

Lake Erie Fisheries Status and Trends Report 2005

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

LAKE ERIE FISHERIES STATUS AND TRENDS REPORT
2005

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 96% increase in the perch landings above 2004. The 2005 landings are the largest since commercial fishing was restricted to trap nets in 1996. Landings of other species either increased or remained stable from 2004 through 2005, depending upon the course of the markets and of changing abundance.

Yellow Perch

Commercial perch CPE for trap nets has increased steadily after 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 mean age in the 2004 catch of 5.9 years and 6.1 in 2005 is consistent with the ageing structure of the stock. The collective persistence of older perch and mean age in the population of about 6 years is evidence of a sustained higher survival of the fishable perch stock. This is about 60%. Accordingly, the commercial TAC for 2006 is 35,000 pounds, the same as 2005. The reality is that 2006 landings may only be around 60% of the TAC, or not even 1%

of the perch in Pennsylvania waters. This will still be up from last year's expectations due to the anticipated recruitment of the large 2003 year class as age 3 fish.

Walleye

The commercial landings of walleye in 2005 were 803 pounds, the high for the period 1996-2005. The 2005 TAC for walleye was 5,000 pounds. What few walleye are landed are considered incidental catches taken in the spring and fall of the year. Despite the low abundance of walleye throughout Lake Erie, catch rates increased 6% in 2005, probably due to the full recruitment of the 2001 year class and partial recruitment of the 2003. The commercial exploitation of walleye is not expected to be anymore than incidental in 2006.

Lake Whitefish

Few whitefish were reported in commercial landings in 2005, but they were above the levels of the previous five 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

2005 burbot landings were at near lowest levels since 1996, and trap net CPE returned a value well below the median number since 1996. The burbot population probably has stabilized at a reduced level over the past few years.

White Perch and White Bass

White bass landings have been reported at very low levels since 2001, and trap net CPE's have increased little after 2002. Catchability may have changed since 2002 but 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 but its influence did not extend far into the 2005 fishery.

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 are 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 2005 continue to show a perch stock (age 2 and older) at levels of abundance similar to the 1980's, with a stock decline of modest intensity in 2005. Only the period of the early 1980's exhibited larger perch stock sizes. This level of abundance is still 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 fish from the strong 2003 cohort, along with a decline of older fish from the population. This notwithstanding, survival of perch age 3 and older still remains adequate, total mortality for the fishable perch stock is estimated at 40% annual rate for the latest period.

Based upon YOY trawl index values for perch, the 2004 and 2005 year classes rank low in the series of annual estimates dating to 1981. As the large year classes now begin recession due to old age, the perch stock will continue its decline. The severity of the decline will be reflective of fishing mortality and the prospects of at least modest year class production in the next two years.

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. Based on these changes in the population, the severity of the MSL of 18 inches was modified to 15 inches.

The overall catch rate for the Pennsylvania angling fishery for 2003 and 2004 is at or higher than 0.25 walleye/angler hour. The 2005 catch rate jumped to 0.49 due to the appearance of the large 2003 year class. The 18 inch MSL restrained the angling harvest rate to 0.14. The commercial trap net fishery recorded 7.2 lbs. walleye/lift in 2004 and 7.5 lbs walleye/lift in 2005. 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. However there is little evidence that this year class continued to persist 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 had only shown weak promise as yearlings in 2004 and was a weak representative in the 2005 population. The 2005 year class is initially measured as one of the weaker smelt cohorts produced in the last ten years.

The adult populations of recent years carry fewer than three age groups.

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 than positive 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. The initial estimate of the 2005 cohort is also weak. However, the larger numbers of 2-year old shiners seen in 2005 demonstrates that survival rates for this specie are adequate to carry over modest year classes through their normal longevity.

Round goby rank as the most abundant forage fish in Pennsylvania waters, either as YOY or yearling and older age groups. Survey data suggests a decline in their numbers since their peak abundance in 2000. The 2005 YOY index value was below median for the annual series. Following their initial introduction and expansion, stabilization was expected followed by trend declines over time. 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. The winter mortalities exhibited by these species are indications of their persistence.

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 administered since 1987, and provides long term (19 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. This will be the last year charter captains and stream guides will be

required to participate in the LECAL program.

This information presently provides the best historical account 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 2005, 14 LECAL participants returned 19 logbooks detailing 323 fishing trips. LECAL anglers targeted walleye (30%), steelhead trout (30%), yellow perch (27%), smallmouth bass (6%), largemouth bass (3%), brown trout (3%), lake trout (2%) and sheepshead (0.6%).

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.

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 2005 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 2005, scales were collected from yellow perch (N=206) and walleye (N=18).

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 2005 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 2005, creel clerks collected 664 completed trip interviews from boat anglers landing at Walnut Creek Access Area (370), North East Access Area (151), East Avenue Boat Launch (84) 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 2005 showed that boat anglers targeted yellow perch, walleye, smallmouth bass, “anything that bites”, steelhead, crappie, lake trout and largemouth bass. Most of the open lake boat effort was directed at yellow perch (54%), walleye (31%), smallmouth bass (9%), and steelhead trout (2%) (Table S-3).

Boat anglers also caught 13 different “species” and harvested 9 different “species” (Table S-4). Most of the catch was comprised of yellow perch (72%), walleye (6%), sheepshead (6%), white bass (4%), round goby (4%), white

perch (3%) and smallmouth bass (2%). Most of the fish harvest was comprised of yellow perch (95%) and walleye (4%). 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. In order to rehabilitate the Lake Erie walleye stocks, in cooperation with the other Lake Erie jurisdictional fishery managers, the PFBC installed an 18” MSL (up from 15”) and a 4 walleye/day creel limit in 2004. As the following creel data shows, the MSL had extreme impacts on angler harvests in 2005. After 2002, the fishery began showing signs of recovery as angler success increased and catch rates improved. A declining trend in targeted effort has finally reversed itself, and we expect anglers will expend more effort in 2006 targeting walleye as good year classes from 2001 and 2003 recruit into the angling fishery. In response to a recovering walleye population, the 2006 sport fishing regulations have been returned to “pre-rehabilitation” status, with a minimum size limit of 15” and a daily creel limit of 6 walleye/day.

Walleye Angler Effort:

For the fourth consecutive year, walleye failed to attract the majority of the open lake boat angling effort. The 2005 fishing season showed a reversal in the declining trend of walleye angling effort as anglers spent 109,132 hours fishing for walleye (Figure S-1). This represented a 23% increase from 2004, but was still 56% below the long-term average (10 year) average. As usual,

the majority (59%) of the effort was concentrated in the central basin. Walleye angler effort decreased 12% in central basin waters but increased 187% in eastern basin waters from 2004. LECAL data substantiated this trend and showed that the majority of the walleye fishing was North East of Presque Isle peninsula (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 2005, walleye anglers caught an estimated 63,258 walleye and harvested 20,316 walleye. This was a 131 % increase in catch but only a 2% increase in harvest from 2004 catch and harvests (Figure S-1). Anglers released 68% of the walleye they caught, primarily due to the 18" MSL and the high proportion of sub-legal (2003 year-class) walleye in the population.

Coincident with targeted effort, the majority of the catch (68%) and harvest (69%) was in the central basin. Walleye catch increased 78% in central basin waters and an astonishing 532% in eastern basin waters from 2004. Walleye harvest actually decreased 22% in central basin waters, but increased 78% in central basin waters from 2004. The 18" MSL was extremely effective in protecting the 2003 walleye year class from angler harvest in 2005.

Walleye Angler Success and Catch Rate:

Catch rate from the 2005 LEBAS walleye assessment was the highest in the time series (Figure S-3), and the LECAL walleye angler catch rate (0.27 walleye/line hour) is above the long-term average (0.25 walleye/line hour) for the

first time since 1998 (Figure S-4). The catch rate by LECAL anglers targeting walleye has steadily increased every year since 2001. Additionally, the success rate (catching at least on walleye) of walleye anglers increased from 2004.

The best walleye fishing continues to be in central basin waters (Table S-7). Eastern basin waters showed the greater improvement in both catch and harvest rates from 2004, but as expected, remain below the more productive central basin areas. Overall catch rate in 2005 (0.49 walleye/angler hour) was almost twice the long-term average (0.28 walleye/angler hour), but the 2005 harvest rate of (0.14 walleye/angler hour) was still well below the long-term average of (0.21 walleye/angler hour). This divergence in catch rate and harvest rate trends should reverse in 2006 because the 15" MSL has been reinstated and the 2003 year-class will be fully recruited into the sport fishery in 2006.

Smallmouth Bass

As the following section shows, the quality (as measured by catch rate) of the smallmouth bass fishery had declined in recent years. If one measures the quality of the fishery in terms of the size of the smallmouth bass, the quality remains; every year, the PFBC's *Angler Award Program* is dominated by Lake Erie smallmouth bass.

The impact of invasive species (especially round gobies) remains unknown. Research has suggested that smallmouth bass nests are highly susceptible to predation by gobies if left unguarded for any length of time. But if bass survive beyond their first year, the gobies then become an excellent forage item for adult smallmouth bass.

We are optimistic that the catch rates for smallmouth bass will improve in 2006 based on good recruitment of the 2003 and 2002 year-classes. We also had a good year class in 1999, which was probably the staple of the fishery last year. The last good year class we saw prior to these cohorts was in 1993.

Smallmouth Bass Angler Effort:

In 2005, anglers spent an estimated 40,157 hours fishing for smallmouth bass in open lake waters of Lake Erie (Table S-5). Smallmouth bass angler effort decreased slightly (5%) from 2004 and was 49% below the average of the last ten years (Figure S-5). Monthly distribution of effort showed a peak in June and a steady decline throughout remainder of the season. Most anglers targeted smallmouth bass in the spring. In 2005, May and June accounted for 67% of all effort directed at smallmouth bass. Anglers continue to target smallmouth bass almost exclusively in eastern basin waters. About 85% of the effort directed at smallmouth bass was in eastern basin waters and about 15% of the effort was in central basin waters.

Smallmouth Bass Catch and Harvest:

2005 smallmouth catch estimates decreased 23% when compared with the 2004-angling season, and declined 68% from the ten-year average (Figure S-5). Catch and release fishing continues to dominated the fishery as 95% of the bass that were caught were released. Total lake-wide estimated smallmouth catch in PA waters was 33,618 bass, with an estimated harvest of 1,517 bass (Table S-5). LECAL anglers also released most (96%) of their smallmouth catch (Table S-1).

Temporal distribution of catch in 2005 showed that May (42%) and June (30%) 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 (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 2005, LEBAS anglers were successful on 75% of their trips and LECAL anglers were successful on 61% 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 2005. The LEBAS data shows the lowest smallmouth bass angler catch rate (0.59 bass/angler hour) in the 10 year time series (Figure S-7). The LECAL data shows a similar trend; the 2005 smallmouth bass angler catch rate was also the lowest in the time series (0.26 bass/line hour) and suggests that smallmouth bass fishing has been “below average” (1.1 bass/line hour) since 1998 (Figure S-8).

Yellow Perch

Yellow perch have provided excellent fishing for the last four years. In 2005, more than half (54%) of the recorded angling effort (at the four LEBAS sites) was directed at yellow perch. Although fishing was relatively poor, early in the season (probably due to weather), the perch fishing became exceptional in the fall (see catch rate section below).

Recovery of the yellow perch stocks had prompted a relaxation in the sport fishing regulations and upon publication in the Pennsylvania Bulletin (September

9, 2005) new perch regulations were officially adopted. The daily creel limit was increased from 20 perch/day to 30 perch/day, and the 8" minimum size limit (MSL) was dropped completely. Interestingly, before the creel limit regulation change (20 perch/day) about 18% of anglers attained the creel limit, but after the creel limit regulation change about 30% of the anglers attained the creel limit. This was probably a function of better perch fishing later in the season.

Yellow Perch Angler Effort:

Angler interest in Lake Erie perch fishing remains strong and for the fourth consecutive year, perch had exceeded walleye in directed angler effort. Anglers directed an estimated 198,382 hours at yellow perch in 2005 (Table S-5). Effort decreased about 17% from 2004 estimates but was still 75% higher than the average of the last ten years (Figure S-9). Effort peaked in June and decreased steadily through October (Figure S-10). Few anglers targeted perch in October. The majority (64%) of the perch angler effort was concentrated in central basin waters, west of Presque Isle Peninsula.

Yellow Perch Catch and Harvest:

During the 2005 fishing season anglers caught and harvested an estimated 543,885 perch and 360,759 perch respectively (Table S-5). This represented a 27% decrease in catch and a 35% decrease in harvest from the (time-series) record catch and harvest estimates in 2004. Relative to the average over the last ten years, catch has increased 88% and harvest increased 64% (Figure S-9). About 69% of the total yellow perch catch and 72% of the total harvest was concentrated in central basin waters. Catch and harvest

were highest in September, June and August (Figure S-10).

Yellow Perch Angler Success and Catch Rate:

Overall, yellow perch angler catch rate (3.69 perch/angler hour) decreased again in 2005 based on data collected through the LEBAS, but anglers were still successful on 91% of the trips in which they targeted perch (Figure S-11). By basin, catch rate continued to decrease in the central basin, but continued to increase in the eastern basin from 2003 and 2004 catch rates (Table S-7). Seasonally, the catch rate peaked late in the season. The highest catch rates of the season were recorded in September (6.90 perch/angler hour) and October (6.94 perch/angler hour). LECAL anglers targeting yellow perch in 2005 enjoyed a 95% success rate with a catch rate of 2.7 perch/line hour. This catch rate was slightly lower than the long-term average of 3.1 perch/line hour (Figure S-12).

Length and Age of Harvested Yellow Perch:

The PFBC officially rescinded the 8" MSL on September 9, 2005. We collected information on angler perch harvest both before and after this regulation was changed. Anglers creeled yellow perch ranging in size from 7 to 13 inches, with an average length of 9.9 inches, an increase from 2004 (10.3"). Figure S-13 shows a length frequency distribution of perch harvest before and after the MSL regulation was changed. The mean size of perch harvested under the 8" MSL was 10.6 inches but decreased to 9.4 inches after the 8" MSL was rescinded.

Sport caught yellow perch ranged in age from 3 to 11 years. The 2001 year class (age 4) dominated the harvest, representing 34% of the total perch

harvest (Figure S-14). Other cohorts contributed very well to the perch fishery including the 2000, 1999 and 1998 year-classes. The 1996 (age 9) 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. 2005 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 2005 when the PFBC stocked 1,056,946 steelhead, and was supplemented by sportsman's cooperative nursery stocking of 126,300 steelhead, resulting in total stockings of 1,183,246 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 as described in detail under a separate report (Murray and Shields, 2004). The information in this report is derived from the 2005 LEBAS and the 2005 LECAL.

Steelhead Angler Effort:

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 2005 LEBAS estimated the open lake steelhead effort by boat anglers at 8,761 hours (Table S-5). This was a 54% decrease from 2004 estimates and a 72% decrease from the ten-year average of 30,872 hours (Figure S-15). In 2005, 72% 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 October (52%) and September (32%). 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:

Boat anglers caught an estimated 3,118 steelhead and harvested an estimated 2,183 steelhead, harvesting about 70% of the steelhead that they caught (Table S-5). A monthly distribution of catch and harvest is depicted in Figure S-16, and shows that steelhead are taken throughout the boating season. Much of the catch and harvest in July and August are incidental by-catch by boat anglers that are targeting walleye. 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 427 steelhead, and harvesting 117 steelhead, a 27% harvest rate (Table S-1). Those LECAL anglers that fished the tributaries recorded catching 297 steelhead and keeping only 15 steelhead, harvesting only 5% of the steelhead they caught. High catch and

release by tributary anglers continue and help sustain the fishery and create more fishing opportunities. This trend was also evident in the 2003-2004 tributary survey, when tributary anglers released about 78% of the steelhead they caught.

LECAL boat anglers recorded catching 130 steelhead and keeping 102 steelhead, a harvest rate of 78% (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 Angler Success and Catch Rate:

Steelhead angler catch rate as calculated from LECAL participants fishing the tributaries was 0.82 steelhead/line hour and these anglers were successful on 79% of their trips. Higher catch rates are typical of the LECAL data, which is influenced by the superior angling ability of LECAL participants. Since 2000, Lake Erie steelhead anglers have experienced a period of exceptionally high catch rates. Trends in angler diary catch rates by steelhead anglers in Pennsylvania reached historical highs during 2001 (Figure S-18). Although there was a decrease in catch rates in 2005 compared to 2004, the 2005 catch rate (0.82 fish/hr) remained well above the long-term average of 0.59 fish/hr.

Based on the results of the LEBAS data, 38% of the boat anglers targeting steelhead were successful in catching at least one steelhead and landed about one steelhead for every 9.6 angler hours fished (0.10 steelhead/angler hour). The 2005 catch rate declined from 2004, when anglers landed a steelhead for every 6.3 fishing hours fished. Declines in open lake steelhead fishing were heavily influenced by a sharp decline in

fishing quality in eastern basin waters. Table S-7 shows that the catch rate was much better in central basin waters (0.17 steelhead/angler hour) than eastern basin waters (0.02 steelhead/angler hour).

Reference:

Murray, C., and M. Shields. 2004. Creel analysis and economic impact of Pennsylvania's Lake Erie tributary fisheries in Erie County, Pennsylvania, with special emphasis on landlocked steelhead trout (*Oncorhynchus mykiss*). Pennsylvania Fish and Boat Commission. Lake Erie Research Unit. Fairview, Pennsylvania, USA.

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
1996	81	0	5,340	4,125	1,580	0	6,848	872	234	2,262	235	96	2	21,771
1997	193	0	7,398	3,223	766	96	3,806	626	1,117	8,910	1,628	386	1,597	29,696
1998	417	0	5,281	3,544	1,283	132	2,125	972	628	8,963	701	113	3,496	27,655
1999	229	-	2,905	1,864	566	-	1,877	619	677	7,943	201	670	670	20,220
2000	183	-	5,950	862	436	-	1,269	861	567	3,529	379	338	-	20,214
2001	73	-	2,702	755	287	-	601	594	381	4,359	427	43	-	10,222
2002	43	-	2,030	508	142	-	452	18	389	5,177	489	19	25	9,292
2003	129	-	5,050	856	467	-	73	30	936	1,821	408	88	93	9,951
2004	501	-	7,753	1,402	348	-	72	286	1,486	2,401	459	110	91	14,909
2005	830	-	15,228	3,461	2,111	-	880	868	3,050	2,238	3,844	154	563	33,227
MEAN	8,627	22	37,420	4,887	1,322	24	1,189	377	8,077	10,367	16,108	993	88,411	178,324

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	70	860	230	218	150	35	155	370	53	12	17	2,170
May	105	2,260	456	163	25	69	224	420	112	0	87	3,921
June	194	2,696	344	153	105	56	305	186	602	9	30	4,680
July	88	1,540	531	188	41	54	91	282	184	26	105	3,130
August	81	2,360	1,198	311	200	177	838	165	731	46	67	6,174
September	177	2,259	287	163	176	163	781	245	972	22	96	5,341
October	71	3,062	299	858	173	302	604	374	1,030	35	144	6,952
November	41	190	86	37	10	18	51	131	160	4	17	745
December	3	1	30	20	0	0	1	65	0	0	0	120
Total	830	15,228	3,461	2,111	880	874	3,050	2,238	3,844	154	563	33,233

Table C-2: Monthly commercial landings in pounds, Pennsylvania waters of Lake Erie, 2005.

Yearclass	AGE	FREQUENCY	NUMBER	LENGTH	WEIGHT	CPE
2002	3	0.02	677	202	98	5.25
2001	4	0.11	3,386	221	125	26.25
2000	5	0.04	1,354	260	212	10.50
1999	6	0.13	4,063	263	232	31.50
1998	7	0.37	11,173	267	235	86.61
1997	8	0.17	5,079	274	252	39.37
1996	9	0.07	2,031	282	278	15.74
1995	10	0.06	1,693	283	2,844	13.12
1994	11	0.01	339	288	305	2.63
1993	12	0.01	339	276	259	2.63

Mean age: 6.1 30,134 233.60

length in mm, weight in grams
CPE - number per lift

Table C-3: Yellow perch commercial 2005 harvest in numbers by year-class.

Year Class	Age	CPE	Frequency	Average Length	Average Weight
2004	1	0.60	0.09	114	23
2003	2	3.02	0.44	153	52
2002	3	1.21	0.18	187	112
2001	4	1.06	0.16	210	134
2000	5	0.30	0.04	215	143
1999	6	0.30	0.04	244	196
1998	7	0.30	0.04	278	339
mean age: 2.6		6.8			

CPE in numers per 10 minute tow

Table A1. Yellow perch population year class structure and relative abundance based upon 2005 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
2005	3	38	-	-	16	1	1	1	-	-	145	124
Mean	40	17	2	5	1,142	550	36	2	102	10	306	113

Table A-2: 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	1.9
2005	4	19	3	0	-
Mean	69.3	268.0	42.6	2.5	3.3

* Summer, deep water trawl assessment

index values are numbers per 10 minute trawl tow

Table A-3: 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
2005	0	0	0

Table A-4. Deep-water trawl index of lake whitefish age groups; 1982 - 2005.

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	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
1992	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
1993	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
1994	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
1995	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
1996	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
1997	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
1998	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
1999	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
2000	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
2001	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
2002	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
2003	0.0	0.0	1.3	0.0	0.0	0.0	204.0	206.7	15.9	2.6	0.3	4.1	1.9	1.6	17.8	123.0	0.0	0.0	6.7	1.9	42.3	0.0
Average 1990 - 2005	12.5	4.5	3.2	0.0	0.2	0.0	579.9	162.1	1,186.9	90.6	31.6	30.1	9.9	5.3	43.5	51.2	1.5	2.8	167.2	37.0	240.6	13.2

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
2005	0.0	0.0	0.0	1.0	0.0	0.0	497.7	390.2	47.9	0.0	27.4	171.2	11.9	8.3	0.5	52.5	0.0	0.0	9.7	22.7	51.2	1.9
Average 1990 - 2005	5.6	3.1	0.7	0.5	1.9	0.9	673.6	261.0	332.1	209.0	38.2	30.3	4.5	4.8	117.5	27.3	2.9	5.8	94.0	29.4	153.4	9.7

Table A-5: 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 - 2005.

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
2005	2.1	0.2	1.1	0.1	0.1	0.4	0.2

Table A-6 . Fall trawl assessment values for Lake Erie yellow perch stock; trawl mean CPE.

Year Class	Age	Frequency	Average Length (mm)	Average Weight (grams)
2003	2	0.21	362	383
2002	3	0.14	436	791
2001	4	0.14	487	1,213
2000	5	0.04	505	1,165
1999	6	0.07	506	1,308
1998	7	0.04	510	1,293
1997	8	0.14	591	1,799
1996	9	0.07	693	2,665
1994	11	0.07	716	4,139
1993	12	0.04	679	2,908
1992	13	0.04	644	2,514

Mean age: 5.8

Table A-7: Walleye year-class structure based upon limited 2005 assessment returns.

	BOAT		DOCK/PIER		ICE		SHORE/WADE		TOTAL	
	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
Yellow Perch	2,380	1,965	69	32	26	8	0	0	2,475	2,005
Walleye	1,427	886	0	0	0	0	0	0	1,427	886
Steelhead	130	102	0	0	0	0	297	15	427	117
White Perch	360	11	0	0	0	0	0	0	360	11
Sheepshead	338	0	0	0	0	0	0	0	338	0
Round Goby	211	18	0	0	0	0	0	0	211	18
LM Bass	167	0	0	0	0	0	4	0	171	0
SM Bass	112	5	0	0	0	0	2	0	114	5
Smolt	0	0	0	0	0	0	63	0	63	0
Brown Trout	6	6	0	0	0	0	48	20	54	26
Smelt	0	0	1	0	53	51	0	0	54	51
White Bass	33	0	0	0	0	0	0	0	33	0
Lake Trout	31	29	0	0	0	0	0	0	31	29
Rock Bass	28	0	0	0	0	0	0	0	28	0
Sucker	0	0	0	0	0	0	4	0	4	0
Chub	0	0	0	0	0	0	1	0	1	0
Gar	1	0	0	0	0	0	0	0	1	0
Mud Puppy	0	0	0	0	1	0	0	0	1	0
Muskullenge	1	0	0	0	0	0	0	0	1	0

Table S-1: Catch and harvest of all species by Lake Erie Cooperative Angler Log participants by fishing trip type for 2005

Statistics		Walleye	Yellow Perch	Smallmouth Bass	Steelhead
Boat					
	Trips	96	78	18	6
	Catch / line hr	0.275	2.883	0.261	0.097
	Lines	7.8	3.4	2.4	6.0
	Time (hrs)	6.4	3.6	4.2	6.0
	Success (%)	94%	95%	61%	100%
Ice					
	Trips	-	3	-	-
	Catch / line hr	-	0.351	-	-
	Lines	-	5.3	-	-
	Time (hrs)	-	4.8	-	-
	Success (%)	-	100%	-	-
Shore					
	Trips	-	-	-	89
	Catch / line hr	-	-	-	0.820
	Lines	-	-	-	1.2
	Time (hrs)	-	-	-	3.5
	Success (%)	-	-	-	79%
Combined					
	Trips	96	86	18	95
	Catch / line hr	0.275	2.701	0.261	0.775
	Lines	7.8	3.5	2.4	1.5
	Time (hrs)	6.4	3.6	4.2	3.6
	Success (%)	94%	95%	61%	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 2005 Lake Erie Cooperative Angler Log.

	Central Basin	Eastern Basin	Total Open Lake
Interview N	391	260	651
Angler Hours	147,733	111,851	259,583
Yellow Perch	90,243	50,212	140,455
Walleye	48,146	33,376	81,522
Smallmouth Bass	3,577	20,237	23,813
Anything that Bites	1,432	4,733	6,166
Steelhead	3,807	1,449	5,257
Crappie	0	1,099	1,099
Lake Trout	298	407	705
Largemouth Bass	229	338	567

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 2005.

	Central Basin		Eastern Basin		Total Open Lake Waters	
# of Interviews	391		260		651	
Angler Hours	147,733		111,851		259,583	
	Catch	Harvest	Catch	Harvest	Catch	Harvest
Yellow Perch	343,162	238,663	151,773	93,235	494,936	331,898
Walleye	29,291	9,471	13,724	4,344	43,016	13,815
Sheepshead	26,650	0	13,879	0	40,529	0
White Bass	21,054	1,329	7,155	114	28,209	1,444
White Perch	16,663	137	3,281	0	19,945	137
Round Goby	7,830	0	22,466	384	30,296	384
SM Bass	1,774	123	18,061	802	19,835	925
Steelehad	1,512	1,056	359	253	1,871	1,310
LM Bass	818	0	3,663	0	4,481	0
Rock Bass	464	0	1,445	0	1,909	0
Channel Catfish	62	0	263	92	325	92
Smelt	39	0	45	0	84	0
Lake Trout	36	36	91	67	127	103

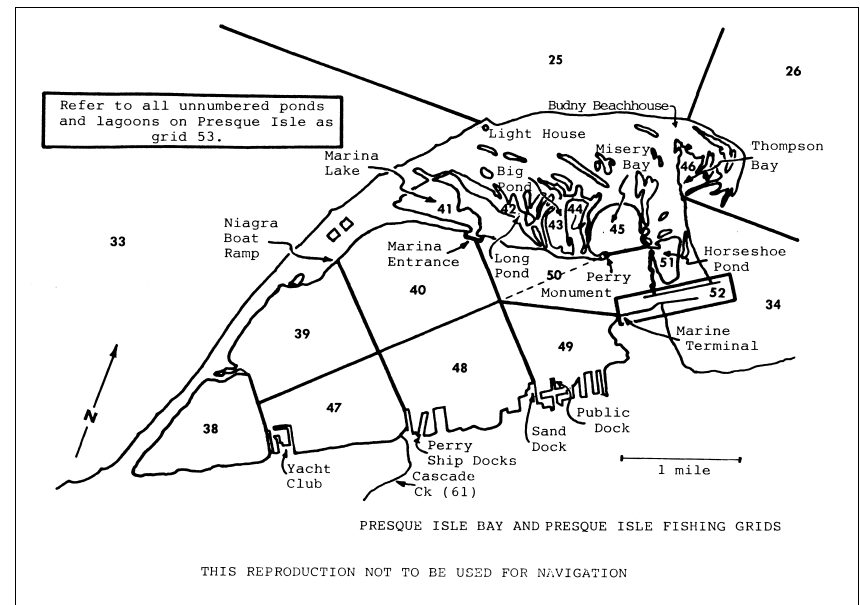
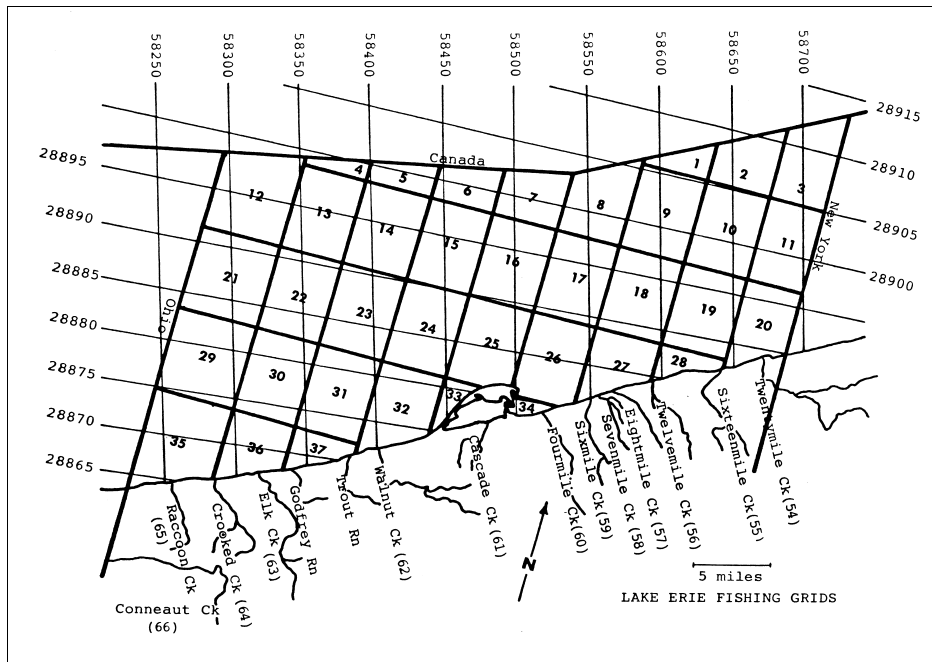
Table S-4: Estimated Catch and harvest of various fish species in central basin, eastern basin and total open lake waters of Lake Erie in Pennsylvania by anglers landing at Walnut Creek Access Area, Lampe marina, East Avenue Boat Launch and North East Access Area during 2005.

		Central Basin Waters			Eastern Basin Waters			Total Open Lake Waters		
		Effort	Catch	Harvest	Effort	Catch	Harvest	Effort	Catch	Harvest
Walleye	May	191	0	0	1,213	107	103	1,404	107	103
	June	17,334	3,105	2,429	11,009	1,358	1,199	28,343	4,463	3,628
	July	25,048	18,716	7,722	18,181	7,850	3,675	43,229	26,566	11,397
	Aug	16,008	15,986	2,618	11,797	8,729	1,115	27,805	24,715	3,733
	Sept	4,743	4,694	655	2,479	2,140	297	7,222	6,834	952
	Oct	1,130	574	503	0	0	0	1,130	574	503
	Total	64,452	43,075	13,928	44,680	20,183	6,388	109,132	63,258	20,316
Smallmouth Bass	May	870	293	0	8,807	13,857	0	9,678	14,150	0
	June	3,797	1,412	95	13,413	8,757	281	17,210	10,170	375
	July	443	1,061	107	3,225	3,985	136	3,668	5,047	243
	Aug	392	240	0	6,071	3,158	648	6,463	3,398	648
	Sept	529	0	0	1,761	731	251	2,290	731	251
	Oct	0	0	0	849	123	0	849	123	0
	Total	6,031	3,007	202	34,126	30,611	1,315	40,157	33,618	1,517
Yellow Perch	May	1,499	1,120	1,060	9,187	12,217	7,394	10,685	13,337	8,455
	June	50,974	120,676	85,195	8,688	14,008	6,489	59,662	134,684	91,684
	July	26,869	44,365	33,640	16,536	23,281	16,539	43,406	67,645	50,178
	Aug	22,768	67,275	44,856	22,634	47,021	30,625	45,402	114,296	75,481
	Sept	22,855	129,602	86,719	11,962	60,770	31,954	34,816	190,372	118,673
	Oct	2,497	14,064	7,946	1,914	9,489	8,342	4,411	23,552	16,288
	Total	127,462	377,101	259,416	70,921	166,784	101,343	198,382	543,885	360,759
Steelhead Trout	May	0	0	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0	0	0
	July	0	554	332	0	245	59	0	799	391
	Aug	594	580	391	790	225	232	1,384	805	623
	Sept	1,442	263	197	1,387	127	131	2,829	390	328
	Oct	4,309	1,124	841	238	0	0	4,547	1,124	841
	Total	6,346	2,520	1,761	2,415	598	422	8,761	3,118	2,183

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 2005 Lake Erie Boat Angler Survey.

	Grids Producing				
	Greatest Catch	2nd Greatest Catch	3rd greatest catch	4th greatest catch	5th greatest catch
Walleye	17	31	18	32	20
Smallmouth Bass	31	34	20	52	
Yellow Perch	37	31	32	20	24
Steelhead	63	54	17	7	62

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 2005 Lake Erie Cooperative Angler Log.



		Central				East				Total Open Lake			
		N	% Success	CUE	HUE	N	% Success	CUE	HUE	N	% Success	CUE	HUE
Walleye	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
	2005	143	75%	0.56	0.17	81	69%	0.37	0.09	224	73%	0.49	0.14
Smallmouth Bass	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
	2005	13	38%	0.21	0.04	47	85%	0.69	0.03	60	75%	0.59	0.03
Yellow Perch	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
	2005	258	96%	4.28	2.93	141	84%	2.61	1.76	399	91%	3.69	2.52
Steelhead Trout	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
	2005	15	53%	0.17	0.10	11	18%	0.02	0.02	26	38%	0.10	0.07

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 – 2005 Lake Erie Boat Angler Surveys.

	Central Basin			East Basin			Total Open Lake			
	Effort (hours)	Catch	Harvest	Effort (hours)	Catch	Harvest	Effort (hours)	Catch	Harvest	
Walleye	1996	208,246	86,954	72,040	107,910	21,256	17,047	316,157	108,210	89,087
	1997	241,237	78,259	72,357	147,258	17,394	16,325	388,494	95,653	88,682
	1998	297,680	132,603	105,627	92,067	24,458	19,187	389,747	157,060	124,814
	1999	295,418	79,663	76,512	101,091	12,805	12,526	396,509	92,467	89,038
	2000	140,822	63,670	58,310	103,294	20,740	19,205	244,116	84,410	77,515
	2001	158,025	45,339	40,618	83,221	16,702	12,072	241,246	62,041	52,690
	2002	87,626	17,808	16,979	42,818	5,377	5,102	130,444	23,186	22,081
	2003	110,840	40,885	32,767	48,199	11,403	10,814	159,039	52,289	43,581
	2004	72,855	24,180	17,791	15,592	3,195	2,177	88,446	27,375	19,969
2005	64,452	43,075	13,928	44,680	20,183	6,388	109,132	63,258	20,316	
Smallmouth Bass	1996	49,430	81,846	5,561	97,688	159,000	16,002	147,118	240,846	21,562
	1997	45,148	69,079	10,621	106,611	168,455	12,825	151,760	237,534	23,445
	1998	12,054	20,357	2,767	60,480	101,001	4,613	72,534	121,358	7,381
	1999	18,907	20,070	1,091	103,028	74,285	14,195	121,934	94,356	15,285
	2000	19,968	8,649	913	65,906	43,857	4,089	85,874	52,506	5,003
	2001	9,057	9,066	974	33,780	71,331	1,508	42,837	80,397	2,483
	2002	6,279	18,912	1,133	26,189	43,292	1,507	32,468	62,205	2,640
	2003	6,527	8,453	518	42,890	70,547	2,245	49,417	79,000	2,763
	2004	5,278	11,304	259	36,822	32,510	648	42,100	43,814	907
2005	6,031	3,007	202	34,126	30,611	1,315	40,157	33,618	1,517	
Yellow Perch	1996	18,148	15,284	12,433	10,299	10,546	7,667	28,448	25,830	20,100
	1997	43,377	32,955	28,891	13,744	13,492	5,516	57,121	46,447	34,408
	1998	30,613	37,929	35,174	4,084	4,370	1,779	34,697	42,299	36,953
	1999	28,486	53,804	35,542	13,623	8,564	5,566	42,109	62,368	41,108
	2000	48,561	117,633	80,050	21,146	52,190	32,852	69,707	169,824	112,902
	2001	77,686	240,921	202,913	12,450	30,140	19,093	90,136	271,061	222,006
	2002	123,287	374,252	308,057	61,735	126,775	104,023	185,022	501,027	412,080
	2003	138,721	393,484	336,396	49,048	85,196	77,654	187,770	478,681	414,050
	2004	175,596	623,783	461,538	62,639	126,348	90,514	238,235	750,132	552,052
2005	127,462	377,101	259,416	70,921	166,784	101,343	198,382	543,885	360,759	
Steelhead Trout	1996	20,071	951	381	3,826	574	499	23,897	1,525	880
	1997	41,039	2,642	1,721	4,123	110	0	45,163	2,752	1,721
	1998	36,634	6,227	4,348	2,879	947	947	39,513	7,174	5,295
	1999	45,070	8,332	6,306	21,870	1,613	1,095	66,939	9,945	7,401
	2000	27,071	14,368	9,880	1,504	1,301	1,131	28,575	15,669	11,011
	2001	9,382	8,760	4,193	21,989	4,612	2,859	31,371	13,372	7,053
	2002	21,601	7,409	4,552	8,218	1,416	676	29,819	8,825	5,229
	2003	13,079	3,321	1,430	2,456	884	287	15,535	4,205	1,717
	2004	14,605	3,146	2,041	4,546	1,743	615	19,151	4,889	2,657
2005	6,346	2,520	1,761	2,415	598	422	8,761	3,118	2,183	

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 – 2005 Lake Erie Boat Angler Surveys.

Year Class	2002	2001	2000	1999	1998	1997	1996	1995	1994	Total	Mean
Age	3	4	5	6	7	8	9	10	11		5.52
CPE	0.11	0.85	0.38	0.54	0.33	0.11	0.16	0.02	0.02	2.52	
%	4.4%	33.6%	15.0%	21.2%	13.3%	4.4%	6.2%	0.9%	0.9%		
N	16840	127988	57258	80834	50521	16840	23577	3368	3368	380,594	
LENGTH	199	225	241	250	276	290	295	344	345		
WEIGHT	91	141	168	204	288	351	329	530	460		

Minimum size limit of 8.0 inches (203 mm) in effect until July, no MSL thereafter
weight in grams

Table S- 9: Yellow perch 2005 sport harvest numbers, year class structure for Lake Erie fishery

Year Class	2001	2000	1999	1998	1997	1996	Total	Mean
Age	4	5	6	7	8	9		6.6
Freq	0.167	0	0.278	0.278	0.167	0.111		
N	3393	0	5648	5648	3393	2255	20,316	
LENGTH	514		582	593	599	689		
WEIGHT	1641		1310	1293	1810	2377	CPE - .186	

CPE - number per angler-line hour; harvest rate Length in mm, Weight in grams

Table S-10: 2005 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	75,002
Linesville FCS	Steelhead Trout	Raccoon Creek	48,355
Linesville FCS	Steelhead Trout	Crooked Creek	52,875
Tionesta FCS	Steelhead Trout	Elk Creek	261,090
Tionesta FCS	Steelhead Trout	Godfrey Run	38,680
Fairview FCS / Tionesta FCS	Steelhead Trout	Trout Run	92,797
Tionesta FCS	Steelhead Trout	Walnut Creek	203,070
Fairview FCS	Steelhead Trout	Presque Isle Bay	58,019
Fairview FCS	Steelhead Trout	Fourmile Creek	14,511
Tionesta FCS	Steelhead Trout	Sevenmile Creek	19,340
Fairview FCS	Steelhead Trout	Twelvemile Creek	38,687
Tionesta FCS	Steelhead Trout	Twentymile Creek	154,520
			1,056,946 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	East Basin Pond	950
Corry FCS	Brown Trout	Elk Creek	13,949
Corry FCS	Brown Trout	Twentymile Creek	3,200
Corry FCS	Brown Trout	West Basin Pond	950
			25,319 Total Brown Trout

Table S-11: Lake Erie drainage Steelhead Trout and Brown Trout stocking numbers in 2005 by Pennsylvania Fish and Boat Commission hatchery, by location.

Cooperative Hatchery	Species	Location	Number Stocked
3-C-U	Brook Trout	Elk Creek	200
3-C-U	Brook Trout	Mallory Run	450
Albion Sportsman's Club	Brook Trout	Elk Creek	260
Albion Sportsman's Club	Brook Trout	Mallory Run	1,115
Albion Sportsman's Club	Brook Trout	Taylor Run	942
Albion Sportsman's Club	Brook Trout	Temple Run	12,828
Albion Sportsman's Club	Brook Trout	West Branch Conneaut Creek	605
Wesleyville Sportsman's Club	Brook Trout	Sevenmile Creek	461
Wesleyville Sportsman's Club	Brook Trout	Telvemile Creek	100
			16,961 Total Brook Trout
3-C-U	Brown Trout	Elk Creek	530
3-C-U	Brown Trout	Lake Erie	5,500
3-C-U	Brown Trout	Mallory Run	200
Albion Sportsman's Club	Brown Trout	Elk Creek	60
Albion Sportsman's Club	Brown Trout	Little Elk Creek	700
Albion Sportsman's Club	Brown Trout	Mallory Run	1
Albion Sportsman's Club	Brown Trout	Temple Run	2,304
Albion Sportsman's Club	Brown Trout	West Branch Conneaut Creek	50
Wesleyville Sportsman's Club	Brown Trout	Fourmile Creek	430
Wesleyville Sportsman's Club	Brown Trout	Sevenmile Creek	389
			10,164 Total Brown Trout
3-C-U	Golden Rainbow Trout	Elk Creek	10
3-C-U	Golden Rainbow Trout	Mallory Run	10
Albion Sportsman's Club	Golden Rainbow Trout	Mallory Run	1
Albion Sportsman's Club	Golden Rainbow Trout	Temple Run	81
Wesleyville Sportsman's Club	Golden Rainbow Trout	Fourmile Creek	10
Wesleyville Sportsman's Club	Golden Rainbow Trout	Sevenmile Creek	20
Wesleyville Sportsman's Club	Golden Rainbow Trout	Telvemile Creek	13
			145 Total Golden Rainbow
Albion Sportsman's Club	Rainbow Trout	Elk Creek	160
Albion Sportsman's Club	Rainbow Trout	Mallory Run	502
Albion Sportsman's Club	Rainbow Trout	Taylor Run	235
Albion Sportsman's Club	Rainbow Trout	Temple Run	5,547
Albion Sportsman's Club	Rainbow Trout	West Branch Conneaut Creek	592
Wesleyville Sportsman's Club	Rainbow Trout	Fourmile Creek	430
Wesleyville Sportsman's Club	Rainbow Trout	Sevenmile Creek	975
Wesleyville Sportsman's Club	Rainbow Trout	Telvemile Creek	480
			8,921 Total Rainbow Trout
3-C-U	Steelhead Trout	Elk Creek	8,400
3-C-U	Steelhead Trout	Godfrey Run	32,900
3-C-U	Steelhead Trout	Trout Run	69,000
3-C-U	Steelhead Trout	Walnut Creek	16,000
			126,300 Total Steelhead
SONS of Lake Erie	Walleye fry	Presque Isle Bay	1,000,000
SONS of Lake Erie	Yellow Perch fry	Presque Isle Bay	1,000,000

Table S-12: Stocking by Sportsman's Cooperative Nurseries in 2005, by hatchery, by species, by location.

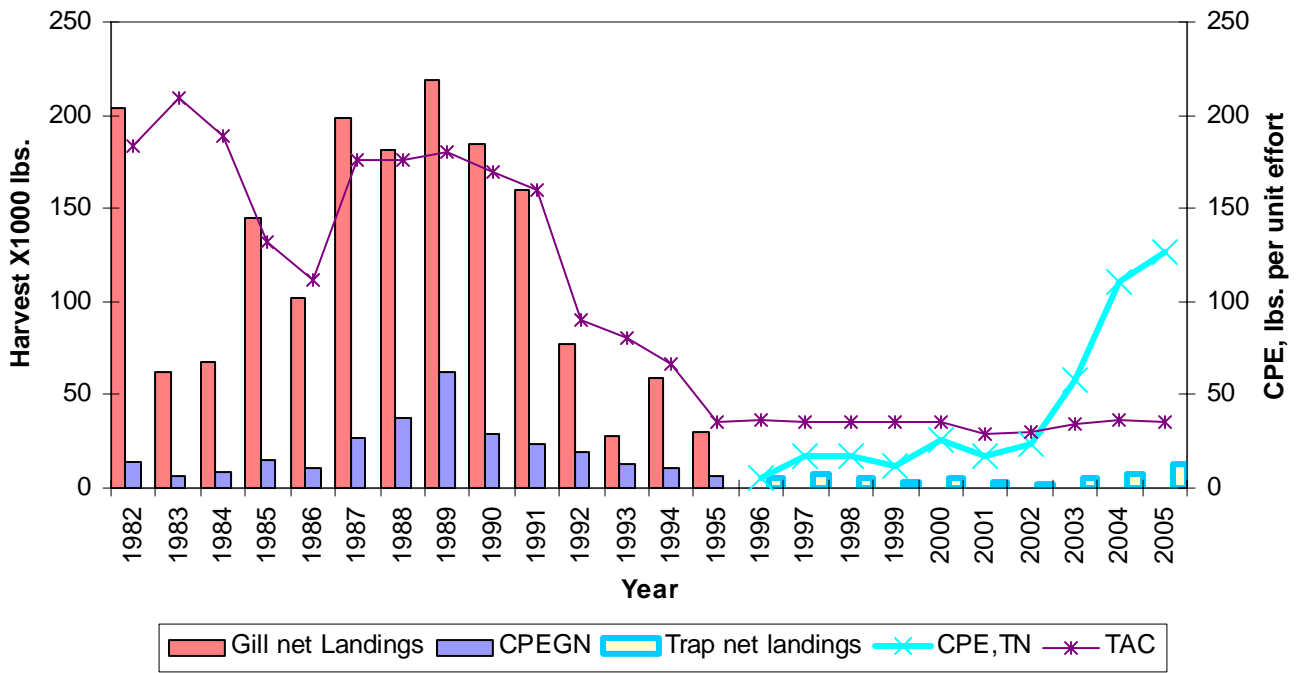


Figure C-1: Yellow perch commercial landings 1982 - 2005, Pennsylvania waters of Lake Erie.

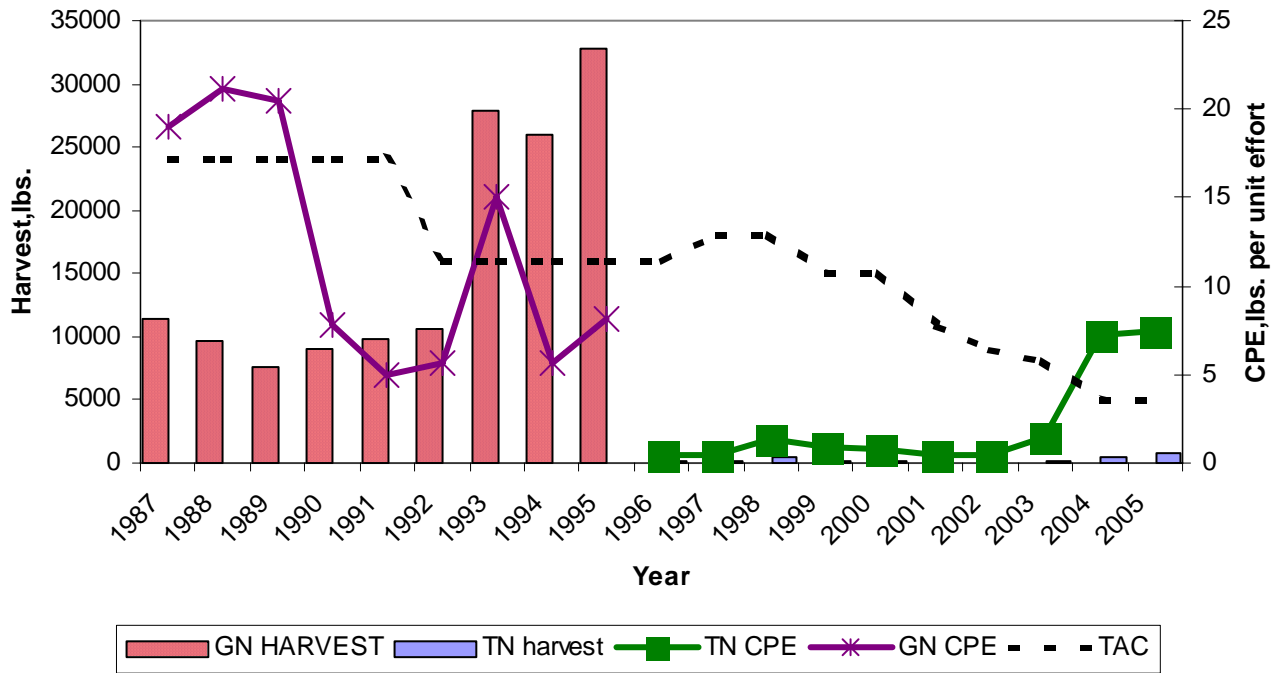


Figure C-2: Commercial walleye landings 1987 - 2005, Pennsylvania waters of Lake Erie.

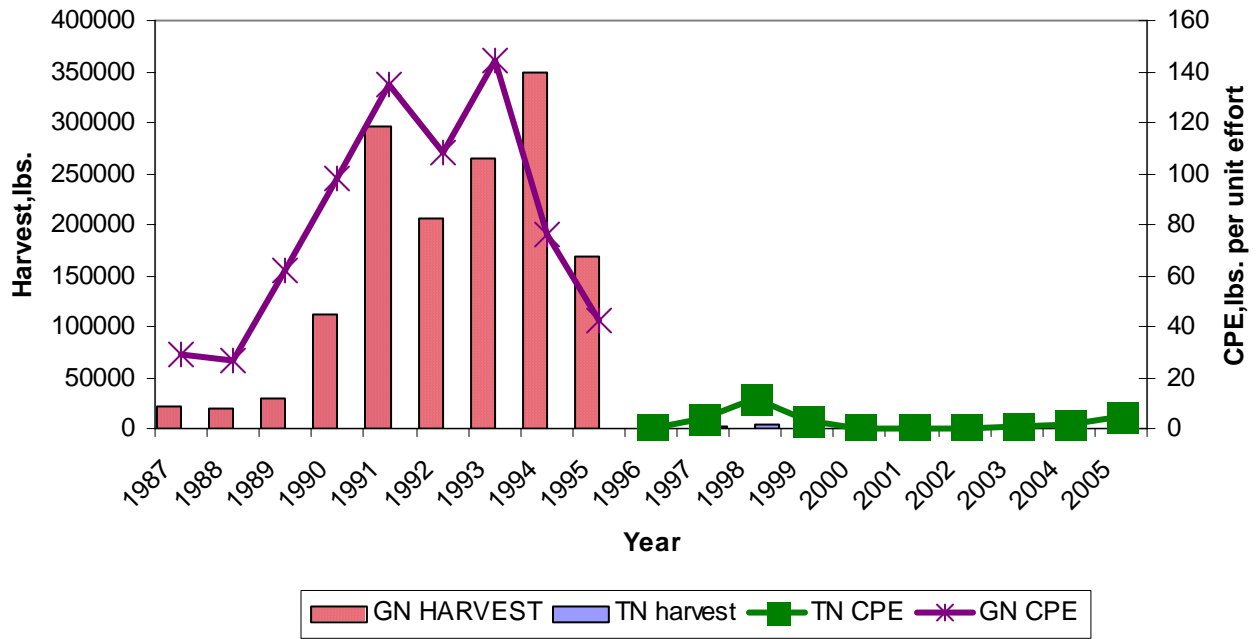


Figure C-3: Commercial whitefish landings 1987 - 2005, Pennsylvania waters of Lake Erie.

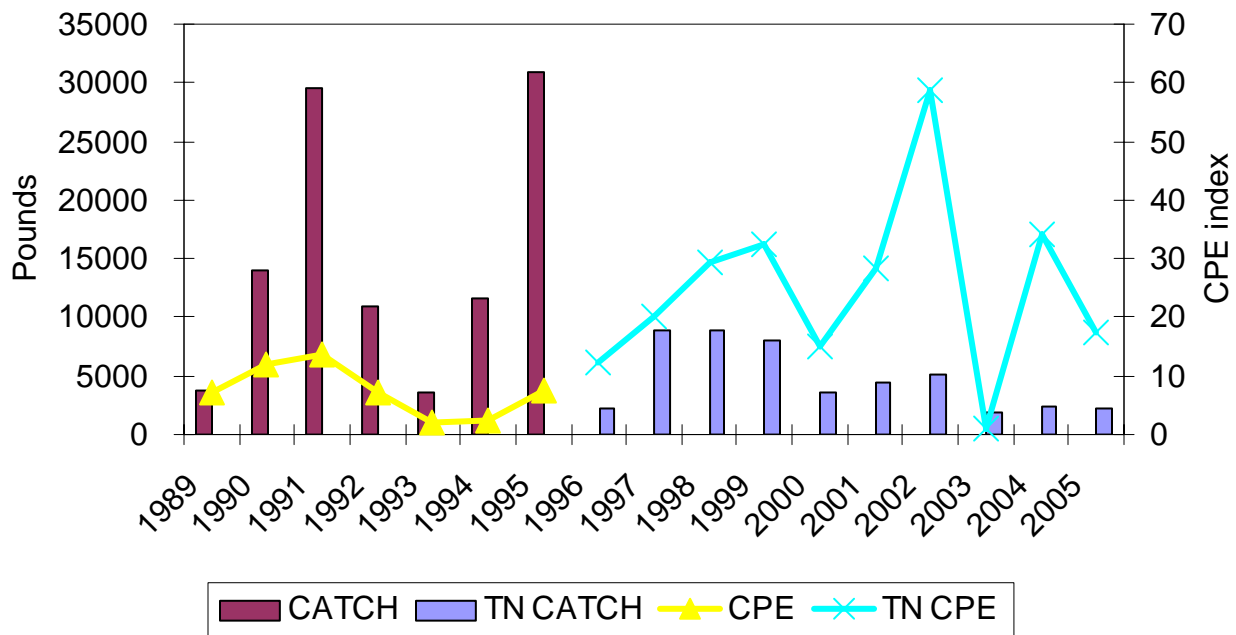


Figure C-4: Commercial burbot landings 1989 - 2005, Pennsylvania waters of Lake Erie.

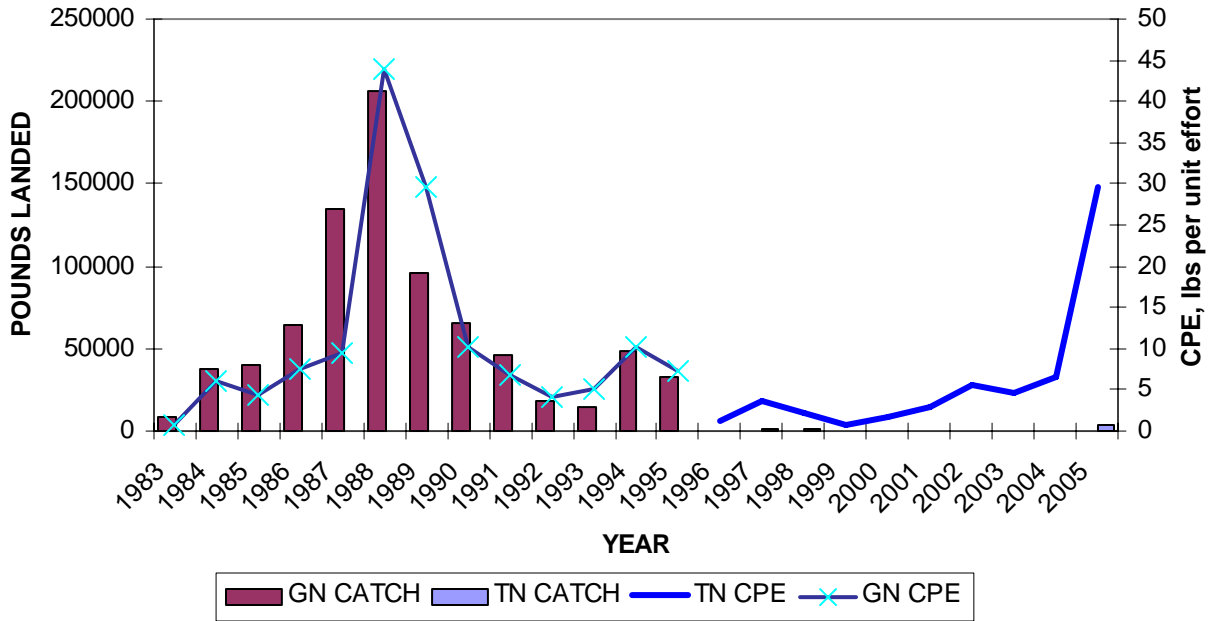


Figure C-5: Commercial white perch landings 1983 – 2005, Pennsylvania waters of Lake Erie.

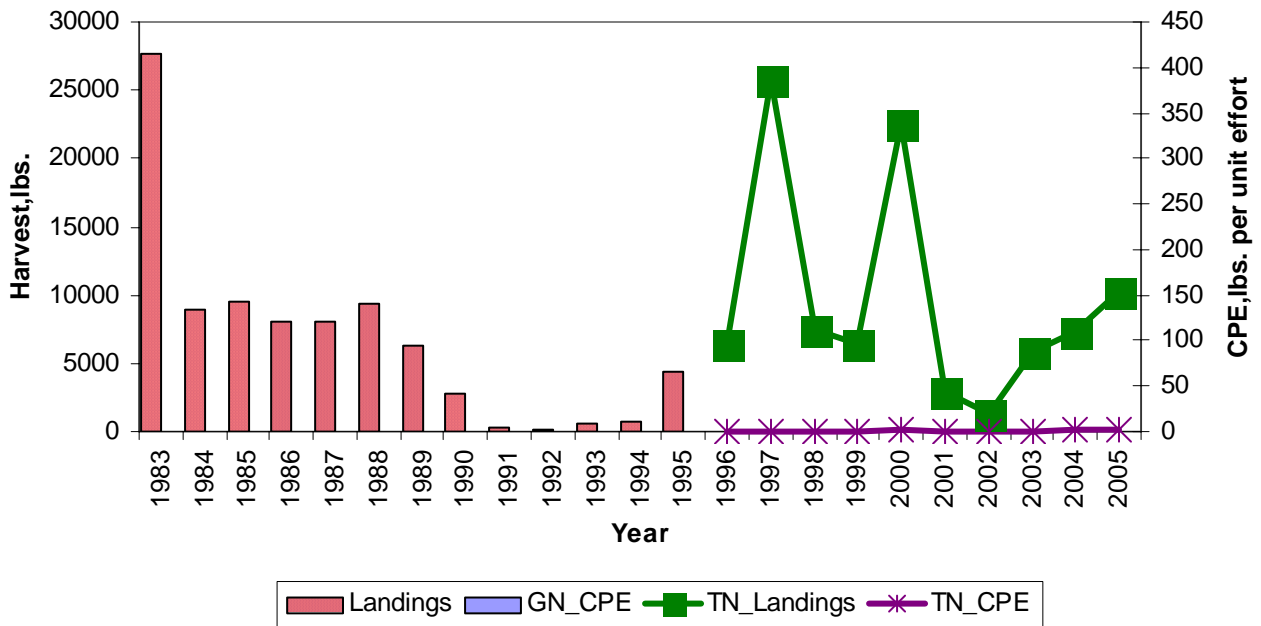


Figure C-6: Commercial white bass landings 1983 – 2005, Pennsylvania waters of Lake Erie.

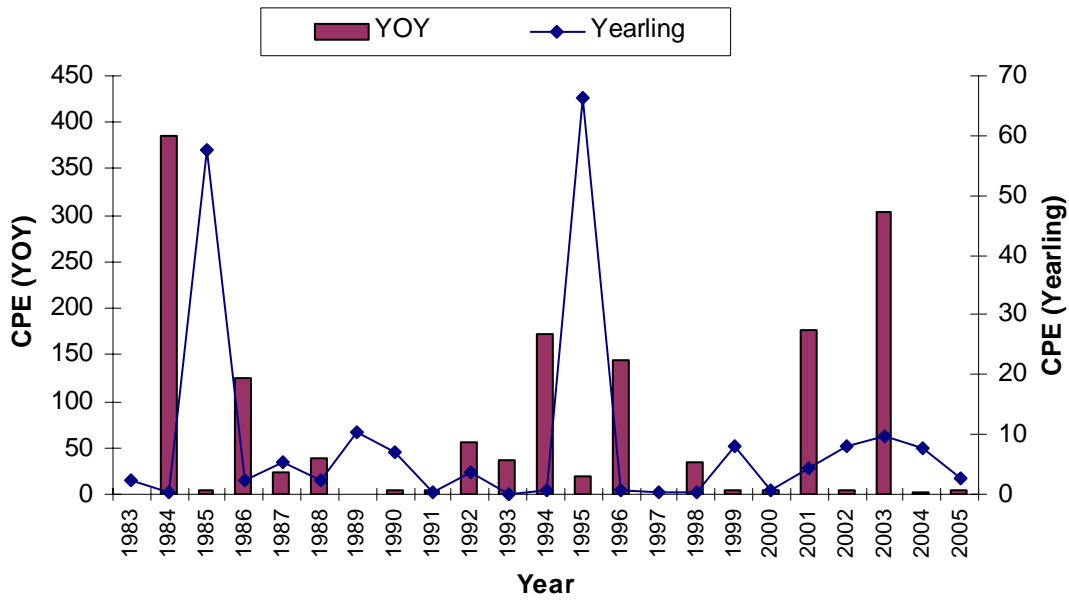


Figure A-1: Yellow Perch fall trawl indices for young-of-the-year (YOY) and yearling age groups.

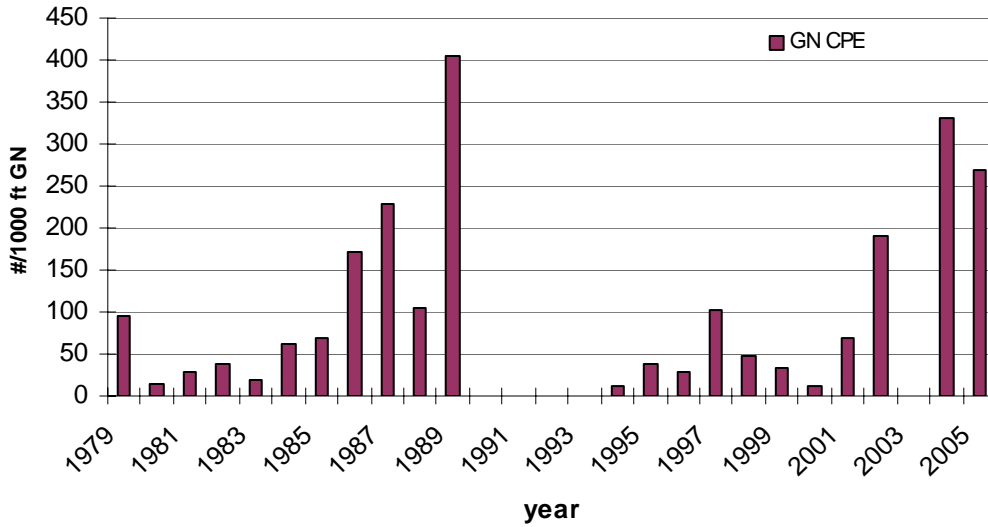


Figure A-2: Yellow perch abundance indices for assessment gill net surveys.

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
2005	2.1	0.2	1.1	0.1	0.1	0.4	0.2

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

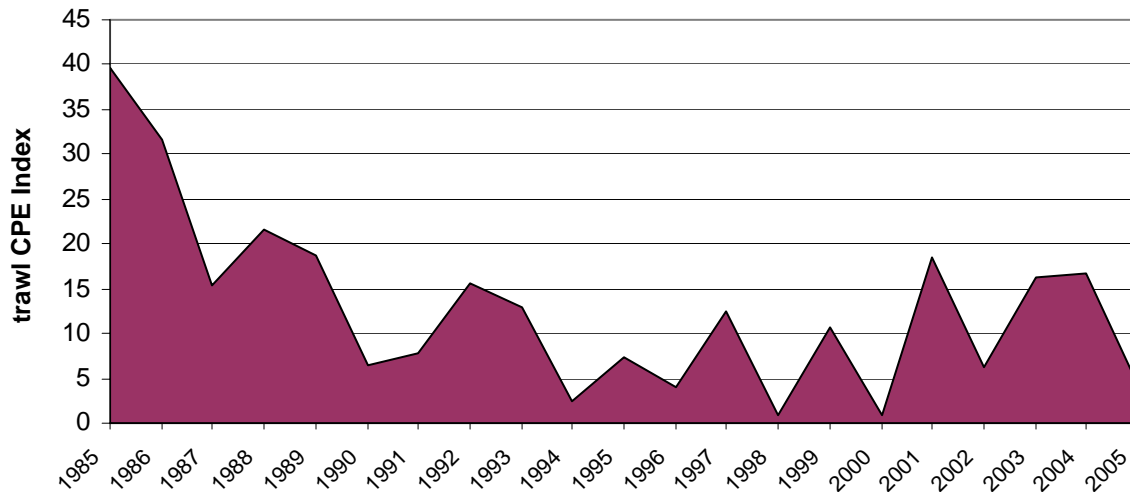


Figure A-3: Yellow Perch indices of abundance for age 2 and older fall stock.

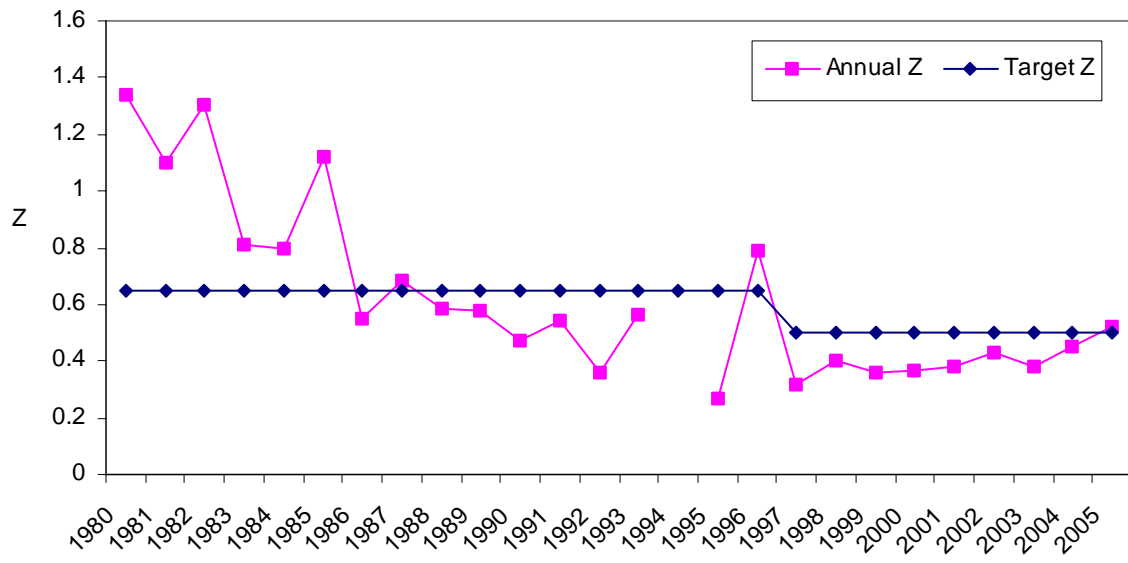


Figure A-4: Trends in yellow perch mortality.

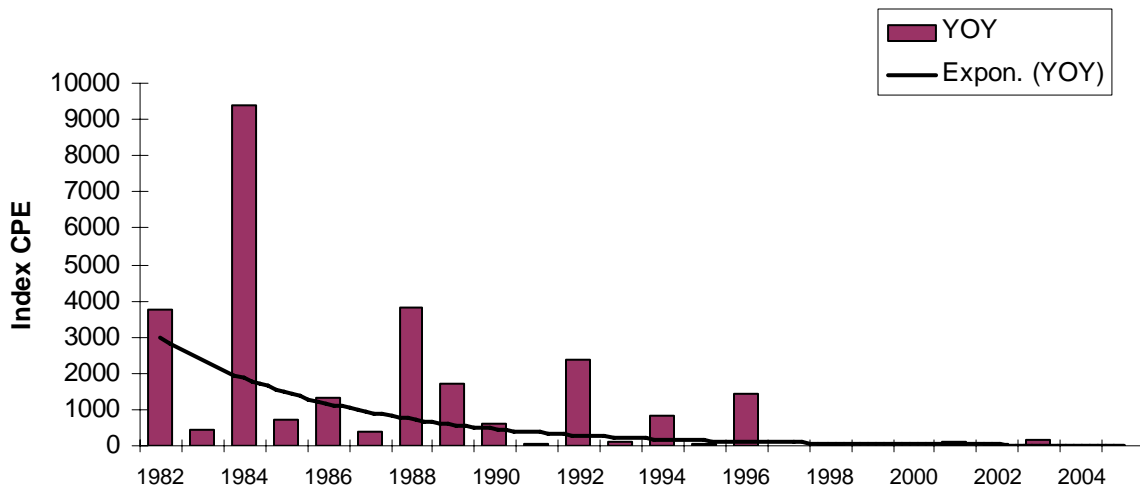


Figure A-5: Indices and trends in smelt abundance.

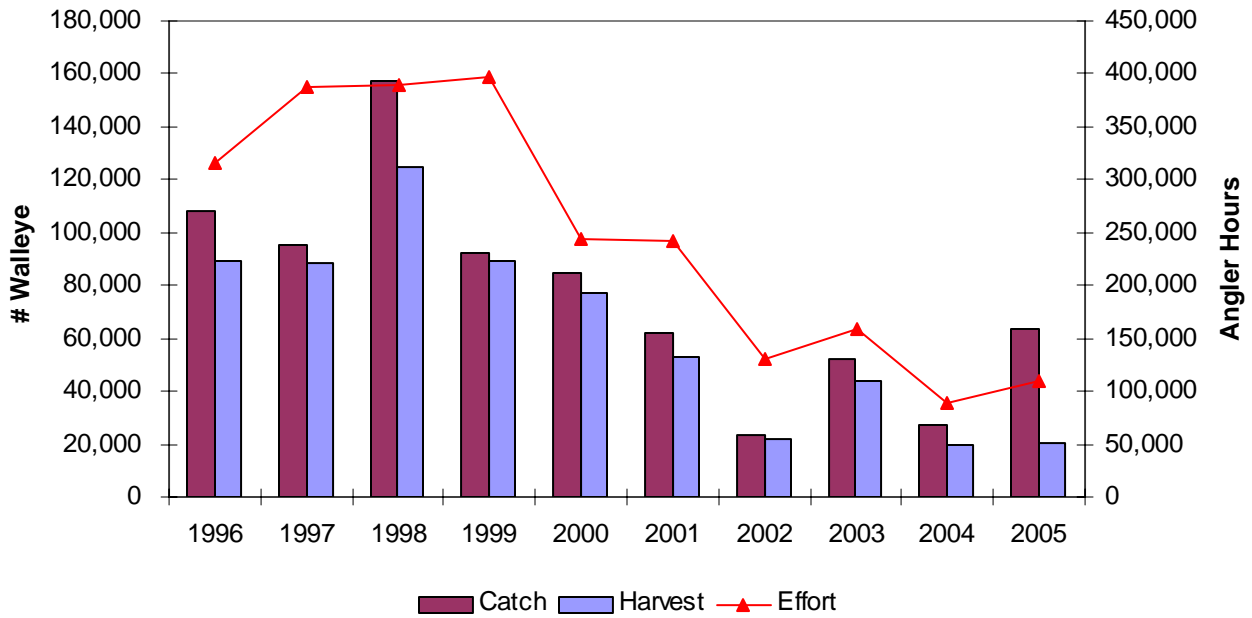


Figure S-1: Estimated walleye angler effort (hours), catch and harvest for the 1996 – 2005 Lake Erie Boat Angler Surveys.

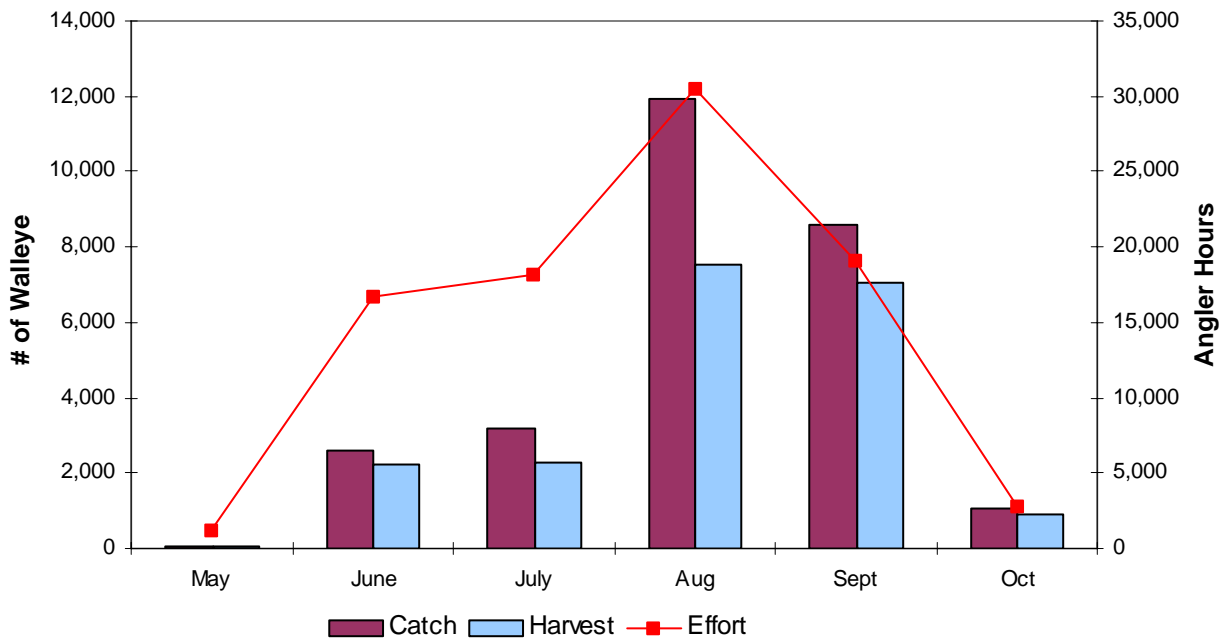


Figure S-2: Monthly estimated walleye angler effort (hours), catch and harvest for the 2005 Lake Erie Boat Angler Survey.

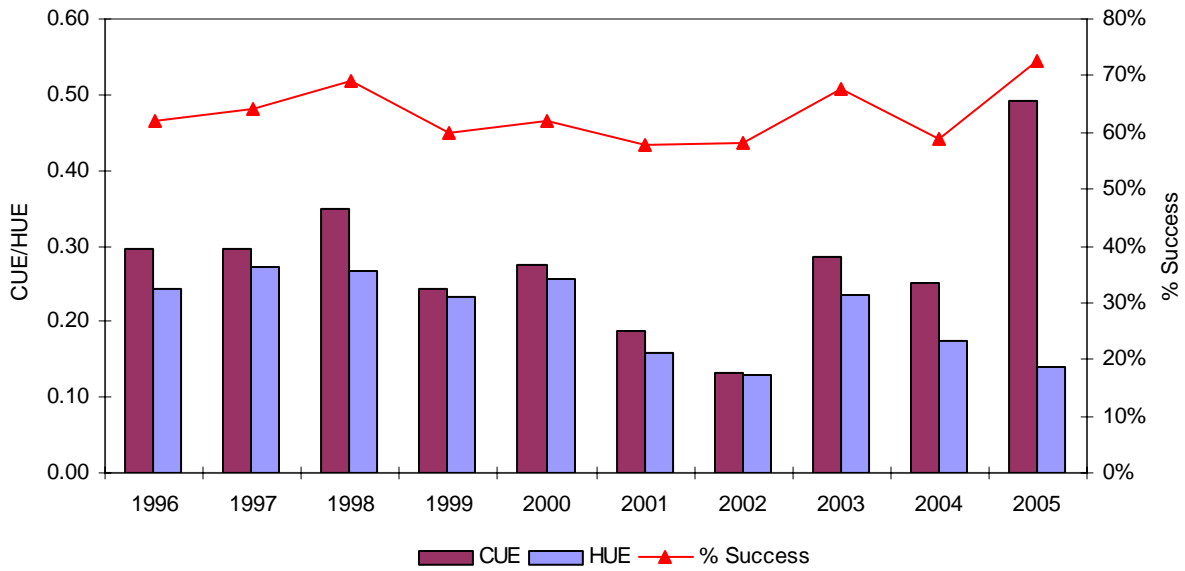


Figure S-3: Walleye angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2005 Lake Erie Boat Angler Surveys.

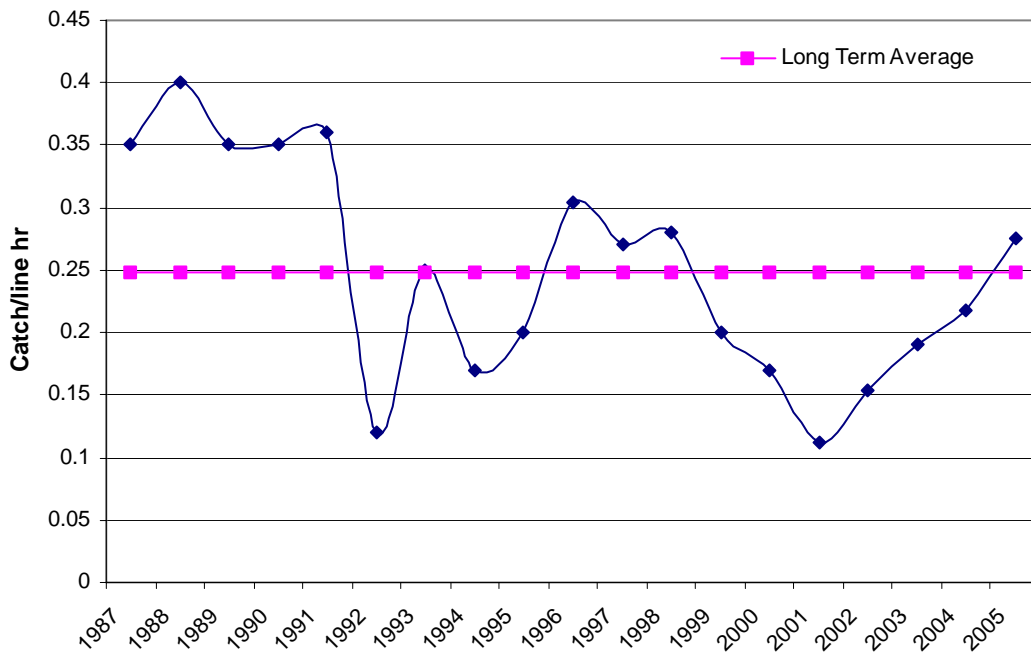


Figure S-4: Walleye angler catch per line hour by open lake boat anglers from the Lake Erie Cooperative Angler Log 1987-2005.

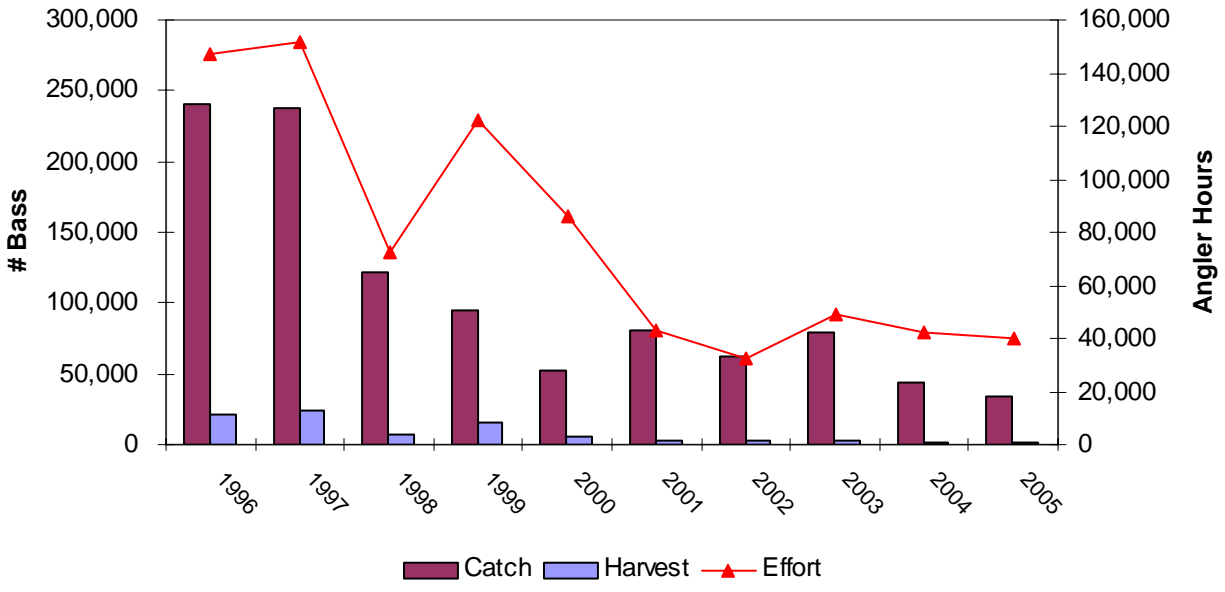


Figure S-5: Estimated smallmouth bass angler effort (hours), catch and harvest for the 1996 – 2005 Lake Erie Boat Angler Surveys.

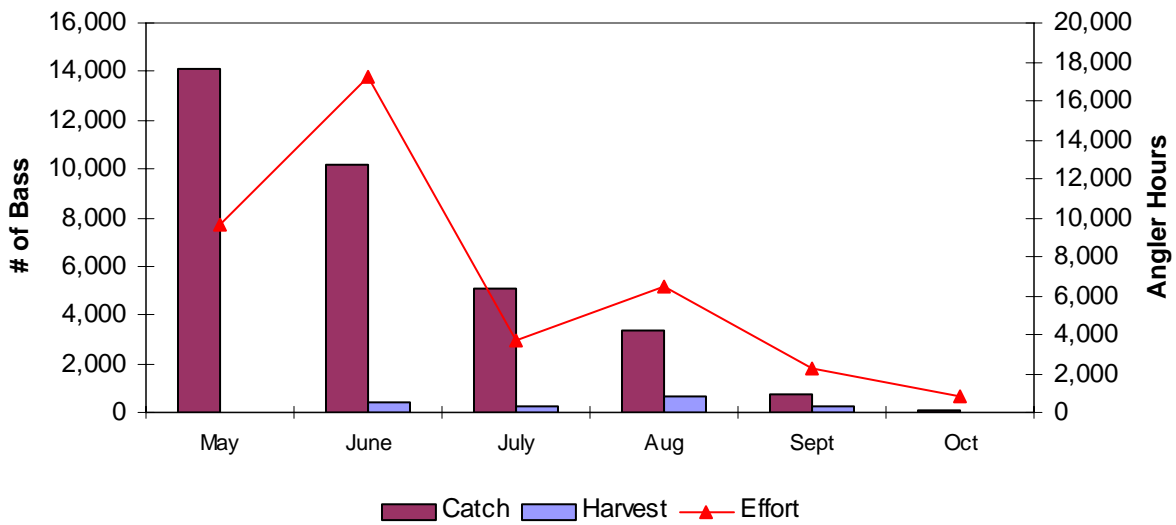


Figure S6: Monthly estimated smallmouth bass angler effort, catch and harvest for the 2005 Lake Erie Boat Angler Survey.

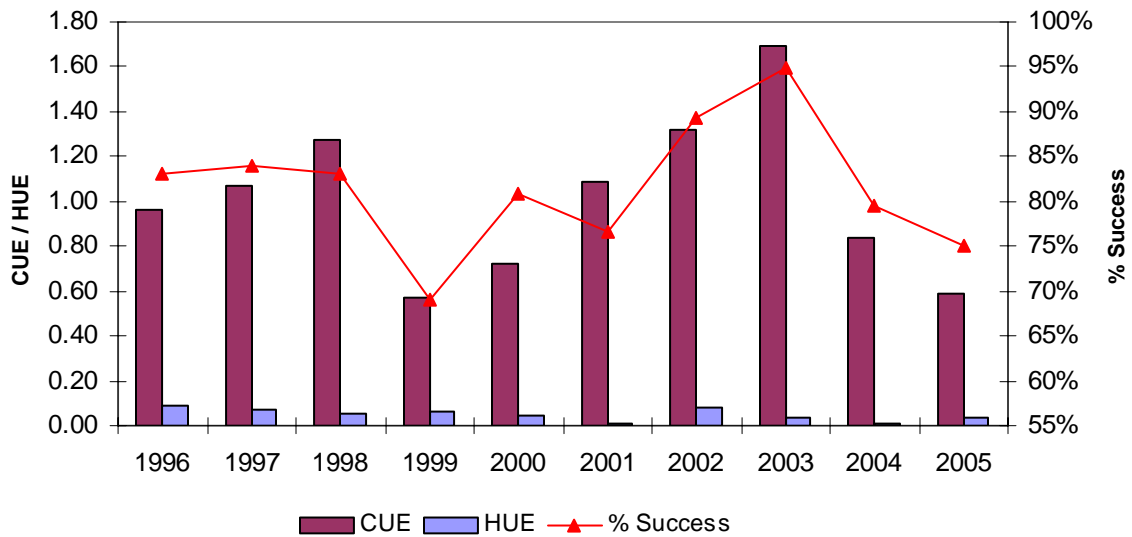


Figure S-7: Smallmouth bass angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2005 Lake Erie Boat Angler Surveys.

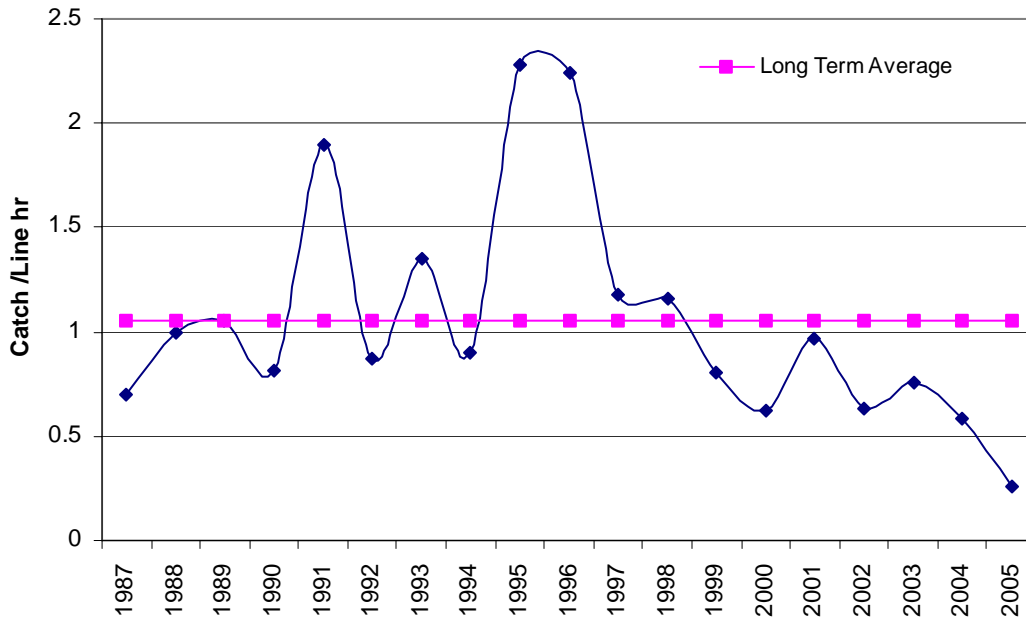


Figure S-8: Smallmouth bass boat angler catch per line hour from 1987 – 2005 and the long-term average from the Lake Erie Cooperative Angler Log.

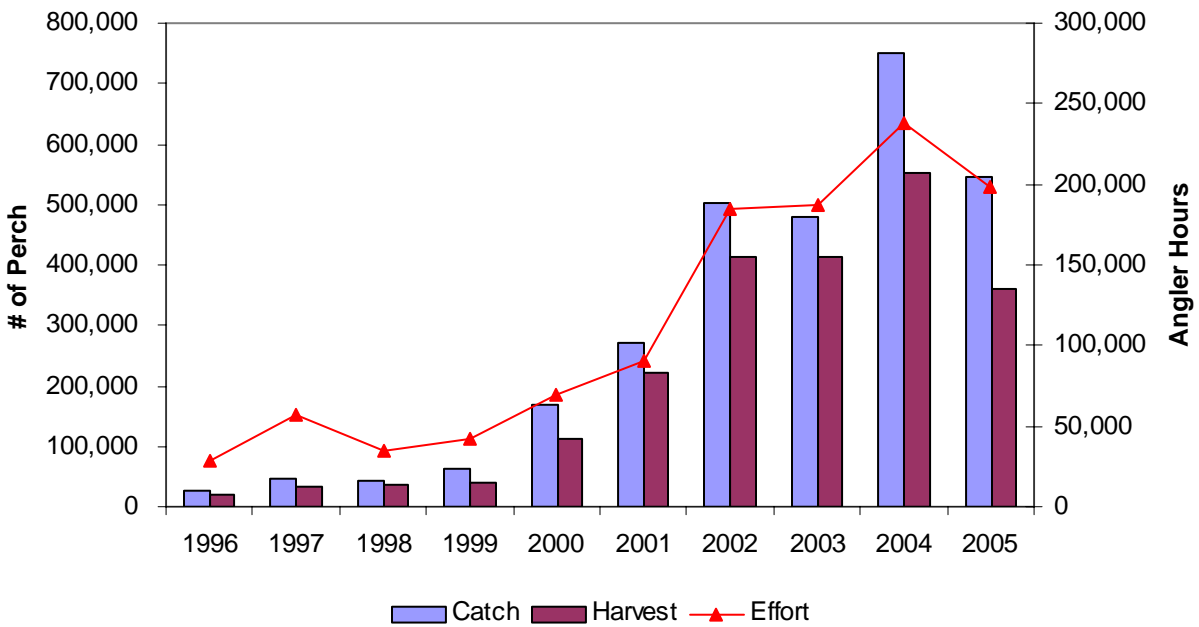


Figure S-9: Estimated yellow perch angler effort (hours), catch and harvest for the 1996 – 2005 Lake Erie Boat Angler Surveys.

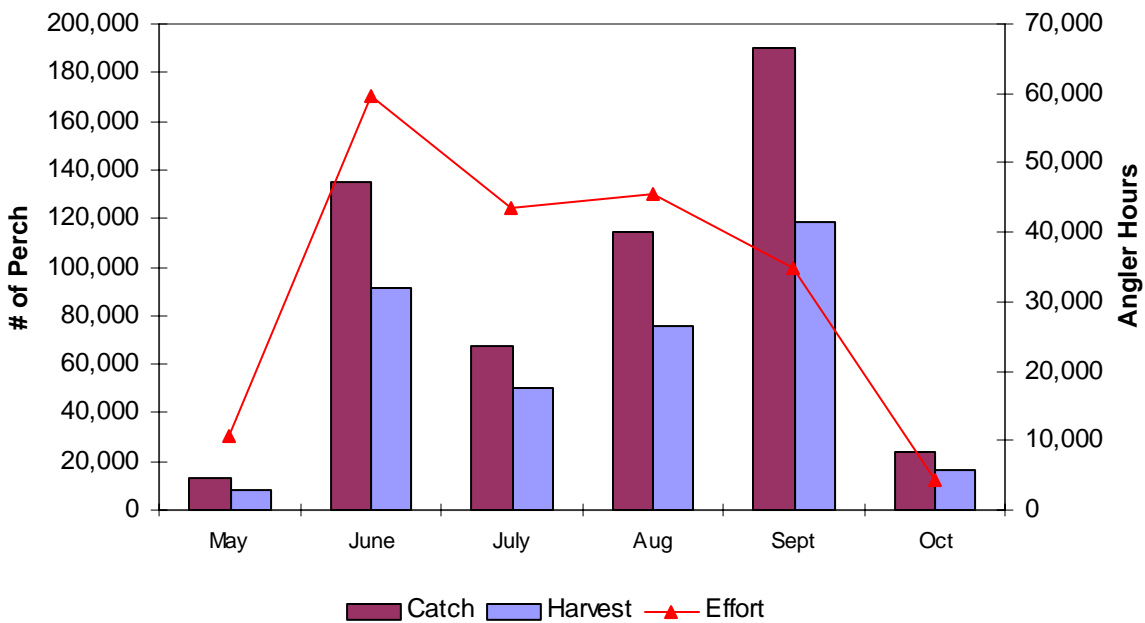


Figure S-10: Monthly estimated yellow perch angler effort, catch and harvest for the 2005 Lake Erie Boat Angler Survey.

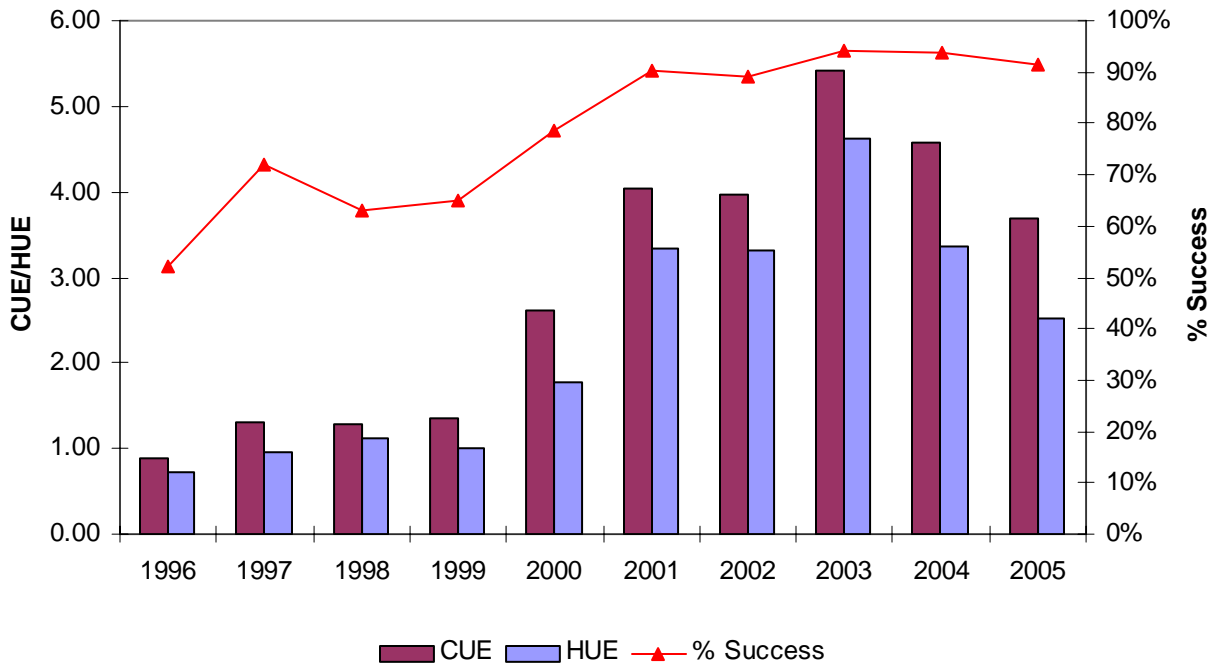


Figure S-11: Yellow perch angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2005 Lake Erie Boat Angler Surveys.

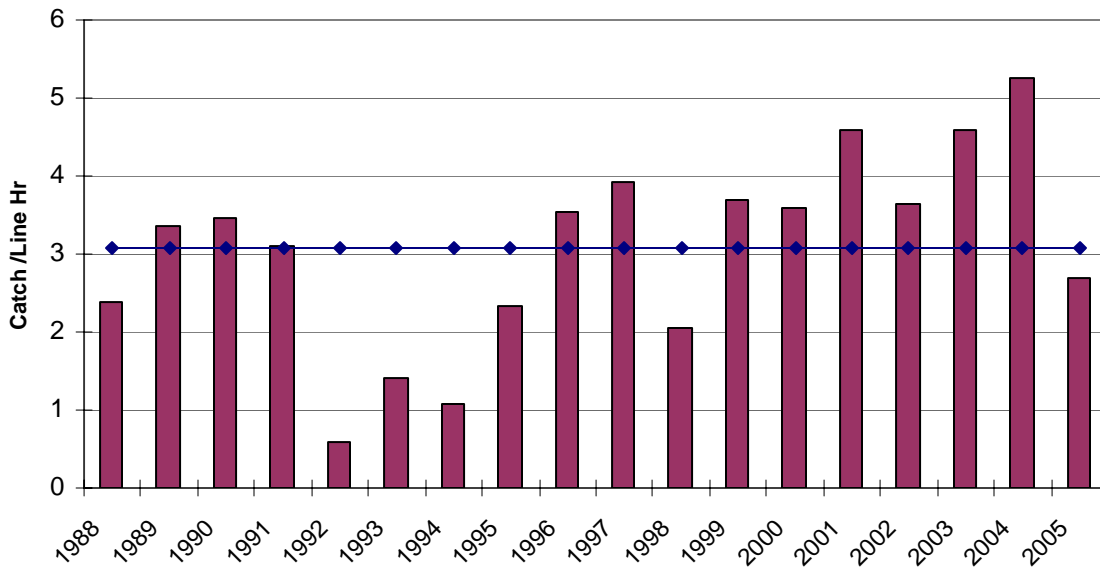


Figure S-12: Yellow perch catch per line hour and long-term average from 1988 – 2005 from the Lake Erie Cooperative Angler Log.

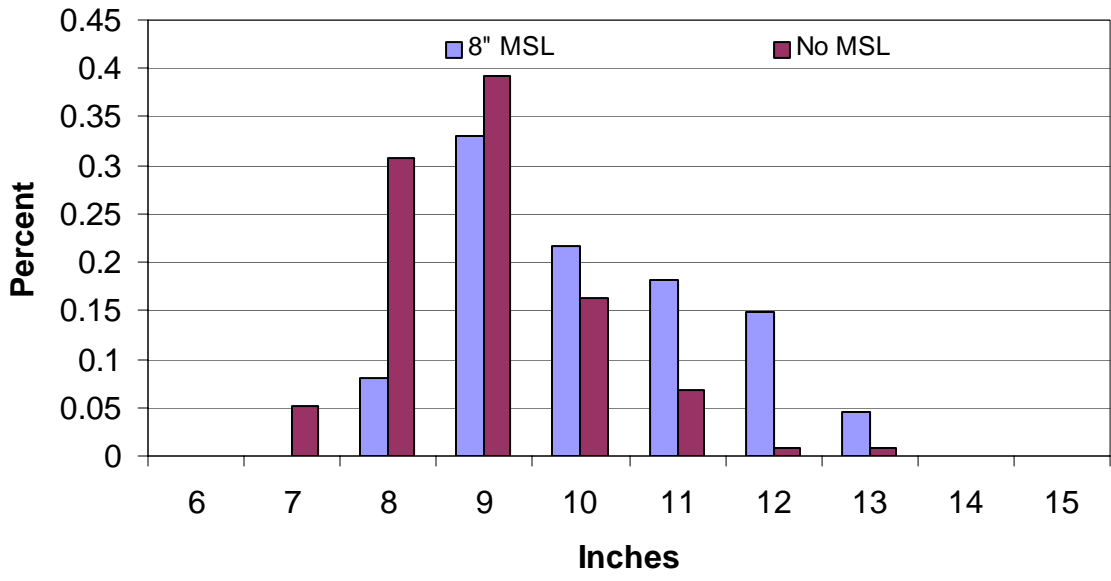


Figure S-13: Length frequency of yellow perch harvested by open lake boat anglers in 2005 before and after the elimination of the 8" MSL.

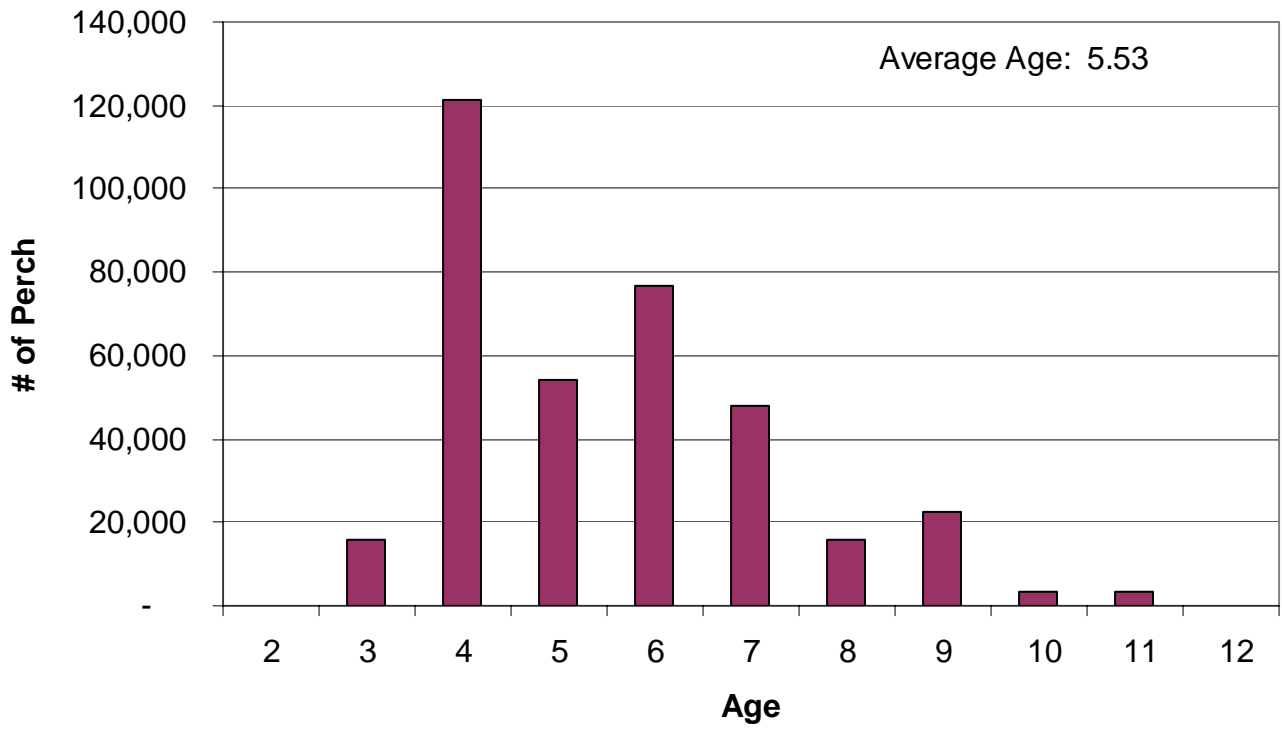


Figure S-14: Age frequency of yellow perch harvested by open lake boat anglers in 2005

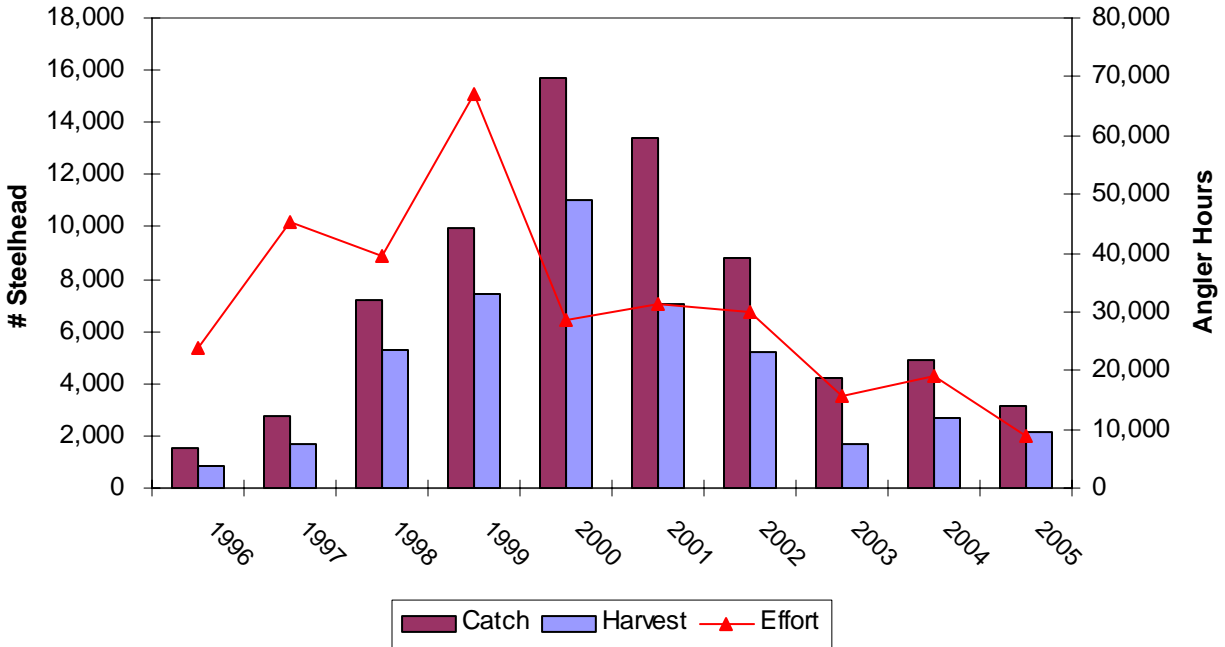


Figure S-15: Estimated steelhead angler effort (hours), catch and harvest for the 1996 – 2005 Lake Erie Boat Angler Surveys.

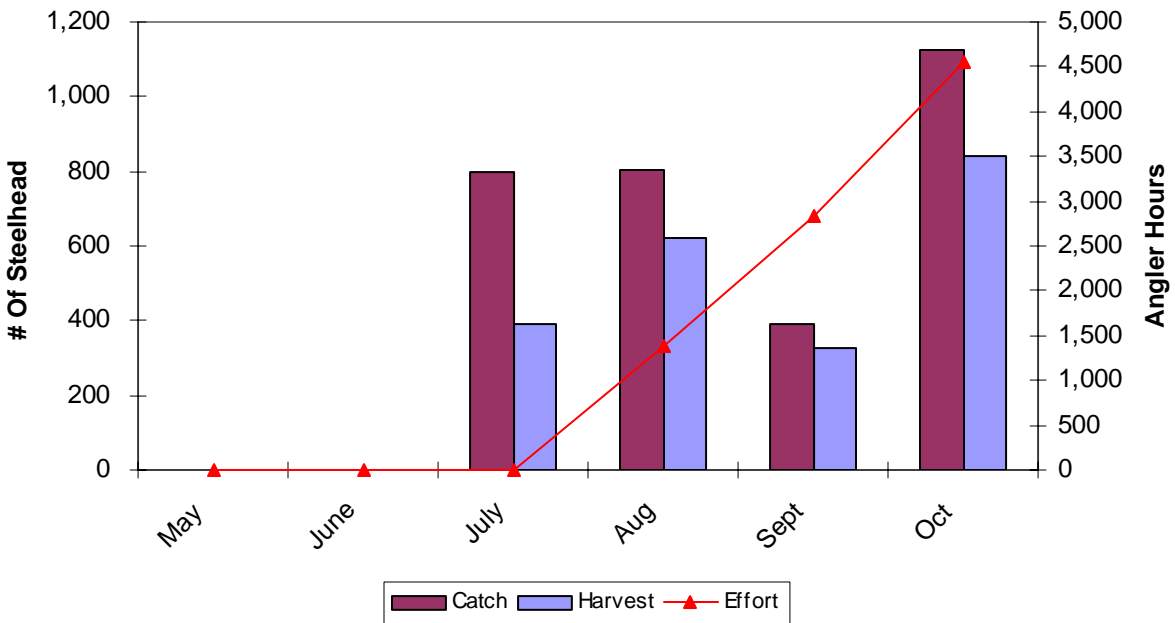


Figure S-16: Monthly estimated steelhead angler effort, catch and harvest for the 2005 Lake Erie Boat Angler Survey.

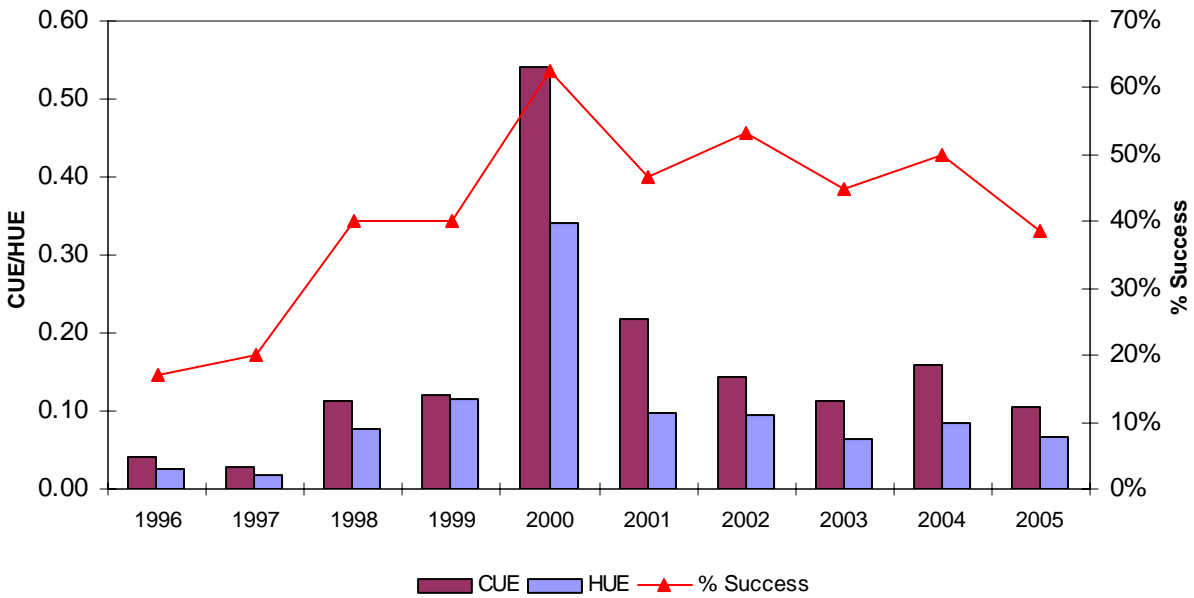


Figure S-17: steelhead angler % success, catch per angler hour (CUE) and harvest per angler hour (HUE) for the 1996 – 2005 Lake Erie Boat Angler Surveys.

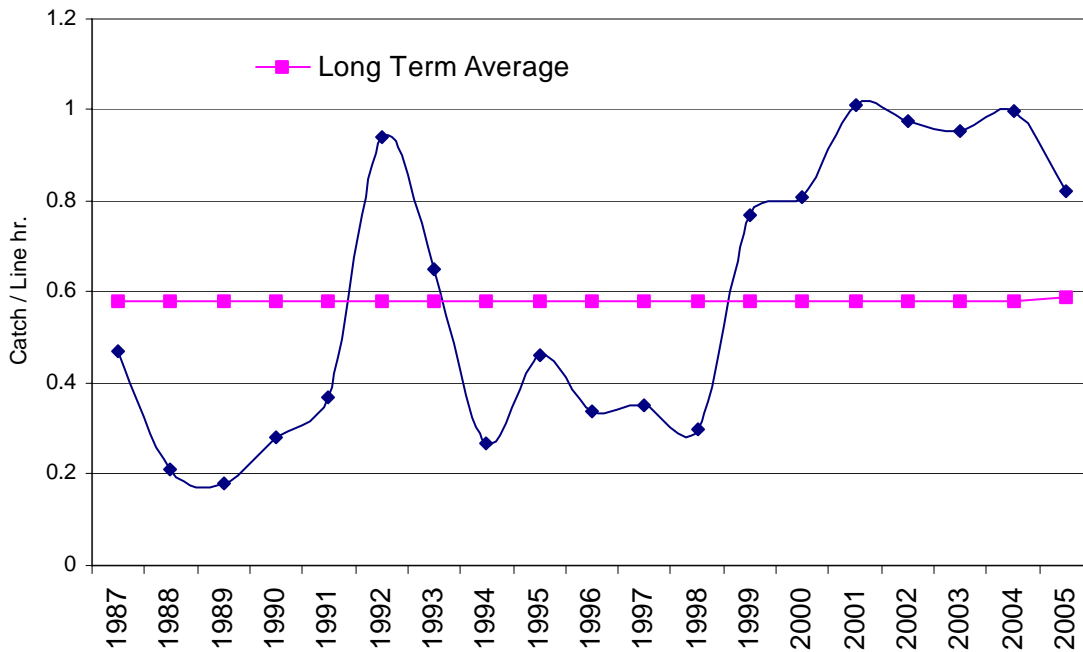


Figure S-18: Tributary and boat steelhead angler catch per line hour from 1987 – 2005 from the Lake Erie Cooperative Angler Log.

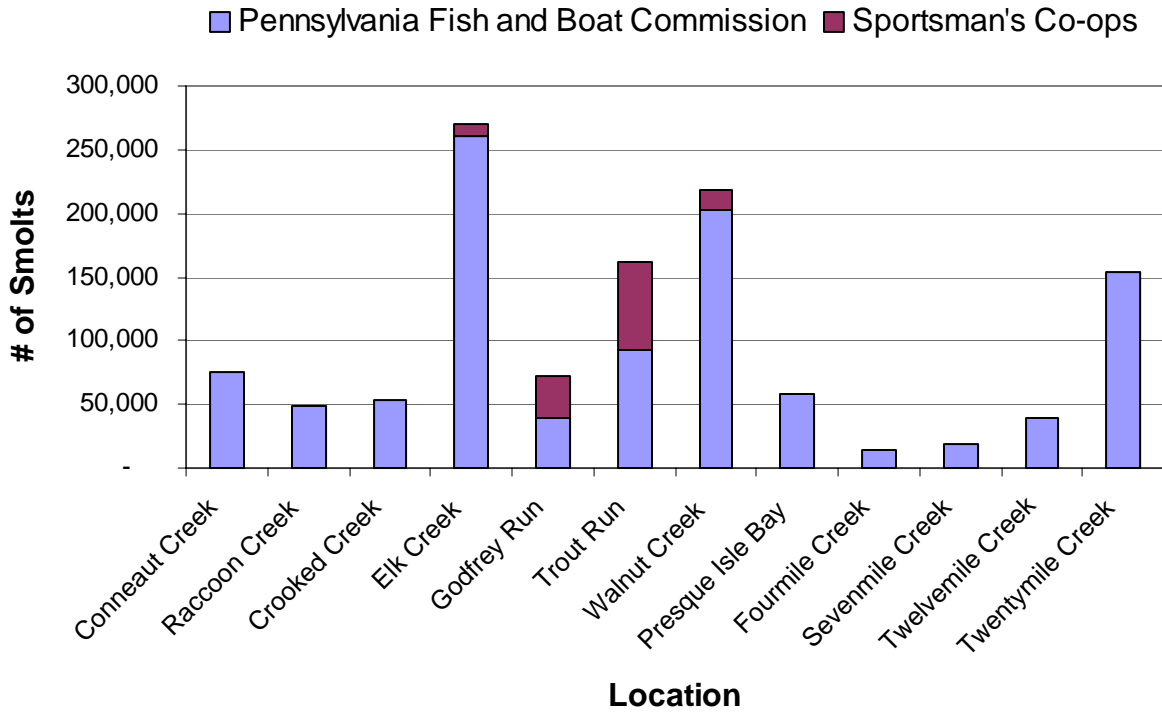


Figure S-19: Total (PFBC + Sportsman’s Cooperative Nurseries) steelhead stocking by location in 2005.

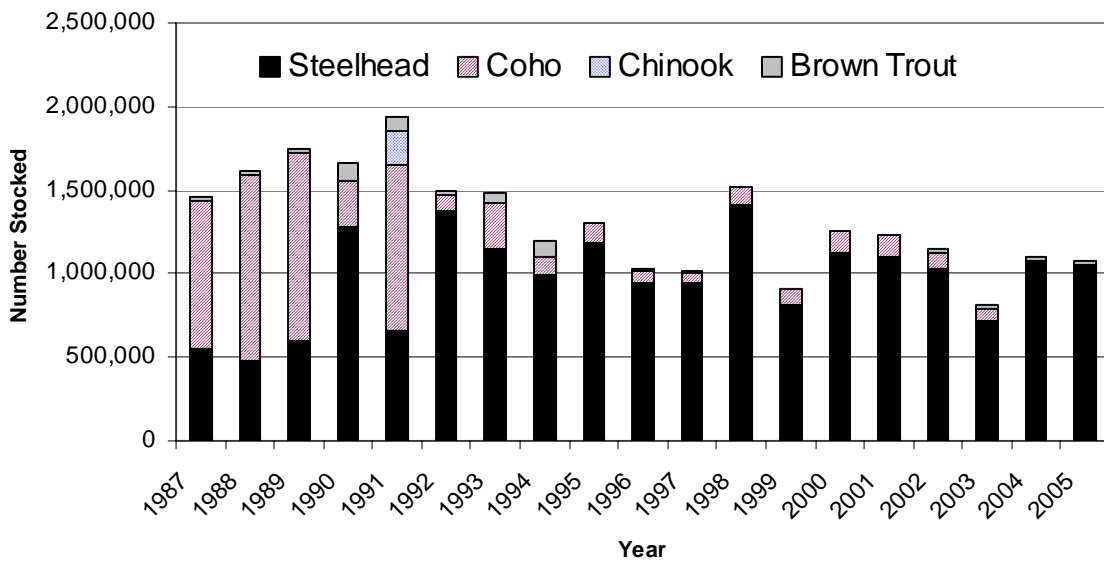


Figure S-20: Total anadromous trout and salmon stocking for Steelhead trout, Coho salmon, Chinook salmon and brown trout, 1987 – 2005. These numbers represent only PFBC hatchery plants.