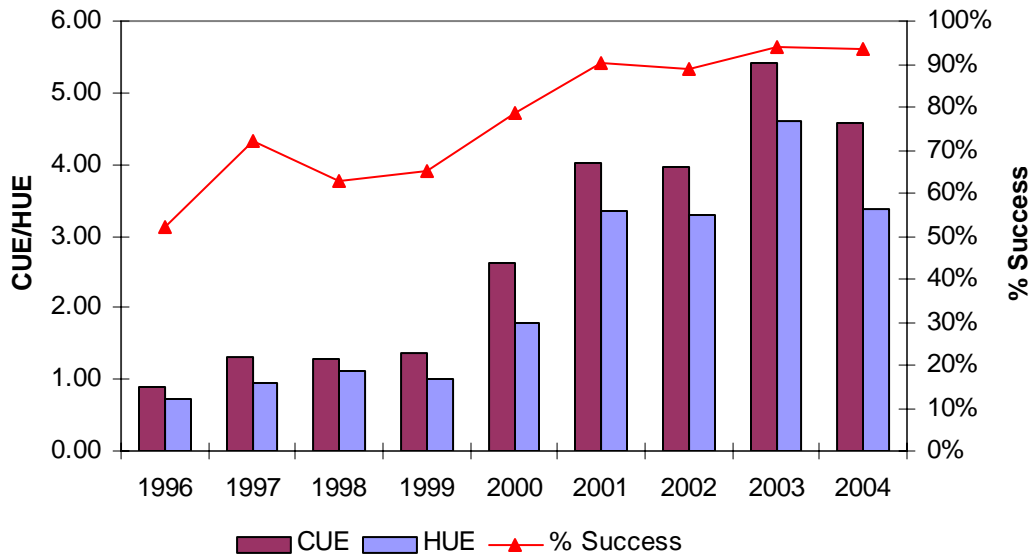


**Figure S-9:** Estimated yellow perch angler effort (hours), catch and harvest for the 1996 – 2004 Lake Erie Boat Angler Surveys.

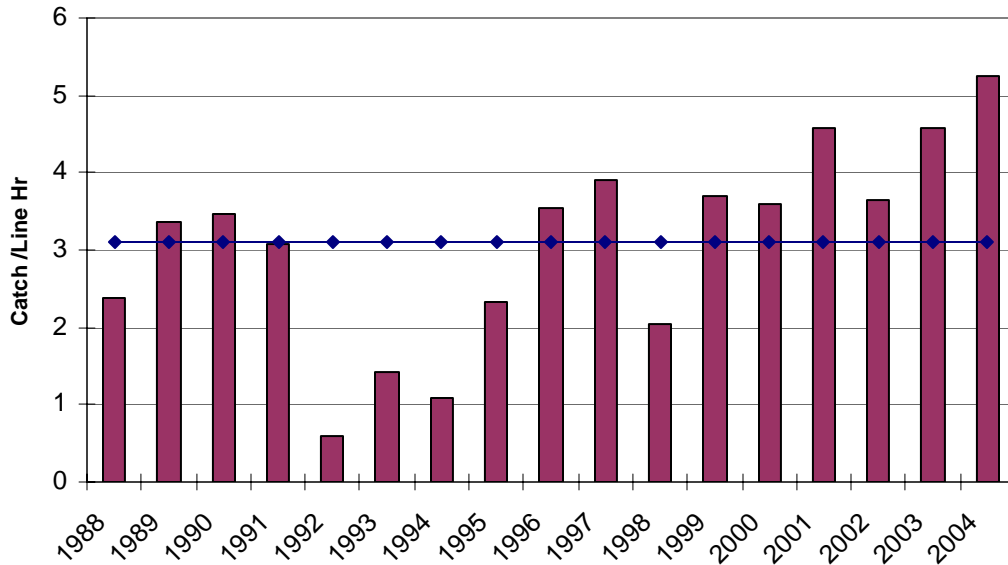


**Figure S-10:** Monthly estimated yellow perch angler effort, catch and harvest for the 2004 Lake Erie Boat Angler Survey.

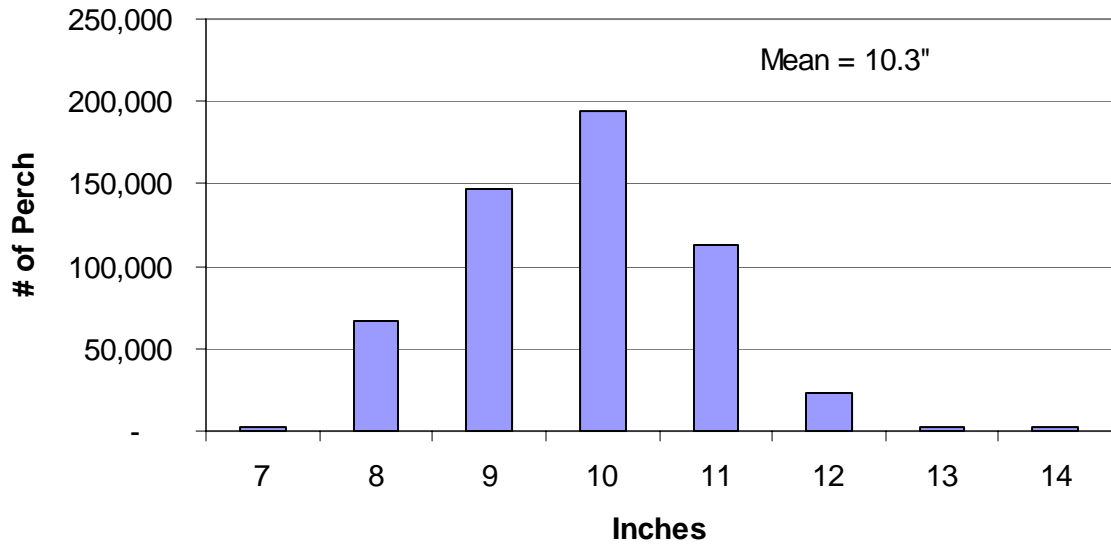




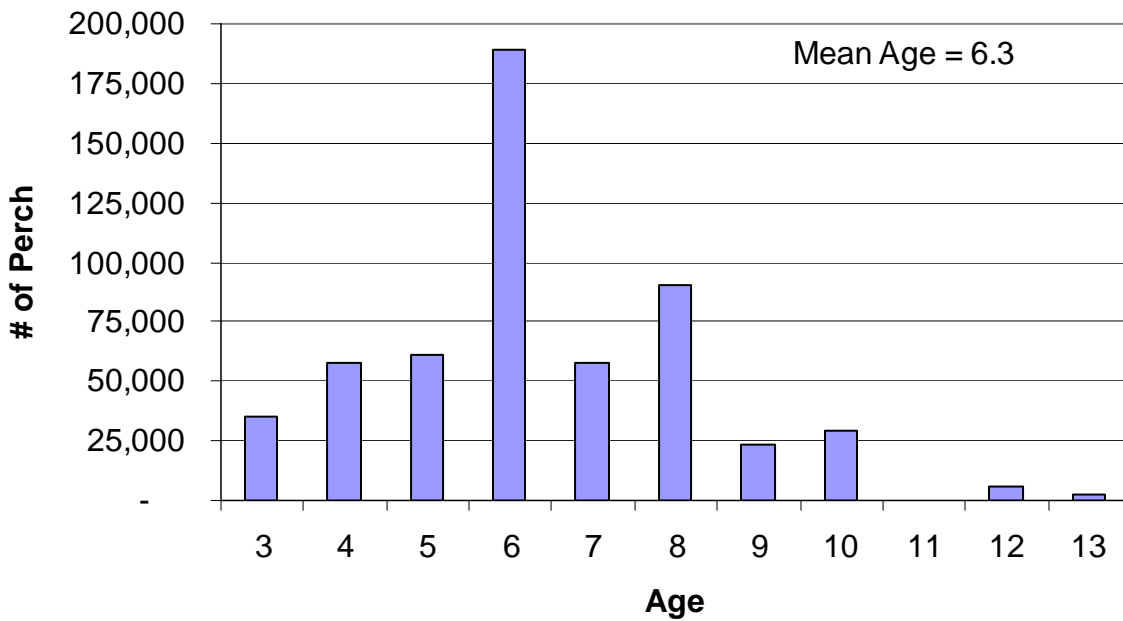
**Figure S-11:** Yellow perch angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2004 Lake Erie Boat Angler Surveys.



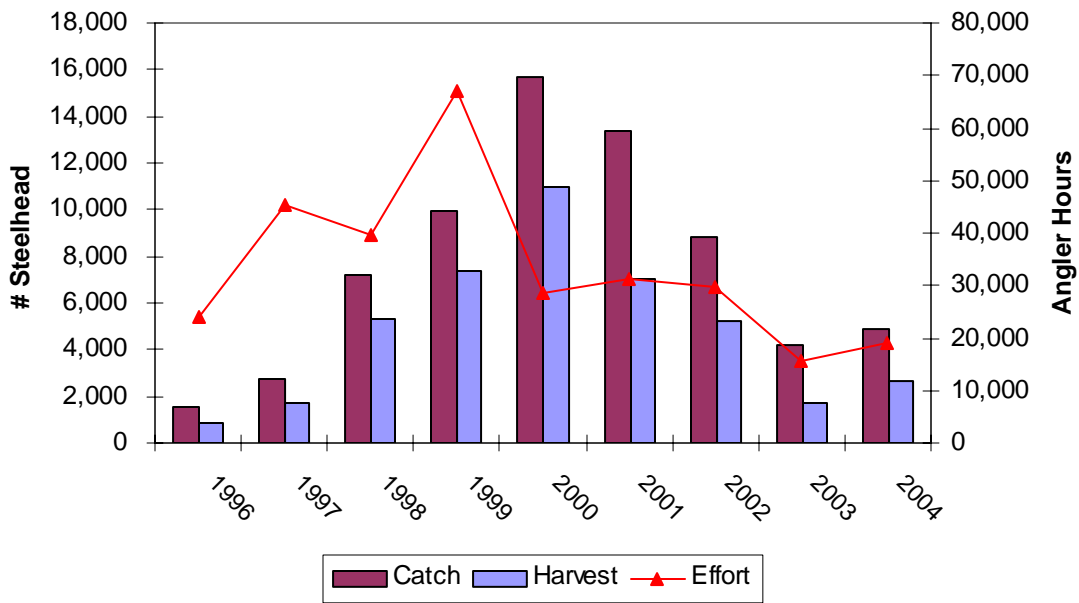
**Figure S-12:** Yellow perch catch per line hour and long-term average from 1988 – 2004 from the Lake Erie Cooperative Angler Log.



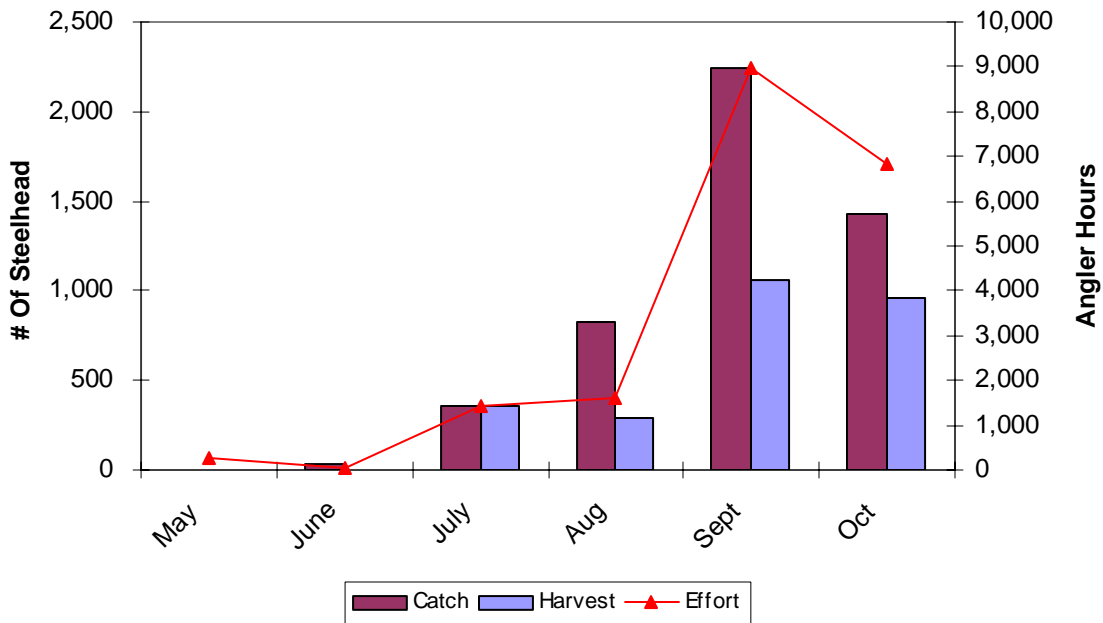
**Figure S-13:** Length frequency of yellow perch harvested by open lake boat anglers in 2004.



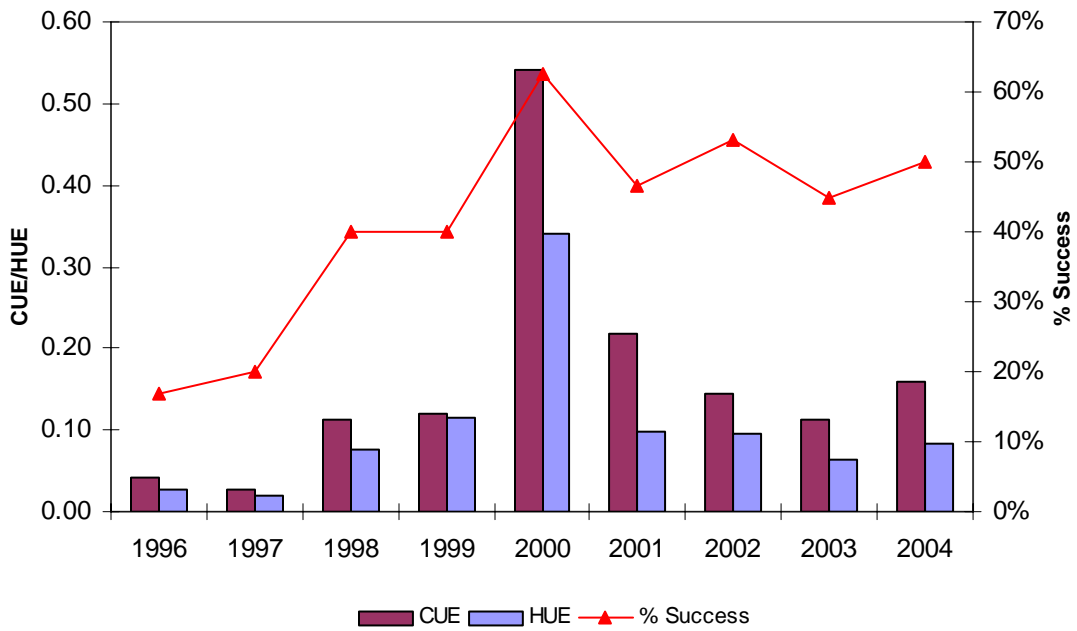
**Figure S-14:** Age frequency of yellow perch harvested by open lake boat anglers in 2004



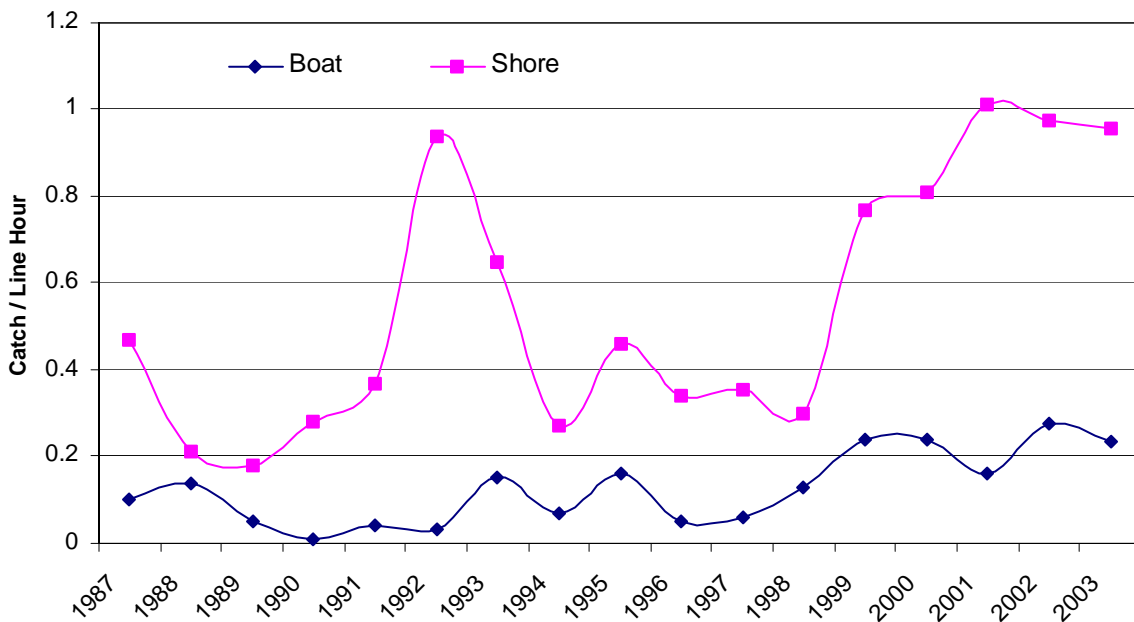
**Figure S-15:** Estimated steelhead angler effort (hours), catch and harvest for the 1996 – 2004 Lake Erie Boat Angler Surveys.



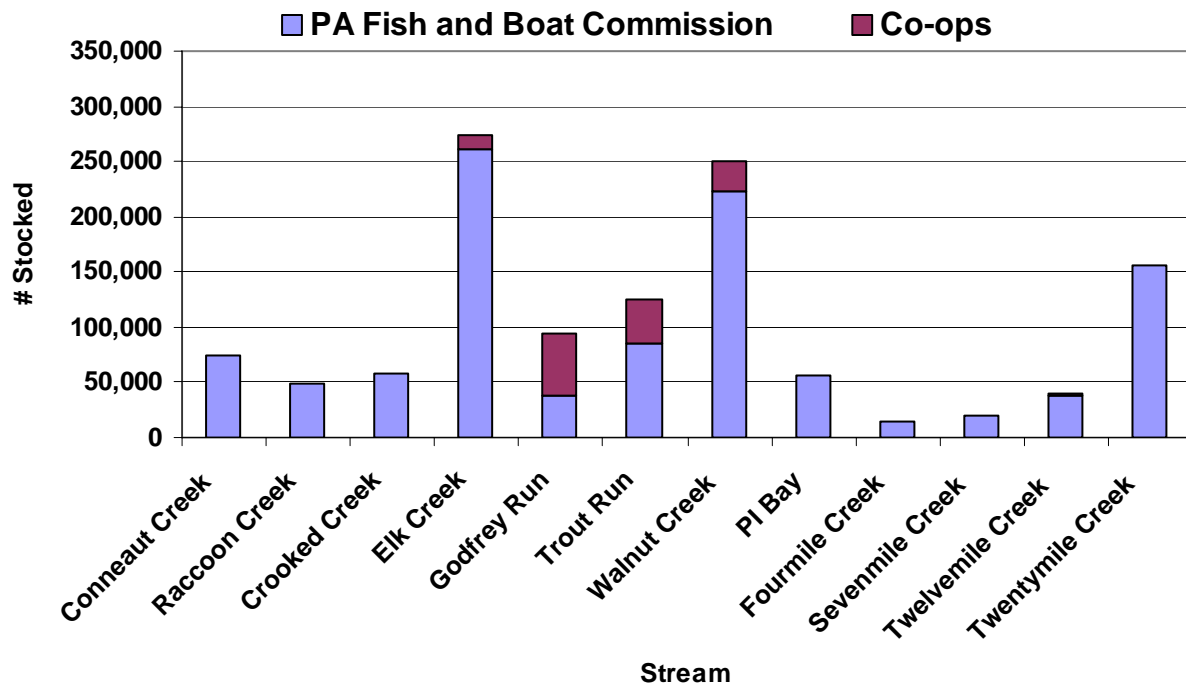
**Figure S-16:** Monthly estimated steelhead angler effort, catch and harvest for the 2004 Lake Erie Boat Angler Survey.



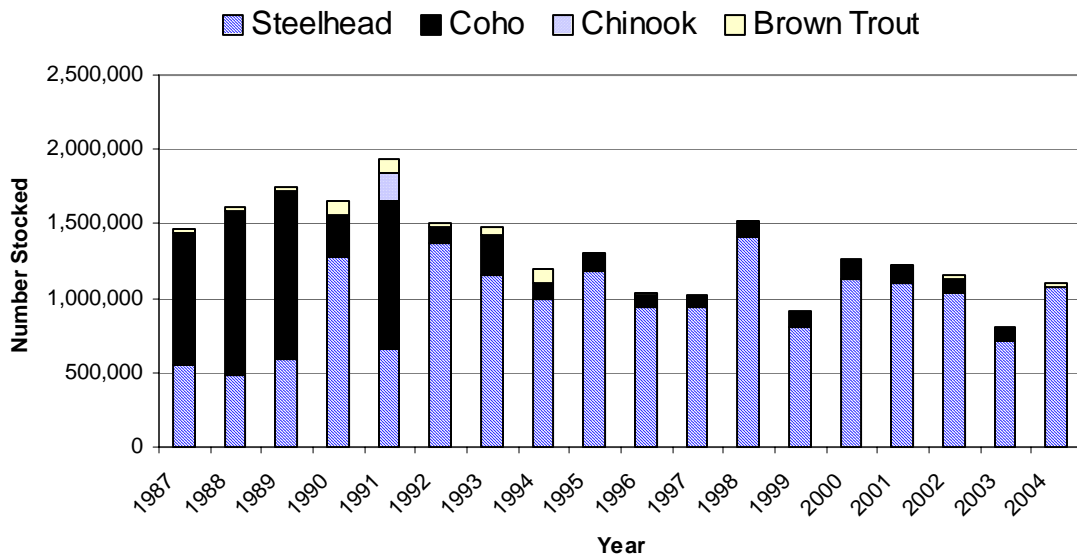
**Figure S-17:** steelhead angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2004 Lake Erie Boat Angler Surveys.



**Figure S-18:** Tributary and boat steelhead angler catch per line hour from 1987 – 2004 from the Lake Erie Cooperative Angler Log.



**Figure S-19:** Total (PFBC + Sportsman’s Cooperative Nurseries) steelhead stocking by location in 2004.



**Figure S-20:** Total anadromous trout and salmon stocking for Steelhead trout, Coho salmon, Chinook salmon and brown trout, 1987 – 2004. These numbers represent only PFBC hatchery plants.