

2006 Lake Ontario Fishing Boat Census

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This report summarizes and highlights results of census work conducted by the Department of Environmental Conservation (DEC) from 1985 to 2006 on sport fishing boats operating in New York waters of Lake Ontario's main basin. These census efforts are targeted at providing data to assist in management of New York's open lake salmonid fishery although valuable information on other species are also collected (Eckert 1999a). Since data from 1985-2005 have been summarized in earlier annual reports, this report will concentrate on new information collected in 2006 and on comparisons with data collected in the previous five years (2001-2005 censuses). More detailed breakdowns of effort, harvest and catch, and biological data, are presented in a series of appended tables and figures. The appendix tables typically present individual yearly estimates for each category for the 1997-2006 censuses, plus a 12-year average for the 1985-1996 censuses. The individual yearly values used to generate the 1985-1996 averages can be found in Eckert (1999b).

Methods

Census methods and procedures have changed little throughout the 22 years sampled. With the exception of 1995, 2002 and 2003, the fishing boat censuses have covered the entire six month period April 1 to September 30. A similar time frame was planned for 1995, 2002 and 2003, but due to delays in hiring, the sampling in those three years was begun between April 11 and April 26.

The census design takes advantage of the fact that boating access to New York waters of the western and central basins is limited, and occurs mainly through comparatively narrow connecting channels associated with embayments and tributaries. Census agents located in small (18-20 ft) boats at the mouths of these channels are able to maintain a count of all boats returning from

Lake Ontario while intercepting and interviewing a random sample. Two crews of two agents each were used to census all the important access channels distributed from the Niagara River, at the extreme western end of New York's jurisdiction, to Association Island Cut in the northeastern end near Henderson, approximately 190 miles of shoreline (Figure 1). Channels censused were divided each year into 3 or 4 sample strata based on estimates of expected fishing boat use, while days censused were divided into two strata. Days and channels to be censused each month were then chosen according to a stratified random design with proportional allocation of effort among day and channel types. Both census crews were scheduled to work each of the designated high-use days (weekend days and holidays), while only half of the crew/day combinations were scheduled among the low-use week days. Total access channels censused varied between years from 28 to 30 (30 channels censused in 2006), with differences occurring only among sites with the lowest estimated use. Based on estimates of fishing boat use for those years censused, the addition or deletion of any one of these low-use channels would have changed effort or catch by less than 1% of their respective seasonal estimates.

Time periods censused varied according to seasonal changes in sunrise and sunset, with each crew censusing opposite halves of the time period from two hours after sunrise to one-half hour after sunset. Interviews were conducted only among boat anglers who had completed their fishing trip, and all data and estimates presented in this report, unless clearly stated otherwise, are from complete fishing boat trips. A fishing boat trip was classified as complete if the anglers were not planning on returning to Lake Ontario within 1.5 hours, or if some or all of the fish or fishermen would be left onshore before returning. Under these criteria, any complete fishing boat trip could

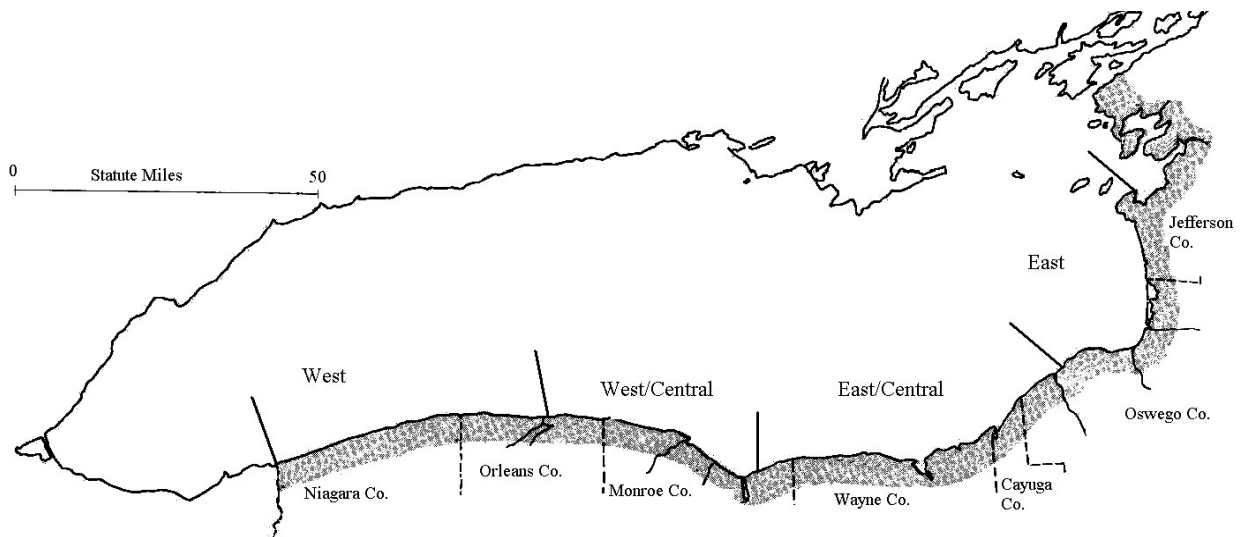


Figure 1. Map of Lake Ontario showing the New York shoreline shaded in gray, the seven New York counties which border the lake, and the four geographic areas used in analysis of the census data.

have consisted of more than one excursion to and from Lake Ontario, and the same boat or anglers could have participated in more than one complete fishing boat trip per day. The term harvest is used throughout this report for fish that were actually kept by the anglers, as well as any fish that were intentionally killed and discarded. The term released is used for fish brought along side or into the boat and then intentionally unhooked and returned to the water alive, while the term catch is used for the sum of fish harvested plus fish intentionally released.

Coverage of boat anglers returning to New York ports in Lake Ontario's western and central basins during the months censused was very complete. The only components missed were boats returning to port in the time period from one-half hour after sunset to less than two hours after sunrise (i.e., returns at night or very early morning), or boats returning to shoreline docks or to the small uncensused access channels. All of these missed components are thought to be quite small, although no statistically valid estimates for them are available. Other more significant components of the Lake Ontario boat fishery which were not covered by this census program include boat fishing in embayments and tributaries, boats fishing from ports in the eastern outlet basin, except for those which terminated their trip by returning through the Association Island Cut, and boats fishing anywhere in Lake Ontario during the months of October through March.

Estimates of fishing boat effort, harvest, and catch were calculated for each channel and day censused utilizing data from the sample of interviewed boats expanded by the total count of boats returning. These individual daily estimates were then multiplied by two to account for the "half day" census periods, and expanded by month using standard formulas for stratified random samples (Cochran 1977) to obtain monthly and seasonal estimates of effort, harvest, catch, and their respective variances. Variance estimates obtained from these formulas are conservative and the associated confidence intervals are accordingly quite broad. Confidence intervals (95%) are included for most of the seasonal effort and harvest estimates and are shown in brackets immediately following the first listing of the particular estimate using a plus and minus format [\pm]. Estimates of most other variables such as angler residence, characteristics of fish harvested (length, age, etc.), and harvest rates by month and area, were calculated directly from the interviewed boats assuming they were a random sample of the population.

Geographic comparisons of effort, harvest and catch data were made by dividing the New York shoreline into four roughly equal areas (Figure 1), and lumping the daily estimates for access channels within each area for the entire 6-month season (i.e., months were eliminated as a strata classification). Differences in the various seasonal estimates that resulted from this

alternative stratification scheme were small, and were resolved by proportionately reducing or expanding the four area estimates. Boundaries of the four geographic areas and their designated names used throughout this report are: west area - Niagara River to Point Breeze; west/central area - Bald Eagle Creek to Irondequoit Bay; east/central area - Bear Creek to Oswego Marina; and east area - Sunset Bay (Nine Mile Point) to Association Island Cut. Smaller geographic sites were also used for additional analysis of smallmouth bass data, since bass populations and their associated fisheries appear to be more localized than the various species of trout and salmon. These geographic sites combined access channels which were in close proximity to each other, and concentrated on specific shoreline areas with significant smallmouth bass fisheries. Analysis was limited to comparisons of harvest and catch rates using the boats interviewed throughout the season as a simple random sample. To facilitate comparisons with other studies such as the 1998 eastern basin angler census (McCullough and Einhouse 1999), harvest and catch rates at the nine localized sites are expressed as bass per boat angler hour. More detailed descriptions of the four broad geographic areas and the nine more localized smallmouth bass sites are given in Table A1.

Delays in implementing the 1995 and 2002 censuses resulted in smaller, incomplete samples for the months of April, inadequate for making unbiased monthly estimates of effort and catch (census began April 26 in 1995, and April 13 in 2002). To facilitate comparisons of the 1995 and 2002 data with other years, approximations or adjustments for the time periods missed were made using data from the respective previous three years; and estimates given in this report for 1995 and 2002 have all been expanded to a full April 1 through September 30 (183 consecutive day) time period. Descriptions of the adjustments to the 1995 and 2002 census data are given in the 1995 and 2002 NYSDEC Lake Ontario Annual Reports (Eckert 1996 and Eckert 2003, respectively).

Delays in starting the 2003 census until April 11 also resulted in an incomplete April sample, similar to 2002, and similar methods of adjusting the data were considered. However, in contrast to 2002, the weather in late March and early April 2003 was unusually cold. Ice continued to block

access sites such as Henderson Bay, Sandy Pond, Port Bay and Sodus Bay, through the first week of April 2003. On April 4, 2003, a severe ice storm hit the eastern half of the Lake Ontario shoreline. The hardest hit areas (Pultneyville to Mexico, NY) were without electrical power for at least several days, and additional access sites were closed for cleanup and due to lack of power. In other areas, early April 2003 weather was unpleasant, colder than average, with rain and snow. Considering all of these factors, a decision was made to simply assume that fishing effort and catch were zero for the first 10 days of April 2003. The potential errors associated with assuming that catch and effort were zero for April 1-10, 2003, were believed to be lower than the errors associated with making theoretical calculations based previous years with warmer, more seasonable weather.

Results and Discussion

Fishing/Boating Effort:

Fishing effort within the area censused during the months of April-September 2006 was estimated at 66,906 complete boat trips [$\pm 13.6\%$] (Figure 2, Table A2). This was the lowest 6-month effort estimate among the 22 years censused, and a 23.4% decrease compared to the 2001-2005 effort average (previous five years). Regression analysis (SAS 1985, Proc REG) shows a statistically significant upward trend in fishing boat trips from 1985 to 1990 ($P=0.0025$), followed by and a significant downward trend from 1990 to 2006 ($P<0.0001$). The largest declines in boat trips occurred shortly after the peak, with declines of 31,537 trips between 1990 and 1991, 43,826 trips between 1991 and 1992, and 29,829 trips between 1995 and 1996. The rate of decline in fishing boat effort then seems to have decreased from 1996-2005. Small increases were observed between some years, although regression analysis shows the continuation of a statistically significant downward trend ($P=0.0174$) over the 10-year period. The estimated decline in fishing boat trips between 2005 and 2006 was the largest decrease observed since 1996, a difference of 18,670 fishing boat trips or 21.8%, the fourth largest numeric decline and the third largest percentage decline between consecutive years among the years censused. Compared to the peak observed in 1990, effort in 2006 was down 150,917 fishing boat trips, or 69.3%. Boat angler trips in 2006 were estimated at 186,109 with an average of 2.78

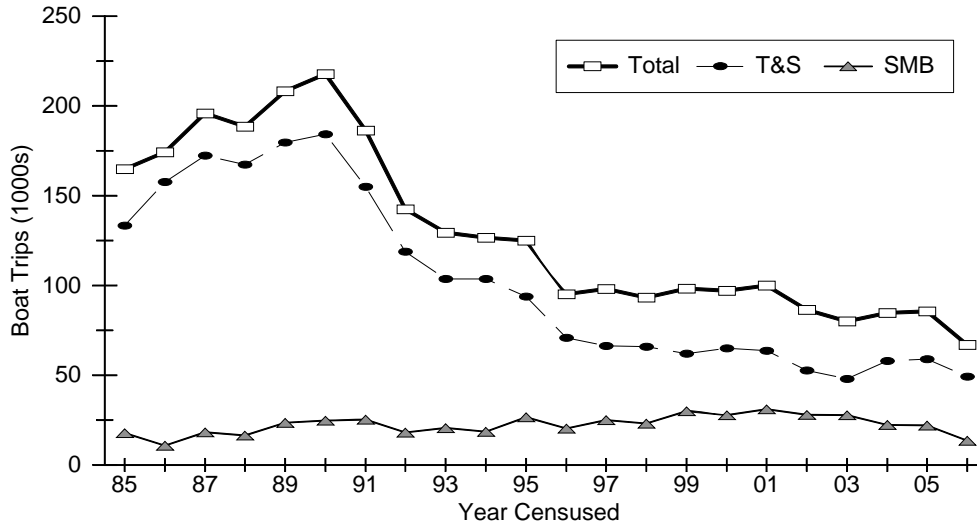


Figure 2. Seasonal estimates of total fishing boat trips, and trips targeted at trout and salmon or smallmouth bass.

anglers per boat (Table A2). Boat angler hours in 2006 were estimated at 946,347 with an average length of 5.08 hours per boat trip. Boat angler trips and boat angler hours show patterns of change over the years censused nearly identical to the pattern observed in fishing boat trips, with minor variations depending on yearly changes in average number of anglers and average length of a boat trip. Average number of anglers per boat trip, and average length of a boat trip, have also shown statistically significant ($P < 0.05$) upward trends followed by significant downward trends over the years censused. These trends are again similar to the trends observed in fishing boat trips, but with some variations. Anglers per boat trip increased from a low of 2.46 in 1985 to a peak of 2.91 in 1991, followed by a gradual statistically significant decline to 2.58 in 2003. The 2006 estimate of 2.78 anglers per boat trip, represents a 3.8% increase compared to 2005 and a 4.7% increase compared to the 2001-2005 average. Hours per boat trip increased from 5.23 in 1985 to a peak of 5.78 in 1992, followed by a steeper statistically significant decline to a low of 4.84 in 2004. The 2006 estimate of 5.08 is a 4.2% increase compared to 2005, and a 3.0% increase compared to the 2001-2005 average.

In addition to the overall pattern of fishing effort increasing through 1990 and then declining, other trends are evident among the six months and four geographic areas. Relative fishing effort (percent contribution) in the months of April and May both showed statistically significant declines ($P < 0.0001$

and $P = 0.0029$, respectively) over the 22 years censused. For example, relative effort contribution in the months of April and May averaged 15.5% and 17.2% respectively from 1985-1989 (first 5 years) as compared to 5.6% and 12.1% respectively in 2002-2006 (last 5 years). Interestingly, these declines were evident even before total fishing boat trips peaked in 1990. Significant increases in relative fishing effort were observed in the months of June ($P = 0.0291$), July ($P = 0.0019$), and August ($P = 0.0026$). Among the four geographic areas, the west and west/central areas both show statistically significant declines in relative effort contribution ($P = 0.0012$ and $P = 0.0207$, respectively) over the 22 years censused, while the east/central area showed a significant increase ($P < 0.0001$). Since 1996, these differences have diminished or varied irregularly, and regression analysis of the 1996-2006 data series shown no statistically significant ($P < 0.05$) trends in relative fishing effort among the months or geographic areas. Comparisons of the number of fishing boat trips per month in 2006 with the previous five years (overall 23.4% decrease in 2006 compared to 2001-2005 average) showed larger than expected declines in the months of June and August (down 42.2% and 33.5%, respectively, compared to their 2001-2005 averages), smaller than expected declines in the months of May and July (down 17.1% and 11.3%, respectively, compared to their 2001-2005 averages), and an increase in the month of April (up 27.0% compared to its 2001-2005 average). Comparisons among the four geographic areas

showed a relatively consistent pattern of decreases in the number of boat trips with the smallest relative decline in the west/central area (down 16.3% in 2006 compared to its 2001-2005 average), and the largest decline in the east area (down 27.5% compared to its 2001-2005 average).

Although the census was specifically designed to survey fishing boats, the sampling does document all recreational boats returning from Lake Ontario. Power boaters who spent at least a portion of their time fishing on Lake Ontario accounted for 67,654 vessel excursions (Table A2), 49.2% of the total vessel traffic in 2006. Nonfishing power boats, which were the largest component of boat traffic in five of the last ten years, were estimated at just 57,576 excursions in 2006, 41.9% of the total, and the lowest estimate among the years censused. Nonfishing power boat traffic has peaked and declined in a manner similar to that described for fishing boats, and in 2006, nonfishing power boat excursions were down 69.7% compared to the peak observed in 1988 (190,243 excursions). Sail boats have always been the smallest component of vessel traffic, and have also shown a general pattern of decline over the years censused. In 2006, sail boats accounted for 12,186 excursions. This was the third consecutive record low yearly estimate, just 8.9% of the 2006 vessel traffic, and a 74.8% decline compared to the peak observed in 1987 (48,352 sail boat excursions).

Species Sought:

The term "species sought" refers to the species or species group that anglers were seeking (targeting) during the majority of their boat trip. Trout and salmon, as a group, have been the dominant target of the boat anglers interviewed since 1985 (Figure 2, Table A2), and changes in fishing effort have been due largely to trout and salmon anglers. In 2006, fishing effort targeted at trout and salmon was estimated at 49,223 boat trips [$\pm 16.8\%$], the second lowest estimate among the years censused (only 2003 was lower), and 12.5% below its 2001-2005 average. Although fishing effort targeting trout and salmon has declined significantly since the 1990 peak (down 73.3% from 1990 to 2006), trout and salmon anglers still accounted for 73.6% of the total fishing boat trips in 2006, 78.6% of boat angler trips, and 86.9% of boat angler hours (Table A2). In contrast to most other years where the anglers

stated they were targeting a mix of two or more species, the majority of the trout and salmon anglers interviewed in 2005 and 2006 selected a single target species, Chinook salmon. In 2006, 48.4% of the trout and salmon boat anglers interviewed stated they were specifically targeting Chinook salmon, while 41.0% targeted a mix of salmonine species. Brown trout was the third most commonly targeted trout and salmon category, comprising just 9.6% of the fishing boats interviewed.

Smallmouth bass has always been the dominant species sought among anglers not seeking trout or salmon. Fishing effort targeted at smallmouth bass in 2006 from the opening of the season (June 17) to September 30 declined substantially, with an estimate of just 13,586 fishing boat trips [$\pm 22.9\%$]. This was the second lowest seasonal estimate among the years censused (only 1986 was lower), a 38.5% decrease compared to 2005, and a 48.2% decrease compared to the 2001-2005 average number of bass boat trips (Figure 2, Table A2). Regression analysis of the 1985-2006 data shows a variable, but statistically significant increase averaging 797 boat trips per year from 1985-2001 ($P=0.0004$), followed by a more rapid decline averaging 3,146 boat trips per year from 2001-2006 ($P=0.0044$). The percent contribution of the smallmouth bass fishery has varied widely depending on changes in the smallmouth bass and trout and salmon fisheries, ranging from a low 6.2% of all fishing boat trips in 1986 to a high of 34.7% in 2003. In 2006, smallmouth bass anglers fishing from June 17 through September 30 accounted for 20.3% of the total (April-September) fishing boat trips, 16.6% of the boat angler trips, and 10.2% of boat angler hours. Yellow perch and walleye were the third and fourth most commonly targeted species among open lake boat anglers in 2006, but comprised only 1.1%, and 0.4%, respectively, of the total fishing boat trips. The "all others" category, which comprised 4.4% of the 2006 fishing boat trips, was composed largely of anglers who stated that they were fishing for anything (Table A2).

Residence:

Residence patterns have varied among the years censused, undoubtedly in part due to changes in levels of fishing interest and effort. Anglers with their legal residence in New York State have consistently dominated the open lake boat fishery, but nonresident or out-of-state anglers have

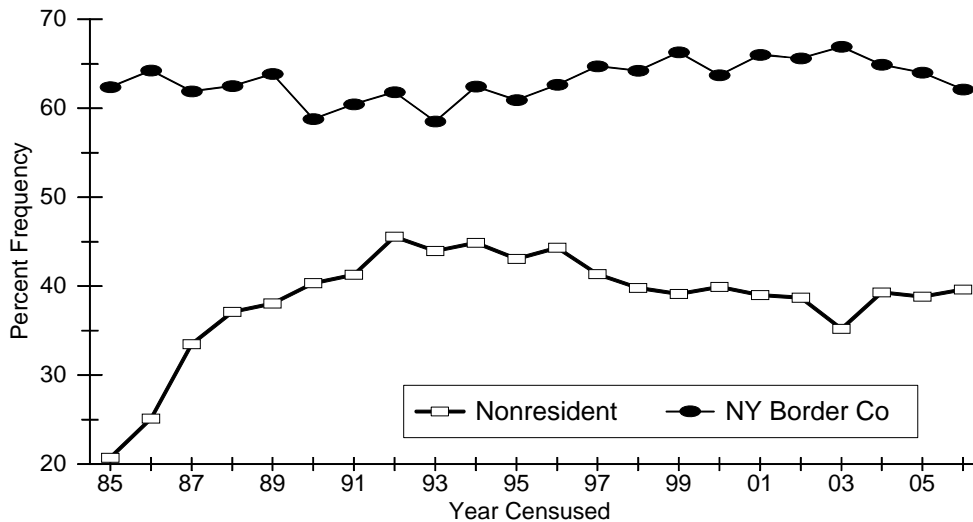


Figure 3. Percent contribution of nonresident anglers, and NY residents residing in one of the border counties.

increased and decreased significantly over the years censused in a pattern similar to the changes in levels of fishing effort (Figure 3). Percent frequency of occurrence of nonresident anglers increased significantly from a low of 20.7% in 1985 to a high of 45.5% in 1992 (SAS 1985, Proc REG, $P=0.0002$). From 1992 through 2006, nonresident anglers showed a more gradual and variable, but statistically significant ($P>0.0001$), decrease in frequency of occurrence. In 2006, nonresidents comprised 39.6% of the boat anglers interviewed, up slightly compared to the 2001-2005 average of 38.2%. New York State resident anglers naturally show the exact opposite patterns in percent contribution, with decreases from 1985-1992, followed by a gradual increase through 2006 (Table A3). Pennsylvania has been the principal source of nonresident anglers among the years censused, contributing 19.6% of the total anglers in 2006, and ranging from a low of 8.7% in 1985 to a high of 19.8% in 2004. (Table A3). Other major sources of nonresident anglers in 2006 were: New Jersey (3.7%), Massachusetts (3.0%), Ohio (2.9%), and Vermont (2.4%).

Analysis of percent frequency of occurrence data for the out-of-state residences listed in Table A3 shows a variety of patterns. Seven of the 15 states and provinces (Connecticut, Massachusetts, Michigan, New Jersey, Ohio, Province of Quebec, and West Virginia) show a generalized dome shape in yearly percent frequency distributions, with statistically significant ($P<0.05$) increases in percent frequency through

the 1980s, peaks in the early to mid 1990s, followed by statistically significant declines in percent frequency through 2006. Three states (New Hampshire, Pennsylvania, and Vermont) show statistically significant increases in percent frequency through the early 1990s, but no statistically significant trends from the early 1990s through 2006. Three additional states (Florida, Maine, and Virginia) show a significant pattern of increasing percent frequency spread rather evenly over the entire 22-year census period, while the Province of Ontario shows significant decreases in percent frequency over the entire census period. Data for the state of Maryland show no statistically significant trends over any portion of the years censused.

Among New York resident anglers there have been a number of statistically significant fluctuations in the frequency of participation by anglers from various counties, but compared to the state and province residence data, the New York county data seem more variable between years with fewer meaningful trends (Table A3). Percent frequency data for anglers residing in one of the seven counties bordering Lake Ontario (Figure 1) do shown a number of statistically significant trends, although the magnitude of the differences between years are relatively small. The frequency of occurrence of border county residents declined significantly ($P=0.0493$) through the 1980s reaching a low of 58.5% of all New York anglers in 1993, and then increased significantly ($P=0.0005$) from 1993-2003 (Figure

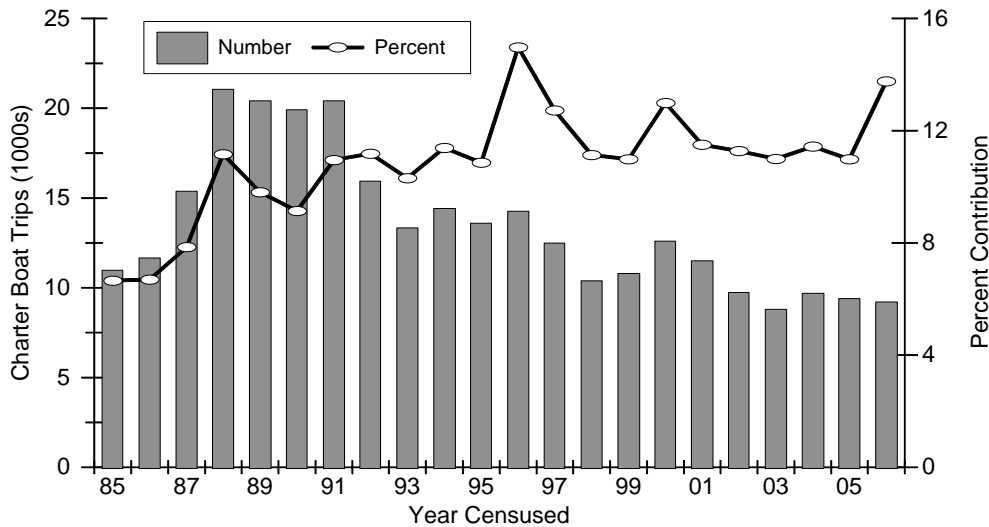


Figure 4. Seasonal estimates of charter fishing boat trips, and their percent contribution to total fishing boat trips.

3, Table A3), reaching a high of 66.9% of all New York anglers in 2003. Frequency of border county residents decreased slightly from 2004-2006, and in 2006, anglers residing in one of the seven counties bordering Lake Ontario comprised 62.1% of the New York boat anglers interviewed. These observed trends in total New York resident anglers, New York anglers from one of the seven border counties, and the opposite trend among nonresident anglers, may be directly linked to changes in interest and participation in the Lake Ontario boat fishery. As the fishery increased, proportionately more anglers from locations further away appear to have become involved, and as the fishery decreased, proportionately more have apparently dropped out. Statistically significant trends ($P < 0.05$) in yearly percent frequency data over the 22-year data series were evident in five of the seven Lake Ontario border counties, with significant upward trends in Cayuga, Oswego and Wayne counties, and significant downward trends in Monroe and Niagara counties. Among the remaining 11 counties listed in Table A3, the only statistically significant trends evident were downward trends in Broome, Erie, and Genesee counties, and a significant upward trend in Orange County. Monroe County remained the most important source of residents in the boat fishery, contributing 19.9% of the New York anglers interviewed in 2006 (Table A3). Other top counties with their 2006 percent contributions were: Oswego (13.3%), Wayne (12.2%), Niagara (7.9%); and Onondaga (5.3%).

Charter Trips:

Charter boats are an important, highly visible component of the Lake Ontario open lake fishery. Charter boat trips increased steadily during the first four years censused, remained essentially constant at approximately 20,450 trips per year from 1989 through 1991, then declined gradually with a record low of 8,790 boat trips in 2003 and an average of approximately 9,430 trips from 2004-2006 (Table A2, Figure 4). This is a pattern similar to that observed for both total fishing boat trips, and boat trips targeted at trout and salmon, although the percent decrease is somewhat less for charter boats (56.2% decline from peak to 2006 for charter boats, versus 69.3% for all boats and 73.3% for trout and salmon boats). In 2006, charter effort was estimated at 9,204 fishing boat trips [$\pm 27.3\%$], the second lowest seasonal estimate among the years censused, and down 6.3% compared to the 2001-2005 average. Since charter boat fishing effort has declined relatively less than total fishing boat trips over the years censused, the percent contribution of charter boats has tended to increase (Figure 4). In 2006, charter boats accounted for 13.8% of the total fishing boat trips within the area censused, 24.9% of the boat angler trips (captains and mates counted as anglers), and 33.0% of the boat angler hours, the second highest set of percentages observed among the years censused.

Charter boats have always differed significantly from noncharter boats in a number of rather predictable respects. For example, the average

charter boat trip has more anglers onboard (captain and mate included), fishes for a longer period of time, has a higher proportion of nonresident anglers, is more likely to be fishing for trout and salmon, has higher catch rates, and harvests a higher percentage of the catch. Differences in harvest rates are particularly dramatic, and of considerable interest to many anglers. Among boats targeting trout and salmon in 2006, the average charter harvested 5.20 salmonines per boat trip versus 0.77 for noncharters (Table A4), a 6.8 fold harvest rate difference. When harvest rates are compared on an angler hour basis, the differential narrowed to 0.15 for charters versus 0.06 for noncharters, a 2.6 fold difference. It was estimated that charter boats fishing for trout and salmon accounted for 59.7% of all the salmonines harvested within the census area and time in 2006 (Table A4), the highest percent harvest by charter boats among the years censused.

Species Information:

Numbers of fish harvested and fish caught in the 2006 fishing boat census are summarized in Table 1. The nine species listed represent the more important sport fish species from the perspective of specific management programs and efforts, and overall use or interest among open lake anglers. Each of these nine species is discussed separately in following sections. Numbers of fish harvested and caught provide the best measure of the size or magnitude of the fishery, but are dependent on both availability of the various species and on fishing effort. Comparisons of angling quality between years, species, areas, etc., are best made using harvest and catch rates. A number of similar statistics are available for presenting the census results and making comparisons. Since the basic unit sampled in the Lake Ontario census is an individual boat, effort data and harvest and catch rates have traditionally been presented per fishing boat trip; and since most of the trout and salmon are managed primarily for put-grow-and-take fishing, emphasis has been placed on harvest statistics. Data on numbers of fish caught, number of anglers per boat, and length of each boat trip, have always been collected in the census, and estimates for these parameters have always been included in the appendix tables, although discussions of them have traditionally been limited. However, recent changes suggest that expanding the discussions to include some additional statistics would be desirable. Changes

in fishing regulations and angler behavior have the potential to significantly decrease the percentage of fish harvested, suggesting the need for more emphasis on discussions of catch and catch rate data. Changes in percent contribution by charter boats, which have much higher harvest and catch rates, have shown the value of making separate comparisons for both the charter and noncharter components. This was highlighted in the analysis of the 2005 census data, where an increase in charter contribution resulted in a record high harvest rate per boat trip for all trout and salmon, even though the harvest rates for the charter and noncharter components were only the third and fifth highest, respectively (Eckert 2006a, page 25). Finally, differences in sampling and reporting methods effectively limit comparisons between Lake Ontario and the other Great Lakes to the use of statistics on charter catch rates per angler hour. Since graphs of charter catch rates per angler hour have been included in a number of Lake Ontario public meetings in recent years, graphs of these same statistics are now included in the census report. Figures are included in the appendix showing graphs of harvest rates by charter and noncharter boats seeking trout and salmon, catch rates among all trout and salmon boats and the charter and noncharter components, and catch rates per angler hour among charter boats targeting trout and salmon. Many of these graphs show very similar patterns, but where apparent major differences do occur, they are referenced and discussed in the report. Hopefully, these additional discussions and statistics will help to clarify the census data and better describe the changing Lake Ontario fishery.

The “other fish” category in Table 1 includes a variety of species, plus any unidentified fish, and a complete listing for the 1985-2006 surveys is given in Table A5. As in previous years, the “other fish” category was dominated in 2006 by warm water fish, which traditionally included species such as white perch, rock bass and freshwater drum. Some of these are important members of the near shore fish community, and although most open lake boat anglers do not actively target these species, numbers harvested and numbers caught may be substantial. Game fish included in the 2006 “other fish” category with their estimates of harvest and catch were: unidentified trout and salmon (0 harvested, 251 caught), northern pike (135 harvested, 206 caught), and largemouth bass (269 harvested,

Table 1. Summary of fish harvested and fish caught in the 2006 DEC Lake Ontario fishing boat census.

	Number Harvested	Number Caught
Coho Salmon	9,370	12,448
Chinook Salmon	39,439	59,606
Rainbow Trout	10,750	18,029
Atlantic Salmon	0	158
Brown Trout	15,642	26,230
Lake Trout	2,964	8,656
Smallmouth Bass	17,759	74,052
Yellow Perch	13,858	39,801
Walleye	164	408
Other Fish	20,326	44,944

1,306 caught). From 1985 through 2002, there was a significant decline in the total number of “other fish”, due largely to decreases in white perch and rock bass. Estimates for white perch and rock bass have remained low through 2006, and the 2006 estimate of rock bass catch was a record low (2,731 rock bass) among the years censused. Despite these declines, total harvest and catch of “other fish” has increased since 2003 due to increased abundance of round goby. Round goby is an exotic species first observed in the DEC fishing boat census in 2001 at Niagara River. By 2002, round goby was the most commonly harvested “other species” (most are actually killed and then discarded), and by 2004, it became the most commonly captured “other species” (54.9% of the 2004 “other species” total). Round goby harvest and catch both continued to increase dramatically, and in 2006 were up 52.8% and 68.6% respectively compared to 2005, comprising 82.7% and 76.4% respectively of the 2006 “other species” harvest and catch. Anecdotal reports and observations suggest that anglers fishing on bottom with worms can now catch round gobies anywhere along New York’s Lake Ontario shoreline, and in many areas anglers complain that gobies disrupt their attempts to catch other species.

Coho Salmon:

Coho salmon was the fourth most commonly captured salmonine in New York’s Lake Ontario boat fishery. Harvest in 2006 was estimated at 9,370 coho salmon [$\pm 45.1\%$], 12.0% of the total

2006 salmonine harvest (Tables 1 and A6, Figure 5), and a 106.0% increase compared to the 2001-2005 average. Coho salmon catch was estimated at 12,448 fish [$\pm 40.7\%$], 9.9% of the total 2006 salmonine catch, and 86.7% higher than the 2001-2005 average. The 2006 estimates of harvest and catch were both the highest numbers observed for coho salmon in the DEC fishing boat census since 1998. Percent harvest of coho salmon in 2006 was estimated at 75.3%, 8.9 percentage points higher than the 2001-2005 average percent harvest (66.4%), but just slightly below the 1985-2005 average (75.5%). There was no statistically significant trend ($P=0.05$) evident in the percent harvest estimates for coho salmon from the 1985-2006 censuses.

The 2006 seasonal harvest rate among all boats fishing for trout and salmon was 0.18 coho salmon per boat trip (Figure 5, Table A6), a record high among the 22 years censused, and a 123.8% increase compared to the 2001-2005 average harvest rate. Among charter boats fishing for trout and salmon, the 2006 seasonal harvest rate was 0.58 coho salmon per boat trip (Table A4, Figure A1), a record high among the years censused, and up 160.2% compared to the 2001-2005 average rate. Among noncharter boats fishing for trout and salmon, the 2006 seasonal harvest rate was 0.091 coho salmon per boat trip, the fourth highest harvest rate among the years censused, and 75.9% above the 2001-2005 average. Relative to the previous five years (Table A6, Figure A2), 2006 coho salmon harvest rates among all boats targeting trout and salmon were above average in the months of April (+152.4%), May (+470.5%), June (+63.6%) and August (+40.7%), and in all four geographic areas (west +127.5%, west/central +111.0%, east/central +211.3%, and east 58.1%); and below average only in the months of July (-10.6%) and September (-18.9%). The most meaningful positive differences occurred in the months of April and May, and in the west, west/central, and east/central areas, which are typically important months and areas in terms of the expected seasonal harvest of coho salmon. The 2006 seasonal catch rate among all boats fishing for trout and salmon was 0.24 coho salmon per boat trip, a record high among the years censused, and a 106.0% increase compared to the 2001-2005 average catch rate. Coho salmon harvest and catch rates have fluctuated widely between years,

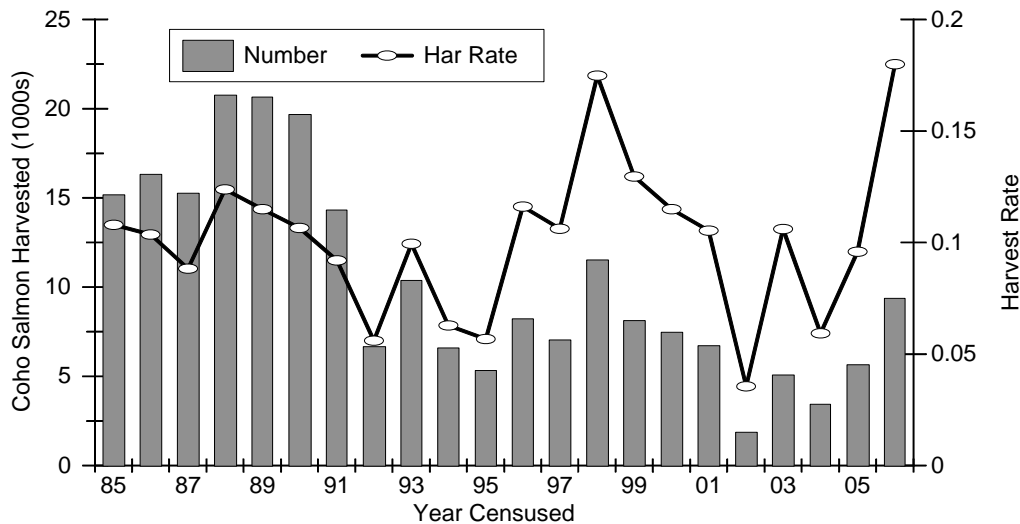


Figure 5. Total coho salmon harvested, and harvest rate per boat trip for boats seeking trout and salmon.

but show no statistically significant trends over the 22 years censused. Patterns in the harvest and catch rates are generally similar with peaks in 1998 and 2006, and lows in 1995 and 2002 (Figures 1 and A1). The harvest and catch rates among all trout and salmon boats and among the charter boats show overall good agreement, while the noncharter boats show comparatively higher harvest and catch rates from 1985-1990.

Coho salmon age and growth data are summarized in Table A7. Age-2 fish have always dominated the open lake harvest, and in 2006 contributed 97.8% of coho salmon sampled. This was 7.1 percentage points higher than the 2001-2005 average age-2 contribution (90.7%), but similar to the percent contributions observed in about half of the years censused. Age-1 fish contributed just 2.2% of the coho salmon sampled in 2006 (7 fish sampled in August and September), 5.4 percentage points below the average of 7.6% age-1 fish estimated for 2001-2005. No age-3 coho salmon were observed in 2006, the sixth year among the 22 years censused that no age-3 fish were sampled. Mean lengths of age-2 coho salmon were slightly above average in 2006, but the differences tended to decline as the season progressed. Mean length of age-2 fish sampled in April 2006 was 4.7% higher than the 2001-2005 April average, declining to a 1.9% difference between the respective September means. Statistical comparisons of age-2 coho salmon sampled in the months of April, May, August, and September (SAS 1985, Proc GLM, Student-

Newman-Keuls multiple range test, $P=0.05$, and Proc Reg, $P=0.05$), show statistically significant fluctuations in length data between years, but no obvious trends among years. Differences between years have generally been small, and tests of mean values commonly group together 5-10 years as having differences that are statistically insignificant. Monthly gain in length of age-2 coho salmon between April and September 2006 was estimated to average 1.60 inches, 6.3% below the 2001-2005 average length gain, but well within the range of values estimated previously. Weights of standard length coho salmon calculated from seasonal length-weight regressions have also shown significant variations between years, but in contrast to the length data, do show statistically significant trends among the years sampled (SAS 1985, Proc Reg, $P=0.05$). These are upward trends, most evident among the 20 to 30-inch standard length groups, with weights tending to increase from 1985 to a peak in 2003. Declines in estimated weights after 2003 were particularly evident among the smaller coho salmon, with record low weights calculated in 2005 for the 18, 20, and 22-inch standard length fish. Weights of standard length coho salmon calculated for 2006 remain slightly below their respective 2001-2005 averages, ranging from a difference of -5.7% for the 18-inch length group to a difference of -3.0% for the 30-inch length group.

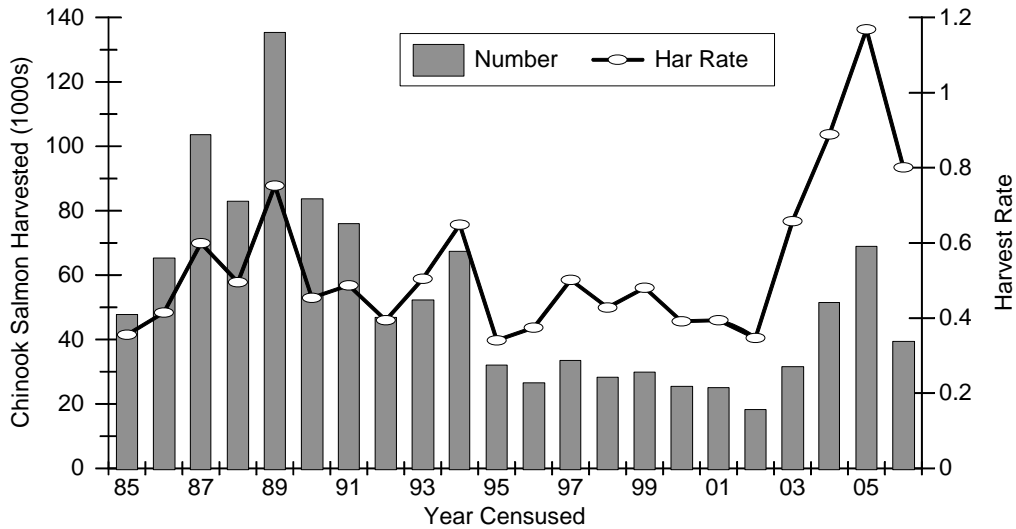


Figure 6. Total chinook salmon harvested, and harvest rate per boat trip for boats seeking trout and salmon.

Chinook Salmon:

Chinook salmon have dominated the harvest and catch of trout and salmon in New York’s Lake Ontario boat fishery since 2003, and were the most commonly captured salmonine in 11 of the 22 years censused. Harvest in 2006 was estimated at 39,439 Chinook salmon [$\pm 26.3\%$], 50.5% of the total 2006 salmonine harvest (Tables 1 and A8, Figure 6), and the third highest percent contribution by a single species to the total salmonine harvest in any one year (the two higher percent contributions were also by Chinook salmon, in 2004 and 2005). The 2006 harvest estimate was a 42.8% decrease compared to 2005 and a 23.3% decrease compared to 2004, but aside from these two years, was the highest Chinook salmon harvest observed in the boat fishery since 1994. Chinook salmon catch was estimated at 59,606 fish [$\pm 29.1\%$], 47.5% of the total 2006 salmonine catch, and the third largest number caught in the boat fishery since 1994 (2004 and 2005 catches were again higher). Percent harvest of Chinook salmon in 2006 was estimated at 66.2% (Table A8), 5.7 percentage points higher than the 2001-2005 average percent harvest (60.5%), but 5.3 percentage points lower than the 1985-2005 average (71.5%). Yearly percent harvest estimates show moderate variation, with the highest percent harvest in 1995 (87.3%), and the lowest percent harvests in 2003 and 2004 (50.8% and 55.9%, respectively). Regression analysis will show a statistically significant upward trend in percent harvest data for Chinook salmon from 1985-1995 ($P=0.0218$), followed by

a statistically significant downward trend from 1995-2006 ($P=0.0085$).

The 2006 seasonal harvest rate among boats seeking trout and salmon was 0.80 Chinook salmon per boat trip (Table A8, Figure 6). This was the third highest seasonal Chinook salmon harvest rate among the years censused (only 2004 and 2005 were higher), and a modest 15.9% increase compared to the 2001-2005 average harvest rate, but a 51.9% increase compared to the 1985-2005 average harvest rate. Among charter boats fishing for trout and salmon, the 2006 seasonal harvest rate was 2.37 Chinook salmon per boat trip (Table A4), the third highest harvest rate among the years censused (only 2005 and 2004 were higher), and up 17.6% compared to the 2001-2005 average. Among noncharter boats, the 2006 seasonal harvest rate was 0.45 Chinook salmon per boat trip, the fifth highest harvest rate among the years censused, but up just 4.9% compared to the 2001-2005 average. Comparisons of 2006 harvest rates with their respective 2001-2005 averages (Table A8, Figure A2) show above average rates in 2006 in three of the six months (June +17.1%, July +28.6%, and August +36.7%) and in three of the four geographic areas (west area +16.8%, west/central area +30.5%, and east/central area +66.8%). Below average harvest rates in 2006 compared to their respective 2001-2005 averages were observed in the months of April (-37.6%), May (-12.8%), and September (-8.3%), and in the east geographic area (-28.4%). Chinook salmon

harvest and catch rates for all trout and salmon fishing boats, and for the charter and noncharter components (Figures 6 and A3), all show very similar patterns, with harvest and catch rates showing a variable but gradual decline from the mid to late 1980s through 2002, followed by above average to record high values from 2003 through 2006. Similar patterns are evident in plots of Chinook salmon harvest rates for the months of May, July, August, and September, and among the four geographic areas. Depending on the component, month, or area selected, statistically significant downward trends can be detected in some of the 1985-2002 data series, and statistically significant upward trends can be detected in some of the 1985-2006 data series. Increases in Chinook salmon harvest and catch rates since 2003 have been particularly dramatic, and possible reasons for these increases are discussed later on in this report.

Chinook salmon harvest and harvest rates are typically highest in the month of August, and this pattern was clearly evident in both 2005 and 2006. Considering the popularity of Chinook salmon, and the exceptionally high harvest rates observed in both years (2005 had the highest August harvest rate among the years censused, 2006 was the second highest; Table A8), it is surprising that fishing effort among boats targeting trout and salmon was down in the month of August for both years. Effort estimates for 2005 and 2006 among boats seeking trout and salmon were the two lowest August values observed among the years censused (Table A2), and both were well below their respective previous 5-year averages (August 2005 fishing effort down 29.3% compared to the 2000-2004 average, August 2006 effort down 21.4% compared to the 2001-2005 average). Although no one would dismiss the importance of above average Chinook salmon harvest rates on angler interest and behavior, it would seem apparent there are other factors with even more influence affecting the amount of fishing effort in New York's Lake Ontario boat fishery during the summer months.

Age, length, and weight data from harvested Chinook salmon are summarized in Table A9. Compared to their respective 2001-2005 averages, contribution of age-1 and age-3 Chinook salmon were both up in 2006 (+10.4% and +24.1%, respectively), while the contribution of age-2 fish was down (-35.0%). Percent contribution of age-4

Chinook salmon rose to 4.2% in 2006, the highest percent contribution observed since 1996, but age-4 fish remained a relatively small, and therefore difficult to assess, component of the seasonal harvest. Regression analysis of the yearly percent age contributions show no statistically significant trends (SAS 1985, Proc REG, $P=0.05$) for age-1, age-2, or age-3 fish, for any combination of years tested. Despite the increase in percent contribution in 2006, age-4 Chinook salmon do show a statistically significant downward trend ($P=0.0251$) over the 16 years (1991-2006) that age composition has been determined from fish aged by scales. Eliminating the one unusually high percent contribution estimated for age-4 fish in 1996 (14.0%) further increase the significance of this trend ($P=0.0033$). The overall mean length of Chinook salmon harvested in April-September 2006 was 32.5 inches, up just 3.1% compared to the 2001-2005 overall mean length. Seasonal mean lengths are affected by a number of factors besides changes in actual growth rates. These includes yearly variations in the age composition of the fish harvested, and variations in numbers harvested in any given month. Chinook salmon weights calculated from length-weight regressions of fish harvested in July and August 1988-2006 (Table A9) for seven standard lengths (16-inch to 40-inch length fish by 4-inch size increments), show no statistically significant trends over the entire 19-year time series ($P=0.05$), but do show some interesting patterns and statistically significant trends over shorter time intervals. Generally, calculated weights were highest from the late 1990s to 2000, and lower before 1995 and after 2000. The highest calculated weights for the 16-inch to 36-inch lengths groups (6 of the 7 standard lengths), all occurred in 2000. Among the 40-inch length fish, the peak weights occurred from 1997-2000, with 2000 the third highest weight estimate. The lowest calculated weights for the four smallest standard sizes occurred in 1990 and 1989. Among the 32-inch to 40-inch standard sizes, the lowest calculated weights all occurred in 2006. The combination of lower estimated weights through the mid 1990s, and higher weights up to 2000, resulted in statistically significant upward trends in calculated weights from 1988-2000 for the 16-inch to 36-inch length groups (6 of 7 standard lengths). Declines in calculate weights from 2000-2006 resulted in statistically significant downward trends for the 16-inch to 32-inch lengths groups (5 of 7 standard lengths). There were no statistically significant

trends in weights for the 40-inch length group, for any of the time series tested. The ecological significance of these changes in calculated weights remains debatable, but the overall patterns of increase from 1988-2000, followed by declines through 2006, and the record low weights calculated in 2006 for the 32-inch, 36-inch, and 40-inch standard lengths, all seem noteworthy.

More rigorous analysis of Chinook salmon growth was undertaken using lengths of fish harvested in 1991-2006 during the months of July-September, and aged by scales (Table A10, Figure A5). Statistical tests were conducted to look for significant variations in lengths between years and months, and to evaluate which mean values were statistically different (SAS 1985, Proc GLM with Student-Newman-Keuls multiple range test, $P=0.05$), and to look for trends in the monthly means over the 16-year data series (SAS 1985, Proc REG, $P=0.05$). All four age groups (age-1 to age-4) showed statistically significant variations in lengths among the years and months tested, and all four ages showed some increase in mean length in 2006 compared to recent years. Increases in Chinook salmon lengths in 2006, were most evident among age-1 fish. The mean lengths of age-1 Chinook salmon sampled in 2006 were well above average, with the July mean length (19.61 inches, Table A10) the fourth highest among the 16-years tested, the August mean length a new record high (20.97 inches), and the September mean length the second highest value observed (23.57 inches). There were no statistically significant trends evident among years in the mean lengths of age-1 Chinook salmon sampling in the boat fishery, although the 2006 mean values were significantly larger than the 2002-2005 estimates. Age-2 Chinook salmon showed only a small (statistically insignificant) increase in mean length in 2006 compared to 2004 and 2005, and the 2006 monthly mean estimates were average or below average compared to all the other years tested. Growth between months was below average in 2006, resulting in an incrementally smaller increases in monthly mean length in 2006 compared to other years, and the September mean length of age-2 Chinook salmon sampled in 2006 (30.93 inches) was the fourth lowest September estimate among the 16-years compared. Regression analysis shows no statistically significant trends in the mean lengths of age-2 Chinook salmon from 1991-2006, but does show significant downwards trends in the

1998-2006 data. Age-3 Chinook salmon showed an intermediate increase in mean length, with a substantial increase in mean size in 2006 compared to the very low values observed in 2003-2005, but with 2006 mean lengths still below average compared to all of the years tested. Overall, the mean length of age-3 Chinook salmon sampled in July-September 2006 was the sixth smallest among the 16-years compared, and where sample sizes are adequate for testing, monthly mean length estimates for 2006 are significantly smaller than most other years. Regression analysis shows a statistically significant downward trend in age-3 mean lengths in the 1991-2006 July data series, and significant downward trends in the 1999-2006 August and September data series. The oldest Chinook salmon sampled in Lake Ontario are age-4. Mean lengths of age-4 fish are larger than the respective age-3 means one year previous, but growth in length between age-3 and age-4 is typically quite small, averaging around 5%, and the lengths of age-3 and age-4 Chinook salmon overlap broadly. Patterns of growth on the scales suggest that the fastest growing individuals of any year class are more likely to mature and spawn at an earlier age, thereby removing themselves from the lake population, and that many of the age-4 fish are among the slower growing members of their cohort. Analysis of age-4 Chinook salmon data is limited by the small sample sizes available in most months and years, but there were no obvious trends in the age-4 length data from 1991-2006. Mean lengths of age-4 Chinook salmon sampled in 2006 were generally larger than 2004 or 2005, but were still below the age-4 average of all the years compared (Table A10). The longest fish sampled in any year have commonly been fast growing age-3 fish, and that pattern was again evident in 2006. The two longest Chinook salmon sampled by the census agents in 2006 were both age-3 fish, 41.6 and 41.7 inches total length. The heaviest fish sampled by the census agents in 2006 was an age-4 fish, weighing 34.1 pounds and measuring 41.5 inches (tied with 2 age-3 fish as the third longest Chinook salmon sampled).

Chinook salmon populations in Lake Ontario are believed to be heavily dependent on annual stocking programs, and changes in the stocking policy have always been intensely debated. Chinook salmon stocking targets were substantially reduced in 1993, and again in 1994, over concerns that prey fish populations were

declining (O’Gorman et al. 1996). These stocking reductions caused a great deal of concern among fishermen and fishing related business owners, and many people concluded that lower harvest rates observed in 1995 and 1996 were directly attributable to the stocking cuts. Due to public concerns, the DEC Chinook salmon stocking target was increased in 1997 to an intermediate level of 1.6 million fingerlings. In 2004, the Chinook salmon stocking target was increased an additional 10% (Eckert 2006b). Analysis of Chinook salmon stocking and harvest data has become a standard part of the fishing boat census annual reports in an attempt to gain insight into a number of related questions. These include whether or not statistically significant relationships between harvest and number stocked be detected, has the effectiveness of the stocking program changed over time, and can combinations of number stocked or harvest at earlier ages be used to predict harvest at later ages? Information on Chinook salmon stocked in Lake Ontario are summarized in Table A11 for the 1981-2005 year classes. Shown are the number and average size of fingerling equivalents stocked from the DEC Salmon River and Caledonia hatcheries, from all OMNR hatcheries, and from the various pen projects. Fingerling equivalents are calculated from numbers stocked using corrections for expected survival differences among Chinook salmon stocked at different sizes, and assuming OMNR stocked fingerlings contribute half as much to harvest by New York anglers (the majority of the New York’s Chinook salmon harvest occurs among maturing fish from mid July through September, so it seems logical that OMNR stockings would contribute substantially less per fish stocked). Numbers of fingerling equivalents average 16.1% less than the actual number stocked for the 1981-2005 year classes, and range from 7.1% less for the 1987 year class to 43.4% less for the 1982 year class. Chinook salmon harvest rate data by age group for the 1985-2006 censuses are summarized in Table A12, and are tabulated both by year sampled and by year class to help clarify later discussions. Age compositions of Chinook salmon harvested in the 1985-1990 censuses were estimated using monthly length frequency distributions, while age compositions of the 1991-2006 censuses were estimated using monthly length-age keys derived from fish aged by scales. Comparisons of the harvest at age data seemed easier to visualize when using whole numbers of fish adjusted to a

common base similar to the amount of targeted fishing effort that was actually occurring in the open lake fishery, as opposed to a fractional number harvested per boat trip, and the initial attempts at analysis of these data made in the early 1990s used a common base of 150,000 boat trips targeted at trout and salmon. Although fishing effort has declined substantially since then (only 49,223 trout and salmon boat trips in 2006; Figure 2, Table A2), a common base of 150,000 targeted boat trips has been maintained. Regardless of which base the data are adjusted to, they are harvest rate data, and the total Chinook salmon harvests shown in Table A12 are directly comparable to the Chinook salmon harvest rate data shown in Figure 6 and Table A8 (simply harvest rates per 150,000 boats trips as opposed to harvest per boat trip), and the percent differences between years are identical. The term relative harvest has been used in previous census reports, and will be used in this report, when discussing the data in Table A12. Just keep mind that these relative harvest values are calculated numbers of Chinook salmon harvested per 150,000 boat trips targeted at trout and salmon.

Chinook salmon harvest per 150,000 targeted fishing boat trips (Table A12) has fluctuated widely over the years censused. Relative harvest appears to be most affected by the performance of the various year classes, and the totals for those year classes with complete age-1 to age-4 harvest estimates (1984-2002 year classes) have varied from a high of 200,653 fish for the 2002 year class, to a low of 19,895 fish for the 1994 year class, a 10.1 fold difference. By comparison, total relative harvest between years censused has varied from the high of 175,311 fish in 2005, to a low of 51,251 fish in 1995, only a 3.4 fold difference. Relative harvest and harvest rates have increased substantially in the last three years censused (Figure 6, Tables A8 and A12), and inspection of the harvest at age data (Table A12) show these increases have been due largely to higher than expected returns from the 2002 and 2003 year classes. Both year classes were stocked at intermediate levels. Adjusting the relative harvest data to a common base of 2,000,000 fingerling equivalents stocked, results in a rather dramatic, statistically significant ($P=0.0003$), upward trend in chinook salmon harvest per number of fish stocked over the period of years censused (Figure 7). From 1985-1996 Chinook salmon harvest per 150,000 targeted boat trips per 2,000,000

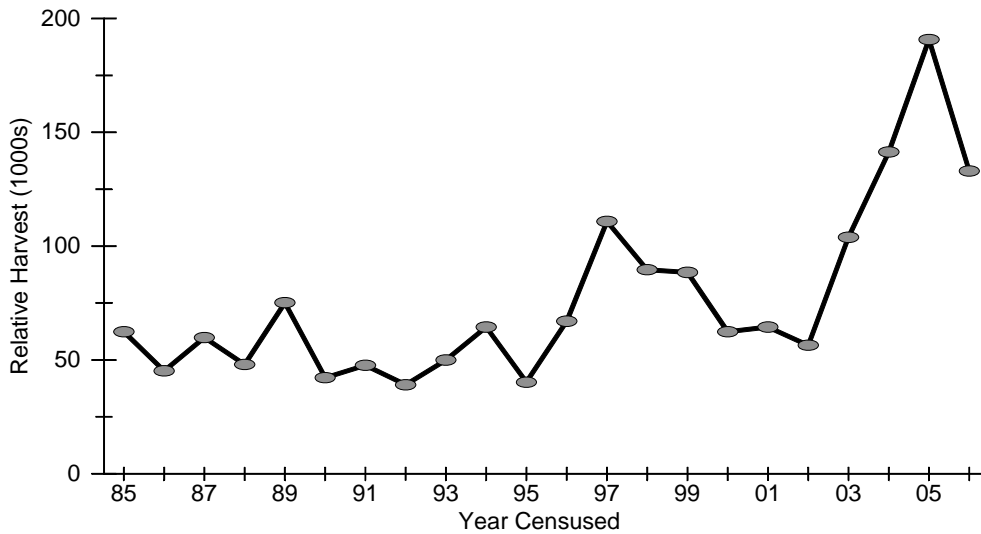


Figure 7. Relative harvest of Chinook salmon per 150,000 boat trips targeted at trout and salmon, per 2,000,000 fingerling equivalents stocked.

fingerling equivalents stocked fluctuated around an average of 53,400 fish, increased suddenly in 1997 to around 110,800 fish, declined incrementally from 1998 through 2002, and then increased dramatically again in 2003. Over the last three years, relative harvest per 2,000,000 fingerling equivalents has averaged just under 155,000 fish. Analyzing the relative harvest data per unit number of fingerling equivalents stocked (Figure A6), by age group, shows statistically significant upward trends among the age-2 ($P=0.0026$) and age-3 fish ($P=0.0045$), but no statistically trends among the age-1 or age-4 fish. Explanations for this upward trend in relative harvest per unit number stocked remain unclear. Survival of the stocked fish could have improved, for a number of reasons, increasing the number of Chinook salmon available in Lake Ontario relative to the number of boats targeting them. A second hypothesis involves increased contributions of wild fish, also resulting in an increase in the relative abundance of Chinook salmon in recent years. A third hypothesis involves increases in catchability of the Chinook salmon, allowing anglers to harvest more fish from a population of the same relative size. Increases in catchability could result from decreases in the available prey fish causing the Chinook salmon to act more aggressively, yearly variations in angling conditions or improvements in angling techniques, or from decreases in fishing effort reducing the competition among boats for those fish available. Finally, two or more of these factors could have

been operating together in any one year or over a period of years.

Chinook salmon relative harvest has been higher than expected in the last three years, especially the relative harvest data for age-2 and age-3 fish from the 2002 and 2003 year classes. Although fishermen and managers seldom complain about higher than expected harvest rates, higher than expected values are just as disruptive as lower than expected values when attempting to observe relationships between variables. Inclusion of the 2004-2006 census data certainly supports this statement. Results of regression analyses on combinations of the data in Table A12 changed dramatically with the addition of the recent census estimates, showing a decrease in the total number of relationships which were considered significant or marginally significant, as well as changes in those variables which displayed a statistically significant relationships. Of 18 tested relationships, only six have remained statistically significant. The six relationships were all significant below the $P=0.005$ level, but none had an R^2 value greater than 0.6192 (lots of variation unaccounted for by the theoretical relationship). All six involved comparisons of age-3 relative harvest versus age-2 relative harvest, either alone, or in combination with age-1 relative harvest or number of fingerling equivalents stocked. Virtually all the explainable variation in age-3 relative harvest was accounted for by the age-2 harvest, and the addition of age-1 harvest or numbers stocked made no meaningful

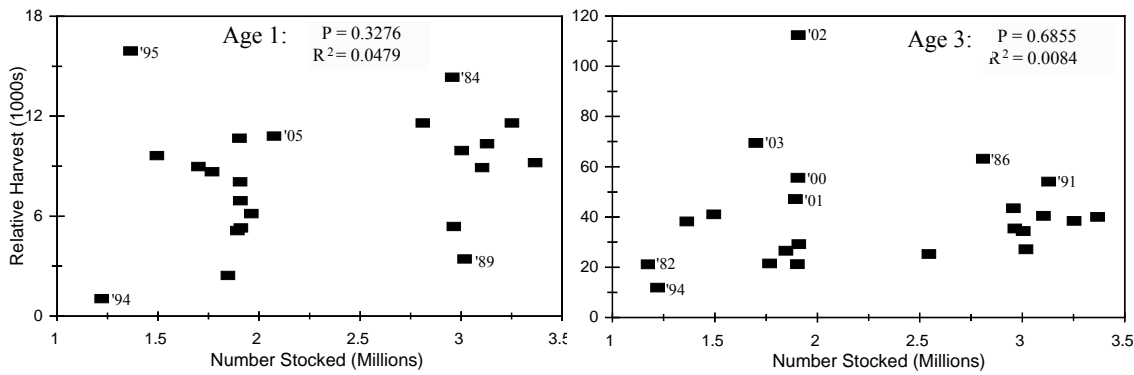


Figure 8. Relative harvest of age-1 Chinook salmon from the 1984-2005 year classes, and relative harvest of age-3 fish from the 1982-2003 year classes, plotted against number of fingerling equivalents stocked.

improvements in the relationships. Although it seems logical that relative harvest at age-2 would be valid predictor of subsequent harvest at age-3, this relationship was never statistically significant until data from the 2002 year class were included (2005 census report). Similarly, it would seem logical that relative harvest at age-1 would be a reasonable predictor of subsequent harvest at age-2 or age-3, and previously, these relationships were statistically significant (2003 census report). However, inclusion data for the 2002 year class, negated both of these relationships (from a statistical point of view). Reasons for these rather sudden changes in the significance of relationships between harvest at earlier and later ages remain unclear. There were no statistically significant relationships evident between number stocked and relative harvest of any of the age groups utilizing the 1985-2006 census data.

Relationships between numbers stocked and subsequent harvest can be further clarified by examining figures of fingerling equivalents stocked plotted against relative harvest at either age-1 or age-3 (Figure 8). The plot of age-1 harvest against number stocked shows two general groupings, each with a significant amount of vertical scattering. The left group includes the 1993-2005 year classes with stocking values ranging from 1.22-2.08 million fingerling equivalents, and has both the lowest ('94 year class) and highest ('95 year class) age-1 relative harvest estimates. The right group includes the 1984-92 year classes with stocking values ranging from 2.96-3.37 million fingerling equivalents, and has age-1 harvest values ranging widely from 3,439 fish (1989 year class) to 14,344 fish (1984 year class). Clearly, there is no significant relationship between age-1 relative harvest and

number stocked ($P=0.3276$, $R^2=0.0479$) for the year classes examined. The plot of age-3 relative harvest against number stocked also shows a significant amount of vertical scattering at similar stocking levels, but the relationship was previously significant ($P=0.05$) for 5 years using the 1982-1996 year classes up through the 1982-2000 year classes. These relationship were heavily influenced by four data points, the low harvest and low number stocked data points for the 1982 and 1994 year classes, and the high harvest and higher number stocked data points for the 1986 and 1991 year classes. Including the data points for the 2000 and 2001 year classes weakened the relationship, since relative harvest data for these two were somewhat higher than other year classes stocked at similar levels (1982-2001 year classes; $P=0.0640$, $R^2=0.1779$). The 2002 and 2003 year classes had even higher relative harvest estimates, and including these two year classes to the data series completely eliminated any statistical significance in the relationship (1982-2003 year classes; $P=0.6855$, $R^2=0.0084$) between number stocked and subsequent harvest rate at age-3. The relationship between age-2 relative harvest and number stocked is not shown in Figure 8, but has similar problems with widely varying relative harvest estimates for similar levels of stocking, and no evidence of a statistically significant relationship among with any of the year classes tested ($P=0.5943$, $R^2=0.0144$).

Based on the data currently available for Lake Ontario Chinook salmon, it would appear that relationships between harvest and numbers stocked, and relative harvest at various ages, will continue to be highly variable and of little practical significance. This is not to say that

numbers stocked have no affect on later harvest, that survival of stocked fish did not increase in recent years, or that strong or weak year classes cannot be predicted by harvest at earlier ages. Rather, the data suggest that there have been no consistent relationships over the 22 years examined, and that other factors are often more important in determining relative harvest in subsequent years.

Despite concerns about the practical significance of relationships between Chinook salmon relative harvest at various ages, and numbers stocked, the census report has traditionally included predictions of age-3 relative harvest and compared those with subsequent relative harvest observations (census estimates). Table A13 summarizes the results of predictions made for the 1993-2003 Chinook salmon year classes per 150,000 trout and salmon fishing boat trips, showing the percent differences between predicted and observed age-3 relative harvest (Table A12). Predictions were made with all possible combinations of harvest and stocking data which were statistically significant at the 10% level, using those data available one year prior to the year that age-3 harvest was observed. For example, age-3 relative harvest predictions for the 2003 year class used data from the 1985-2005 censuses to predict the 2006 age-3 relative harvest, calculated for six different relationships. Results in Table A13 show the number of relationships for which predictions were made for each year class, the range and average of the predicted values, and their percent differences from the observed relative harvest. Comparisons of observed and predicted age-3 relative harvests show good agreement only for the 1993, 1997, and the 2003 Chinook salmon year classes, and poor or variable agreement for the 1994-1996 and 1998-2002 year classes. The individual relationships used in the predictions also varied dramatically from year to year, which further decreases confidence in their value. Predictions of age-3 harvest for the 2003 year class were particularly good, averaging just 2.3% less than the observed 2006 age-3 harvest, but considering all of the concerns and uncertainties involved, were probably more a case of good luck rather than an improvement of our understanding of factors affecting Chinook salmon harvest. Predictions of age-3 harvest in 2007 (2004 year class) using data from the 1985-2006 censuses and the six statistically significant relationships found

in the regression analyses, are included in Table A13. These predictions of relative harvest per 150,000 fishing boat trips range from 44,692 to 49,134 age-3 Chinook salmon, with an average of 47,089. Assuming that fishing effort for trout and salmon in 2007 will be similar to the last five years (about 53,500 trout and salmon fishing boat trips), harvest of age-3 Chinook salmon in 2007 was predicted to be approximately 16,800 fish.

Fishermen are of course extremely interested in factors that potentially affect the survival and performance of Chinook salmon, and the census agents are often asked about the relevance of things such as size at stocking or the impacts of pen rearing and wild fish. While data are not available to definitively answer these questions, the stocking and census data can provide some perspective on the issues.

Average size of the stocked Chinook salmon is one of the more commonly cited factors potentially influencing survival and performance. The conventional wisdom is that larger fish will survive better, although too large a size at stocking may result in poor homing since the fish have are already smolted. Average weights (grams) of stocked Chinook salmon from the 1981-2005 year classes are summarized in Table A11. Sizes have been fairly consistent since the 1985 year class ranging from 4.4 to 5.1 g, and there appears to be no obvious relationship between overall average size (Table A11) and relative harvest of the year class (Table A12). The strongest year class observed to date, the 2002 year class, did have one of the highest average sizes (5.0 g), but other strong year classes, such as the 1986, 1995, and 2003 year classes, had some of the smaller average sized fish (4.4-4.5 g average).

Caledonia Hatchery has always been one of the main DEC hatcheries rearing fish for New York's Lake Ontario program, but after establishment of the Salmon River Hatchery in the early 1980s, was assigned a limited role in rearing Chinook salmon. Caledonia Hatchery does have an excellent spring water supply, providing cool water temperatures during the warm months, and relatively warm water temperatures during the colder months. Other factors being equal, Caledonia Hatchery grows some of the largest fish in the DEC hatchery system. Many Lake Ontario anglers have concluded that Chinook salmon

reared at Caledonia Hatchery are superior, and have continued to ask for an increased role for the hatchery in the Lake Ontario program. Despite this widely held belief among anglers, the available data show no obvious benefit for Caledonia reared Chinook salmon compared to those reared at Salmon River Hatchery. Chinook salmon reared at Caledonia Hatchery do grow faster in the spring, but are usually stocked earlier in the year in the western New York tributaries, and average sizes of fish from the two DEC hatcheries are approximately equal (Table A11). The fishing boat census data have been carefully examined, but show no obvious pattern of higher harvest rates for those areas stocked with Caledonia Hatchery fish during the late summer fishery when the corresponding age-3 fish should be staging near the streams they will home to. Fin clip experiments conducted at Oak Orchard Creek and the lower Niagara River with the 1999-2002 year classes compared direct stock Caledonia and Salmon River Hatchery fish with pen reared fish (Bishop et al. 2006a). At the lower Niagara River, the Caledonia Hatchery fish were the poorest performing group with both year classes, while at Oak Orchard Creek, the Caledonia fish were the poorest performing group in one comparisons (2001 year class) and the middle of the three groups in the other (1999 year class). Finally, recent increases in Chinook salmon harvest rates do not correlate with changes in Caledonia Hatchery stocking contributions. Caledonia Hatchery contributed 4.7%-6.5% of the 1999-2003 year class stockings (Table A11), but only the 2002 and 2003 year classes showed dramatic increases in relative harvest (Table A12). Relative harvest of the 2004 year class appears to be lower and approximately equal to the long term average, based on age-1 and age-2 returns, even though Caledonia Hatchery contributed 23.0% of the total fingerling equivalents stocked.

Cooperative pen rearing projects for Chinook salmon between DEC and sportsman groups began in 1998, with one project on Oak Orchard Creek. Pen rearing proved to be very popular with Lake Ontario angler groups, and the number of Chinook salmon projects quickly expanded to four in 1999. From 1999-2005, the various cooperative projects have finished rearing an average 15.9% of the total fingerling equivalents stocked in Lake Ontario (Table A11). Most of the Chinook salmon reared in the pen projects have been released without identifying marks, but four

marked groups of pen reared fish were stocked at Oak Orchard Creek (1999 and 2001 year classes) and the lower Niagara River (2000 and 2002 year classes) and compared against marked groups of direct stocked fish from Salmon River and Caledonia Hatcheries. Results from these four marked groups are mixed (Bishop et al. 2006a). The two year classes of pen reared Chinook salmon stocked in the Niagara River both returned at a lower rate than the direct stock Salmon River Hatchery fish, and pen rearing of Chinook salmon at lower Niagara River was discontinued after 2005. The opposite result was observed at Oak Orchard Creek, where the pen reared fish from both year classes returned better than either of the direct stock groups. A significant unexplainable observation with the Oak Orchard Creek and Niagara River experiments was the very poor return of marked fish compared to the numbers of marked and unmarked fish stocked. As Bishop et al. (2006a) stated in their report, the poor returns of marked fish do not invalidate the assessment of the relative performance of the experimental lots; but the very high numbers of unmarked fish do certainly highlight our limited knowledge of factors affecting the returns of Chinook salmon to any given location. It should also be noted that the recent increases in Chinook salmon relative harvest (Table A12) do not correlate with the numbers of pen reared fish stocked. Pen rearing has contributed a substantial number of Chinook salmon to Lake Ontario since 1999, but increases in Chinook salmon harvest rates have been due largely to the 2002 and 2003 year classes. This does not suggest that pen rearing has not contributed to the Lake Ontario Chinook salmon population, but it does suggest that recent increases in harvest rates cannot be directly linked to them.

The role of wild Chinook salmon in Lake Ontario has been receiving more and more interest in recent years. Most of the studies along New York's shoreline have focused on Salmon River. In 1996, seasonal base flows were mandated for Salmon River as part of the Federal Energy Regulatory Commission hydroelectric relicensing agreement (Bishop et al. 2006b). These base flows resulted in a dramatic increase in natural reproduction of Chinook salmon since 1997, and studies have documented millions of fingerlings produced per year (Bishop et al. 2006, Everitt 2006). The contributions of wild fingerlings to harvest by anglers remains unclear, but harvest

rate patterns from the open lake boat fishery do not correlate with expected returns to Salmon River. In addition to the wild fingerlings, Salmon River is stocked at a higher level than any other New York tributary to insure adequate returns of brood fish to Salmon River Hatchery. Theoretically, these two sources of fingerlings should result in more mature Chinook salmon returning to Salmon River than any other New York tributary, and boat fishing near the mouth during the late summer early fall staging period would be expected to be above average. This has not been consistently observed in the fishing boat census, and recent increases in harvest rates during the late summer early fall period have been observed along the entire New York shoreline (Table A8, Figure A4), not just in the east geographic area. Chinook salmon harvest rates in the east geographic area in 2006 were in fact below their 2001-2005 averages, especially in the month of September. Although this does not disprove a significant or increasing role for wild fish in Lake Ontario Chinook salmon populations, the harvest rates in the boat fishery are certainly inconsistent with expectations assuming that Salmon River was the single largest producer of wild fingerlings. Also, it is interesting to note that the first substantial increase in Chinook salmon harvest rate per unit number of fish stocked (Figure 7), occurred in 1997, before the increased fingerling production in Salmon river could have had an effect.

Reductions in Chinook salmon growth and prey fish abundance have been documented in the upper Great Lakes, and it seems logical that predatory fish would be more aggressive if prey fish abundance were low, potentially resulting in higher harvest rates per given population size. However, linkages between prey fish abundance, Chinook salmon growth, and Chinook salmon harvest rates remain unclear in Lake Ontario. Abundance of adult alewives (age-2 and older) measured in bottom trawls has progressively declined since 1981 (O’Gorman et al. 2007), and Chinook salmon weighing 40 pounds or more are no longer available in Lake Ontario, but whether these two observations are correlated, or just coincidentally, is unknown. Fluctuations in mean lengths of aged Chinook salmon (Table A10, Figure A5), and calculated weights of standard length fish (Table A9), have been documented in Lake Ontario, but the changes don’t consistently

correlate with changes in prey fish abundance or harvest rates. For example, the dramatic increases in Chinook salmon harvest rates that occurred in 2004 and 2005, do coincide with low mean lengths of age-3 fish, possibly suggesting hungry slower growing fish. Adult alewife abundance was consistently low from 2002-2005, which would seem to agree with the slower growth and high harvest rates, but alewife abundance was even lower in 1999 when Chinook salmon harvest rates were lower and age-3 mean lengths higher. In addition, adult alewife abundance in bottom trawls declined 71% in 2006 compared to 2005, reaching a new record low among the years sampled (O’Gorman et al. 2007). Theoretically, this decline in prey fish might have further reduced Chinook salmon growth and further increased harvest rates. Although Chinook salmon harvest rates were well above average in 2006, they did decline compared to 2005 and 2004, the opposite of what might have been expected. Mean lengths of Chinook salmon also increased slightly in 2006 compared to 2004 and 2005, again, the opposite of what was expected. Yearling alewife abundance was very high in 2006 (fourth highest yearling index) and it could be argued that the yearlings caused in the growth increase and harvest rate decrease, but the fact remains, Chinook salmon growth rates and harvest rates don’t consistently correlate with changes in adult alewife abundance. Results from the upper Great Lakes, particularly Lake Huron, clearly demonstrate the undesirable consequences of depressed prey fish populations on Chinook salmon performance, but despite all the concerns and the very real potential for future problems, Lake Ontario has yet reached a point where prey fish abundance seriously limits Chinook salmon growth.

Rainbow Trout:

Rainbow trout was the third most commonly harvested, and the third most commonly captured, salmonine in the 2006 census, contributing 13.8% of the total trout and salmon harvest and 14.4% of the total catch. The 2006 harvest was estimated at 10,750 fish [$\pm 52.6\%$] (Figure 9, Tables 1 and A14), a 42.3% increase compared to 2005, and a 7.2% increase compared to the 2001-2005 average harvest. Rainbow trout catch in 2006 was estimated at 18,029 fish [$\pm 43.1\%$], a 33.3% increase compared to 2005, and a 13.8% increase

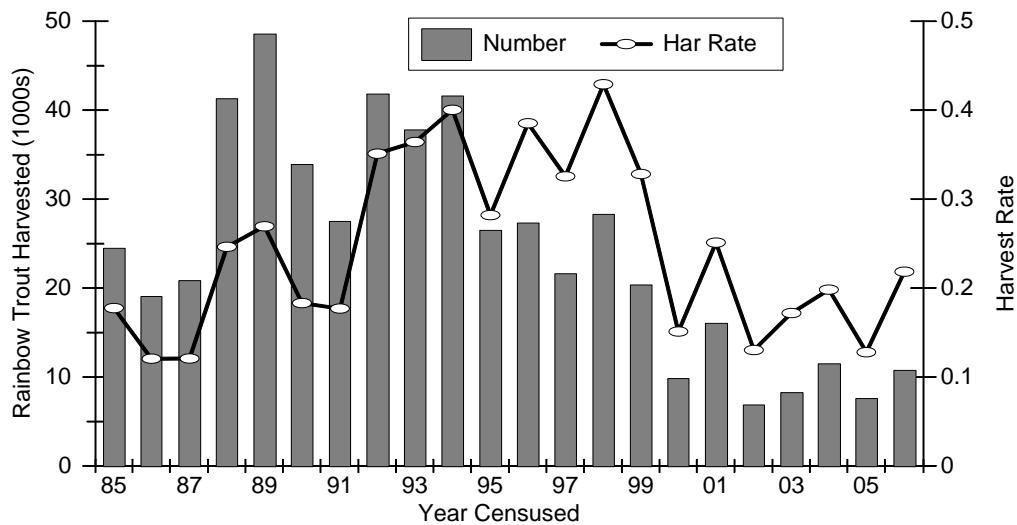


Figure 9. Total rainbow trout harvested, and harvest rate per boat trip for boats seeking trout and salmon.

compared to the 2001-2005 average catch. Percent harvested in 2006 was 59.6%, the fourth lowest value among the years censused, but similar to the previous three years. Percent harvest estimates for rainbow trout in the open lake fishery have varied substantially. Regression analysis shows no statistically significant trend over the years censused ($P=0.0812$), despite the fact that the four lowest percent harvest estimate have all occurred in the last four years.

The 2006 seasonal harvest rate among boats seeking trout and salmon was 0.22 rainbow trout per boat trip, a relatively low value compared to the harvest rates observed in the late 1990s, but a 70.9% increase compared to 2005 and a 24.2% increase compared to the 2001-2005 average harvest rate (Figure 9, Table A14). Among charter boats fishing for trout and salmon, the 2006 seasonal harvest rate was 0.80 rainbow trout per boat trip (Table A4), up 23.2% compared to the 2001-2005 average. Among noncharter boats, the seasonal harvest rate was 0.090 per boat trip, up just 12.7% compared to the 2001-2005 average. The 2006 seasonal catch rate among boats targeting trout and salmon was 0.37 rainbow trout per boat trip, up 32.2% compared to the 2001-2005 average. Patterns in the harvest and catch rates among charter and noncharter boats are generally similar (Figure A7), except rates among charter boats peaked in 1994 while rates among noncharter boats and all boats peaked in 1998 or 1993. Compared to the previous five years, harvest rates in 2006 were above their respective 2001-2005 averages in the month of

September (+408.5%), and in the west (+11.7%), west central (+165.1%) and east geographic areas (+69.6%); and below their respective 2001-2005 averages in the months of April (-62.7%) and August (-34.4%) (Table A14, Figure A8). The increase in rainbow trout harvest in the month of September was particularly dramatic, and 2006 was the first year among those censused that the highest monthly harvest was observed in September. September 2006 accounted for 40.2% of the total rainbow trout seasonal harvest, with a harvest rate 1.8 times higher than the next highest month. Patterns of rainbow trout harvest among the four geographic areas were generally similar in 2006 to those observed in previous years, with the west area continuing to dominate. In 2006, the west geographic area accounted for 61.8% of the seasonal rainbow trout harvest, with a harvest rate 2.7 times higher than the next highest geographic area.

Rainbow trout harvest in New York's Lake Ontario boat fishery has declined in recent years, and the seven lowest seasonal harvest estimates among the years censused have all occurred within the last seven years. Part of this decline in harvest can be easily explained by decreases in fishing effort targeted at trout and salmon, but part appears due to recent decreases in rainbow trout harvest rates. Rainbow trout harvest rates among boats targeting trout and salmon had shown a fairly consistent, statistically significant, upward trend from 1985 through 1999 (SAS 1985, Proc Reg, $P=0.0003$), with a peak of 0.43 rainbow trout per boat trip in 1998 (Figure 9). Harvest rates

dropped substantially in 2000, and have remained at a lower level through 2006, averaging 0.18 fish per boat trip for the seven years from 2000-2006 as compared to an average of 0.36 for the eight years from 1992-1999. Reasons for the recent decline in rainbow trout harvest rates remain speculative. Numbers of rainbow trout stocked have not declined (Eckert 2000, 2006b), and fishing patterns and methods do not appear to have changed appreciably. Excellent Chinook salmon fishing since 2004 has been suggested as a factor in the decline in harvest of some species, but would seem more likely to be a contributing factor rather than a controlling factor for rainbow trout. Chinook salmon and rainbow trout occupy fairly similar niches, and for most of the fishing season are suspended offshore around temperature breaks. Boats fishing in these areas often have a mixed catch. Reductions in harvest rates could also be caused by declines in the rainbow trout population, resulting from factors such as decreases in the survival rates of stocked fish or the relative contribution of natural reproduction. Unfortunately, there exists little information on overall survival of stocked fish, even less information on relative contribution of natural reproduction, and no independent measure of the size of the rainbow trout population, against which these hypotheses can be properly tested.

Reports from stream anglers have also suggested smaller returns of rainbow trout (steelhead) in recent years, and complaints of poor fishing have increased and expanded to include most of New York's Lake Ontario tributaries (DEC fish managers, personal communication). These complaints have further raised concerns about the size and status of the Lake Ontario rainbow trout population. In an attempt to gain insights into the survival of stocked rainbow trout, a more intensive review of the available fin clip and stocking data was completed for the 2004 census report (Eckert 2005). An updated summary of that review is given below.

Fin clips of rainbow trout harvested in the open lake boat fishery provide a means of comparing the relative performance of various stocked groups. Table A15 includes fin clips of rainbow trout examined in the 1985-2006 fishing boat censuses, plus a summary of fish stocked from the 1980-2004 year classes. To help account for expected differences in survival of fish stocked at substantially different sizes and at different life

stages, numbers stocked have been converted to yearling equivalents. The DEC Washington strain steelhead yearlings were used as the standard when calculating yearlings equivalents (range in average size from 11-25 fish per pound), and given a weighted value of 1.0. Substantially smaller yearlings, and smaller fish stocked at younger life stages, were given proportionately lower weighted values, while domestic rainbow trout yearlings, which typically weigh 4-6 times more than the Washington yearlings, were given a weighted value of 2.0. Although most stocked fish have been released without fin clips or other identifying marks, each year class stocked since 1980 has contained a reasonable number of fin clipped fish. The majority of these can be organized into three groups; the LV and LV-Ad clipped fish used primarily to mark the DEC Washington strain steelhead stocked in Salmon River, the LP-Ad clipped fish used primarily to mark the DEC Skamania steelhead, and the "OMNR" clipped fish which used the Ad, RV, RV-Ad, RP and RP-Ad clips (Eckert 2005). To help visualize comparisons of the numbers stocked with subsequent harvest in the boat fishery, fin clip data from each year of the census are positioned in Table A15 above the year class that would have produced the age-2 fish (most commonly harvested age in the fishing boat census). Plots of percent composition of the three main fin clip groups, and the unclipped fish, along with their respective percent composition of yearling equivalents stocked, are shown in Figure A9 with a similar two year offset (i.e., the percent composition of LP-Ad clipped fish observed in the 2004 fishing boat census is plotted at the same location on the x-axis as the percent composition of the LP-Ad clipped fish in the 2002 year class [age-2 fish in 2004]).

The LV and LV-Ad fish have consistently been the largest fin clipped group of rainbow trout stocked in Lake Ontario, comprising an average 18.8% of the yearling equivalents (range 12.0% to 23.7%) in the 1983-2004 year classes (Table A15). Percent returns in the 1985-2006 fishing boat censuses have been consistently lower than the percent stocked, averaging just 8.8%, with a range of 2.0% (2001 census) to 21.4% (1985 census), and have shown a statistically significant downward trend (SAS 1985, Proc Reg, $P < 0.0001$). Concerns over declining returns of LV and LV-Ad fish were first raised by Salmon River anglers in the mid 1990s, after several poor

fishing seasons, and initially were focused on the number of fish harvested by the boat fishery. However, numbers harvested in the boat fishery also declined during this time period, suggesting that other factors were responsible. Estimates of LV and LV-Ad rainbow trout harvested in the boat fishery have been less than 1,000 fish since 1999, with an estimate of just 524 LV and LV-Ad clipped fish in the 2006 census (4.9% of rainbow trout sampled). Differences between the contributions of yearling equivalents stocked and the census returns two years later have averaged 8.5 percentage points, and show a statistically significant increase (SAS 1985, Proc Reg, $P < 0.0001$) over the years censused (i.e., differences between the two getting larger, see Figure A9). From 1985-1989, the difference averaged 4.1 points (average contribution in 1983-1987 year classes was 4.1 percentage points higher than the average returns in the 1985-1989 censuses), increasing to 12.9 points for 2002-2006 (2000-2004 year classes versus 2002-2006 censuses). This trend towards larger differences between yearling equivalents stocked and subsequent harvest in the boat fishery suggests a continuing decrease in recruitment of the stocked LV and LV-Ad clipped fish, resulting in a decrease in the number of fish available for harvest.

The "OMNR" group is the second largest of the three rainbow trout fin clip groups, contributing an average 9.9% of the yearling equivalents stocked for the 1983-2004 year classes (Table A15). Numbers stocked peaked with the 1986 and 1987 year classes, and the "OMNR" group has contributed an average 8.9% of the yearling equivalents for the 1988-2004 year classes. These "OMNR" fish were typically substantially smaller at any given life stage than the DEC Washington steelhead, and during the calculation of yearling equivalents were typically weighted at half that of the corresponding DEC fish. Percent returns in the boat fishery averaged 6.8% for the 1985-2006 censuses, 7.9% for the 1990-2006 censuses (last 17 years), and show a statistically significant upward trend (SAS 1985, Proc Reg, $P = 0.0059$) over the 22 years censused despite a substantial decrease in the 2005 data. Differences in percent contribution of the yearling equivalents stocked versus the census returns two years later, appear to fall into two distinct periods (Figure A9). In the first five years (1983-1987 year classes versus the 1985-1989 census returns), census returns

averaged 13.1 percentage points less than the year class contributions. In the last 17 years (1988-2004 year classes versus the 1990-2006 census returns), census returns fluctuated about their respective year class contributions, and averaged just 1.02 points less. One potential bias in analyzing the census fin clip data is the presence of deformed fins, or false clips, that are impossible to consistently distinguish from true fin clips. Theoretically, this bias would affect all the fin clip groups, but the "OMNR" group is probably the most affected since it includes the sum of five possible fin clips, including three single clips (more opportunity for false clips to occur).

The LP-Ad group is the smallest of the rainbow trout fin clip groups, contributing an average 6.1% of the yearling equivalents stocked for the 1983-2004 year classes, including four year classes where no LP-Ad clipped fish were stocked (Table A15). Returns in the boat fishery have been quite variable, and sample sizes since the mid 1990s have been rather small. Percent contribution in the boat fishery has generally been less than the percent contribution in the respective year classes, and has averaged just 3.8% of the 1985-2006 boat harvest (Table A15, Figure A9). Despite rather high percent returns in the 1989 and 1990 censuses (7.9% and 9.7% respectively), there were no statistically significant trends ($P < 0.05$) evident in returns to the boat fishery, or in the differences between those returns and the relative contribution in the 1993-2004 year classes. It should be noted that beginning with the 1990 year class, a substantial portion of the LP-Ad clipped Skamania steelhead have been stocked in Salmon River, and that the Skamania steelhead yearlings were similar in size to the LV and LV-Ad Washington steelhead of the same year classes. Considering the declines in recruitment evident in the Salmon River Washington steelhead, it is not surprising that returns of the LP-Ad Skamania fish were also less than expected based on number stocked.

Most of the rainbow trout stocked in Lake Ontario have been released without fin clips or other identifying marks, and unmarked fish have averaged 64.8% of the yearling equivalents stocked for the 1983-2004 year classes; ranging from 34.6% to 74.7%, or 56.2% to 74.7% if the 1987 year class is ignored (Table A15). Unclipped fish have also dominated in the 1985-

2006 fishing boat censuses, averaging 76.9% of the fish sampled. The percent contribution of unclipped rainbow trout in the boat fishery has generally been higher than their percent contribution to the respective year classes stocked (Figure A9), and has shown a gradual but statistically significant upward trend (SAS 1985, Proc Reg, $P < 0.0001$). Differences between the contributions of the yearling equivalents stocked and the census returns two years later have averaged 11.3 percentage points (year class contributions lower than census contributions), but show no statistically significant trend. Rainbow trout are known to spawn successfully in Lake Ontario tributaries, and if natural reproduction does contribute significantly to the open lake population, then it is not surprising that returns of unclipped fish in the censuses are higher than would be expected based solely on numbers stocked. It is also tempting to use the difference between the census returns and the number stocked (average 11.3 points) as a minimal estimate of recruitment from natural reproduction. However, the scarcity of data on unclipped stocked fish make this problematic. Of particular concern are the large numbers of DEC Washington steelhead stocked in tributaries other than Salmon River, and the large-sized domestic rainbow trout stocked by DEC along the Lake Ontario shoreline. Adequate data to evaluate either one of these groups in Lake Ontario do not exist.

Length and weight data for rainbow trout sampled in the 1985-2006 fishing boat censuses are presented in Table A16. Mean lengths of fish sampled have varied significantly (SAS 1985, Proc GLM, $P < 0.0001$) between years, and regression analysis does show an overall significant upward trend in mean lengths ($P = 0.0366$) over the 22 years sampled. Mean lengths peaked in 1998 and 1999, the same time harvest rates were peaking in the boat fishery. Mean lengths have declined to more intermediate values in recent years, and regression analysis also shows a statistically significant downward trend in the 1998-2006 data (last nine years, $P = 0.0453$). Reasons for these trends in mean lengths are unclear, although variations in year class recruitment and selective harvest by anglers could readily influence the age and size of harvested fish. Unfortunately, data on the sizes of fish released, or the age of the harvested rainbow trout,

are currently unavailable for New York waters of Lake Ontario. Data on the percentage of rainbow trout harvested (Table A14) show no statistically significant trend over the entire 22-year census period, but it is interesting to note that the four lowest yearly percent harvest values (all $< 60\%$) have been observed in the last four years and correspond with years of lower rainbow trout harvest rates and intermediate mean size. Calculated weights of standard length rainbow trout (Table A16) show several interesting trends. Weights of the three smallest standard size groups (18, 20 and 22-inch rainbow trout) all show very similar, statistically significant upward trends (SAS 1985, Proc Reg, $P < 0.05$) from 1988-2006 (weight data were not collected in the 1985-1987 censuses), with peak weights recorded in 2003. Calculated weights of the four largest size groups (26, 28, 30 and 32-inch fish) all peak in 2000, and all show similar statistically significant upward trends from 1988-2000 and statistically significant downward trends from 2000-2006. Weights of the 24-inch standard length fish show an intermediate pattern with statistically significant upward trends from 1985-2000 and 1985-2003, and similar peak weights in 2000 and 2003. Reasons for these trends in calculated weights (condition factor), and the differential peaks in the smallest and largest size groups, are unclear.

Atlantic Salmon:

New York's Lake Ontario Atlantic salmon program was changed in 1990 from a small scale experimental project with an annual stocking target of 50,000 yearlings, to a larger put-grow-take program for trophy fish (> 25 inches) with an annual stocking target of 200,000 yearlings and fall fingerlings. Substantial stocking increases began in 1991 (1990 year class) and although target numbers were never met, annual stockings were equal to or greater than 160,000 fish in most years (Eckert 2000, 2006b). In 1996, the annual stocking target was reduced to 100,000 yearlings and fall fingerlings, while maintaining the objective of a put-grow-take program for trophy fish. Based on numbers stocked, it was expected that Atlantic salmon catch in the open lake fishery would increase substantially beginning in 1992, remain at a higher level through 1997, and then begin to decline to more moderate levels. As shown in Table A15, significant increases in number harvested or number caught did not occur, and aside from a spike in harvest and catch in

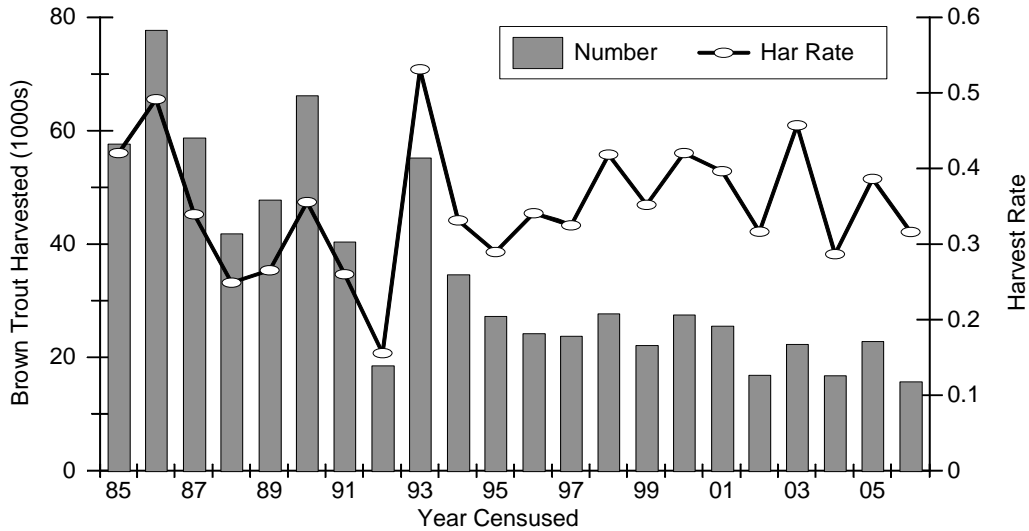


Figure 10. Total brown trout harvested, and harvest rate per boat trip for boats seeking trout and salmon.

1994, there has been an overall pattern of decline. From 2003-2005, Atlantic salmon observed in the boat fishery by the census agents were limited to a single fish each year, resulting in harvest estimates of less than 20 fish per year. In 2006, no Atlantic salmon were observed among the 2,239 fishing boats interviewed. The harvest estimate for 2006 is therefore zero Atlantic salmon, although other sampling by Cape Vincent personnel did confirm the harvest of two fish (one a legal size fish, the other sublegal). Total Atlantic salmon catch in 2006 was estimated at 158 fish [$\pm 104.4\%$].

Due to the continuing poor returns of stocked Atlantic salmon, the DEC and local sportsmen decided to replace Atlantic salmon stockings in Black River with an equivalent number of brown trout. This change became effective with the 2002 year class, and cut the DEC Lake Ontario Atlantic salmon policy back to an annual target of 50,000 yearlings.

Brown Trout:

Brown trout harvest decreased in 2006 to 15,642 fish [$\pm 47.2\%$] (Tables 1 and A18, Figure 10), a record low harvest estimate among the years censused, and a 24.8% decrease compared to the 20001-2005 average number harvested. Despite this decrease, brown trout remained the second most commonly harvested trout or salmon species in 2006, accounting for a rather modest 20.0% of the total salmonine harvest within the area censused. Total brown trout catch in 2006 was

26,230 fish [$\pm 36.5\%$], the third lowest catch estimate among the years censused, and a 21.1% decrease compared to the 2001-2005 average catch. The 2006 percent harvest was 59.6% , the second lowest percent harvest estimate for brown trout, and 10.6 percentage points less than the average of all the previous years censused. Regression analysis of the percent harvest estimates does show a variable but statistically significant ($P=0.0018$) pattern of decline over the entire 22-year sample period, with most the decline evident since 1993.

The 2006 seasonal harvest rate among boats seeking trout and salmon was 0.32 brown trout per boat trip, a 14.3% decrease compared to the 2001-2005 average harvest rate (Table A18). Among charter boats fishing for trout and salmon, the 2006 harvest rate was 1.14 brown trout per boat trip (Table A4), a minor 4.8% decrease compared to the 2001-2005 charter boat average. Among noncharter boats fishing for trout and salmon, the 2006 harvest rate was 0.13 brown trout per boat trip, the second lowest noncharter harvest rate among the years censused, and a 33.9% decrease compared to their 2001-2005 average. Comparisons by month and geographic area show that 2006 harvest rates were well below their respective 2001-2005 averages in 5 of the 6 the months censused (range -16.1% to -51.0%), and in 3 of the 4 geographic area (range -18.2%to -43.7%) (Table A18, Figure A11). Increases in 2006 brown trout harvest rates were observed only in the month of July (+52.6%) and in the east

geographic area (+18.2%). The most important differences were the decreases that took place in 2006 in the months of April and May and in the east/central geographic area, which are typically important components of the seasonal brown trout harvest, although the months of April and May still accounted for 60.1% of the 2006 seasonal harvest and the east/central area still accounted for 62.9%. The 2006 brown trout catch rate among boats targeting trout and salmon was 0.53 fish per boat trip, a 10.9% decrease compared to the 2001-2005 average (Table A18 and Figure A10). Brown trout harvest and catch rates, and harvest and catch rates among charter and noncharter boats, all show moderately high yearly variation, and regression analysis of the data (SAS 1985, Proc Reg) show only two statistically significant relationships. The seasonal harvest rate among noncharter boats does show a significant ($P=0.0130$) downward trend over the years censused, due to high estimated harvest rates in 1985 and 1986. Re-analysis of the data using just the 1987-2006 noncharter harvest rates shows no statistically significant trends. The second significant trend noted was a downward trend in brown trout harvest rates among all trout and salmon boats in the east geographic area, that was evident despite increases in east area harvest rates in 2005 and 2006. Anecdotal reports from fishermen suggested that the excellent Chinook salmon fishing may have reduced brown trout harvest and catch in 2004-2006, as substantial changes in fishing techniques and locations took place in order to better target Chinook salmon.

Length, weight, fin clip, and age data for brown trout sampled during the 1985-2006 censuses are summarized in Table A19. Age-2 brown trout comprised just 67.8% of the fish sampled in 2006, a decrease of 12.3 percentage points compared to 2005, and a decrease of 3.7 percentage points compared to the 2001-2005 average percent composition, and the third lowest age-2 percentage among the years that data are available from the census. Age-3 and age-4 brown trout comprised 26.6% and 4.8%, respectively, of the 2006 census sample, 4.2 percent points above and 0.1 percentage points below their respective 2001-2005 averages. The oldest brown trout observed in the 2006 census was one age-5 fish. Few brown trout are observed older than age-5, and in the 14 years that scale samples have been collected, only seven age-6 and one age-7 brown trout have been observed. Mean length of age-2

brown trout in April 2006 was estimated at 17.7 inches, well within the range of means observed in previous years, and just 2.5% less than the 2001-2005 April average (mean lengths of age-2 brown trout sampled in other DEC April programs, 1974-86, ranged from 17.0-18.5 inches, DEC unpublished file data; O'Gorman et al. 1987). Growth of age-2 brown trout was excellent in 2006, and the average increase in length from April-August (0.96 inches per month) was the highest rate estimated among the 14 years compared. Mean length of age-3 brown trout sampled in April 2006 was 22.2 inches, 3.5% less than the 2001-2005 age-3 average. Statistical analyses of the 1993-2006 brown trout length data (SAS 1985, Proc GLM with Student-Newman-Keuls multiple range test, and Proc REG) show significant fluctuations between years, but no significant trends among years. Weights of standard length brown trout calculated from the 2006 seasonal length-weight relationships were above their respective 2001-2005 averages for the 16-inch to 24-inch standard sizes, and below their respective 2001-2005 averages for the 26-inch and 28-inch standard lengths. The 2005 calculated weights of 26-inch and 28-inch brown trout were the lowest respective values estimated among the years that weight data have been recorded in the census, and increases of 3.8% and 2.6% respectively were calculated for 2006. Regression analyses (SAS 1985, Proc REG, $P=0.05$) of the calculated weight data show no statistically significant trends for any of the standard length groups over the 19-year data series.

Numbers of fin clipped brown trout collected in the 1997-2006 fishing boat censuses from experiments comparing yearling fish stocked from shore (the traditional method) versus fish stocked from a barge (usually around the 30 ft contour) are summarized in Table A20. These experiments were begun with yearlings from the 1995-1997 year classes stocked in eastern Lake Ontario near Oswego and Selkirk. Based in part on preliminary returns which showed significantly higher returns for the barge stocked fish, a second series of experiments was begun with the 2000 and 2001 year classes with equal lots of yearling brown trout shore and barge stocked at both Sodus Bay (central Lake Ontario) and Point Breeze (western Lake Ontario). Partial returns from the 2000 and 2001 year classes showed no significant differences in the performance of barge and shore

stocked lots, but did show significantly higher returns for the larger brown trout yearlings from Caledonia Hatchery that were stocked at Point Breeze. To determine whether this outcome was due to differences in the areas stocked, or the sizes stocked, the larger Caledonia Hatchery yearlings from the 2002 and 2003 year classes were barge and shore stocked at Sodus, while the smaller yearlings from Salmon River Hatchery were stocked at Point Breeze. A preliminary review of the 2000-2002 year class stockings appears in the 2004 census report (Eckert 2005), including a discussion of problems arising from false clips. Hatchery reared brown trout commonly experience damage to the pectoral and ventral fins from fin disease and erosion. If severe, these damaged fins will not grow back properly after stocking, or may even fail to regrow at all. The resulting deformed fins are often substantially smaller than normal, and are difficult to consistently differentiate from clipped fins, or clipped fins which have partially regenerated. This will result in some false pectoral and ventral clips among the fish processed; i.e., fins which appear to have been clipped, but which were not. Adjustments for false left pectoral (LP) and left ventral (LV) clips among the experimental lots were calculated using samples of age-2 brown trout collected in the 1993-2005 censuses (1991-2003 year classes), and assuming the likelihood of false pectoral and ventral clips was the same between year classes and between the right and left sides of the fish. Right pectoral fin clips were not used among any of the brown trout from the 1991-2003 year classes stocked in Lake Ontario, while left pectoral clips were unused among the 1991-1999 year classes. This resulted in 22 separate samples, from which the average rate of false left pectoral fin clips among fish harvested in subsequent years was estimated to be 5.64 per 100 unclipped fish. Ventral clips have been used more commonly among brown trout stocked in Lake Ontario, but the 1991-2003 year classes did include 6 separate samples (3 left side, 3 right side) from which the average rate of false left ventral clips was estimated to be 2.11 per 100 unclipped fish. Adjusted numbers of left pectoral and left ventral clipped experimental fish (see Table A20) were then calculated by taking the observed number of each group, and subtracting the number of unclipped brown trout observed in each age and year class group times the respective calculated rates of false clips. False double clips might also occur among brown trout marked with

an adipose fin clip, but which had an additional badly deformed left pectoral or left ventral clip. The adipose fin clip was used with lots of brown trout from the 1995-1997, 2000, and 2002 year classes, and similar downward adjustments were made in the numbers of left pectoral-adipose and left ventral-adipose clipped fish, by subtracting the number of observed adipose fin clips times the respective calculated rates of false clips. Adjusted number of fish in any particular clip-age-year class group were left as zero in those cases where zero fish were originally observed, or where the adjusted number would have been less than zero (calculated number of false clips was greater than the number originally observed). Differences between the observed and adjusted numbers (Table A20) were most apparent for fish marked with a single left pectoral clip, and least apparent for fish marked with the double left pectoral-adipose and left ventral-adipose clips. Among three of the four experimental lots stocked at Sodus and marked with a left pectoral clip, most of the clipped fish observed in subsequent years would have been expected due simply to false left pectoral fin clips.

Statistical comparisons of the data in Table A20 were conducted with chi-square tests, comparing adjusted numbers of the various fin clip groups versus numbers expected assuming equal survival of stocked fish. Due to small sample sizes, many of the experimental groups were combined. Returns from the 2002 and 2003 year classes are still incomplete, but with data on age-2 and age-3 fish now available, the results are unlikely to change. Adjustments for false clips had relatively minor impacts on the shore and barge groups from the 1995-1997 year classes. Returns of shore stocked yearling brown trout from these three year classes were still significantly lower than returns of barge stocked fish ($X^2=15.49 > \chi^2_{(.005)[1]}=7.88$), although the ratio of shore to barge fish did drop to 1:2.55 as compared to 1:3.65 when using the unadjusted (observed) numbers. Comparisons of brown trout shore and barge stocked at Sodus and Point Breeze continued to show no statistically significant differences for the 2000-2002 year classes (shore to barge ratios of 1:1.01, 1:1.15, and 1:0.98 respectively), but returns of age-2 and age-3 fish from the 2003 year class did show significantly lower returns of shore stocked fish ($X^2=31.37 > \chi^2_{(.005)[1]}=7.88$, shore to barge ratio of 1:4.87). These preliminary returns also suggested the differences for the 2003 year class were most

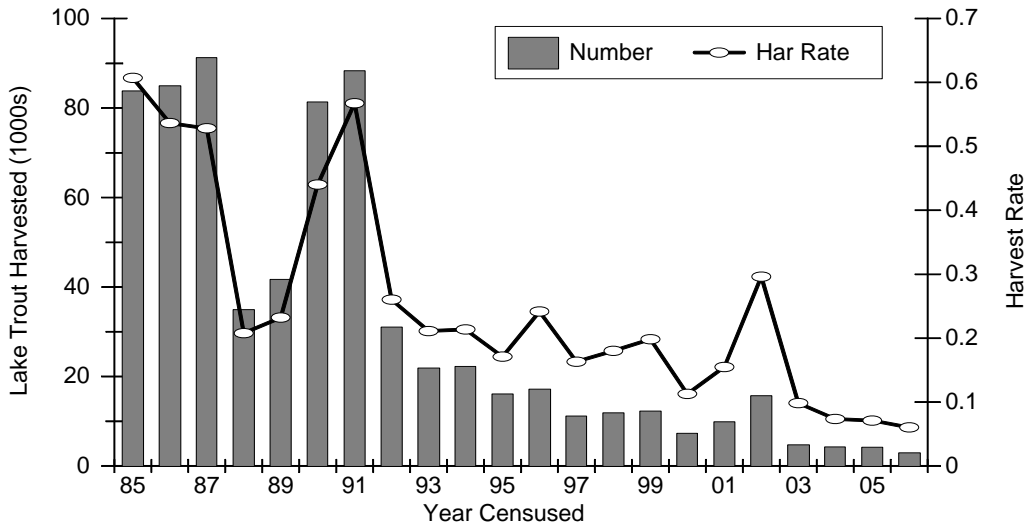


Figure 11. Total lake trout harvested, and harvest rate per boat trip for boats seeking trout and salmon.

pronounced at the Sodus site (0.9 shore versus 35.7 barge, $X^2=33.14 > \chi^2_{(.005)[1]}=7.88$), as compared to the Point Breeze site (11.4 shore versus 24.2 barge, $X^2=4.61 > \chi^2_{(.05)[1]}=3.84$). Differences in return rates between the Sodus and Point Breeze sites (shore and barge stockings combined) were largest for the 2000 and 2001 year classes, with the larger yearlings at Point Breeze returning 13.23 and 9.37 times higher, respectively, than the smaller Sodus yearlings (differences highly significant for both year classes, $P < 0.005$). Switching the stocking location of the larger yearlings for the 2002 and 2003 year classes did result in higher returns at the Sodus site, but the return differences for the larger yearlings were now only 1.72 and 1.03 times higher, respectively (differences significant only for 2002 year class, $P < 0.05$). Differences of these magnitudes would suggest a combination of the stocking size and area factors, where the highest returns were achieved with the larger yearlings stocked at Point Breeze. Regardless of the year class, size, or area stocked, the fin clipped fish were readily captured throughout the area censused, confirming observations made in other spring sampling (1974-86 DEC unpublished file data) that brown trout disperse widely from their stocking sites during and spring and summer.

Lake Trout:

Lake trout was the fifth most commonly harvested trout or salmon species in the 2006 census, contributing just 3.8% of the total salmonine harvest within the area censused. Lake trout

harvest again decreased in 2006 with an estimate of 2,964 fish [$\pm 102.5\%$] (Tables 1 and A21, Figure 11), the fourth consecutive year with a new record low harvest, and a 61.7% decrease compared to the 2001-2005 average harvest. Total catch in 2006 was estimated at 8,656 lake trout, also the fourth consecutive year with a new record low, and an identical 61.7% decrease compared the 2001-2005 average catch. Lake trout harvest in New York waters of Lake Ontario has been limited since 1988 by a slot size limit, designed to increase the number and ages of spawning adults. Consequently, percent harvest has been lower for lake trout than for any of the other major salmonine species managed in the lake (excludes Atlantic salmon). Percent harvest of lake trout in 2006 was estimated at 34.2%, 1.2 percentage points less than the 2001-2005 average. Lake trout percent harvest data do show a statistically significant downward trend over the entire 22-year data series (Proc Reg, $P=0.0016$), but no statistically significant trend since the lake trout slot limit was stabilized at 25-30 inches total length in 1993 (14-year data series).

The 2006 seasonal harvest rate among boats seeking trout and salmon was 0.060 lake trout per boat, the fourth consecutive record low among the years censused, and down 56.6% compared to the 2001-2005 average harvest rate (Table A21, Figure 11). Among charter boats fishing for trout and salmon, the 2006 seasonal harvest rate was 0.31 lake trout per boat trip (Table A4), down 51.1% compared to the 2001-2005 average. Among

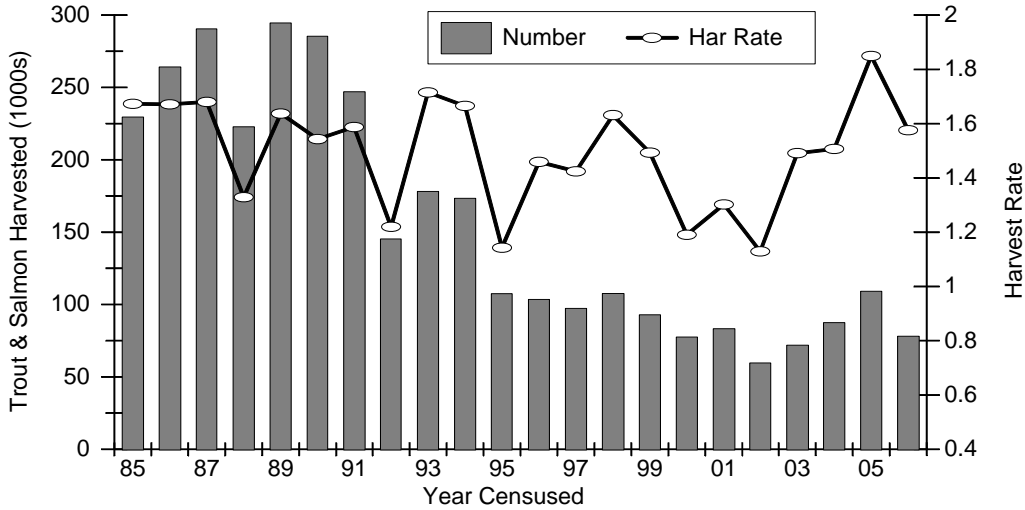


Figure 12. Total trout and salmon harvested, and harvest rate per boat trip for boats seeking trout and salmon.

noncharter boats fishing for trout and salmon, the seasonal harvest rate was an exceptionally low 0.0046 lake trout per boat trip, down 87.1% compared to the 2001-2005 average. Comparisons by month and geographic area show that 2006 harvest rates were all well below their respective 2001-2005 averages (Table A21, Figure A13), except for the month of May which was up 110.3%. The seasonal catch rate among boats seeking trout and salmon was 0.18 lake trout per boat trip, the second lowest seasonal catch rate (only 2005 was lower), and a 56.8% decrease compared to the 2001-2005 average catch rate. Harvest and catch rates show similar patterns over the years censused, and regression analysis (SAS 1985, Proc Reg, $P < 0.01$) shows statistically significant downward trends for seasonal rates, rates among charter boats, and rates among noncharter boats (Figures 11 and A12). As with brown trout, reports from anglers suggested that redirection of fishing effort towards Chinook salmon may have reduced the 2006 lake trout harvest.

Length and average weight data for harvested lake trout sampled in the 1985-2006 censuses are summarized in Table A22. Of 39 lake trout measured by the census agents in 2006, 8 or 20.5%, were inside the protected size slot. Most of the 25-30 inch fish observed in 2006 were within one inch of the lower boundary of the slot limit, and might possibly have been the result of measurement errors. Other lake trout in the 25-30 inch range may have been taken in Ontario waters

of Lake Ontario, and therefore would be exempt from the New York size limit. Percent contribution of lake trout 30 inches or larger was estimated at 15.4% in 2006 (6 of 39). This was the lowest percent contribution of lake trout 30 inches or larger observed since 1996, and 19.6 percentage points lower than the average percent contribution estimated for 2001-2005 (35.0% of all lake trout).

Total Salmonids:

Harvest and catch of all species of trout and salmon in the 2006 fishing boat census decreased substantially compared to 2005, due in part to a decline in fishing effort. The 2006 salmonine harvest was estimated at 78,166 fish [$\pm 24.7\%$] (Figure 12, Tables 1 and A23), a 28.4% decrease compared to 2005, but only a 5.0% decrease compared to the 2001-2005 average harvest. Total catch of all trout and salmon species was estimated at 125,378 fish [$\pm 22.9\%$], a 26.6% decline compared to 2005, and a 12.7% decrease compared to the 2001-2005 average catch. The overall salmonine harvest percentage in 2006 was 62.3%, similar to 2005, and higher than the low values observed in 2002-2004. Regression analysis of the percent harvest data does show a statistically significant ($P = 0.0037$) downward trend over the entire 22-year data series.

The 2006 seasonal harvest rate for all species of trout and salmon among boats fishing for trout and salmon was 1.58 fish per boat trip, down 14.8% compared to the record high observed in

2005, but 8.3% higher than the 2001-2005 average harvest rate (Table A23, Figure 12). Among charter boats fishing for trout and salmon, the 2006 seasonal harvest rate was 5.20 salmonines per boat trip, the eighth highest charter boat harvest rate among the years censused, and up 10.2% compared to the 2001-2005 average (Table A4). Among noncharter boats fishing for trout and salmon, the seasonal harvest rate was 0.77 salmonines per boat trip, the seventh lowest seasonal harvest rate, and down 3.7% compared to the 2001-2005 average. Total trout and salmon harvest rate patterns in 2006 were generally similar to previous years, and show a more even distribution between months and geographic areas compared to any one of the individual salmonine species (Table A23, Figure A15). Comparisons of the 2006 harvest rates with their respective 2001-2005 averages showed no major deviations. Differences of more than 10% were noted in 5 of the 6 months and 3 or the 4 geographic areas, with above average harvest rates in 2006 for the months of May (+11.7%), August (+11.2%), and September (+14.8%) and the west (+13.4%) and east/central (+20.6%) geographic areas, and below average harvest rates in 2006 for the months of April (-11.8%) and June (-16.4%) and in the east geographic area (-17.4%). Regression analysis of the harvest rate data showed no statistically significant trends ($P < 0.05$) for all trout and salmon boats combined (Figure 12), but did show some trends for the charter and noncharter components. Charter boats targeting trout and salmon show a variable but significant pattern of declining harvest rates from 1985-2002 ($P = 0.0121$), followed by higher harvest rates in 2003-2006 (Table A4, Figure A14). Over the entire 22-year data series (1985-2006) charter boats show no statistically significant trend in total trout and salmon harvest rates. Noncharter boats targeting trout and salmon also show a variable declining pattern in harvest rates with a substantial increase in 2005, but their increase in 2005 was proportionately less than was observed for charter boats and was largely limited to 2005. As a result, noncharter boats do show a statistically significant pattern of decline ($P = 0.0011$) in total trout and salmon harvest rates from 1985-2006.

The 2006 seasonal catch rate for all trout and salmon among boats fishing for trout and salmon was 2.53 fish per boat trip, a 12.6% decline compared to 2005, but only a 1.2% decline compared to the 2001-2005 average catch rate

(Table A23). Among charter boats, the 2006 trout and salmon catch rate was 6.28 fish per boat trip, a 1.7% decrease compared to the 2001-2005 average. Among noncharter boats, the 2006 catch rate was 1.69 trout and salmon per boat trip, a 5.2% decrease compared the 2001-2005 average (Table A4, Figure A14). Regression analysis of the trout and salmon catch rate data show no statistically significant trends over the years censused whether comparing the total of all trout and salmon boats, or the charter and noncharter components. Considering the lack of significant relationships in catch rates, the significant relationship found in the charter and noncharter harvest rate data (see previous paragraph), may be due in part to factors other than the number of fish caught.

In addition to harvest and catch rates, angling quality in the boat fishery has been annually tracked with a variety of other parameters, including the percent of boats with zero harvest and catch (considered an indicator of poor angling quality), and the percent of boats harvesting the maximum daily limit of trout or salmon (considered an indicator of good angling quality). These parameters are listed in Table A24, Part A, and generally show an inverse correlations with harvest and catch rates. When harvest or catch rates are higher, a lower percentage of boats fails to harvest or catch at least one fish, and vice versa. What is surprising to many people is the rather high rates of zero harvest and catch that have always occurred. During the first five years of the census program, a time period often fondly remembered as “the good old days”, an average 50.1% of the trout and salmon boats interviewed failed to harvest a single salmonine, while 39.7% failed to catch a single salmonine. In 2006, 57.2% of boats interviewed that were seeking trout and salmon failed to harvest a single trout or salmon, 2.2 percentage points higher than the respective 2001-2005 average (55.0% harvested no trout or salmon); while 41.2% boats interviewed in 2006 failed to catch a single trout or salmon, 0.8 percentage points less than the respective 2001-2005 average. Regression analysis of the data should no statistically significant trend in the percentage of boats with a zero trout or salmon catch over the years censused, but a marginally significant ($P = 0.0584$) upward trend in the percentage of boats with a zero trout or salmon harvest.

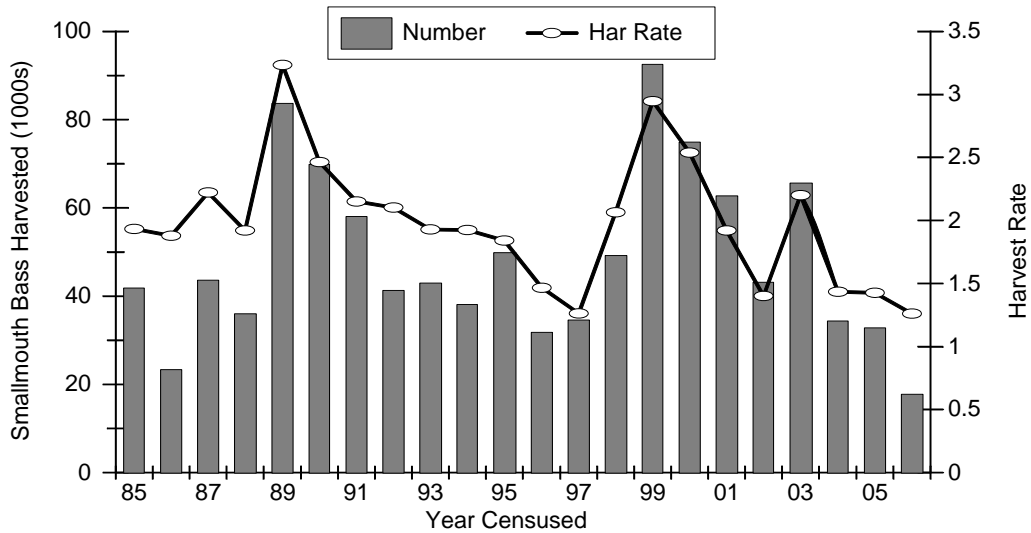


Figure 13. Total smallmouth bass harvested, and harvest rate per boat trip for boats seeking smallmouth bass.

Comparisons of boats that harvested the maximum daily limit are constrained by the fact that fishing regulations were changed between the 1996 and 1997 seasons. From 1985-1996, New York Lake Ontario anglers were allowed a daily aggregate limit of five trout and salmon per angler, with no more than three lake trout and no more than one Atlantic salmon. Beginning with the 1997 season, the daily limit was changed to a maximum aggregate of seven, with no more than three lake trout, no more than one Atlantic salmon, and no more than three fish of coho salmon, Chinook salmon, rainbow trout or brown trout in combination (popularly known as the 3-3-1 limit). In 2006, 15.9% of the charter boats targeting trout and salmon harvested the maximum daily limit of three coho salmon, Chinook salmon, rainbow trout, or brown trout in combination, for their paying customers, 1.8 percentage points higher (better) than the 2001-2005 average, but 7.2 percentage points less than the high value observed in 2005. Of the charter boats with a limit for their customers, 49.8% went on to harvest additional fish permitted under the fishing licenses held by the boats captain and mates, with 11.7% harvesting the limit for all anglers (1.9% of all charter boat trips in 2006). Among noncharter boats fishing for trout and salmon in 2006, 0.7% harvested the maximum daily limit of three coho salmon, Chinook salmon, rainbow trout, or brown trout in combination, 0.5 percentage points less than the 2001-2005 average. Limits of three lake trout per angler have been consistently less common than aggregate

limits for the other four species, and in 2006, only 0.9% of the charter boats interviewed harvested the legal limit of lake trout for their customers, while none of the noncharter boats had a limit of lake trout. Out of all the boats interviewed in the last ten years (1997-2006), not one has had the maximum aggregate limit of seven fish (3-3-1), and not one has had the three fish limits for both lake trout and the coho salmon, Chinook salmon, rainbow trout, brown trout combination (3-3). This includes all the charter boats interviewed, even when counting only the charter party as potential anglers (captains and mates excluded from the angler count).

Smallmouth Bass:

Smallmouth bass was the most commonly harvested fish species in the DEC Lake Ontario fishing boat censuses from 1995-2003. In 2004, 2005, and 2006, Chinook harvest increased while smallmouth bass harvest declined, dropping smallmouth bass to the second most commonly harvested species in all three years. The 2006 smallmouth bass harvest was estimated at 17,759 fish [$\pm 61.3\%$] (Figure 13, Tables 1 and A25), the lowest seasonal harvest observed among the years censused, a 45.9% decrease compared to 2005, and a 62.8% decrease compared to the 2001-2005 average harvest. Smallmouth bass did maintain its position as the most commonly caught species in the 2006 boat fishery with an estimate of 74,052 fish [$\pm 37.3\%$]. Although an impressive number of fish, this was the lowest estimated number of smallmouth bass caught among the

years censused, a 49.0% decrease compared to 2005, and a 76.8% decrease compared to the 2001-2005 average catch. Smallmouth bass catch had show a relatively consistent, statistically significant (SAS 1985, Proc Reg, $P < 0.0001$), pattern of increase from 1985-2003, before beginning a dramatic decline starting in 2004. An estimated 24.0% of the smallmouth bass caught in 2006 were harvested, the highest percent harvest for smallmouth bass since 1994. Percent harvest data do show a variable but statistically significant ($P = 0.0248$) downward trend over the entire 22 years censused (1985-2006), but also show a significant upward trend ($P = 0.0061$) in the five years since 2002.

Smallmouth bass harvest and catch rates among boats targeting smallmouth bass during the open season, have varied substantially between years, and neither parameter shows a statistically significant trend (Proc Reg, $P < 0.05$) over the entire 22 years censused. The 2006 harvest rate among boats seeking smallmouth bass during the open season was 1.26 bass per boat trip, the lowest seasonal harvest rate among the years censused, an 11.6% decrease compared to 2005, and a 24.9% decrease compared to the 2001-2005 average harvest rate. The 2006 catch rate among boats targeting smallmouth bass during the open season was 4.87 bass per boat trip, the lowest catch rate among the years censused, a 17.5% decrease compared to 2005, and a 54.1% decrease compared to the 2001-2005 average catch rate. Among boats targeting smallmouth bass in 2006, 77.2% failed to harvest a single bass, the highest percentage among the years censused, while 42.8% failed to catch at least one bass, also the highest percentage among the years censused (Table A24, Part B). The daily bag limit of 5 bass per angler was harvested by 3.7% of the boats targeting smallmouth bass in 2006, well below the average of the previous years, but slightly higher than the percentage of limits observed in 2002 and 2005. Comparisons of 2006 harvest rates with their respective 2001-2005 averages (Table A25) showed below average fishing quality for boats targeting smallmouth bass in the months of June (-35.9%), July (-22.3%) and September (-55.6%), and in the west (-51.0%), west/central (-72.0%) and east/central (-58.3%) geographic areas. The 2006 harvest rates were essentially average in the month of August (+1.0) compared to its respective 2001-2005 average, while the 2006 harvest rate in the east geographic area was above average

(+28.9%). The most important difference in terms of the overall seasonal harvest estimates occurred in the east/central area which accounted an average 63.5% of the total smallmouth bass harvest from 2001-2005 (average 30,867 bass), but contributed only 34.5% in 2006 (6,119 bass).

Additional analyses of smallmouth bass harvest data utilizing localized geographic sites and harvest rates per angler hour were initially carried out as part of the DEC evaluation of impacts of double-crested cormorant on Lake Ontario smallmouth bass (Eckert 1999a). The intent of these analyses was to look for trends in harvest rates at the various localized sites (Table A1), compared to the lake-wide harvest rate. Assuming that major ecosystem changes such as colonization by dreissenid mussels or reduced productivity should affect bass throughout the lake in a similar manner, and assuming that smallmouth bass year classes in different areas of the lake would be similarly affected by factors such as weather and overall water temperature patterns, then a persistent pattern or trend in any one area would likely be the result of local conditions. Harvest ratios seemed to provide the easiest means of comparing harvest rates at the local sites against lake-wide rates, with values above 1.0 indicating higher harvest rates (better fishing) at the local site, and values less than 1.0 indicating lower harvest rates.

The smallmouth bass harvest data originally presented in Eckert (1999a) have been updated annually with information from the 1999-2006 censuses, and are summarized in Table A26 and Figure A16. Inclusion of the 1999-2004 data did not change any of the conclusions reached previously. Addition of the 2005 census data did alter some of the conclusions, and addition of the 2006 census data resulted in further changes. Up through 2005, the Henderson site continued to show a statistically significant downward trend (SAS 1985, Proc Reg, $P = 0.0361$) in harvest rates relative to the respective lake-wide rates (Figure A16, Table A26). From 1985-1991, harvest rates per angler hour at the Henderson site were nearly equal to or greater than the lake-wide rates, with a 6-year average ratio of 1.16; while from 1991-2005, harvest rates at Henderson were typically well below the lake-wide rates, with a 15-year average ratio of 0.74. Reasons for this decline in Henderson site harvest rates relative to lake-wide rates cannot be proven conclusively, but the

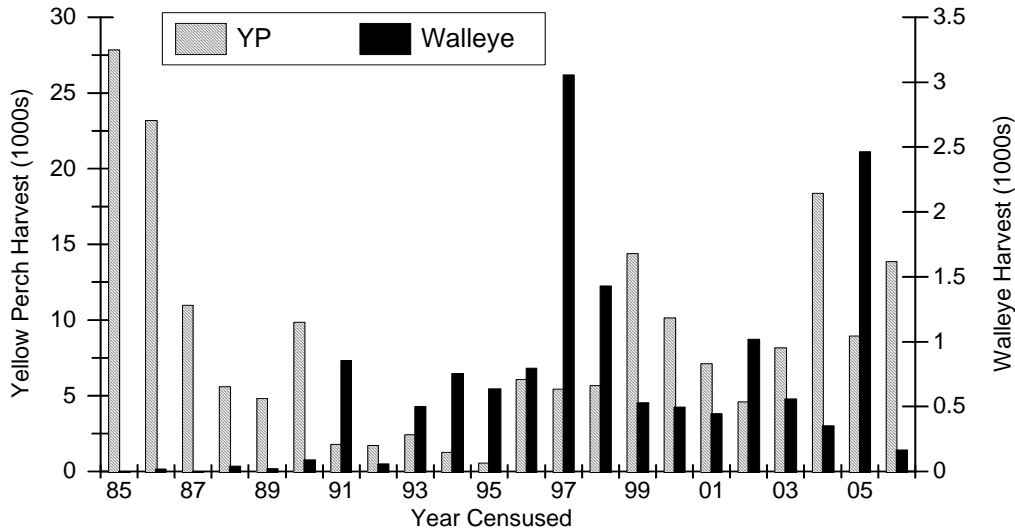


Figure 14. Total yellow perch and walleye harvested by all fishing boats.

timing corresponds with the period when relative mortality of young smallmouth bass increased significantly in the eastern basin of Lake Ontario, presumably in response to predation by double-crested cormorants (Lantry et al. 2002). Intensive efforts to reduce double-crested cormorants in New York waters of the eastern basin of Lake Ontario have been undertaken by DEC since 1999, and numbers of fish consumed have been substantially reduced (McCullough et al. 2006). Although target levels for double-crested cormorant have not yet been reached, catch per unit effort data from the DEC warm water assessment did increase substantially in 2005 and 2006 compared to the previous 5 years (11.33 smallmouth bass per net gang in 2005, 10.45 in 2006, versus an average of 4.21 for 2000-2004; Lantry 2007). In the 2006 fishing boat census, harvest rates at the Henderson site jumped to 0.38 smallmouth bass per angler hour (Table A26), the highest harvest rate observed at this site since 1989, with a harvest ratio of 2.11. This was the highest harvest ratio observed among all the sites compared over the 22 years censused, and completely negated the statistically significant downward trend that was previously observed. Among the other six localized smallmouth bass sites, four continue to show no statistically significant trends in relative harvest rates ($P < 0.05$), with one site averaging below the lake-wide rates (Irondequoit), one essentially equal to the lake-wide rates (Fair Haven), and two averaging above the lake-wide rates (Sodus/Port and Little Salmon), although both of these sites

have recently been below the lake-wide rates. The two remaining localized sites both showed statistically significant trends upon inclusion of the 2005 data, with an upward trend ($P = 0.0422$) in relative harvest rates at the Pultneyville site, and a downward trend ($P = 0.0472$) at the Niagara site (Table A24, Figure A9). Addition of the 2006 census data further reinforced the downward trend at the Niagara site ($P = 0.0224$), but moved the Pultneyville site to a level just outside of the normally accepted significance level ($P = 0.0694$).

Yellow Perch and Walleye:

Yellow perch harvest in 2006 was estimated at 13,858 fish [$\pm 59.7\%$], the fifth highest seasonal harvest among the years censused, a 55.0% increase compared to 2005, and a 46.8% increase compared to the 2001-2005 average harvest (Tables 1 and A27, Figure 14). Catch was estimated at 39,801 yellow perch [$\pm 53.6\%$], the second highest estimated catch among the years censused, and a 52.8% increase compared to the 2001-2005 average catch. Yellow perch are distributed along the entire Lake Ontario shoreline, but harvest and catch were dominated in 2006, and in other recent years, by a relatively small number of fishing boats targeting yellow perch in the east/central area (62.5% of the 2006 harvest). Due to the high catches these boats can achieve, and the low probability of interviewing them, confidence intervals about the harvest and catch estimates of yellow perch are broad. Walleye continued to be a

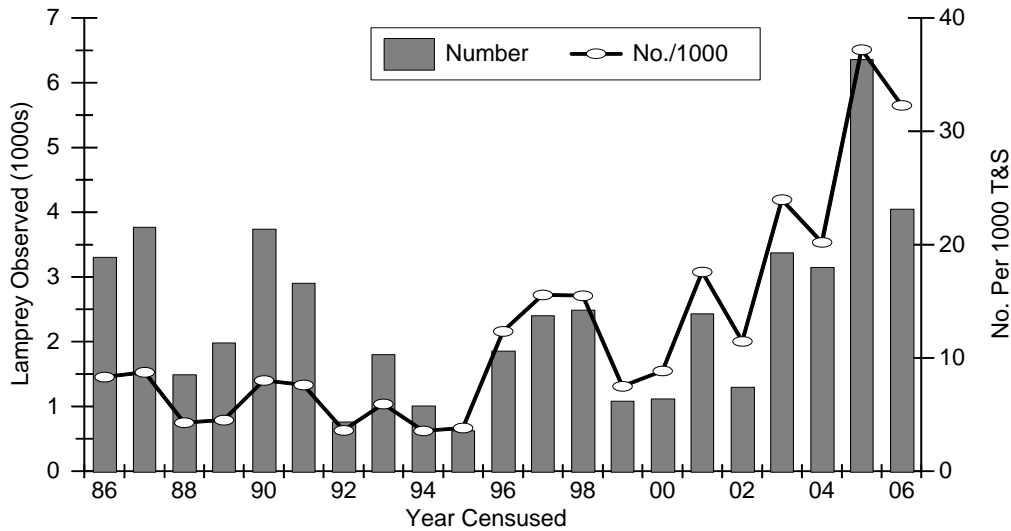


Figure 15. Total lampreys observed, and lampreys observed per 1,000 trout and salmon caught.

minor component of the open lake boat fishery, although angler interest in this species remains high and more active management programs, including fingerling stocking, have been underway in a number of Lake Ontario embayments (Eckert 2006b). Walleye harvest within the area censused decreased dramatically in 2006 to just 164 fish [$\pm 120.7\%$] (Tables 1 and A28, Figure 14), the lowest walleye harvest estimate since 1992, and a 83.1% decrease compared to the 2001-2005 average.

As with yellow perch, the walleye harvest can be strongly influenced by a small number of boats targeting walleye at specific times or locations, resulting in broad confidence intervals around yearly estimates, but the low 2006 estimate does agree with anecdotal angler reports of poor fishing in the eastern basin. Many of the walleyes taken in Lake Ontario are considered to be of trophy size, and the average length of the walleyes sampled in the 2006 census was 27.1 inches.

Fishing effort specifically targeted at yellow perch and walleye (Table A2) generally follow the same trends as their respective harvest estimates (Tables A27 and A28), and changes in fishing effort may be in part responsible for the changes in numbers harvested. However, anecdotal reports from fishermen, unpublished DEC file data, and data collected in the eastern basin of Lake Ontario (Lantry 2007), all suggest that the harvest and effort estimates have generally followed population trends. It should also be mentioned that these same data sources suggest that the populations and fisheries for both walleye and

yellow perch are proportionately higher in the embayments and tributaries adjacent to the open lake fishery, and in Lake Ontario's eastern basin, areas not covered or poorly sampled by the 1985-2006 fishing boat censuses.

Lampreys Observed:

Since 1986, all boat anglers have been specifically asked if they observed lampreys attached to any of the fish they caught. Follow-up questions confirmed that the anglers observed an actual parasitic phase lamprey (as opposed to a lamprey mark), and determined what species of fish the lamprey was attached to. Whenever possible, the lampreys were actually examined and a length measurement taken. Yearly changes in lamprey sightings per 1,000 salmonines caught generally follow the changes in fresh wounding observed on adult lake trout sampled in September (Lantry and Prindle 2006), suggesting that angler sightings are an additional valid index of parasitic lamprey abundance in the open waters of Lake Ontario.

Lampreys observed by boat anglers decreased in 2006 with an estimate of 4,050 [$\pm 41.4\%$] (Figure 15, Table A29), a 36.3% decrease compared to the record high observed in 2005, but a 22.0% increase compared to the 2001-2005 average. When adjusted for numbers of salmonines caught, lamprey sightings in 2006 were estimated at 32.30 per 1,000 trout or salmon caught, the second highest estimate among the years censused (only 2005 was higher), and a 46.2% increase compared to the 2001-2005 average. Chinook salmon was the most frequently observed host fish in 2006 (89 of 119 recorded attacks), due in part to the

number of Chinook salmon caught by anglers. Other host salmonines in 2006 were brown trout (20 attacks), rainbow trout (4 attacks), coho salmon (3 attacks), and lake trout (1 attack). In addition to the expected salmonine hosts, two lampreys were observed on fishing tackle in 2006. These two lampreys were the tenth and eleventh times among the years censused that lampreys have been reported on fishing tackle (in nine of the cases the lampreys were actually caught on the hooks of the lure). Assuming equal numbers of fish caught by anglers, the distribution of lamprey attacks among the salmonines in 2006 was still uneven, with Chinook salmon and brown trout the first and second the most common host species, respectively, while lake trout remained the least common host species (Table A29). Of the 119 lampreys reported observed by the boat anglers interviewed in 2006, only three were available to be examined and measured by the census agents. All three were confirmed to be sea lamprey.

Acknowledgments

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Table A1. Descriptions of the four geographic areas (Roman numerals), and the nine localized smallmouth bass sites (Arabic numerals), used in analysis of the 1985-2006 DEC Lake Ontario fishing boat censuses.

- I. West geographic area: Niagara River to Point Breeze. Access locations include Williams Marina, Niagara State Park launch ramps (Youngstown), Roosevelt Beach, Wilson, Olcott, Green Harbor Marina, Golden Hills State Park, Johnson Creek, and Point Breeze.
 1. Niagara site (NR): Williams Marina, Niagara State Park launch ramps, Wilson.
 2. Point Breeze site (PB): Point Breeze, Eagle Creek Marina.

- II. West/Central geographic area: Eagle Creek Marina, Sandy Creek, Braddocks Bay, Long Pond outlet, Genesee River, Irondequoit Bay.
 3. Irondequoit site (IR): Genesee River, Irondequoit Bay.

- III. East/Central geographic area: Bear Creek, Pultneyville, Hughes Marina, Sodus Bay, East Bay, Port Bay, Blind Sodus Bay, Little Sodus Bay (Fair Haven), Sterling Creek, Wrights Landing at Oswego, Oswego Marina.
 4. Pultneyville site (PV): Bear Creek, Pultneyville, Hughes Marina.
 5. Sodus/Port site (SP): Sodus Bay, East Bay, Port Bay.
 6. Fair Haven site (FH): Blind Sodus Bay, Little Sodus Bay, Sterling Creek.
 7. Oswego site (OS): Wrights Landing at Oswego, Oswego Marina.

- IV. East geographic area: Sunset Bay, Catfish Creek, Dowie Dale Marina, Little Salmon River, Salmon River, Sandy Pond, Lakeview (North and South Sandy), Stony Creek, Association Island Cut.
 8. Little Salmon site (LS): Catfish Creek, Dowie Dale Marina, Little Salmon River, Salmon River.
 9. Henderson site (HN): Stony Creek, Association Island Cut.

Table A2. Summary of statistics on effort and use for the months of April-September in the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Part A: Effort for all fishing boats.											
Seasonal (6-month) estimates of fishing effort for all fishing boats:											
Fishing Boat Trips	162,881	98,105	93,257	98,243	97,068	100,038	86,401	79,958	84,671	85,576	66,906
Boat Angler Trips	452,748	271,622	256,154	264,597	268,672	268,445	230,865	205,897	226,714	229,402	186,109
Boat Angler Hours	2,520,156	1,414,982	1,332,843	1,314,046	1,367,870	1,361,557	1,159,934	1,004,103	1,097,671	1,119,080	946,347
Anglers/Boat Trip	2.78	2.77	2.75	2.69	2.77	2.68	2.67	2.58	2.68	2.68	2.78
Hours/ Boat Trip	5.56	5.21	5.20	4.97	5.09	5.07	5.02	4.88	4.84	4.88	5.08
Monthly estimates of boat trips for all fishing boats:											
April	20,130	6,780	6,522	4,736	6,573	4,700	5,914	3,102	3,753	4,055	5,469
May	26,058	11,664	13,849	12,229	9,834	11,450	10,073	7,244	9,279	13,581	8,558
June	18,185	13,593	10,413	15,710	11,739	14,377	13,993	11,300	8,709	11,670	6,941
July	27,443	19,722	16,625	14,200	23,426	17,516	17,487	15,946	15,613	19,512	15,265
August	40,961	32,920	34,744	28,548	29,865	35,936	26,584	28,411	28,151	20,826	18,602
September	30,104	13,426	11,103	22,820	15,630	16,059	12,349	13,955	19,167	15,932	12,071
Seasonal estimates of boat trips among four geographic areas for all fishing boats:											
West	40,582	18,968	18,402	19,579	20,853	17,663	18,811	15,735	13,271	17,069	12,928
West/Central	25,076	12,703	11,670	13,599	10,526	11,853	12,105	11,247	10,685	11,832	9,659
East/Central	50,061	35,043	33,001	38,103	33,783	41,134	30,510	35,075	31,374	31,325	25,920
East	47,162	31,391	30,184	26,961	31,906	29,388	24,975	17,901	29,341	25,350	18,399
Part B: Seasonal estimates of total boat excursions (traffic).											
Power Boats:											
Fishing Boats	168,964	99,987	94,019	99,784	98,561	101,920	88,325	80,960	85,923	86,845	67,654
Nonfishing Boats	130,953	100,464	107,885	103,828	78,171	94,554	99,951	87,783	76,757	86,726	57,576
Sail Boats	35,285	29,322	36,294	22,313	18,252	23,443	22,097	17,872	14,026	12,918	12,186
Part C: Seasonal estimates of boat angler trips by residence.											
NY Resident	281,977	159,384	154,124	161,238	161,373	163,787	141,443	133,379	137,717	140,428	112,413
Nonresident	170,772	112,238	102,030	103,359	107,299	104,658	89,422	72,518	88,997	88,974	73,696
% NY Resident	61.9%	58.7%	60.2%	60.9%	60.1%	61.0%	61.3%	64.8%	60.7%	61.2%	60.4%
Part D: Effort for boats seeking trout and salmon.											
Seasonal (6-month) estimates of fishing effort for boats seeking trout and salmon:											
Fishing Boat Trips	136,727	66,343	65,934	62,037	64,979	63,710	52,674	47,873	57,872	59,000	49,223
Boat Angler Trips	392,270	196,701	193,690	180,030	193,770	184,803	156,908	134,847	166,854	172,815	146,236
Boat Angler Hours	2,310,412	1,159,383	1,117,353	1,028,516	1,131,654	1,087,434	921,541	762,558	910,543	945,226	822,761
Anglers/Boat Trip	2.88	2.96	2.94	2.90	2.98	2.90	2.98	2.82	2.88	2.93	2.97
Hours/ Boat Trip	5.91	5.89	5.77	5.71	5.84	5.88	5.87	5.65	5.46	5.47	5.63

Table A2 (continued). Summary of effort statistics.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Part D: continued.											
Monthly estimates of boat trips for boats seeking trout and salmon:											
April	19,968	6,780	6,402	4,597	6,389	4,477	5,715	3,102	3,679	3,887	5,435
May	25,053	10,602	12,521	10,596	9,269	10,816	9,548	6,944	8,808	12,945	7,959
June	13,268	7,748	4,887	5,090	5,902	5,998	5,663	5,580	4,783	5,363	2,733
July	18,355	9,831	9,156	6,300	9,655	7,602	6,763	5,865	7,154	10,862	8,259
August	33,955	21,613	26,209	19,189	21,513	24,757	17,415	16,776	19,185	14,090	14,496
September	26,128	9,770	6,760	16,266	12,250	10,061	7,570	9,607	14,262	11,853	10,340
Seasonal estimates of boat trips among four geographic areas for boats seeking trout and salmon:											
West	36,371	13,869	14,208	14,832	16,948	11,949	14,851	11,998	11,357	14,606	10,992
West/Central	20,681	6,227	6,983	6,538	5,800	6,051	4,106	5,115	6,086	7,288	7,118
East/Central	39,580	23,068	21,657	21,554	18,437	23,922	14,708	17,713	18,241	18,068	17,469
East	40,096	23,180	23,086	19,113	23,793	21,788	19,009	13,048	22,188	19,038	13,644
Percent of total seasonal fishing effort by boats seeking trout and salmon:											
Fishing Boat Trips	83.1%	67.6%	70.7%	63.1%	66.9%	63.7%	61.0%	59.9%	68.3%	68.9%	73.6%
Boat Angler Trips	86.0%	72.4%	75.6%	68.0%	72.1%	68.8%	68.0%	65.5%	73.6%	75.3%	78.6%
Boat Angler Hours	91.2%	81.9%	83.8%	78.3%	82.7%	79.9%	79.4%	75.9%	83.0%	84.5%	86.9%
Part E: Boats seeking smallmouth bass during the open season.											
Seasonal (6-month) estimates of fishing effort for boats seeking smallmouth bass during the open season:											
Fishing Boat Trips	20,088	24,980	23,129	30,035	27,857	31,035	27,920	27,754	22,340	22,108	13,586
Boat Angler Trips	46,471	57,983	53,221	70,096	64,974	71,766	60,728	61,856	50,367	47,220	30,938
Boat Angler Hours	161,325	185,960	185,303	237,197	202,124	234,377	194,801	214,630	160,373	146,449	96,062
Anglers/Boat Trip	2.31	2.32	2.30	2.33	2.33	2.31	2.18	2.23	2.25	2.14	2.28
Hours/Boat Trip	3.48	3.21	3.48	3.38	3.11	3.27	3.21	3.47	3.18	3.10	3.10
Monthly estimates of boat trips for boats seeking smallmouth bass during the open season:											
April & May	-	-	-	-	-	-	-	-	-	-	-
June	3,202	3,694	4,699	8,889	4,824	6,379	6,283	3,752	2,312	4,626	2,915
July	7,514	8,394	6,757	7,159	12,437	9,297	9,514	9,125	7,413	7,736	5,881
August	6,034	9,963	7,743	8,264	7,751	10,178	8,224	10,922	8,191	6,115	3,743
September	3,338	2,928	3,930	5,724	2,846	5,182	3,898	3,954	4,423	3,631	1,048
Seasonal estimates of boat trips among four geographic areas for boats seeking smallmouth bass during the open season:											
West	2,466	3,667	2,792	3,244	2,830	4,290	2,413	2,690	1,272	1,623	1,237
West/Central	3,019	5,649	3,765	5,735	3,835	4,995	6,684	4,899	3,710	3,574	1,512
East/Central	8,865	9,320	10,216	14,859	13,867	15,264	13,574	16,114	11,348	11,331	6,912
East	5,737	6,345	6,356	6,197	7,325	6,486	5,249	4,051	6,010	5,580	3,925
Percent of total seasonal fishing effort by boats seeking smallmouth bass during the open season:											
Fishing Boat Trips	13.1%	25.5%	24.8%	30.6%	28.7%	31.0%	32.3%	34.7%	26.4%	25.8%	20.3%
Boat Angler Trips	10.8%	21.3%	20.8%	26.5%	24.2%	26.7%	26.3%	30.0%	22.2%	20.6%	16.6%
Boat Angler Hours	6.8%	13.1%	13.9%	18.1%	14.8%	17.2%	16.8%	21.4%	14.6%	13.1%	10.2%

Table A2 (continued). Summary of effort statistics.

	1985-96 avg	1997	1998	1999	Year Censused 2000	2001	2002	2003	2004	2005	2006
Part F: Other species sought.											
Seasonal estimates of fishing boat trips by species sought for boats not seeking trout and salmon, or smallmouth bass:											
Northern Pike	108	38	48	94	203	83	79	40	53	0	73
Largemouth Bass	46	0	0	0	0	0	0	0	0	0	0
Yellow Perch	1,085	626	586	615	599	497	718	485	955	717	769
Walleye	251	1,865	500	1,150	790	563	506	348	326	570	278
All Other	4,575	4,251	3,059	4,311	2,639	4,151	4,504	3,459	3,125	3,182	2,976
% Northern Pike	0.07%	0.04%	0.05%	0.10%	0.21%	0.08%	0.09%	0.05%	0.06%		0.11%
% Largemouth Bass	0.03%										
% Yellow Perch	0.64%	0.64%	0.63%	0.63%	0.62%	0.50%	0.83%	0.61%	1.13%	0.84%	1.15%
% Walleye	0.20%	1.90%	0.54%	1.17%	0.81%	0.56%	0.59%	0.44%	0.39%	0.67%	0.42%
% All Other	2.86%	4.33%	3.28%	4.39%	2.72%	4.15%	5.21%	4.33%	3.69%	3.72%	4.45%
Part G: Charter fishing boats.											
Seasonal (6-month) estimates of fishing effort for charter boats:											
Fishing Boat Trips	15,944	12,484	10,381	10,787	12,605	11,503	9,742	8,790	9,686	9,402	9,204
Boat Angler Trips	80,750	62,907	52,579	54,406	61,086	56,194	48,657	42,378	48,416	47,976	46,274
Boat Angler Hours	600,265	466,428	391,426	392,588	428,493	409,774	357,920	300,309	324,703	315,095	312,108
Anglers/Boat Trip	5.01	5.04	5.06	5.04	4.85	4.89	4.99	4.82	5.00	5.10	5.03
Hours/Boat Trip	7.41	7.41	7.44	7.22	7.01	7.29	7.36	7.09	6.71	6.57	6.74
Monthly estimates of boat trips for charter boats:											
April	1,314	800	937	713	760	886	597	376	226	304	610
May	2,776	2,716	1,900	1,543	1,685	1,978	1,421	1,555	1,546	1,590	1,572
June	1,813	1,159	1,149	1,126	1,429	1,196	1,237	1,140	711	1,063	531
July	2,436	1,537	1,368	1,284	2,179	1,843	1,556	1,537	1,568	1,457	2,037
August	4,736	4,836	4,357	4,249	4,074	4,613	4,019	2,630	4,086	3,038	2,791
September	2,868	1,437	670	1,872	2,476	988	912	1,552	1,549	1,950	1,664
Seasonal estimates of boat trips among four geographic areas for charter boats:											
West	4,276	3,006	2,917	2,636	3,161	2,630	2,573	2,333	2,181	2,802	1,824
West/Central	1,811	853	1,306	1,241	885	1,024	921	809	1,236	1,088	1,021
East/Central	5,564	4,772	3,862	3,931	5,051	4,819	2,958	3,584	3,579	3,343	4,330
East	4,292	3,852	2,296	2,979	3,508	3,030	3,289	2,065	2,690	2,169	2,030
Percent of total seasonal fishing effort by charter boats:											
Fishing Boat Trips	10.1%	12.7%	11.1%	11.0%	13.0%	11.5%	11.3%	11.0%	11.4%	11.0%	13.8%
Boat Angler Trips	18.2%	23.2%	20.5%	20.6%	22.7%	20.9%	21.1%	20.6%	21.4%	20.9%	24.9%
Boat Angler Hours	24.4%	33.0%	29.4%	29.9%	31.3%	30.1%	30.9%	29.9%	29.6%	28.2%	33.0%

Table A3. Residence information for boat anglers interviewed during the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses. Shown are percent frequencies for the more common states or provinces, and for the more common counties among New York resident anglers.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
State or Province of Residence - Percent Frequency											
Connecticut	2.0	2.7	2.4	2.5	2.4	1.8	1.7	2.0	2.2	1.8	1.8
Florida	0.2	0.4	0.4	0.4	0.3	0.3	0.6	0.4	0.3	0.3	0.3
Maine	0.6	1.1	1.4	0.9	0.7	0.8	1.1	1.2	0.9	1.1	1.5
Maryland	0.3	0.4	0.4	0.2	0.5	0.5	0.2	0.2	0.3	0.2	0.5
Massachusetts	4.2	4.4	3.7	3.3	3.7	4.4	3.8	3.1	3.3	3.2	3.0
Michigan	0.4	0.2	0.2	0.2	0.1	0.4	0.1	0.0	0.2	0.3	0.1
New Hampshire	1.2	1.0	1.2	1.1	1.0	1.1	1.0	1.4	1.0	1.1	1.5
New Jersey	4.3	5.7	5.5	4.6	4.7	4.5	4.5	4.0	4.4	3.3	3.7
New York	61.9	58.7	60.2	60.9	60.1	61.0	61.3	64.8	60.7	61.2	60.4
Ohio	5.0	4.3	3.3	3.9	3.9	3.3	3.1	3.4	2.3	3.2	2.9
Pennsylvania	15.6	17.2	17.7	17.4	18.6	18.3	18.3	16.3	19.8	19.2	19.6
Province of Ontario	0.3	0.1	0.1	0.4	0.0	0.0	0.1	0.0	0.1	0.0	0.0
Province of Quebec	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.2	0.1
Vermont	2.1	1.9	1.6	2.3	2.3	2.1	2.6	1.8	2.6	3.0	2.4
Virginia	0.1	0.3	0.3	0.4	0.2	0.1	0.3	0.1	0.3	0.3	0.2
West Virginia	0.5	0.3	0.3	0.4	0.3	0.1	0.4	0.3	0.3	0.3	0.3
Total of all Listed States & Provinces:	99.1	99.0	98.7	98.9	98.8	98.7	98.9	99.2	99.0	98.7	98.4
County of Residence Among NY Anglers - Percent Frequency											
County Bordering Lake Ontario:											
Cayuga	2.1	2.4	2.6	2.8	2.4	3.0	2.3	3.2	2.6	2.7	3.6
Jefferson	2.5	3.8	3.6	2.3	2.2	2.5	2.4	1.8	1.2	2.3	2.0
Monroe	25.9	22.3	23.5	24.6	21.2	23.2	23.7	22.1	23.2	23.2	19.9
Niagara	9.1	9.2	6.5	9.1	7.3	9.2	8.6	7.9	6.8	8.9	7.9
Orleans	3.9	3.8	3.3	3.3	3.6	3.0	3.1	3.3	4.1	4.2	3.2
Oswego	9.0	13.0	11.6	12.4	14.5	12.3	11.4	13.1	12.0	10.8	13.3
Wayne	9.2	10.3	13.1	11.9	12.5	12.7	14.0	15.6	14.9	11.9	12.2
Border Co. Total	61.7	64.8	64.2	66.3	63.7	66.0	65.6	66.9	64.9	64.0	62.1
Other NY Counties:											
Albany	1.2	1.5	1.4	1.8	1.2	1.7	0.9	1.1	1.4	1.1	1.5
Broome	2.0	2.3	1.9	0.9	1.9	1.5	1.6	1.7	1.8	1.9	2.0
Dutchess	1.0	1.0	0.6	0.9	1.0	0.9	0.6	0.9	1.0	1.3	1.2
Erie	5.4	2.8	2.9	2.2	2.8	3.1	3.1	2.4	2.8	3.5	3.7
Genesee	1.8	1.2	1.3	1.0	0.8	1.2	1.1	1.2	1.2	1.7	1.4
Livingston	0.9	0.5	1.0	0.7	0.8	0.8	0.4	0.7	0.7	0.7	0.7
Oneida	2.3	2.2	2.0	1.9	2.0	1.9	1.3	1.7	1.6	1.0	2.0
Onondaga	5.7	5.2	5.6	6.3	6.4	5.5	6.1	5.6	6.5	5.6	5.3
Ontario	1.5	1.5	2.1	1.4	1.6	1.2	1.5	1.4	1.3	1.7	1.6
Orange	0.7	0.9	0.8	1.4	0.9	0.8	1.0	0.9	1.5	0.8	1.2
Saratoga	1.1	0.9	1.3	1.0	1.0	0.8	0.9	0.7	0.8	0.7	0.7
Total of all Listed Counties:	85.3	84.8	85.2	86.0	84.1	85.4	84.1	85.1	85.4	84.0	83.2

Table A4. Summary of fishing effort, and harvest and catch statistics, among charter and noncharter boats fishing for trout and salmon in the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of fishing effort among charter boats fishing for trout and salmon:											
Fishing Boat Trips	15,657	11,504	10,026	10,471	12,210	11,079	9,264	8,292	9,535	9,151	8,960
Boat Angler Trips	79,388	58,023	50,874	52,872	59,425	54,431	46,648	40,054	47,531	46,675	45,127
Boat Angler Hours	590,493	425,497	378,036	384,976	417,835	400,679	343,360	284,250	319,596	309,254	303,972
Seasonal harvest rates per boat trip among charter boats fishing for trout and salmon:											
Coho Salmon	0.281	0.285	0.535	0.362	0.294	0.226	0.097	0.369	0.140	0.283	0.580
Chinook Salmon	1.488	1.425	1.139	1.169	0.978	1.023	0.807	1.900	2.602	3.759	2.374
Rainbow Trout	0.942	1.041	1.294	1.035	0.456	0.892	0.560	0.586	0.763	0.429	0.796
Atlantic Salmon	0.009	0.001	0.003	0.004	0.000	0.000	0.000	0.002	0.000	0.000	0.000
Brown Trout	1.040	0.932	1.263	1.169	1.482	1.306	0.932	1.573	1.004	1.190	1.144
Lake Trout	1.420	0.705	0.795	0.909	0.372	0.725	1.399	0.382	0.347	0.319	0.310
Seasonal catch rates per boat trip among charter boats fishing for trout and salmon:											
Coho Salmon	0.301	0.300	0.599	0.407	0.331	0.249	0.102	0.393	0.152	0.371	0.670
Chinook Salmon	1.760	1.746	1.354	1.423	1.263	1.478	0.949	2.959	3.695	4.568	2.614
Rainbow Trout	1.054	1.254	1.459	1.247	0.520	1.004	0.589	0.687	0.953	0.543	1.023
Atlantic Salmon	0.034	0.001	0.004	0.021	0.019	0.012	0.000	0.005	0.000	0.003	0.007
Brown Trout	1.210	1.069	1.350	1.652	2.058	1.459	1.325	2.210	1.309	1.497	1.508
Lake Trout	2.212	1.729	2.161	1.822	0.762	1.487	2.367	0.655	0.515	0.396	0.458
Trout and salmon seasonal harvest and catch rates among charter boats fishing for trout and salmon:											
Harvest/Boat Trip	5.180	4.389	5.028	4.661	3.583	4.172	3.796	4.813	4.857	5.980	5.204
Catch/Boat Trip	6.571	6.099	6.927	6.584	4.953	5.689	5.333	6.910	6.626	7.380	6.280
Harvest/Angler Trip	1.041	0.870	0.991	0.923	0.736	0.849	0.754	0.996	0.974	1.172	1.033
Catch/Angler Trip	1.315	1.209	1.365	1.304	1.018	1.158	1.059	1.430	1.329	1.447	1.247
Harvest/Angler Hr.	0.141	0.119	0.133	0.127	0.105	0.115	0.102	0.140	0.145	0.177	0.153
Catch/Angler Hr.	0.178	0.165	0.184	0.179	0.145	0.157	0.144	0.202	0.198	0.218	0.185
Percent of salmonids caught that were harvested among charter boats fishing for trout and salmon:											
Coho Salmon	93.0%	94.9%	89.4%	89.0%	88.8%	90.6%	94.9%	93.9%	91.7%	76.3%	86.7%
Chinook Salmon	84.9%	81.6%	84.1%	82.1%	77.4%	69.2%	85.0%	64.2%	70.4%	82.3%	90.8%
Rainbow Trout	89.6%	83.0%	88.7%	83.0%	87.8%	88.9%	95.0%	85.3%	80.0%	79.0%	77.8%
Atlantic Salmon	25.1%	100.0%	67.4%	18.3%	0.0%	0.0%	-	47.4%	-	0.0%	0.0%
Brown Trout	85.7%	87.1%	93.5%	70.8%	72.0%	89.5%	70.4%	71.2%	76.7%	79.5%	75.9%
Lake Trout	62.7%	40.8%	36.8%	49.9%	48.9%	48.8%	59.1%	58.3%	67.3%	80.4%	67.7%
Total	79.0%	72.0%	72.6%	70.8%	72.3%	73.3%	71.2%	69.7%	73.3%	81.0%	82.9%
Percent of total salmonids taken within the area censused accounted for by charter boats fishing for trout and salmon:											
% Harvested	40.8%	52.0%	46.8%	52.5%	56.4%	55.5%	58.9%	55.5%	53.0%	50.1%	59.7%
% Caught	34.2%	45.4%	43.3%	47.9%	47.9%	45.7%	43.7%	40.8%	40.5%	39.5%	44.9%

Table A4 (continued). Summary of fishing effort, and harvest and catch statistics, among charter and noncharter boats.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of fishing effort among noncharter boats fishing for trout and salmon:											
Fishing Boat Trips	121,070	54,839	55,909	51,567	52,769	52,631	43,410	39,582	48,337	49,849	40,263
Boat Angler Trips	312,881	138,679	142,816	127,158	134,345	130,372	110,261	94,792	119,324	126,140	101,109
Boat Angler Hours	1,719,918	733,886	739,317	643,540	713,819	686,755	578,181	478,309	590,947	635,972	518,789
Seasonal harvest rates per boat trip among noncharter boats fishing for trout and salmon:											
Coho Salmon	0.068	0.069	0.110	0.082	0.074	0.080	0.022	0.051	0.043	0.061	0.091
Chinook Salmon	0.349	0.308	0.300	0.341	0.255	0.262	0.249	0.397	0.551	0.692	0.451
Rainbow Trout	0.153	0.176	0.274	0.185	0.080	0.116	0.039	0.085	0.087	0.072	0.090
Atlantic Salmon	0.004	0.002	0.001	0.002	0.000	0.001	0.003	0.000	0.000	0.000	0.000
Brown Trout	0.240	0.197	0.267	0.186	0.175	0.205	0.185	0.223	0.145	0.239	0.132
Lake Trout	0.215	0.050	0.070	0.054	0.053	0.035	0.061	0.039	0.020	0.025	0.005
Seasonal catch rates per boat trip among noncharter boats fishing for trout and salmon:											
Coho Salmon	0.096	0.087	0.150	0.120	0.102	0.112	0.065	0.089	0.074	0.113	0.147
Chinook Salmon	0.496	0.470	0.402	0.490	0.407	0.442	0.439	0.947	1.175	1.220	0.898
Rainbow Trout	0.249	0.249	0.419	0.313	0.176	0.223	0.070	0.204	0.229	0.171	0.220
Atlantic Salmon	0.012	0.005	0.005	0.005	0.004	0.004	0.006	0.002	0.001	0.002	0.002
Brown Trout	0.354	0.305	0.408	0.311	0.345	0.390	0.313	0.549	0.293	0.441	0.311
Lake Trout	0.544	0.309	0.234	0.200	0.202	0.242	0.552	0.278	0.136	0.118	0.113
Trout and salmon seasonal harvest and catch rates among noncharter boats fishing for trout and salmon:											
Harvest/Boat Trip	1.028	0.802	1.022	0.850	0.637	0.699	0.559	0.795	0.846	1.091	0.768
Catch/Boat Trip	1.755	1.427	1.623	1.441	1.238	1.417	1.446	2.081	1.909	2.066	1.692
Harvest/Angler Trip	0.400	0.317	0.400	0.345	0.250	0.282	0.220	0.332	0.343	0.431	0.306
Catch/Angler Trip	0.681	0.564	0.635	0.585	0.486	0.572	0.569	0.869	0.773	0.817	0.674
Harvest/Angler Hr.	0.073	0.060	0.077	0.068	0.047	0.054	0.042	0.066	0.069	0.085	0.060
Catch/Angler Hr.	0.124	0.107	0.123	0.116	0.092	0.109	0.109	0.172	0.156	0.162	0.131
Percent of salmonids caught that were harvested among noncharter boats fishing for trout and salmon:											
Coho Salmon	71.1%	78.7%	73.4%	68.5%	71.9%	71.6%	34.6%	57.3%	58.7%	54.4%	61.6%
Chinook Salmon	71.1%	65.5%	74.8%	69.5%	62.8%	59.2%	56.7%	41.9%	46.9%	56.8%	50.2%
Rainbow Trout	62.4%	70.5%	65.3%	58.9%	45.7%	52.0%	55.5%	41.6%	37.9%	42.3%	40.8%
Atlantic Salmon	31.1%	35.7%	14.3%	42.0%	12.6%	32.4%	52.7%	0.0%	38.0%	12.9%	0.0%
Brown Trout	68.0%	64.8%	65.5%	59.9%	50.6%	52.5%	59.1%	40.7%	49.4%	54.1%	42.3%
Lake Trout	36.3%	16.1%	29.7%	26.8%	26.0%	14.4%	11.0%	14.0%	14.4%	21.4%	4.1%
Total	58.7%	56.2%	63.0%	58.9%	51.4%	49.3%	38.7%	38.2%	44.3%	52.8%	45.4%
Percent of total salmonids taken within the area censused accounted for by noncharter boats fishing for trout and salmon:											
% Harvested	58.7%	45.2%	53.1%	47.1%	43.3%	44.2%	40.7%	43.8%	46.8%	49.8%	39.6%
% Caught	65.3%	50.7%	56.5%	51.6%	51.8%	54.0%	55.6%	58.6%	59.2%	60.3%	54.3%

Table A5. Estimated numbers of fish other than coho salmon, Chinook salmon, rainbow trout, Atlantic salmon, brown trout, lake trout, smallmouth bass, yellow perch, walleye, or sea or silver lamprey, that were harvested and caught in the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6 month) estimates of fish harvested:											
Unidentified Fish	4						16			33	
Bowfin							15				
American Eel	12										
Alewife	44		57	24		42				31	
Gizzard Shad	6										
Cisco	48										
Pink Salmon	4								16		
Unidentified Salmonine	9	23		144							
Northern Pike	121	121	49	63			36		22		135
Common carp	8										
Yellow Bullhead	2										
Brown Bullhead	150		28	15		336			70		45
Channel Catfish	74	171	14	161	40			121			
Threespine Stickleback							24				
White Perch	3,033					53		149			
White Bass	534	40	176								
Rock Bass	4,721	886	650	1,825	884	1,156	564	1,119	644	133	473
Pumpkinseed	656	413	266	380	77	143	57	318	192	228	658
Bluegill	141	120	46		57	27		82			562
Largemouth Bass	141		31		116			49			269
Black Crappie	53										1,301
Freshwater Drum	604	398	607	410	206	475	91	347	194	158	76
Round Goby						705	876	4,415	2,865	10,996	16,807
Seasonal (6 month) estimates of fish caught:											
Unidentified Fish	45			32			39	81		48	
Lake Sturgeon						44					
Longnose Gar										43	
Bowfin	25	36			30		32	25			45
American Eel	135	156									
Alewife	550	254	401	50	65	263	1,076	52		31	32
Gizzard Shad	20										
Cisco	64										
Pink salmon	4								16		
Unidentified Salmonine	387	148	274	199	157	198	90	544	20	32	251
Rainbow Smelt	18										
Northern Pike	449	261	473	158	361	26	183	79	214	44	206
Muskellunge	3		22					19			
Common Carp	100	260		88	197	99	72	140		106	15
White Sucker	42					72	43				29
Unidentified Redhorse	6	176									
Yellow Bullhead	2										
Brown Bullhead	222		72	15	60	336	110		70		45
Channel Catfish	149	828	95	218	61	73	50	121			
Threespine Stickleback					20		47				
White perch	7,785	1,502	44	312	53	148	854	207			
White Bass	2,353	40	203			29	367	19	16	31	111
Rock Bass	21,800	8,159	7,363	8,173	9,733	7,950	6,912	5,849	3,610	3,381	2,731
Pumpkinseed	1,943	2,336	1,119	2,028	539	403	941	1,094	1,040	461	1,994
Bluegill	377	120	46	54	651	227		82		429	1,198
Largemouth Bass	734	49	70	245	305	211	459	217	311	82	1,306
Black Crappie	120			28	52	49				21	1,390
Freshwater Drum	10,088	8,335	7,109	6,985	5,548	5,878	5,241	4,379	3,072	1,914	1,255
Round Goby						965	2,484	4,928	10,201	20,371	34,336

Table A6. Coho salmon harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	13,276	7,043	11,525	8,125	7,466	6,714	1,870	5,079	3,430	5,653	9,370
Catch	17,385	8,260	14,400	10,554	9,434	8,640	3,835	6,801	5,028	9,028	12,448
% Harvested	77.6	85.3	80.0	77.0	79.1	77.7	48.8	74.7	68.2	62.6	75.3
Monthly estimates of harvest for all fishing boats:											
April	4,882	1,299	2,950	842	666	759	386	419	182	839	1,749
May	2,484	1,748	2,048	1,645	1,831	652	634	1,002	493	1,820	4,759
June	693	768	747	81	310	120	49	521	50	357	178
July	503	253	242	373	537	579	40	238	135	36	214
August	2,277	2,229	5,229	2,983	3,774	3,775	541	1,313	2,114	439	1,644
September	2,437	746	309	2,201	347	830	221	1,586	456	2,163	824
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	5,891	2,305	4,448	2,670	3,504	1,902	839	2,275	1,085	1,976	3,156
West/Central	2,792	623	1,331	739	167	259	68	424	75	562	691
East/Central	2,975	3,162	3,187	3,529	2,783	1,845	500	1,626	794	1,111	3,904
East	1,617	954	2,559	1,187	1,013	2,708	462	754	1,476	2,004	1,619
Percent of seasonal harvest and catch made by boats seeking any or all species of trout and salmon:											
% Harvest	99.4	100.0	100.0	98.9	100.0	100.0	100.0	100.0	100.0	100.0	94.5
% Catch	99.4	99.8	100.0	99.2	100.0	100.0	97.8	99.7	100.0	100.0	95.9
Seasonal rates of harvest and catch for boats seeking any or all species of trout and salmon:											
Harv/Boat Trip	0.094	0.106	0.175	0.130	0.115	0.105	0.036	0.106	0.059	0.096	0.180
Catch/Boat Trip	0.122	0.124	0.218	0.169	0.145	0.136	0.071	0.142	0.087	0.153	0.242
Harv/Angler Trip	0.033	0.036	0.060	0.045	0.039	0.036	0.012	0.038	0.021	0.033	0.061
Catch/Angler Trip	0.043	0.042	0.074	0.058	0.049	0.047	0.024	0.050	0.030	0.052	0.082
Harv/Angler Hour	0.006	0.006	0.010	0.008	0.007	0.006	0.002	0.007	0.004	0.006	0.011
Catch/Angler Hour	0.007	0.007	0.013	0.010	0.008	0.008	0.004	0.009	0.006	0.010	0.015
Monthly harvest rates per boat trip for boats seeking any or all species of trout and salmon:											
April	0.303	0.192	0.461	0.178	0.104	0.170	0.068	0.135	0.049	0.216	0.322
May	0.097	0.165	0.164	0.155	0.198	0.060	0.066	0.144	0.056	0.141	0.533
June	0.050	0.099	0.153	0.016	0.053	0.020	0.009	0.093	0.010	0.067	0.065
July	0.028	0.026	0.026	0.059	0.056	0.076	0.006	0.041	0.019	0.003	0.026
August	0.066	0.103	0.200	0.152	0.175	0.152	0.031	0.078	0.110	0.031	0.113
September	0.087	0.076	0.046	0.135	0.028	0.082	0.029	0.165	0.032	0.182	0.080
Seasonal harvest rates per boat trip among four geographic areas for boats seeking any or all species of trout and salmon:											
West	0.155	0.166	0.313	0.178	0.207	0.159	0.056	0.190	0.096	0.135	0.289
West/Central	0.129	0.100	0.191	0.113	0.029	0.043	0.017	0.083	0.012	0.077	0.098
East/Central	0.076	0.137	0.147	0.164	0.151	0.077	0.034	0.092	0.044	0.061	0.192
East	0.039	0.041	0.111	0.059	0.043	0.124	0.024	0.058	0.067	0.105	0.120

Table A7. Summary of total length (inches), weight (lbs), and age statistics for coho salmon sampled during the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mean length and weight data for coho salmon sampled April - September:											
Mean Length (in)	23.2	23.8	24.7	26.5	25.1	24.3	24.2	23.5	24.3	24.7	24.4
Mean Weight (lbs)	-	6.21	6.96	9.17	7.73	6.85	6.63	6.28	6.93	6.82	6.23
Estimated weight (lbs) for standard length coho salmon sampled April - September:											
Standard Length											
18.0 inches	-	1.96	1.90	2.25	2.12	2.16	1.99	2.19	1.97	1.74	1.90
20.0 inches	-	2.90	2.81	3.21	3.08	3.12	2.92	3.18	2.91	2.63	2.80
22.0 inches	-	4.11	4.00	4.42	4.32	4.35	4.12	4.45	4.15	3.82	3.99
24.0 inches	-	5.67	5.53	5.93	5.87	5.89	5.65	6.04	5.73	5.36	5.50
26.0 inches	-	7.61	7.43	7.77	7.78	7.79	7.55	8.01	7.71	7.33	7.40
28.0 inches	-	9.94	9.73	9.93	10.06	10.03	9.83	10.34	10.09	9.74	9.68
30.0 inches	-	12.87	12.62	12.58	12.90	12.81	12.68	13.25	13.10	12.83	12.55
Percent length composition of coho salmon sampled April - September:											
<15.0 in	0.7%	1.1%	0.0%	0.9%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15.0-15.9 in	1.0%	0.0%	0.0%	0.9%	2.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%
16.0-16.9 in	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	0.0%	0.0%
17.0-17.9 in	2.7%	2.8%	1.9%	0.9%	0.0%	2.9%	2.9%	2.8%	2.9%	0.0%	0.0%
18.0-18.9 in	4.3%	3.4%	1.9%	0.9%	1.0%	5.8%	0.0%	11.1%	8.6%	0.9%	0.0%
19.0-19.9 in	9.0%	3.9%	2.4%	0.0%	2.0%	6.7%	8.6%	9.7%	2.9%	6.5%	1.0%
20.0-20.9 in	13.2%	10.1%	10.5%	0.9%	7.9%	4.8%	2.9%	6.9%	11.4%	14.0%	5.1%
21.0-21.9 in	13.7%	10.6%	13.4%	2.8%	8.9%	9.6%	28.6%	5.6%	2.9%	12.1%	8.9%
22.0-22.9 in	9.8%	16.2%	15.3%	8.5%	10.9%	8.7%	8.6%	6.9%	4.3%	11.2%	17.1%
23.0-23.9 in	7.3%	11.2%	10.0%	10.4%	8.9%	10.6%	8.6%	8.3%	2.9%	7.5%	18.1%
24.0-24.9 in	4.5%	5.6%	5.7%	15.1%	14.9%	3.8%	8.6%	9.7%	7.1%	5.6%	16.2%
25.0-25.9 in	5.0%	6.1%	3.3%	9.4%	5.9%	9.6%	2.9%	9.7%	8.6%	1.9%	9.5%
26.0-26.9 in	6.7%	4.5%	2.9%	3.8%	4.0%	3.8%	2.9%	9.7%	11.4%	0.0%	4.8%
27.0-27.9 in	6.3%	5.6%	3.8%	5.7%	5.0%	15.4%	0.0%	9.7%	15.7%	9.3%	6.0%
28.0-28.9 in	6.9%	6.1%	7.7%	5.7%	8.9%	4.8%	5.7%	5.6%	4.3%	13.1%	5.7%
29.0-29.9 in	4.6%	7.8%	6.7%	4.7%	4.0%	7.7%	5.7%	1.4%	8.6%	9.3%	5.4%
30.0-30.9 in	2.6%	3.9%	7.2%	11.3%	7.9%	2.9%	8.6%	0.0%	1.4%	5.6%	1.0%
31.0-31.9 in	0.7%	1.1%	4.8%	11.3%	3.0%	1.0%	2.9%	1.4%	0.0%	2.8%	1.3%
32.0-32.9 in	0.2%	0.0%	2.4%	6.6%	4.0%	0.0%	2.9%	0.0%	1.4%	0.0%	0.0%
>32.9 in	0.2%	0.0%	0.0%	0.0%	1.0%	1.0%	0.0%	1.4%	1.4%	0.0%	0.0%
Percent age composition of coho salmon sampled April -September:											
Age-1	1.9%	3.4%	2.4%	11.3%	9.9%	21.2%	8.6%	0.0%	7.1%	0.9%	2.2%
Age-2	97.3%	96.6%	97.1%	88.7%	89.1%	76.9%	91.4%	98.6%	88.6%	98.1%	97.8%
Age-3	0.8%	0.0%	0.5%	0.0%	1.0%	1.9%	0.0%	1.4%	4.3%	0.9%	0.0%
Length data (inches) for age 2 coho salmon sampled April - September:											
April Mean	20.2	20.8	21.5	23.2	21.4	19.9	21.5	20.7	19.0	20.6	21.3
September Mean	28.0	28.0	29.0	30.2	26.5	28.1	30.7	26.2	26.8	28.6	28.6
Avg Monthly Gain	1.66	1.64	1.81	1.53	1.24	1.91	1.87	1.33	1.75	1.67	1.60

Table A8. Chinook salmon harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	68,320	33,537	28,245	29,812	25,478	25,097	18,307	31,525	51,443	68,957	39,439
Catch	91,360	46,157	36,058	40,181	36,928	39,617	27,932	62,094	92,042	102,792	59,606
% Harvested	75.5	72.7	78.3	74.2	69.0	63.3	65.5	50.8	55.9	67.1	66.2
Monthly estimates of harvest for all fishing boats:											
April	3,188	44	79	50	300	128	403	1,224	176	80	381
May	10,090	2,126	698	800	1,354	4,281	2,630	3,629	8,471	14,209	4,513
June	3,276	673	2,189	195	983	847	151	820	1,314	1,747	586
July	8,267	4,667	3,736	2,364	4,980	4,336	1,215	4,116	9,540	11,931	8,241
August	25,433	21,483	19,685	14,990	13,314	12,400	10,653	12,752	21,472	22,685	18,228
September	18,065	4,543	1,859	11,412	4,547	3,106	3,255	8,984	10,470	18,304	7,489
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	30,908	8,356	7,977	9,764	10,119	6,800	7,269	13,465	16,621	24,903	13,737
West/Central	8,680	1,940	1,177	1,146	924	1,029	570	1,938	3,185	5,544	3,663
East/Central	13,593	12,102	7,587	12,179	6,246	8,995	2,282	7,567	14,471	16,080	15,369
East	15,140	11,139	11,504	6,723	8,190	8,273	8,185	8,555	17,165	22,430	6,670
Percent of seasonal harvest and catch made by boats seeking any or all species of trout and salmon:											
% Harvest	99.8	99.3	99.9	100.0	99.8	100.0	99.9	99.8	100.0	99.9	100.0
% Catch	99.8	99.4	99.9	100.0	99.8	100.0	99.7	99.9	100.0	99.8	99.9
Seasonal rates of harvest and catch for boats seeking any or all species of trout and salmon:											
Harv/Boat Trip	0.485	0.502	0.428	0.481	0.391	0.394	0.347	0.657	0.889	1.168	0.801
Catch/Boat Trip	0.647	0.691	0.546	0.648	0.567	0.622	0.529	1.296	1.590	1.739	1.210
Harv/Angler Trip	0.168	0.169	0.146	0.166	0.131	0.136	0.117	0.233	0.308	0.399	0.270
Catch/Angler Trip	0.225	0.233	0.186	0.223	0.190	0.214	0.177	0.460	0.552	0.594	0.407
Harv/Angler Hour	0.029	0.029	0.025	0.029	0.022	0.023	0.020	0.041	0.056	0.073	0.048
Catch/Angler Hour	0.038	0.040	0.032	0.039	0.033	0.036	0.030	0.081	0.101	0.109	0.072
Monthly harvest rates per boat trip for boats seeking any or all species of trout and salmon:											
April	0.125	0.006	0.012	0.011	0.047	0.029	0.071	0.395	0.048	0.021	0.070
May	0.373	0.191	0.056	0.076	0.146	0.396	0.275	0.523	0.959	1.098	0.567
June	0.225	0.087	0.448	0.038	0.162	0.141	0.027	0.147	0.275	0.326	0.214
July	0.418	0.475	0.408	0.375	0.516	0.570	0.180	0.702	1.334	1.095	0.998
August	0.740	0.991	0.750	0.781	0.617	0.501	0.612	0.759	1.119	1.610	1.257
September	0.667	0.457	0.275	0.702	0.371	0.309	0.428	0.932	0.734	1.544	0.724
Seasonal harvest rates per boat trip among four geographic areas for boats seeking any or all species of trout and salmon:											
West	0.798	0.602	0.561	0.658	0.597	0.569	0.489	1.122	1.464	1.705	1.250
West/Central	0.388	0.311	0.169	0.175	0.159	0.170	0.139	0.379	0.523	0.761	0.515
East/Central	0.340	0.518	0.349	0.565	0.335	0.376	0.154	0.425	0.792	0.890	0.880
East	0.378	0.477	0.498	0.352	0.344	0.380	0.431	0.654	0.774	1.176	0.489

Table A9. Summary of total length (inches), weight (lbs), and age statistics for Chinook salmon sampled during the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mean length and weight data for chinook salmon sampled April -September:											
Mean Length (in)	31.9	30.2	33.7	33.6	32.5	30.9	31.8	32.1	30.3	32.4	32.5
Mean Weight (lbs)	-	13.15	18.55	18.94	17.18	13.71	15.21	14.65	12.79	15.26	15.39
Estimated weight (lbs) for standard length chinook salmon sampled July & August:											
Standard Length:											
16.0 inches	-	1.34	1.43	1.50	1.57	1.56	1.42	1.49	1.41	1.37	1.42
20.0 inches	-	2.85	2.99	3.08	3.19	3.13	2.95	3.02	2.93	2.85	2.90
24.0 inches	-	5.31	5.48	5.59	5.75	5.55	5.40	5.42	5.34	5.22	5.24
28.0 inches	-	8.93	9.11	9.20	9.40	8.98	8.95	8.83	8.83	8.66	8.59
32.0 inches	-	14.08	14.21	14.22	14.44	13.67	13.92	13.55	13.71	13.48	13.25
36.0 inches	-	21.03	21.02	20.88	21.10	19.81	20.55	19.77	20.21	19.93	19.40
40.0 inches	-	30.00	29.74	29.35	29.52	27.51	29.02	27.61	28.49	28.17	27.21
Percent length composition of chinook salmon sampled April - September:											
<16.0 in	2.0%	0.2%	0.8%	0.2%	0.8%	0.5%	0.0%	0.0%	0.7%	0.4%	0.1%
16.0-17.9 in	3.3%	2.7%	2.5%	2.0%	1.9%	4.1%	3.1%	2.1%	1.8%	1.3%	0.6%
18.0-19.9 in	3.7%	4.1%	1.9%	5.5%	3.2%	3.9%	2.7%	1.2%	2.7%	2.1%	3.8%
20.0-21.9 in	3.3%	4.6%	2.1%	3.7%	4.0%	4.4%	3.4%	1.6%	3.4%	0.6%	3.7%
22.0-23.9 in	3.8%	2.2%	1.7%	4.0%	4.3%	3.7%	2.1%	3.3%	3.9%	2.2%	3.7%
24.0-25.9 in	4.8%	5.9%	2.5%	3.2%	3.5%	2.5%	5.5%	4.2%	6.1%	4.5%	4.3%
26.0-27.9 in	5.9%	11.4%	3.4%	3.2%	4.3%	6.7%	8.2%	7.0%	10.8%	6.7%	5.8%
28.0-29.9 in	6.5%	12.3%	6.2%	4.0%	6.1%	10.8%	5.5%	9.1%	14.0%	6.2%	6.6%
30.0-31.9 in	6.5%	15.7%	6.0%	5.0%	9.6%	11.7%	7.2%	11.4%	15.8%	10.7%	8.1%
32.0-33.9 in	8.7%	16.1%	10.6%	7.0%	11.0%	16.7%	20.9%	14.4%	13.3%	17.6%	10.4%
34.0-35.9 in	13.7%	9.5%	15.8%	10.2%	13.6%	13.3%	13.4%	22.6%	12.0%	22.0%	17.1%
36.0-37.9 in	18.9%	7.6%	24.0%	16.2%	16.0%	11.9%	16.1%	17.4%	11.2%	19.4%	21.4%
38.0-39.9 in	13.1%	4.7%	17.2%	24.1%	16.0%	6.9%	7.9%	5.1%	4.1%	5.5%	10.9%
40.0-41.9 in	5.0%	2.7%	5.1%	10.0%	5.3%	2.8%	2.7%	0.5%	0.3%	0.8%	3.5%
42.0-43.9 in	0.6%	0.3%	0.2%	1.7%	0.3%	0.2%	1.4%	0.2%	0.0%	0.0%	0.0%
>43.9 in	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Percent age composition of chinook salmon sampled April - September:											
Age-0	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Age-1	12.9%	12.7%	8.3%	14.8%	14.7%	13.6%	9.8%	7.0%	6.7%	3.5%	9.0%
Age-2	30.5%	67.5%	30.5%	25.0%	35.6%	49.5%	47.6%	36.5%	57.1%	31.6%	28.9%
Age-3	26.5%	15.7%	59.6%	57.0%	49.7%	36.0%	41.3%	56.3%	35.4%	64.1%	57.9%
Age-4	3.4%	4.1%	1.6%	3.2%	0.0%	0.8%	1.2%	0.2%	0.7%	0.7%	4.2%
Age-3&4 combined	56.6%	19.8%	61.2%	60.2%	49.7%	36.7%	42.5%	56.5%	36.1%	64.9%	62.1%

Table A10. Mean length at age data (total length in inches) for Chinook salmon sampled during the months of July-September in the 1991-2006 DEC Lake Ontario fishing boat censuses.

Age	Year Sampled	July		August		September	
		Mean Length	(n)	Mean Length	(n)	Mean Length	(n)
Age-1	1991	18.74	(8)	19.23	(22)	22.52	(9)
	1992	18.93	(38)	20.49	(53)	22.04	(35)
	1993	18.44	(9)	18.14	(61)	19.37	(33)
	1994	16.40	(1)	17.79	(9)	18.59	(12)
	1995	18.62	(6)	20.53	(4)	-	(0)
	1996	18.58	(15)	19.66	(74)	21.85	(24)
	1997	19.06	(9)	19.18	(45)	20.43	(23)
	1998	20.12	(10)	19.63	(22)	21.13	(3)
	1999	20.58	(19)	20.08	(26)	23.69	(12)
	2000	20.53	(24)	20.56	(17)	23.20	(10)
	2001	18.75	(25)	19.33	(22)	21.65	(10)
	2002	17.86	(10)	19.94	(9)	21.75	(6)
	2003	18.83	(3)	17.48	(10)	21.20	(6)
	2004	18.00	(6)	18.00	(36)	19.84	(23)
	2005	18.12	(25)	18.98	(14)	19.93	(3)
	2006	19.61	(37)	20.97	(38)	23.57	(9)
'91-'06 avg		19.14	(245)	19.41	(462)	21.16	(218)
Age-2	1991	27.40	(30)	28.96	(75)	31.58	(24)
	1992	28.69	(32)	30.00	(122)	32.42	(47)
	1993	29.57	(22)	30.98	(121)	31.61	(43)
	1994	27.27	(60)	28.77	(80)	28.85	(100)
	1995	28.14	(42)	28.74	(49)	31.94	(7)
	1996	31.90	(2)	29.50	(27)	30.52	(12)
	1997	29.95	(61)	30.45	(239)	32.14	(52)
	1998	30.93	(32)	31.68	(77)	33.87	(15)
	1999	29.68	(12)	31.17	(38)	32.95	(41)
	2000	30.28	(28)	32.17	(49)	33.82	(17)
	2001	30.14	(61)	31.86	(67)	32.34	(32)
	2002	30.35	(6)	31.52	(55)	32.54	(36)
	2003	28.64	(56)	29.98	(35)	31.93	(26)
	2004	28.26	(126)	29.48	(203)	30.71	(106)
	2005	28.18	(102)	29.60	(118)	31.65	(78)
	2006	29.15	(75)	29.96	(106)	30.93	(30)
'91-'06 avg		28.83	(747)	30.21	(1461)	31.40	(666)

Table A10 (continued). Mean length at age data (total length in inches) for Chinook salmon.

Age	Year Sampled	July		August		September	
		Mean Length	(n)	Mean Length	(n)	Mean Length	(n)
Age-3	1991	36.81	(44)	37.47	(105)	38.15	(148)
	1992	36.12	(40)	37.24	(124)	37.74	(129)
	1993	37.09	(20)	37.42	(211)	36.90	(110)
	1994	35.86	(91)	36.30	(204)	36.24	(107)
	1995	35.97	(74)	36.34	(134)	36.96	(113)
	1996	36.39	(9)	37.15	(98)	37.89	(76)
	1997	35.21	(7)	36.87	(58)	37.72	(18)
	1998	36.92	(41)	37.33	(194)	37.35	(31)
	1999	36.67	(15)	38.35	(111)	38.29	(85)
	2000	36.20	(23)	37.49	(108)	37.96	(37)
	2001	36.23	(42)	37.26	(51)	37.77	(20)
	2002	38.70	(1)	37.21	(51)	37.17	(42)
	2003	35.14	(28)	35.57	(64)	35.71	(112)
	2004	34.78	(52)	36.12	(160)	35.88	(69)
	2005	34.65	(111)	35.90	(278)	35.86	(172)
2006	35.77	(107)	36.93	(231)	36.71	(121)	
'91-'06 avg		35.78	(705)	36.85	(2182)	36.98	(1390)
Age-4	1991	39.42	(6)	39.87	(21)	39.77	(10)
	1992	40.78	(4)	39.74	(9)	39.25	(12)
	1993	37.37	(3)	38.27	(22)	39.06	(7)
	1994	38.40	(5)	38.55	(15)	39.05	(4)
	1995	38.57	(9)	37.83	(15)	37.78	(5)
	1996	37.50	(2)	39.14	(29)	40.37	(23)
	1997	-	(0)	39.52	(18)	39.68	(4)
	1998	-	(0)	37.97	(6)	-	(0)
	1999	-	(0)	39.73	(6)	39.30	(5)
	2000	-	(0)	-	(0)	-	(0)
	2001	37.20	(2)	-	(0)	41.40	(1)
	2002	-	(0)	36.75	(2)	42.10	(1)
	2003	-	(0)	-	(0)	37.00	(1)
	2004	36.10	(1)	37.36	(5)	37.80	(1)
	2005	35.80	(2)	38.63	(4)	36.00	(2)
2006	37.54	(7)	38.68	(21)	37.10	(2)	
'91-'06 avg		38.31	(41)	38.86	(173)	39.43	(78)

Table A11. Number of fingerling equivalents, and average size in grams, for Chinook salmon stocked in Lake Ontario from 1981-2005. Shown are the numbers stocked by the DEC and OMNR hatcheries, and the number pen reared by the various cooperators. Fingerling equivalents use corrections for expected survival differences among Chinook salmon stocked at different sizes, and due to the tendency of Chinook salmon to home to their stocking site, assume OMNR stocked fingerlings contribute half as much to harvest by New York anglers.

Year Class	DEC Stocked Fish						OMNR Stocked Fish				Total Lake Ontario Chinook Salmon	
	Salmon River		Caledonia		Pen Reared		OMNR Hatchery		Pen Reared		Number Stocked	Avg Size
	Number Stocked	Avg Size	Number Stocked	Avg Size	Number Stocked	Avg Size	Number Stocked	Avg Size	Number Stocked	Avg Size		
1981	379,941	1.8	479,300	3.1			3,599	2.3			862,840	2.4
1982	888,400	2.1	184,000	3.7			102,954	2.5			1,175,354	2.3
1983	2,064,260	3.8	455,000	4.2			24,920	1.8			2,544,180	3.8
1984	2,609,750	3.5	195,000	2.0			152,480	2.0			2,957,230	3.1
1985	2,957,800	4.8					295,030	4.4			3,252,830	4.7
1986	1,848,800	4.2	663,200	4.5			298,771	4.9			2,810,771	4.4
1987	2,495,000	4.9	616,330	4.6			256,966	4.2			3,368,296	4.8
1988	2,305,000	4.5	543,000	4.5			256,104	5.1			3,104,104	4.6
1989	2,212,200	4.5	540,000	4.9			266,554	4.4			3,018,754	4.6
1990	2,180,000	5.3	540,000	4.5			244,722	4.1			2,964,722	5.0
1991	2,794,000	5.1			41,000	4.1	294,453	4.8			3,129,453	5.1
1992	2,655,691	4.6			46,260	3.9	302,378	5.0			3,004,329	4.7
1993	1,557,300	4.5			40,000	3.8	249,592	5.1			1,846,892	4.6
1994	944,000	5.0			40,000	3.9	237,491	4.5			1,221,491	4.8
1995	1,136,666	4.6					227,424	4.3			1,364,090	4.5
1996	1,300,000	4.6					195,138	3.8			1,495,138	4.4
1997	1,604,980	5.1					306,060	4.6			1,911,040	4.9
1998	1,546,000	5.0			49,763	7.6	308,166	4.6			1,903,929	4.9
1999	1,183,000	4.7	90,000	4.5	315,000	4.5	179,524	4.3			1,767,524	4.6
2000	1,252,300	4.7	90,000	4.1	300,000	4.8	264,243	4.1			1,906,543	4.5
2001	1,202,800	4.9	118,610	3.9	300,000	5.0	272,276	4.0			1,893,686	4.6
2002	1,211,000	5.3	123,000	4.3	299,496	5.4	274,506	4.4			1,908,002	5.0
2003	1,167,240	4.7	110,400	3.5	189,356	4.5	223,233	3.9	10,145	5.4	1,700,374	4.4
2004	928,160	4.7	451,030	3.9	322,269	5.3	251,103	4.1	10,004	5.2	1,962,565	4.5
2005	994,660	5.3	421,280	4.1	386,599	5.3	262,621	4.7	10,010	6.0	2,075,169	5.0

Table A12. Chinook salmon harvest at age data by year sampled and year class, from the 1985-2006 DEC Lake Ontario fishing boat censuses. Harvest at age data are adjusted to a common base of 150,000 salmonid fishing boat trips per 6-month season. Fingerling equivalents use corrections for expected survival differences among Chinook salmon stocked at different sizes, and assume OMNR stocked fingerlings contribute half as much to harvest by New York anglers.

		Chinook Salmon Harvested Per 150,000 Boat Trips				
Year Sampled	Salmonid Boat Trips	Age-1	Age-2	Age-3	Age-4	Total
1985	133,407	14,344	16,717	21,164	1,498	53,723
1986	157,605	11,589	24,174	25,318	1,098	62,180
1987	172,414	11,600	31,245	43,576	3,657	90,078
1988	167,328	9,217	23,126	38,483	3,429	74,255
1989	179,718	8,922	33,437	63,237	7,352	112,949
1990	184,222	3,439	21,378	40,084	3,255	68,156
1991	154,974	5,383	21,947	40,540	5,671	73,541
1992	118,871	10,349	19,138	27,178	2,303	58,967
1993	103,715	9,946	26,582	35,476	3,689	75,693
1994	103,741	2,441	37,086	54,162	3,715	97,404
1995	93,896	1,054	12,298	34,444	3,455	51,251
1996	70,836	15,914	5,870	26,607	7,858	56,249
1997	66,343	9,636	51,182	11,911	3,098	75,827
1998	65,934	5,308	19,595	38,297	1,060	64,260
1999	62,037	10,685	17,992	41,066	2,341	72,084
2000	64,979	8,670	20,921	29,225	0	58,816
2001	63,710	8,062	29,225	21,246	447	58,980
2002	52,674	5,134	24,841	21,551	604	52,130
2003	47,873	6,931	36,020	55,632	191	98,774
2004	57,872	8,986	76,187	47,196	969	133,338
2005	59,000	6,150	55,426	112,449	1,286	175,311
2006	49,223	10,812	34,749	69,535	5,086	120,182

Table A12 (continued). Chinook salmon harvest at age data by year sampled and year class.

		Chinook Salmon Harvested Per 150,000 Boat Trips				
Year Class	Fing Equiv Stocked	Age-1	Age-2	Age-3	Age-4	Total
1981	862,840				1,498	
1982	1,175,354			21,164	1,098	
1983	2,544,180		16,717	25,318	3,657	
1984	2,957,230	14,344	24,174	43,576	3,429	85,523
1985	3,252,830	11,589	31,245	38,483	7,352	88,669
1986	2,810,771	11,600	23,126	63,237	3,255	101,219
1987	3,368,296	9,217	33,437	40,084	5,671	88,409
1988	3,104,104	8,922	21,378	40,540	2,303	73,143
1989	3,018,754	3,439	21,947	27,178	3,689	56,253
1990	2,964,722	5,383	19,138	35,476	3,715	63,711
1991	3,129,453	10,349	26,582	54,162	3,455	94,549
1992	3,004,329	9,946	37,086	34,444	7,858	89,334
1993	1,846,892	2,441	12,298	26,607	3,098	44,443
1994	1,221,491	1,054	5,870	11,911	1,060	19,895
1995	1,364,090	15,914	51,182	38,297	2,341	107,733
1996	1,495,138	9,636	19,595	41,066	0	70,297
1997	1,911,040	5,308	17,992	29,225	447	52,971
1998	1,903,929	10,685	20,921	21,246	604	53,456
1999	1,767,524	8,670	29,225	21,551	191	59,638
2000	1,906,543	8,062	24,841	55,632	969	89,503
2001	1,893,686	5,134	36,020	47,196	1,286	89,638
2002	1,908,002	6,931	76,187	112,449	5,086	200,653
2003	1,700,374	8,986	55,426	69,535		
2004	1,962,565	6,150	34,749			
2005	2,075,169	10,812				

Table A13. Predicted relative harvest of age-3 Chinook salmon per 150,000 trout and salmon fishing boat trips, and percent differences between observed and predicted estimates. Predictions were made with various combinations of data on number stocked, and age-1 and age-2 relative harvest data from the DEC Lake Ontario fishing boat censuses, using those data available one year prior to the year that age-3 harvest was observed. Positive differences indicate the predicted harvest was larger than the observed harvest, while negative differences show the predicted harvest was smaller.

	<u>Predicted Age-3 Harvest</u>	<u>% Differences</u>
<u>1993 Year Class:</u>		
One Relationship	28,314	+6.0%
<u>1994 Year Class:</u>		
Range 3 Relationships	21,503 - 30,105	+44.6% to +60.4%
Average	25,474	+53.2%
<u>1995 Year Class:</u>		
Range 9 Relationships	16,141 - 62,958	-137.3% to +39.2%
Average	43,009	+11.0%
<u>1996 Year Class:</u>		
Range 7 Relationships	24,868 - 43,615	-65.1% to +5.8%
Average	32,511	-26.3%
<u>1997 Year Class:</u>		
Range 6 Relationships	28,541 - 33,855	-2.4% to +13.7%
Average	30,908	+5.4%
<u>1998 Year Class:</u>		
Range 7 Relationships	31,218 - 45,460	+31.9% to +53.3%
Average	38,329	+44.6%
<u>1999 Year Class:</u>		
Range 8 Relationships	29,180 - 38,412	+26.1% to +43.9%
Average	33,334	+35.3%
<u>2000 Year Class:</u>		
Range 8 Relationships	29,752 - 35,264	-87.0% to -57.8%
Average	31,961	-74.1%
<u>2001 Year Class:</u>		
Range 6 Relationships	22,592 - 35,812	-108.9% to -31.8%
Average	29,061	-62.4%
<u>2002 Year Class:</u>		
Range 5 Relationships	32,680 - 57,515	-244.1% to -95.5%
Average	41,976	-167.9%
<u>2003 Year Class:</u>		
Range 6 Relationships	64,764 - 70,533	-7.4% to +1.4%
Average	67,941	-2.3%
<u>2004 Year Class:</u>		
Range 6 Relationships	44,692 - 49,134	
Average	47,089	

Table A14. Rainbow trout harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	32,537	21,604	28,286	20,351	9,816	16,018	6,866	8,245	11,472	7,557	10,750
Catch	45,526	28,234	38,106	29,277	15,646	22,927	8,533	13,943	20,303	13,528	18,029
% Harvested	72.2	76.5	74.2	69.5	62.7	69.9	80.5	59.1	56.5	55.9	59.6
Monthly estimates of harvest for all fishing boats:											
April	2,334	315	1,001	87	396	574	285	492	202	259	186
May	7,819	3,329	1,902	2,659	2,473	3,776	685	1,202	3,986	1,320	1,872
June	5,029	6,422	3,349	478	764	935	346	2,124	653	1,038	526
July	4,194	2,101	2,197	2,027	651	3,659	1,073	740	1,376	1,584	1,901
August	9,771	7,696	19,550	8,939	3,721	5,755	4,133	3,305	3,752	2,274	1,948
September	3,390	1,741	286	6,161	1,810	1,320	344	380	1,504	1,082	4,318
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	17,284	15,425	23,958	17,809	6,791	11,245	6,141	5,229	6,367	5,163	6,639
West/Central	4,501	658	1,072	531	351	260	72	483	1,121	576	1,578
East/Central	8,699	5,168	3,079	1,811	2,301	4,230	451	2,393	3,733	1,156	2,160
East	2,052	353	177	200	372	283	201	140	251	662	372
Percent of seasonal harvest and catch made by boats seeking any or all species of trout and salmon:											
% Harvest	99.6	100.0	100.0	100.0	100.0	99.9	100.0	99.7	100.0	99.8	100.0
% Catch	99.6	99.5	99.9	99.8	100.0	99.8	99.5	98.8	99.3	99.9	100.0
Seasonal rates of harvest and catch for boats seeking any or all species of trout and salmon:											
Harv/Boat Trip	0.256	0.326	0.429	0.328	0.151	0.251	0.130	0.172	0.198	0.128	0.218
Catch/Boat Trip	0.354	0.423	0.577	0.471	0.241	0.359	0.161	0.288	0.348	0.229	0.366
Harv/Angler Trip	0.088	0.110	0.146	0.113	0.051	0.087	0.044	0.061	0.069	0.044	0.074
Catch/Angler Trip	0.122	0.143	0.197	0.162	0.081	0.124	0.054	0.102	0.121	0.078	0.123
Harv/Angler Hour	0.015	0.019	0.025	0.020	0.009	0.015	0.007	0.011	0.013	0.008	0.013
Catch/Angler Hour	0.021	0.024	0.034	0.028	0.014	0.021	0.009	0.018	0.022	0.014	0.022
Monthly harvest rates per boat trip for boats seeking any or all species of trout and salmon:											
April	0.131	0.046	0.156	0.019	0.062	0.128	0.050	0.159	0.055	0.067	0.034
May	0.334	0.314	0.152	0.251	0.267	0.349	0.072	0.173	0.453	0.101	0.235
June	0.407	0.829	0.685	0.094	0.129	0.156	0.061	0.376	0.137	0.194	0.192
July	0.231	0.214	0.240	0.322	0.067	0.481	0.159	0.126	0.192	0.146	0.230
August	0.304	0.356	0.746	0.466	0.173	0.232	0.237	0.197	0.196	0.161	0.134
September	0.142	0.178	0.042	0.379	0.148	0.129	0.045	0.040	0.105	0.091	0.418
Seasonal harvest rates per boat trip among four geographic areas for boats seeking any or all species of trout and salmon:											
West	0.531	1.112	1.686	1.201	0.401	0.941	0.414	0.436	0.561	0.352	0.604
West/Central	0.212	0.106	0.154	0.081	0.061	0.043	0.018	0.094	0.184	0.079	0.222
East/Central	0.233	0.224	0.142	0.084	0.125	0.176	0.031	0.134	0.205	0.064	0.124
East	0.050	0.015	0.008	0.010	0.016	0.013	0.011	0.011	0.011	0.035	0.027

Table A15. Fin clips of rainbow trout sampled in the 1985-2006 DEC Lake Ontario fishing boat censuses, and number of rainbow trout yearling equivalents stocked in Lake Ontario for the 1980-2004 year classes.

Observed fin clips of sampled rainbow trout by year censused:															
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996			
No Clips	373	261	401	754	765	387	353	561	534	427	283	305			
LV	98	74	77	84	186	74	62	95	77	45	8	20			
LV-Ad	15	5	1	5	3	3	1	0	0	1	1	3			
LP-Ad	14	9	16	58	88	58	28	16	33	24	20	11			
Ad	2	7	5	19	12	19	10	16	25	25	16	12			
RV	2	3	5	13	34	31	5	9	20	14	4	10			
RV-Ad	0	1	0	0	1	1	2	1	0	0	1	3			
RP	2	2	1	6	5	3	1	8	16	12	9	17			
RP-Ad	1	2	0	1	1	1	2	0	0	0	1	0			
Misc.	21	20	27	23	26	20	11	18	33	23	15	23			
Total	528	384	533	963	1121	597	475	724	738	571	358	404			
Thousands of rainbow trout yearling equivalents stocked by year class:															
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Washington Steelhead	168.8	114.2	113.0	292.6	333.5	341.3	418.3	305.7	389.8	427.2	555.3	446.8	379.9	415.3	512.6
Skamania Steelhead	0	0	0	0	0	66.0	25.0	107.0	0	0	32.0	84.8	74.0	72.2	0
Other DEC Steelhead	45.4	10.8	0	0	0	0.2	5.5	6.9	1.0	0	0	0	0	0	10.9
Domestic Rainbows	220.2	75.2	253.5	242.1	209.6	227.9	190.4	184.4	247.8	198.2	176.5	174.6	176.0	184.0	48.4
Ganaraska Steelhead	0	0	0	55.0	53.1	100.0	153.0	264.1	70.3	52.5	62.5	70.6	40.6	32.0	60.1
Other MNR Strains	100.2	68.5	104.9	0	0	0	0	0	0	0	0	0	0	0	0
Lake Ontario Total	534.6	268.6	471.4	589.7	596.3	735.4	792.3	868.2	708.9	677.9	826.4	776.7	670.5	703.4	632.0
LV & LV-Ad group	108.2	114.2	121.9	140.0	123.5	156.0	116.4	196.2	120.0	120.0	150.0	120.0	120.0	108.0	113.2
LP-Ad group	11.6	0	41.5	39.8	0	66.0	25.0	107.0	0	0	32.0	84.8	74.0	72.2	0
"OMNR" group	81.2	0	0	55.0	53.1	100.0	153.0	264.1	59.2	52.5	62.5	70.6	40.6	32.0	60.1
unclipped group	333.5	154.5	269.2	354.9	419.6	413.4	497.8	300.8	529.6	505.4	581.8	501.3	436.0	491.3	458.8

Note: LV and LV-Ad group includes all LV and LV-Ad clips including combinations with elastomer tags, and LV-LM clips.

"OMNR" group includes all Ad, RV, RV-Ad, RP, RP-Ad clips, and Ad-CWT mark combinations.

Table A15 (continued). Fin clips of rainbow trout sampled in the 1985-2006 DEC Lake Ontario fishing boat censuses, and number of rainbow trout yearling equivalents stocked in Lake Ontario for the 1980-2004 year classes.

Observed fin clips of sampled rainbow trout by year censused:										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
No Clips	311	346	209	105	213	41	70	120	115	173
LV	9	29	8	6	3	1	1	4	3	4
LV-Ad	6	9	2	1	2	1	2	2	3	6
LP-Ad	12	10	6	2	8	2	1	7	4	4
Ad	11	4	3	4	2	0	1	1	1	7
RV	5	6	3	1	12	0	2	6	1	3
RV-Ad	2	0	0	1	1	1	1	0	0	2
RP	24	22	10	6	5	3	5	6	4	1
RP-Ad	0	0	2	0	0	0	0	0	0	1
Misc.	31	25	4	2	8	0	2	12	5	4
Total	411	451	247	128	254	49	85	158	136	205

Thousands of rainbow trout yearling equivalents stocked by year class:										
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Washington Steelhead	470.7	499.9	494.8	455.9	483.8	505.7	487.4	507.3	507.3	517.9
Skamania Steelhead	82.0	66.9	55.0	65.0	71.0	77.0	48.0	56.0	50.6	52.3
Other DEC Steelhead	0	0	0	0	0	0	0	0	0	0
Domestic Rainbows	140.6	186.4	184.8	200.7	150.0	119.9	145.2	155.4	131.5	150.0
Ganaraska Steelhead	65.5	71.6	83.8	72.7	75.7	55.9	72.1	72.9	58.3	65.5
Other MNR Strains	0	180.0	2.9	1.4	2.0	2.4	4.6	3.3	3.4	9.0
Lake Ontario Total	758.8	1004.7	821.3	795.7	782.6	760.9	757.3	794.9	751.1	794.6
LV & LV-Ad group	125.2	121.0	120.0	120.0	120.0	135.0	120.0	134.5	125.6	142.0
LP-Ad group	82.0	65.0	55.0	65.0	49.6	77.0	48.0	53.0	50.5	52.3
"OMNR" group	65.5	71.6	103.8	92.7	95.2	55.9	71.9	72.9	73.5	86.8
unclipped group	486.1	747.1	542.6	518.0	517.8	493.0	517.4	534.4	501.6	513.5

Note: LV and LV-Ad group includes all LV and LV-Ad clips including combinations with elastomer tags, and LV-LM clips.

"OMNR" group includes all Ad, RV, RV-Ad, RP, RP-Ad clips, and Ad-CWT mark combinations.

Table A16. Summary of length (total length in inches) and weight (lbs) statistics for rainbow trout sampled during the months of April-September in the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mean length and weight data for rainbow trout sampled April - September:											
Mean Length (in)	24.0	24.5	25.9	25.8	24.3	24.5	25.2	23.5	24.4	24.5	24.2
Mean Weight (lbs)	-	6.32	7.36	7.80	6.67	6.60	7.58	6.00	6.16	6.09	5.88
Estimated weight (lbs) for standard length rainbow trout sampled April - September:											
Standard Length:											
18.0 inches	-	2.26	2.30	2.38	2.42	2.36	2.48	2.62	2.27	2.42	2.43
20.0 inches	-	3.12	3.16	3.28	3.34	3.25	3.39	3.51	3.10	3.25	3.26
22.0 inches	-	4.18	4.22	4.40	4.47	4.34	4.51	4.57	4.13	4.25	4.25
24.0 inches	-	5.45	5.48	5.75	5.84	5.65	5.84	5.82	5.35	5.42	5.42
26.0 inches	-	6.96	6.98	7.35	7.47	7.19	7.42	7.27	6.79	6.78	6.78
28.0 inches	-	8.68	8.68	9.18	9.33	8.97	9.21	8.89	8.44	8.31	8.30
30.0 inches	-	10.72	10.69	11.35	11.53	11.05	11.32	10.77	10.37	10.08	10.06
32.0 inches	-	13.06	12.99	13.84	14.06	13.44	13.72	12.88	12.57	12.08	12.04
Percent length composition of rainbow trout sampled April - September:											
<15.0 in	0.5%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15.0-15.9 in	0.4%	0.0%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
16.0-16.9 in	1.5%	0.0%	0.0%	0.0%	0.0%	0.4%	2.0%	1.2%	1.9%	0.0%	0.5%
17.0-17.9 in	2.5%	1.2%	0.0%	0.4%	2.3%	2.4%	4.1%	4.7%	1.3%	1.5%	1.0%
18.0-18.9 in	4.9%	2.9%	1.1%	1.2%	2.3%	6.3%	6.1%	10.6%	5.1%	3.7%	2.9%
19.0-19.9 in	7.2%	7.5%	3.3%	4.0%	8.6%	6.3%	8.2%	7.1%	7.6%	5.1%	5.4%
20.0-20.9 in	9.0%	11.1%	3.8%	3.6%	7.0%	10.6%	2.0%	12.9%	6.3%	7.4%	8.3%
21.0-21.9 in	9.2%	9.9%	6.0%	8.1%	14.1%	6.7%	8.2%	10.6%	9.5%	5.1%	9.3%
22.0-22.9 in	8.7%	8.2%	8.6%	6.9%	12.5%	7.1%	12.2%	3.5%	8.9%	17.6%	7.8%
23.0-23.9 in	8.5%	9.0%	10.2%	9.7%	11.7%	8.7%	6.1%	5.9%	10.1%	8.8%	15.6%
24.0-24.9 in	8.2%	8.2%	9.1%	9.3%	5.5%	5.5%	0.0%	8.2%	8.2%	8.8%	13.2%
25.0-25.9 in	6.9%	4.4%	10.6%	9.7%	7.0%	5.9%	2.0%	5.9%	8.2%	6.6%	8.3%
26.0-26.9 in	6.2%	5.6%	7.3%	8.9%	3.1%	7.9%	4.1%	5.9%	3.2%	8.1%	5.4%
27.0-27.9 in	6.5%	8.5%	8.6%	6.9%	3.9%	8.3%	8.2%	7.1%	7.6%	8.1%	6.8%
28.0-28.9 in	6.0%	7.5%	7.5%	8.1%	4.7%	5.9%	6.1%	1.2%	4.4%	5.9%	6.3%
29.0-29.9 in	4.6%	5.8%	8.2%	4.8%	3.1%	6.3%	8.2%	4.7%	5.1%	6.6%	4.4%
30.0-30.9 in	3.9%	4.1%	6.8%	6.0%	3.1%	5.9%	8.2%	2.4%	4.4%	1.5%	2.4%
31.0-31.9 in	2.6%	2.7%	5.1%	3.2%	6.3%	2.0%	4.1%	3.5%	5.7%	2.2%	1.5%
32.0-32.9 in	1.4%	2.7%	2.0%	4.8%	2.3%	1.6%	4.1%	3.5%	0.6%	1.5%	0.0%
33.0-33.9 in	0.7%	0.2%	1.1%	1.6%	1.6%	1.2%	4.1%	1.2%	0.6%	1.5%	0.5%
>33.9 in	0.7%	0.5%	0.9%	2.0%	0.8%	0.8%	2.0%	0.0%	1.3%	0.0%	0.5%

Table A17. Atlantic salmon harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	603	121	70	156	24	71	146	18	19	15	0
Catch	2,084	409	329	495	428	349	277	102	50	270	158
% Harvested	29.6	29.6	21.3	31.5	5.6	20.3	52.7	17.6	38.0	5.6	0.0
Monthly estimates of harvest for all fishing boats:											
April	166	40	0	0	24	24	0	18	19	15	0
May	239	44	18	37	0	47	56	0	0	0	0
June	77	0	0	32	0	0	90	0	0	0	0
July	47	0	23	25	0	0	0	0	0	0	0
August	70	36	29	0	0	0	0	0	0	0	0
September	6	0	0	62	0	0	0	0	0	0	0
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	141	0	0	15	24	47	0	18	0	0	0
West/Central	111	29	0	28	0	24	84	0	0	0	0
East/Central	169	35	47	79	0	0	62	0	19	15	0
East	183	57	23	34	0	0	0	0	0	0	0
Percent of seasonal harvest and catch made by boats seeking any or all species of trout and salmon:											
% Harvest	98.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
% Catch	98.8	75.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	54.8	100.0
Seasonal rates of harvest and catch per 100 boat trips, for boats seeking any or all species of trout and salmon:											
Harv/Boat Trip	0.431	0.182	0.106	0.251	0.037	0.111	0.277	0.038	0.033	0.025	0
Catch/Boat Trip	1.482	0.463	0.499	0.798	0.659	0.548	0.526	0.213	0.086	0.251	0.321
Harv/Angler Trip	0.151	0.062	0.036	0.087	0.012	0.038	0.093	0.013	0.011	0.009	0
Catch/Angler Trip	0.520	0.156	0.170	0.275	0.221	0.189	0.177	0.076	0.030	0.086	0.108
Harv/Angler Hour	0.026	0.010	0.006	0.015	0.002	0.007	0.016	0.002	0.002	0.002	0
Catch/Angler Hour	0.089	0.026	0.029	0.048	0.038	0.032	0.030	0.013	0.005	0.016	0.019
Monthly harvest rates per 100 boat trips, for boats seeking any or all species of trout and salmon:											
April	1.154	0.590	0	0	0.376	0.536	0	0.580	0.516	0.386	0
May	0.894	0.415	0.144	0.349	0	0.435	0.587	0	0	0	0
June	0.472	0	0	0.629	0	0	1.589	0	0	0	0
July	0.236	0	0.251	0.397	0	0	0	0	0	0	0
August	0.218	0.167	0.111	0	0	0	0	0	0	0	0
September	0.023	0	0	0.381	0	0	0	0	0	0	0
Seasonal harvest rates per 100 boat trips, among 4 geographic areas, for boats seeking any or all species of trout and salmon:											
West	0.434	0	0	0.101	0.142	0.393	0	0.150	0	0	0
West/Central	0.460	0.466	0	0.428	0	0.397	2.046	0	0	0	0
East/Central	0.430	0.152	0.217	0.367	0	0	0.422	0	0.104	0.083	0
East	0.422	0.246	0.100	0.178	0	0	0	0	0	0	0

Table A18. Brown trout harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	45,806	23,715	27,669	22,082	27,483	25,475	16,811	22,277	16,719	22,785	15,642
Catch	62,477	34,030	36,614	33,776	43,649	37,062	26,006	40,625	26,850	35,691	26,230
% Harvested	73.9	69.7	75.6	65.4	63.0	68.7	64.6	54.8	62.3	63.8	59.6
Monthly estimates of harvest for all fishing boats:											
April	17,827	7,397	12,018	2,470	4,199	4,095	3,874	6,066	2,573	5,995	5,279
May	13,712	9,742	9,789	6,302	10,075	11,384	7,025	5,098	4,382	9,655	4,117
June	5,271	1,376	759	5,280	4,895	4,324	984	2,460	4,497	3,867	1,068
July	4,717	2,844	2,918	3,787	4,769	1,126	1,971	3,210	1,853	2,187	3,630
August	3,499	2,127	2,010	3,774	2,987	4,101	2,896	4,814	3,390	744	1,398
September	779	229	175	470	557	446	61	629	24	337	150
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	3,722	1,076	2,383	2,731	2,255	2,046	1,786	3,239	907	1,851	1,011
West/Central	4,810	853	1,056	3,701	2,007	2,275	2,552	915	2,923	2,179	1,569
East/Central	24,010	12,054	17,822	9,786	17,599	18,021	8,479	16,334	11,328	10,897	9,832
East	13,263	9,732	6,408	5,864	5,622	3,133	3,994	1,789	1,562	7,858	3,231
Percent of seasonal harvest and catch made by boats seeking any or all species of trout and salmon:											
% Harvest	99.5	90.8	99.7	98.9	99.4	99.1	99.1	98.2	99.2	100.0	99.4
% Catch	99.4	85.3	99.2	98.7	99.2	99.0	99.4	98.6	99.3	<100.0	99.3
Seasonal rates of harvest and catch for boats seeking any or all species of trout and salmon:											
Harv/Boat Trip	0.336	0.325	0.418	0.352	0.420	0.396	0.316	0.457	0.287	0.386	0.316
Catch/Boat Trip	0.456	0.437	0.551	0.537	0.667	0.576	0.491	0.837	0.461	0.605	0.529
Harv/Angler Trip	0.118	0.110	0.142	0.121	0.141	0.137	0.106	0.162	0.099	0.132	0.106
Catch/Angler Trip	0.160	0.147	0.188	0.185	0.224	0.199	0.165	0.297	0.160	0.206	0.178
Harv/Angler Hour	0.020	0.019	0.025	0.021	0.024	0.023	0.018	0.029	0.018	0.024	0.019
Catch/Angler Hour	0.027	0.025	0.033	0.032	0.038	0.034	0.028	0.053	0.029	0.038	0.032
Monthly harvest rates per boat trip for boats seeking any or all species of trout and salmon:											
April	1.090	1.091	1.877	0.537	0.657	0.915	0.678	1.956	0.699	1.542	0.971
May	0.536	0.714	0.780	0.595	1.085	1.053	0.736	0.707	0.488	0.746	0.517
June	0.391	0.178	0.155	1.005	0.819	0.683	0.148	0.404	0.940	0.721	0.357
July	0.253	0.289	0.315	0.597	0.494	0.148	0.291	0.547	0.252	0.201	0.440
August	0.103	0.098	0.077	0.194	0.136	0.166	0.166	0.287	0.177	0.053	0.096
September	0.031	0.023	0.022	0.029	0.043	0.044	0.008	0.065	0.002	0.028	0.015
Seasonal harvest rates per boat trip among four geographic areas for boats seeking any or all species of trout and salmon:											
West	0.111	0.075	0.166	0.184	0.133	0.171	0.120	0.253	0.080	0.127	0.092
West/Central	0.242	0.132	0.151	0.562	0.346	0.376	0.623	0.179	0.480	0.299	0.220
East/Central	0.611	0.447	0.820	0.444	0.949	0.746	0.565	0.911	0.614	0.603	0.563
East	0.330	0.404	0.278	0.307	0.234	0.142	0.210	0.137	0.070	0.413	0.230

Table A19. Summary of length (inches), weight (lbs), age, and fin clip statistics for brown trout sampled during the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mean length and weight data for brown trout sampled April - September:											
Mean Length (in)	19.7	18.9	19.9	20.4	20.4	20.5	21.1	20.2	20.6	19.8	20.6
Mean Weight (lbs)	-	3.85	4.50	5.46	5.29	4.92	5.93	5.05	5.09	4.32	5.25
Estimated weight (lbs) for standard length brown trout sampled April - September:											
16.0 inches	-	2.06	2.06	2.39	2.07	1.94	2.17	2.24	2.07	2.04	2.29
18.0 inches	-	3.01	3.02	3.46	3.13	2.88	3.21	3.21	3.01	2.95	3.26
20.0 inches	-	4.26	4.26	4.84	4.58	4.13	4.59	4.45	4.23	4.15	4.50
22.0 inches	-	5.82	5.83	6.55	6.46	5.72	6.33	5.99	5.75	5.65	6.02
24.0 inches	-	7.75	7.76	8.64	8.84	7.70	8.50	7.85	7.61	7.48	7.86
26.0 inches	-	10.08	10.09	11.14	11.79	10.11	11.13	10.06	9.85	9.68	10.05
28.0 inches	-	12.80	12.80	14.04	15.32	12.96	14.23	12.60	12.44	12.23	12.55
Percent length composition of brown trout sampled April - September:											
<15.0 in	2.0%	1.8%	0.2%	1.8%	0.7%	1.0%	0.6%	0.8%	0.0%	0.3%	0.5%
15.0-15.9 in	3.2%	5.8%	0.7%	1.1%	1.1%	0.6%	0.3%	2.8%	1.5%	0.5%	0.3%
16.0-16.9 in	8.5%	14.1%	4.4%	1.8%	2.9%	2.7%	0.6%	7.5%	5.3%	4.7%	5.8%
17.0-17.9 in	14.7%	20.2%	13.6%	6.8%	7.0%	12.5%	5.1%	14.5%	9.7%	16.2%	11.0%
18.0-18.9 in	18.3%	18.9%	25.0%	12.6%	12.7%	17.0%	16.7%	17.6%	21.8%	26.4%	16.2%
19.0-19.9 in	14.2%	14.8%	18.7%	23.6%	16.8%	14.4%	20.1%	15.4%	15.9%	16.7%	12.1%
20.0-20.9 in	10.2%	6.7%	11.3%	18.9%	23.6%	14.8%	14.1%	9.5%	10.0%	10.0%	12.9%
21.0-21.9 in	8.0%	6.5%	8.9%	12.8%	12.7%	10.5%	10.5%	5.9%	7.7%	6.0%	12.9%
22.0-22.9 in	6.2%	3.1%	6.0%	6.1%	10.5%	7.8%	9.6%	7.0%	5.9%	6.5%	8.0%
23.0-23.9 in	4.4%	3.1%	3.4%	6.3%	4.6%	4.7%	7.3%	4.2%	7.1%	4.0%	6.3%
24.0-24.9 in	3.4%	1.1%	2.4%	2.5%	4.2%	6.6%	4.5%	4.2%	4.4%	3.3%	5.5%
25.0-25.9 in	2.8%	2.0%	2.0%	2.3%	1.1%	2.3%	3.1%	3.9%	4.1%	2.2%	4.9%
26.0-26.9 in	2.0%	0.5%	1.6%	1.4%	1.5%	2.9%	4.0%	2.5%	2.9%	1.3%	2.5%
27.0-27.9 in	1.0%	0.7%	0.7%	0.5%	0.6%	1.0%	2.0%	1.7%	0.6%	1.0%	0.5%
28.0-28.9 in	0.6%	0.4%	0.5%	0.9%	0.0%	0.8%	1.1%	1.4%	1.2%	0.3%	0.3%
>28.9 in	0.5%	0.5%	0.5%	0.7%	0.0%	0.4%	0.6%	1.1%	1.8%	0.3%	0.3%
Percent fin clip composition of brown trout sampled April - September:											
No Clips	73.1%	76.0%	82.8%	87.3%	87.7%	86.1%	68.3%	67.2%	61.7%	66.6%	80.8%
LV	4.5%	6.7%	3.4%	3.4%	1.7%	0.4%	2.8%	2.2%	5.9%	7.4%	3.0%
LV-Ad	2.5%	2.0%	1.3%	1.1%	0.0%	0.0%	6.2%	11.8%	7.1%	4.0%	1.1%
LP	4.9%	5.3%	2.2%	1.4%	2.9%	3.1%	2.0%	1.1%	8.0%	4.2%	3.6%
LP-Ad	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	10.6%	5.9%	2.0%	0.0%
Ad	2.0%	0.5%	0.5%	0.5%	0.9%	5.3%	0.8%	4.2%	3.8%	5.5%	3.0%
RV	4.9%	4.4%	2.2%	2.9%	3.1%	2.5%	4.0%	0.6%	1.5%	3.7%	3.3%
RV-Ad	0.5%	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.8%	1.1%
RP	5.1%	3.4%	6.0%	2.9%	3.1%	2.0%	2.0%	1.4%	3.8%	3.5%	3.0%
RP-Ad	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	0.2%	0.3%
Misc.	1.3%	1.6%	1.5%	0.5%	0.6%	0.4%	3.7%	0.6%	2.4%	2.0%	0.8%
Percent age composition of brown trout sampled April - September:											
Age-1	-	0.0%	0.0%	3.2%	0.6%	0.3%	0.8%	0.4%	0.0%	0.0%	0.4%
Age-2	-	87.9%	78.6%	83.5%	84.0%	70.5%	67.4%	73.6%	65.6%	80.1%	67.8%
Age-3	-	9.6%	18.2%	10.7%	14.1%	24.9%	23.6%	20.3%	27.0%	16.2%	26.6%
Age-4	-	1.9%	2.3%	2.3%	1.3%	3.3%	7.5%	4.9%	5.2%	3.3%	4.8%
Age-5+	-	0.6%	0.9%	0.3%	0.0%	1.0%	0.7%	0.8%	2.1%	0.4%	0.3%
Mean length (inches) of aged brown trout sampled in April:											
Age-2	-	17.2	18.4	18.2	18.8	18.2	19.0	17.9	17.8	17.9	17.7
Age-3	-	22.3	22.8	21.9	23.2	22.9	24.5	22.8	22.2	22.8	22.2

Table A20. Returns of fin clipped shore and barge stocked brown trout from the 1995-1997 and 2000-2003 year classes observed in the 1997-2006 DEC Lake Ontario fishing boat censuses. Adjustments to number observed were made to account for false LP and LV clips resulting from fin erosion and damage in the hatcheries.

Year Class	Number Stocked	Size at Stock (g)	Number Observed					Adjusted Number				
			Age 2	Age 3	Age 4	Age 5	Total	Age 2	Age 3	Age 4	Age 5	Total
Selkirk/Oswego barge stocked yearlings (LV fin clip)												
1995	30,600	69.0	40	3	0	0	43	32.7	1.3	0.0	0.0	34.0
1996	34,200	96.6	19	2	0	0	21	11.4	1.1	0.0	0.0	12.5
1997	34,200	88.9	15	5	0	0	20	8.1	3.6	0.0	0.0	11.8
Selkirk/Oswego shore stocked yearlings (LV-Ad fin clip)												
1995	30,600	65.6	11	0	1	0	12	10.9	0.0	1.0	0.0	11.9
1996	34,200	89.7	7	0	0	0	7	6.9	0.0	0.0	0.0	6.9
1997	34,200	78.2	4	0	0	0	4	4.0	0.0	0.0	0.0	4.0
Sodus barge stocked yearlings (LV fin clip)												
2000	20,000	90.7	8	1	0	1	10	4.8	0.0	0.0	1.0	5.7
2001	20,000	72.7	6	4	2	0	12	2.6	2.7	1.7	0.0	7.1
2002	20,000	151.7	18	6	0		24	15.3	4.7	0.0		20.0
2003	20,000	117.8	39	5			44	32.2	3.5			35.7
Sodus shore stocked yearlings (LP fin clip)												
2000	20,000	87.2	6	0	1	0	7	0.0	0.0	0.4	0.0	0.4
2001	20,000	64.8	4	6	0	0	10	0.0	2.6	0.0	0.0	2.6
2002	20,000	144.9	22	8	1		31	14.7	4.6	0.2		19.4
2003	20,000	118.3	19	3			22	0.9	0.0			0.9
Pt. Breeze barge stocked yearlings (LV-Ad fin clip)												
2000	20,000	154.8	25	8	5	0	38	25.0	8.0	5.0	0.0	38.0
2001	20,000	157.0	35	10	2	0	47	34.7	9.9	1.9	0.0	46.6
2002	20,000	78.2	9	1	1		11	9.0	1.0	1.0		11.0
2003	20,000	98.6	22	3			25	21.4	2.8			24.2
Pt. Breeze shore stocked yearlings (LP-Ad fin clip)												
2000	20,000	155.9	37	4	2	0	43	37.0	4.0	2.0	0.0	43.0
2001	19,320 ¹	162.5	35	10	0	0	45	34.3	9.7	0.0	0.0	44.0
2002	20,000	76.9	10	2	0		12	10.0	2.0	0.0		12.0
2003	20,000	92.6	13	0			13	11.4	0.0			11.4

Note: ¹ 320 of the yearlings were shore stocked at Hamlin rather than Point Breeze

Year Class	Ratios of Number Observed:		Ratios of Adjusted Number:	
	Shore Stocked	Barge Stocked	Shore Stocked	Barge Stocked
1995-1997	1	3.65	1	2.55
2000 (both sites)	1	0.96	1	1.01
2001 (both sites)	1	1.07	1	1.15
2002 (both sites)	1	0.81	1	0.98
2003 (both sites)	1	1.97	1	4.87
Year Class	Sodus	Point Breeze	Sodus	Point Breeze
2000	1	4.76	1	13.23
2001	1	4.18	1	9.37
2002	1	0.42	1	0.58
2003	1	0.58	1	0.97

Table A21. Lake trout harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	51,239	11,136	11,862	12,286	7,319	9,866	15,718	4,711	4,250	4,181	2,964
Catch	105,571	37,204	34,790	29,516	19,960	29,236	46,292	16,435	11,490	9,527	8,656
% Harvested	45.7	29.9	34.1	41.6	36.7	33.7	34.0	28.7	37.0	43.9	34.2
Monthly estimates of harvest for all fishing boats:											
April	5,240	698	1,293	2,843	871	1,026	1,454	493	136	0	215
May	9,841	3,597	4,059	1,096	1,462	1,144	1,093	389	473	264	1,173
June	9,382	1,500	2,006	3,473	1,721	1,704	2,885	868	557	940	560
July	15,230	3,274	1,964	2,045	1,757	2,129	3,531	2,065	2,298	913	86
August	10,169	1,963	2,264	2,796	1,425	2,217	5,180	843	739	2,000	930
September	1,377	104	275	34	83	1,646	1,575	54	47	64	0
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	10,993	1,648	1,230	357	1,674	1,956	2,231	1,545	685	483	312
West/Central	4,626	1,069	3,405	2,930	714	2,312	6,105	517	858	1,704	1,709
East/Central	12,863	3,001	3,224	2,440	2,133	1,959	1,897	802	566	351	70
East	22,757	5,418	4,003	6,559	2,798	3,639	5,485	1,846	2,142	1,643	872
Percent of seasonal harvest and catch made by boats seeking any or all species of trout and salmon:											
% Harvest	99.4	97.3	100.0	100.0	100.0	100.0	99.3	100.0	100.0	100.0	100.0
% Catch	99.3	98.9	99.9	99.6	100.0	100.0	99.1	100.0	100.0	100.0	100.0
Seasonal rates of harvest and catch for boats seeking any or all species of trout and salmon:											
Harv/Boat Trip	0.351	0.163	0.180	0.198	0.113	0.155	0.296	0.098	0.073	0.071	0.060
Catch/Boat Trip	0.745	0.555	0.527	0.474	0.307	0.459	0.871	0.343	0.199	0.161	0.176
Harv/Angler Trip	0.124	0.055	0.061	0.068	0.038	0.053	0.099	0.035	0.025	0.024	0.020
Catch/Angler Trip	0.260	0.187	0.179	0.163	0.103	0.158	0.292	0.122	0.069	0.055	0.059
Harv/Angler Hour	0.021	0.009	0.011	0.012	0.006	0.009	0.017	0.006	0.005	0.004	0.004
Catch/Angler Hour	0.044	0.032	0.031	0.029	0.018	0.027	0.050	0.022	0.013	0.010	0.011
Monthly harvest rates per boat trip for boats seeking any or all species of trout and salmon:											
April	0.245	0.103	0.202	0.618	0.136	0.229	0.254	0.159	0.037	0	0.040
May	0.360	0.311	0.324	0.103	0.158	0.106	0.114	0.056	0.054	0.020	0.147
June	0.648	0.194	0.410	0.682	0.292	0.284	0.509	0.156	0.116	0.175	0.205
July	0.802	0.333	0.215	0.325	0.182	0.280	0.522	0.352	0.321	0.084	0.010
August	0.298	0.091	0.086	0.146	0.066	0.090	0.291	0.050	0.039	0.142	0.064
September	0.049	0.011	0.041	0.002	0.007	0.164	0.208	0.006	0.003	0.005	0
Seasonal harvest rates per boat trip among four geographic areas for boats seeking any or all species of trout and salmon:											
West	0.281	0.118	0.087	0.024	0.099	0.164	0.150	0.129	0.060	0.033	0.028
West/Central	0.209	0.170	0.488	0.448	0.123	0.382	1.458	0.101	0.141	0.234	0.240
East/Central	0.322	0.120	0.149	0.113	0.116	0.082	0.129	0.045	0.031	0.019	0.004
East	0.524	0.231	0.173	0.343	0.118	0.167	0.289	0.141	0.097	0.086	0.064

Table A22. Summary of length and weight statistics for lake trout sampled during the months of April-September in the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mean length and weight of lake trout sampled April - September:											
Mean Length (in)	24.5	25.5	25.6	24.6	25.1	27.5	25.1	27.4	25.7	26.8	24.5
Mean weight (lbs)	-	7.18	7.47	6.55	6.99	9.10	7.00	8.53	7.21	8.24	6.28
Percent length composition of lake trout sampled April - September:											
<15.0 inches	0.0%	0.0%	0.3%	0.0%	0.7%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%
15-15.9 inches	0.1%	0.0%	0.0%	0.5%	0.7%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%
16-16.9 inches	0.2%	0.8%	0.3%	1.0%	0.0%	1.1%	1.4%	0.0%	0.0%	0.0%	0.0%
17-17.9 inches	0.6%	0.4%	1.0%	3.9%	4.1%	3.3%	2.4%	0.0%	0.0%	2.6%	0.0%
18-18.9 inches	1.2%	0.8%	3.8%	5.9%	1.4%	1.1%	4.3%	0.0%	2.8%	0.0%	2.6%
19-19.9 inches	2.4%	3.5%	4.2%	7.9%	4.1%	4.9%	2.9%	9.1%	4.2%	2.6%	10.3%
20-20.9 inches	5.0%	5.1%	4.2%	4.4%	7.6%	2.2%	5.3%	3.0%	7.0%	2.6%	7.7%
21-21.9 inches	9.1%	7.8%	8.0%	9.9%	12.4%	4.9%	9.1%	6.1%	7.0%	2.6%	5.1%
22-22.9 inches	12.0%	10.1%	11.4%	11.3%	7.6%	7.1%	11.5%	3.0%	12.7%	10.5%	2.6%
23-23.9 inches	14.9%	15.2%	13.5%	11.3%	9.0%	4.3%	11.0%	15.2%	14.1%	5.3%	20.5%
24-24.9 inches	16.2%	16.0%	10.7%	8.9%	9.7%	6.5%	10.0%	6.1%	11.3%	18.4%	15.4%
25-25.9 inches	12.6%	5.8%	4.2%	3.9%	6.2%	3.8%	6.7%	3.0%	5.6%	7.9%	17.9%
26-26.9 inches	8.4%	2.7%	2.4%	1.5%	2.1%	2.2%	1.0%	3.0%	0.0%	7.9%	2.6%
27-27.9 inches	4.4%	1.6%	0.3%	1.5%	0.7%	0.5%	0.5%	0.0%	0.0%	2.6%	0.0%
28-28.9 inches	3.1%	0.8%	0.0%	0.0%	2.8%	3.3%	0.5%	0.0%	1.4%	0.0%	0.0%
29-29.9 inches	2.5%	5.1%	2.4%	3.4%	4.1%	10.3%	6.7%	3.0%	11.3%	2.6%	0.0%
30-30.9 inches	3.4%	10.9%	14.2%	5.4%	11.0%	10.9%	9.6%	18.2%	1.4%	7.9%	5.1%
31-31.9 inches	1.9%	7.8%	9.7%	11.3%	8.3%	13.0%	6.2%	12.1%	8.5%	7.9%	2.6%
32-32.9 inches	1.1%	1.6%	5.2%	3.0%	3.4%	8.2%	4.3%	3.0%	2.8%	7.9%	2.6%
33-33.9 inches	0.4%	2.3%	2.1%	3.0%	2.1%	7.1%	4.8%	9.1%	5.6%	2.6%	2.6%
34-34.9 inches	0.2%	1.6%	1.4%	2.0%	1.4%	3.3%	0.0%	6.1%	2.8%	7.9%	0.0%
>34.9 inches	0.2%	0.4%	0.7%	0.0%	0.7%	1.6%	1.0%	0.0%	1.4%	0.0%	2.6%
30.0+ inches	7.2%	24.5%	33.2%	24.6%	26.9%	44.0%	25.8%	48.5%	22.5%	34.2%	15.4%

Note: Size groups enclosed by the double lines indicate lake trout theoretically protected from harvest in New York waters of Lake Ontario by the DEC slot limit (25 to <30 inches). Most of these “illegal” fish are within one inch of either side of the slot limit and likely result from measurement errors by the anglers. Also, the census does sample a few fish captured in Canadian waters but landed at New York locations, and which are not protected from harvest by the DEC slot limit. From 1985-1992 a variety of size limits were in effect in New York waters. In 1985-1987, there was only a small minimum size limit in effect. In 1988, and the first half of the 1989 fishing season, the 25 to <30 inch slot limit was in effect. During the second half of the 1989 fishing season, and from 1990-1992, there was a 27 to <30 inch slot limit. In 1993, the 25 to <30 inch slot limit was reinstated.

Table A23. Trout and salmon harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	211,794	97,179	107,657	92,957	77,586	83,241	59,719	71,854	87,349	109,147	78,166
Catch	324,794	154,442	160,572	143,998	126,203	138,029	112,962	140,545	155,799	170,868	125,378
% Harvested	65.5	62.9	67.0	64.6	61.5	60.3	52.9	51.1	56.1	63.9	62.3
Monthly estimates of harvest for all fishing boats:											
April	33,643	9,792	17,341	6,292	6,457	6,606	6,402	8,712	3,288	7,189	7,811
May	44,187	20,587	18,515	12,538	17,195	21,283	12,124	11,319	17,806	27,268	16,436
June	23,727	10,740	9,050	9,539	8,673	7,929	4,505	6,793	7,071	7,949	2,919
July	32,959	13,140	11,080	10,622	12,694	11,827	7,830	10,369	15,217	16,650	14,072
August	51,223	35,534	48,767	33,627	25,223	28,248	23,403	23,027	31,468	28,142	24,148
September	26,054	7,386	2,904	20,340	7,344	7,347	5,456	11,634	12,500	21,949	12,781
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	68,944	28,833	39,996	33,346	24,367	23,996	18,266	25,771	25,681	34,376	24,855
West/Central	25,520	5,172	8,041	9,075	4,163	6,159	9,451	4,277	8,162	10,565	9,210
East/Central	62,318	35,522	34,946	29,968	31,062	35,050	13,671	28,722	30,911	29,610	31,335
East	55,012	27,653	24,674	20,567	17,995	18,036	18,327	13,084	22,596	34,597	12,764
Percent of seasonal harvest and catch made by boats seeking any or all species of trout and salmon:											
% Harvest	99.5	97.2	99.9	99.6	99.7	99.7	99.5	99.3	99.8	99.9	99.2
% Catch	99.5	96.1	99.8	99.5	99.7	99.7	99.3	99.4	99.8	99.8	99.2
Seasonal rates of harvest and catch for boats seeking any or all species of trout and salmon:											
Harv/Boat Trip	1.527	1.424	1.631	1.493	1.190	1.303	1.129	1.491	1.507	1.849	1.576
Catch/Boat Trip	2.341	2.237	2.429	2.309	1.936	2.160	2.130	2.918	2.686	2.890	2.527
Harv/Angler Trip	0.533	0.480	0.555	0.514	0.399	0.449	0.379	0.529	0.523	0.631	0.530
Catch/Angler Trip	0.817	0.755	0.827	0.796	0.649	0.745	0.715	1.036	0.932	0.987	0.851
Harv/Angler Hour	0.091	0.081	0.096	0.090	0.068	0.076	0.065	0.094	0.096	0.115	0.094
Catch/Angler Hour	0.139	0.128	0.143	0.139	0.111	0.127	0.122	0.183	0.171	0.180	0.151
Monthly harvest rates per boat trip for boats seeking any or all species of trout and salmon:											
April	1.906	1.444	2.709	1.363	1.011	1.476	1.120	2.809	0.894	1.849	1.437
May	1.709	1.699	1.477	1.183	1.853	1.968	1.270	1.603	2.010	2.105	2.001
June	1.724	1.386	1.852	1.841	1.454	1.284	0.770	1.176	1.478	1.482	1.035
July	1.735	1.337	1.207	1.682	1.315	1.556	1.158	1.768	2.120	1.529	1.704
August	1.514	1.641	1.859	1.746	1.169	1.141	1.337	1.371	1.640	1.997	1.666
September	0.975	0.748	0.426	1.250	0.597	0.728	0.719	1.208	0.876	1.852	1.236
Seasonal harvest rates per boat trip among four geographic areas for boats seeking any or all species of trout and salmon:											
West	1.880	2.074	2.813	2.247	1.438	2.008	1.230	2.131	2.261	2.352	2.263
West/Central	1.184	0.824	1.152	1.384	0.718	1.018	2.274	0.836	1.341	1.450	1.295
East/Central	1.585	1.448	1.610	1.380	1.675	1.457	0.918	1.608	1.686	1.639	1.762
East	1.325	1.171	1.069	1.073	0.754	0.826	0.965	1.001	1.018	1.815	0.930

Table A24. Summary of parameters used to help assess angling quality among boats interviewed from April-September in the 1985-2006 DEC Lake Ontario fishing boat censuses. Parameters are given separately for boats seeking any or all species of trout and salmon, and for boats seeking smallmouth bass during the open season (starts 3rd Saturday in June). Beginning with the 1997 season, the daily bag limit for trout and salmon was changed to a maximum combination of 7 fish per angler, with no more than 3 lake trout, no more than 3 fish of coho salmon, Chinook salmon, rainbow trout or brown trout in aggregate, and no more than 1 Atlantic salmon (popularly known as the 3-3-1 limit). The maximum daily bag limit for trout and salmon from 1985-1996 was 5 fish in aggregate, with no more than 3 lake trout and no more than 1 Atlantic salmon.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Part A: Boats seeking any or all species of trout and salmon.											
Percent boats with zero harvest of:											
Any Trout or Salmon	53.2%	55.1%	52.3%	54.8%	59.1%	56.9%	63.0%	54.7%	52.2%	48.2%	57.2%
Any Fish Species	52.9%	54.6%	52.2%	54.5%	58.7%	56.4%	62.5%	54.4%	52.0%	48.0%	57.1%
Percent boats with zero catch of:											
Any Trout or Salmon	41.3%	43.7%	41.0%	43.4%	45.9%	43.5%	48.6%	35.0%	37.1%	32.8%	41.2%
Any Fish Species	39.7%	40.4%	37.9%	40.4%	41.2%	38.4%	44.2%	33.1%	35.0%	30.4%	39.9%
Since 1997, percent boats harvesting the daily bag limit of 3 lake trout per angler:											
Charters-Party Only	-	1.0%	2.5%	2.7%	0.7%	0.7%	6.0%	0.6%	0%	0.3%	0.9%
Charters-All Anglers	-	0%	0%	0.2%	0%	0%	0.5%	0%	0%	0%	0%
Noncharter Boats	-	0%	0.1%	0.1%	0%	0%	0%	0.1%	0%	0%	0%
Since 1997, percent boats harvesting the daily bag limit of 3 coho salmon, chinook salmon, rainbow trout, or brown trout, in aggregate, per angler:											
Charters-Party Only	-	10.3%	14.3%	8.6%	9.6%	9.5%	4.9%	16.5%	16.5%	23.1%	15.9%
Charters-All Anglers	-	1.3%	2.2%	2.0%	2.1%	1.3%	1.1%	3.3%	3.5%	3.5%	1.9%
Noncharter Boats	-	1.0%	2.3%	1.4%	0.5%	0.4%	0.4%	1.7%	1.5%	2.1%	0.7%
Part B: Boats seeking smallmouth bass during the open season.											
Percent boats with zero harvest of:											
Smallmouth Bass	59.2%	72.4%	64.9%	59.7%	62.3%	66.8%	75.1%	66.5%	71.6%	72.1%	77.2%
Any Fish Species	57.2%	71.5%	64.1%	58.8%	61.1%	65.4%	73.8%	64.0%	68.2%	66.6%	67.8%
Percent boats with zero catch of:											
Smallmouth Bass	27.2%	25.4%	21.4%	12.9%	21.0%	15.4%	21.5%	15.1%	30.8%	29.0%	42.8%
Any Fish Species	22.6%	21.5%	19.9%	11.7%	18.7%	13.8%	18.9%	14.2%	27.5%	24.8%	28.2%
Percent boats harvesting the daily bag limit of 5 smallmouth bass per angler:											
All Boats Combined	5.9%	2.8%	7.1%	10.6%	9.5%	5.4%	3.4%	9.6%	6.8%	3.4%	3.7%

Table A25. Smallmouth bass harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	46,710	34,588	49,177	92,556	74,954	62,735	43,161	65,633	34,380	32,816	17,759
Catch	199,136	269,773	287,024	433,993	401,049	424,845	442,539	405,723	178,555	145,224	74,052
% Harvested	23.5	12.8	17.1	21.3	18.7	14.8	9.8	16.2	19.3	22.6	24.0
Monthly estimates of harvest for all fishing boats:											
April	1	0	0	27	0	0	0	0	0	34	0
May	99	0	0	27	0	0	0	0	0	0	0
June	6,614	4,046	6,012	26,260	16,461	12,257	11,685	6,886	4,281	7,186	3,392
July	15,167	7,757	12,723	16,563	29,787	16,456	10,908	16,868	7,817	8,571	6,240
August	15,750	17,030	18,054	28,865	23,799	25,336	11,403	27,134	16,442	10,012	7,139
September	9,079	5,756	12,388	20,814	4,907	8,687	9,165	14,744	5,840	7,013	989
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	4,482	2,486	3,602	7,837	1,552	5,464	1,254	3,571	241	379	388
West/Central	3,372	3,143	3,473	7,763	4,014	3,409	4,182	3,589	442	2,175	309
East/Central	19,841	15,934	27,240	56,739	44,700	40,024	29,419	46,438	16,720	21,732	6,119
East	19,016	13,024	14,862	20,216	24,687	13,837	8,306	12,034	16,977	8,530	10,943
Percent of seasonal harvest and catch made by boats seeking smallmouth bass during the open season:											
% Harvest	91.0	91.2	97.2	95.6	94.4	95.0	90.6	93.0	93.3	96.1	96.4
% Catch	85.3	90.9	94.1	92.7	86.2	89.8	89.1	93.9	88.1	89.9	89.4
Seasonal rates of harvest and catch for boats seeking smallmouth bass during the open season:											
Harv/Boat Trip	2.089	1.263	2.066	2.947	2.539	1.920	1.401	2.200	1.435	1.426	1.260
Catch/Boat Trip	8.442	9.820	11.674	13.398	12.411	12.293	14.120	13.734	7.044	5.905	4.873
Harv/Angler Trip	0.899	0.544	0.898	1.263	1.089	0.830	0.644	0.987	0.637	0.668	0.553
Catch/Angler Trip	3.657	4.231	5.074	5.741	5.321	5.316	6.492	6.162	3.125	2.765	2.140
Harv/Angler Hour	0.260	0.170	0.258	0.373	0.350	0.254	0.201	0.285	0.200	0.215	0.178
Catch/Angler Hour	1.058	1.319	1.457	1.697	1.711	1.628	2.024	1.776	0.981	0.891	0.689
Monthly harvest rates per boat trip for boats seeking smallmouth bass during the open season:											
April	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-
June	1.826	0.970	1.258	2.709	3.307	1.902	1.703	1.576	1.679	1.474	1.069
July	1.841	0.907	1.854	2.300	2.260	1.648	1.061	1.765	0.920	1.078	1.006
August	2.352	1.501	2.196	3.459	2.868	2.314	1.206	2.369	2.003	1.554	1.907
September	2.332	1.842	3.140	3.387	1.557	1.655	2.156	3.332	1.122	1.889	0.902
Seasonal harvest rates per boat trip among four geographic areas for boats seeking smallmouth bass during the open season:											
West	1.467	0.591	1.289	2.397	0.523	1.146	0.521	1.112	0.189	0.233	0.314
West/Central	1.002	0.559	0.894	1.285	1.038	0.659	0.541	0.656	0.109	0.608	0.144
East/Central	1.993	1.526	2.618	3.599	3.057	2.482	1.938	2.716	1.352	1.857	0.862
East	3.031	1.890	2.214	3.210	3.123	2.078	1.514	2.743	2.675	1.422	2.688

Table A26. Smallmouth bass harvest rates per boat angler hour for localized sites, lake-wide harvest rates per boat angler hour, and site specific vs. lake-wide harvest rate ratios, among boats targeting smallmouth bass during the open season in the months of June-September from the 1985-2006 DEC Lake Ontario fishing boat censuses. Site specific harvest rates are given only for those years where the number of boats interviewed was equal to or greater than 10. Site abbreviations are explained in Table A1.

Harvest Rates Per Boat Angler Hour:										
Year Censused	Lake-wide Rate	Site Specific Rates (n>9)								
		NR	PB	IR	PV	SP	FH	OS	LS	HN
1985	0.190	0.086		0.155	0.264	0.275	0.147	0.194	0.197	0.200
1986	0.225			0.000	0.313	0.159	0.327		0.154	0.217
1987	0.269	0.273		0.085	0.187	0.254	0.298	0.269	0.230	0.324
1988	0.270	0.149		0.108	0.192	0.302	0.442	0.529	0.298	0.324
1989	0.368	0.253		0.093	0.358	0.647	0.216	0.235	0.479	0.498
1990	0.325	0.218		0.125	0.327	0.389	0.262	0.295	0.490	0.375
1991	0.271	0.339	0.019	0.068	0.244	0.258	0.164	0.092	0.353	0.108
1992	0.265	0.369		0.176	0.243	0.192	0.299		0.281	0.202
1993	0.248	0.098		0.138	0.161	0.411	0.301	0.122	0.198	0.208
1994	0.257	0.160		0.115	0.234	0.304	0.276		0.364	0.242
1995	0.236	0.127		0.123	0.449	0.331	0.289	0.130	0.246	0.146
1996	0.198	0.190	0.000	0.134	0.139	0.200	0.215		0.282	0.103
1997	0.170	0.065	0.060	0.089	0.288	0.208	0.215		0.233	0.160
1998	0.258	0.134		0.120	0.459	0.344	0.427	0.276	0.296	0.144
1999	0.373	0.267		0.106	0.522	0.583	0.410	0.416	0.390	0.272
2000	0.350	0.065	0.000	0.147	0.363	0.393	0.372	1.007	0.410	0.318
2001	0.254	0.137	0.000	0.109	0.401	0.351	0.225	0.278	0.185	0.158
2002	0.201	0.080		0.085	0.187	0.217	0.268	0.172	0.202	0.114
2003	0.285	0.199		0.058	0.349	0.444	0.264	0.169	0.400	0.271
2004	0.200	0.067		0.025	0.304	0.226	0.129	0.240	0.277	0.202
2005	0.215	0.049		0.063	0.435	0.203	0.189	0.397	0.181	0.150
2006	0.178	0.056		0.066	0.342	0.094	0.066	0.143	0.118	0.376

Year Censused	Ratios of (Site Specific Harvest Rate) / (Lake-wide Harvest Rate)									
	NR	PB	IR	PV	SP	FH	OS	LS	HN	
1985	0.456		0.819	1.391	1.449	0.775	1.025	1.038	1.056	
1986			0.000	1.390	0.707	1.456		0.683	0.963	
1987	1.016		0.316	0.696	0.946	1.111	1.000	0.857	1.208	
1988	0.553		0.398	0.709	1.116	1.634	1.956	1.103	1.199	
1989	0.687		0.252	0.974	1.759	0.589	0.638	1.302	1.354	
1990	0.669		0.385	1.006	1.196	0.805	0.908	1.506	1.152	
1991	1.250	0.071	0.252	0.901	0.951	0.606	0.340	1.301	0.398	
1992	1.395		0.667	0.917	0.724	1.128		1.061	0.764	
1993	0.396		0.555	0.648	1.653	1.213	0.492	0.799	0.838	
1994	0.622		0.448	0.911	1.183	1.076		1.418	0.943	
1995	0.540		0.522	1.906	1.404	1.226	0.551	1.045	0.621	
1996	0.961	0.000	0.677	0.704	1.013	1.088		1.424	0.519	
1997	0.381	0.356	0.522	1.699	1.227	1.265		1.376	0.942	
1998	0.520		0.465	1.781	1.334	1.657	1.070	1.147	0.559	
1999	0.714		0.285	1.400	1.562	1.099	1.115	1.044	0.730	
2000	0.185	0.000	0.421	1.036	1.123	1.063	2.878	1.172	0.908	
2001	0.539	0.000	0.430	1.579	1.382	0.884	1.093	0.728	0.622	
2002	0.399		0.421	0.933	1.082	1.335	0.854	1.005	0.568	
2003	0.699		0.205	1.225	1.559	0.929	0.595	1.406	0.953	
2004	0.334		0.127	1.522	1.132	0.644	1.201	1.383	1.010	
2005	0.226		0.295	2.020	0.944	0.879	1.844	0.838	0.698	
2006	0.313		0.368	1.919	0.526	0.368	0.804	0.663	2.112	

Table A27. Yellow perch harvest and catch data for the months of April-September from the 1985-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	8,004	5,442	5,662	14,394	10,127	7,108	4,595	8,171	18,380	8,942	13,858
Catch	11,167	14,532	21,984	56,490	25,467	18,493	16,363	23,179	39,026	33,209	39,801
% Harvested	69.0	37.4	25.8	25.5	39.8	38.4	28.1	35.3	47.1	26.9	34.8
Monthly estimates of harvest for all fishing boats:											
April	7	0	19	0	0	168	0	0	0	0	0
May	1,294	0	1,778	700	0	1,386	0	378	29	1,588	0
June	1,001	2,671	345	3,753	2,897	455	2,754	708	1,464	2,933	7,360
July	2,538	59	457	164	3,174	1,802	1,156	1,905	2,202	486	1,476
August	656	1,673	999	5,879	1,459	2,488	280	3,976	8,617	232	2,233
September	2,508	1,039	2,064	3,898	2,597	809	405	1,203	6,069	3,703	2,789
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	2,942	23	204	712	3,419	209	0	910	126	3,614	506
West/Central	780	906	657	116	1,452	773	386	864	3,444	120	1,180
East/Central	2,489	4,430	4,227	7,596	4,570	5,019	4,049	6,371	14,512	4,908	8,665
East	1,794	83	574	5,970	685	1,106	161	26	298	299	3,507

Table A28. Walleye harvest and catch data for the months of April-September from the 1985-2006 DEC

	Year Censused										
	1985-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seasonal (6-month) estimates of harvest and catch for all fishing boats:											
Harvest	314	3,056	1,430	530	496	445	1,020	560	352	2,465	164
Catch	406	3,609	1,540	642	1,015	518	1,065	690	443	2,715	408
% Harvested	63.2	84.7	92.9	82.6	48.9	85.9	95.8	81.2	79.5	90.8	40.2
Monthly estimates of harvest for all fishing boats:											
April	0	0	0	0	0	0	0	0	0	0	0
May	60	1,013	87	105	42	15	48	64	0	106	73
June	53	95	0	26	25	28	14	108	280	0	0
July	50	0	0	282	82	38	0	19	0	0	15
August	91	1,790	788	94	161	100	872	308	72	2,340	15
September	60	157	554	23	185	263	85	61	0	19	62
Seasonal estimates of harvest among four geographic areas for all fishing boats:											
West	25	218	78	189	76	44	198	21	30	0	70
West/Central	3	0	0	0	0	0	0	0	0	0	0
East/Central	16	730	53	44	0	0	45	85	0	22	79
East	270	2,108	1,299	296	420	401	777	454	322	2,443	14

Lake Ontario fishing boat censuses.

Table A29. Estimates of sea and silver lampreys observed attached to angler caught trout and salmon for the months of April-September from the 1986-2006 DEC Lake Ontario fishing boat censuses.

	Year Censused										
	1986-96 avg	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Monthly and seasonal estimates of lampreys observed:											
April	309	174	447	324	35	208	108	225	31	439	299
May	605	821	791	140	252	484	524	387	624	2,033	731
June	366	314	300	172	259	187	146	268	330	800	178
July	296	488	263	55	117	795	58	462	636	891	1,288
August	430	588	686	241	297	663	392	1,609	1,170	1,120	1,173
September	107	17	0	149	157	92	66	420	356	1,072	381
Total	2,112	2,402	2,488	1,081	1,117	2,429	1,295	3,370	3,147	6,356	4,050
Seasonal estimates of lampreys observed among four geographic areas:											
West	927	985	515	392	443	979	497	1,568	1,151	1,897	1,329
West/Central	275	189	395	126	58	301	247	609	301	665	583
East/Central	486	725	903	208	503	741	232	817	803	1,913	1,719
East	425	502	675	355	114	408	319	377	891	1,882	419
Percentage of lampreys observed that were attached to angler caught trout and salmon:											
Percent	99.1%	98.8%	98.7%	100.0%	100.0%	98.7%	97.6%	100.0%	100.0%	98.5%	98.3%
Monthly and seasonal estimates of lampreys attached to angler caught trout & salmon, per 1000 trout & salmon caught:											
April	5.84	12.43	17.59	27.53	2.71	14.84	4.54	11.20	3.39	41.86	21.43
May	7.55	25.16	24.43	6.42	9.23	14.93	26.03	19.42	18.46	43.89	25.51
June	7.00	15.90	18.04	12.74	14.51	12.63	16.78	19.70	26.83	41.34	33.17
July	5.40	18.83	14.36	3.15	5.25	36.48	4.17	20.59	22.81	33.20	56.32
August	6.23	11.19	10.84	4.94	8.07	15.29	10.19	34.09	21.32	27.05	31.11
September	3.82	1.77	0.00	4.86	17.37	7.91	8.31	24.29	20.01	40.52	22.65
Total	6.43	15.55	15.49	7.51	8.85	17.60	11.46	23.98	20.20	37.20	32.30
Seasonal estimates of lampreys attached to angler caught trout & salmon by geographic area, per 1000 trout & salmon caught:											
West	8.23	20.77	8.79	7.36	10.78	21.03	11.27	29.14	21.28	29.88	28.48
West/Central	6.47	14.87	20.71	5.79	4.34	20.88	11.81	32.12	15.25	27.56	32.55
East/Central	5.36	13.84	18.45	5.21	11.20	14.16	10.30	16.40	15.77	48.32	38.39
East	5.29	11.97	19.86	12.21	4.25	16.49	12.54	20.98	28.68	43.11	26.15
Seasonal percent composition of salmonine host species to which the lampreys were attached:											
Coho Salmon	0.8%	9.0%	6.8%	12.5%	3.3%	2.6%	2.5%	2.2%	1.0%	1.5%	2.6%
Chinook Salmon	34.0%	20.5%	23.0%	25.0%	43.3%	32.5%	30.0%	62.9%	74.3%	59.2%	76.1%
Rainbow Trout	5.8%	20.5%	9.5%	3.1%	3.3%	13.0%	7.5%	11.2%	8.9%	5.1%	3.4%
Atlantic Salmon	0.2%	0.0%	1.4%	3.1%	0.0%	0.0%	5.0%	1.1%	0.0%	0.0%	0.0%
Brown Trout	12.1%	19.2%	20.3%	34.4%	46.7%	29.9%	30.0%	12.4%	13.9%	30.1%	17.1%
Lake Trout	47.1%	30.8%	39.2%	21.9%	3.3%	22.1%	25.0%	10.1%	2.0%	4.1%	0.9%
Seasonal percent composition of salmonine host species for lampreys assuming equal numbers of fish caught:											
Coho Salmon	3.1%	29.8%	6.6%	11.9%	11.9%	9.3%	2.9%	2.3%	9.2%	7.1%	8.5%
Chinook Salmon	30.6%	12.2%	8.9%	6.2%	39.4%	25.2%	4.8%	7.2%	37.9%	24.0%	52.7%
Rainbow Trout	7.2%	19.9%	3.5%	1.1%	7.2%	17.4%	3.9%	5.7%	20.6%	15.8%	7.8%
Atlantic Salmon	4.5%	0.0%	57.5%	63.2%	0.0%	0.0%	80.8%	78.2%	0.0%	0.0%	0.0%
Brown Trout	17.2%	15.5%	7.8%	10.2%	35.9%	24.8%	5.2%	2.2%	24.2%	35.2%	26.9%
Lake Trout	37.5%	22.7%	15.8%	7.4%	5.6%	23.3%	2.4%	4.4%	8.1%	17.9%	4.1%

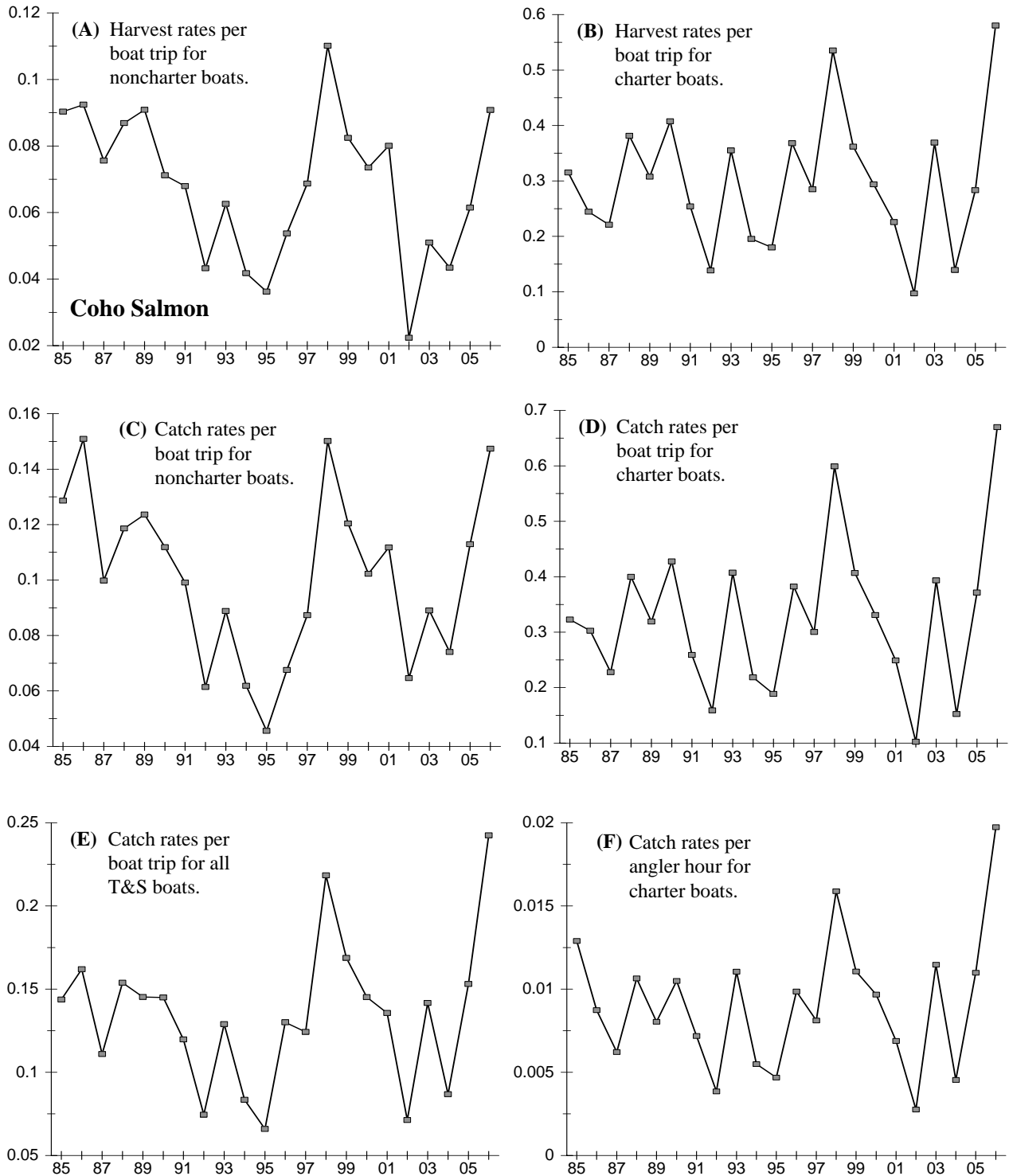


Figure A1. Coho salmon harvest and catch rates among boats seeking any or all species of trout and salmon (T&S boats) from the 1985-2006 DEC Lake Ontario fishing boat censuses. Year censused on the X-axis, harvest or catch rate on the Y-axis. Shown are harvest rates per boat trip for noncharter boats (part A) and charter boats (part B); catch rates per boat trip for noncharter boats (part C), charter boats (part D), and all T&S boats (part E); and catch rates per angler hour for charter boats (part F).

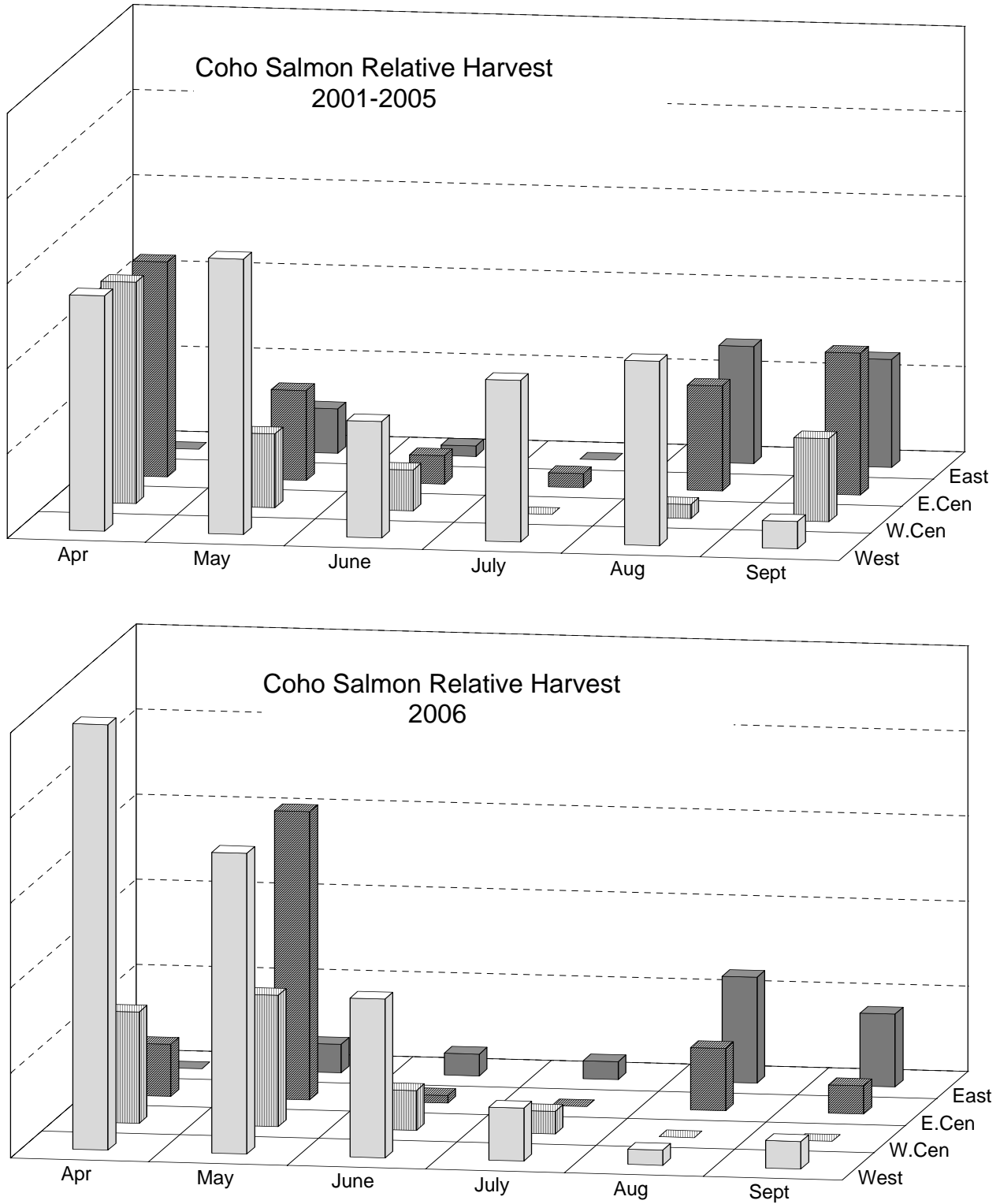
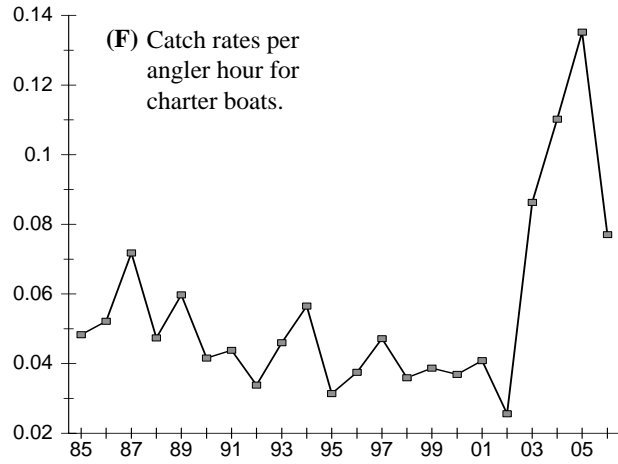
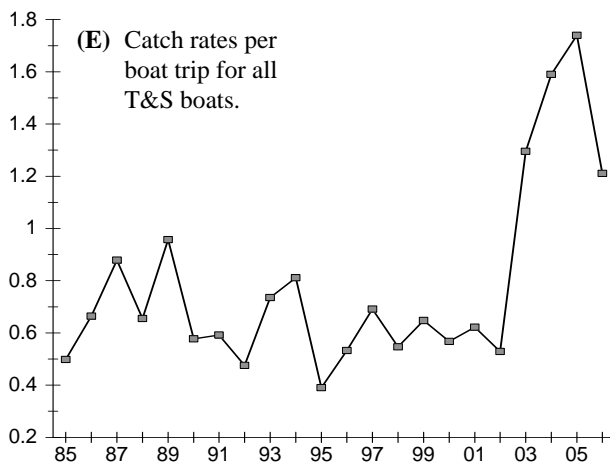
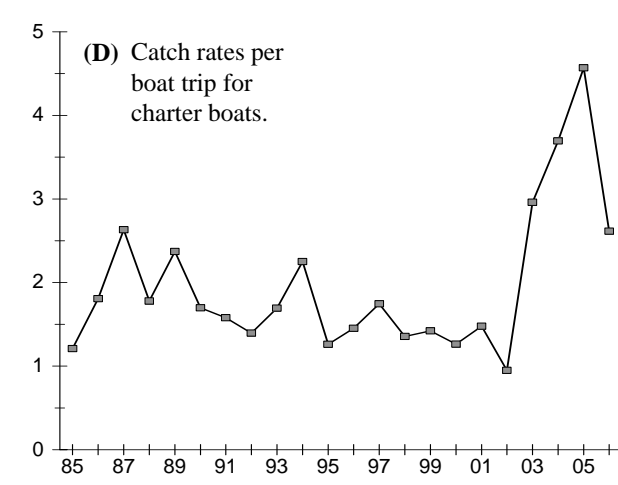
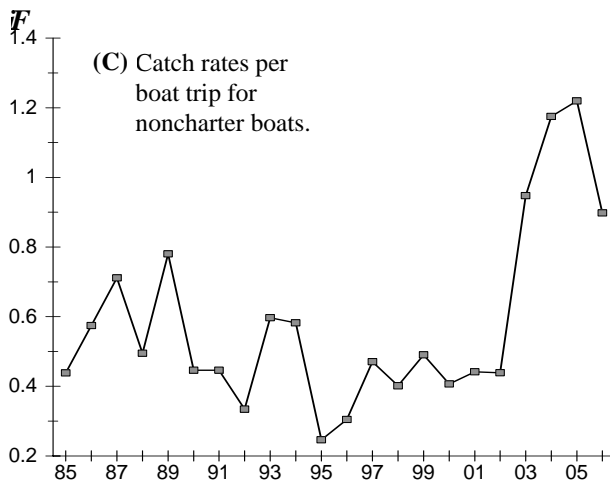
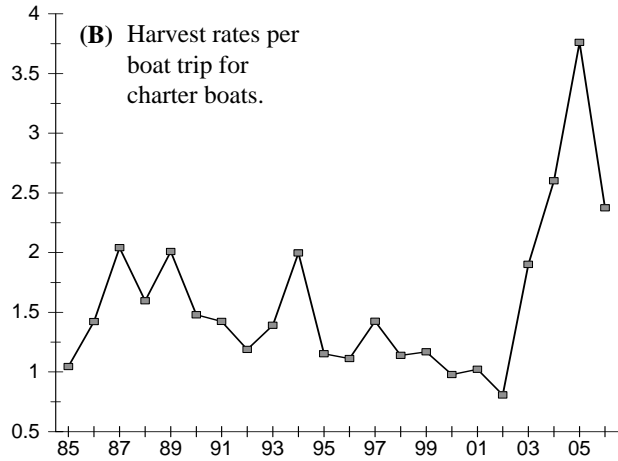
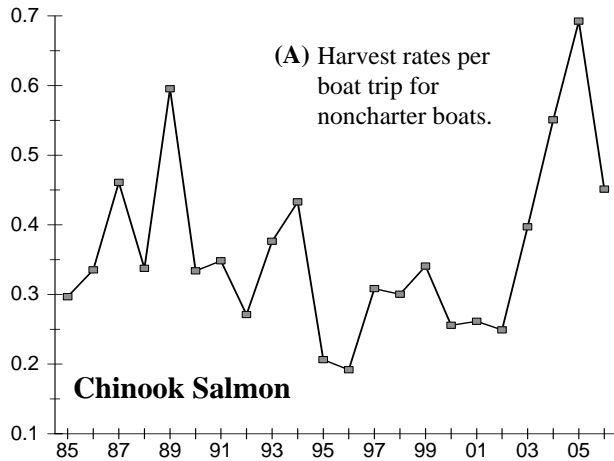


Figure A2. Coho salmon relative harvest patterns per boat trip, by month and geographic area, for boats seeking any or all species of trout and salmon from the 2001-2005 and 2006 DEC Lake Ontario fishing boat censuses.



A3. Chinook salmon harvest and catch rates among boats seeking any or all species of trout and salmon (T&S boats) from the 1985-2006 DEC Lake Ontario fishing boat censuses. Year censused on the X-axis, harvest or catch rate on the Y-axis. Shown are harvest rates per boat trip for noncharter boats (part A) and charter boats (part B); catch rates per boat trip for noncharter boats (part C), charter boats (part D), and all T&S boats (part E); and catch rates per angler hour for charter boats (part F).

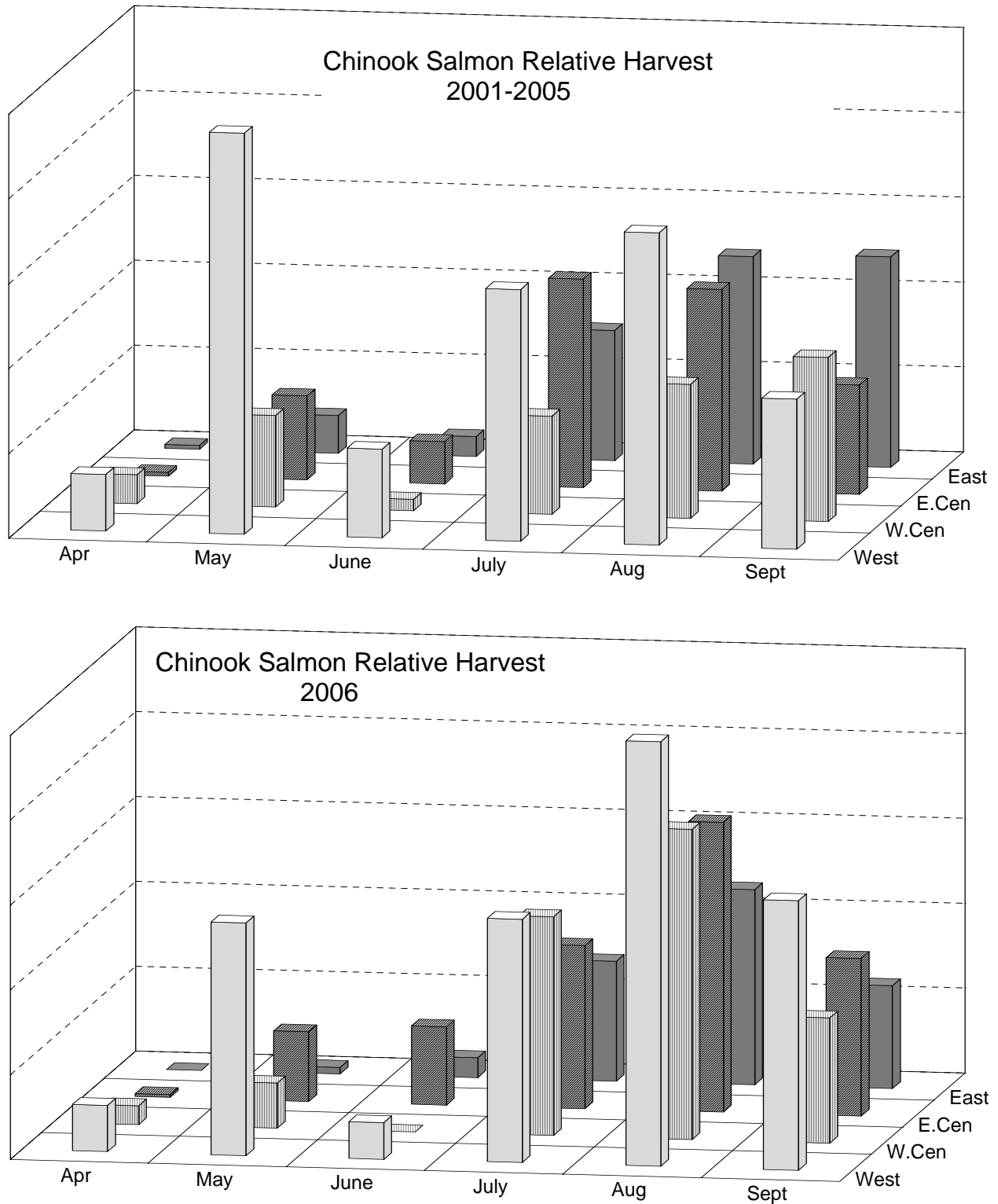


Figure A4. Chinook salmon relative harvest patterns per boat trip, by month and geographic area, for boats seeking any or all species of trout and salmon from the 2001-2005 and 2006 DEC Lake Ontario fishing boat censuses.

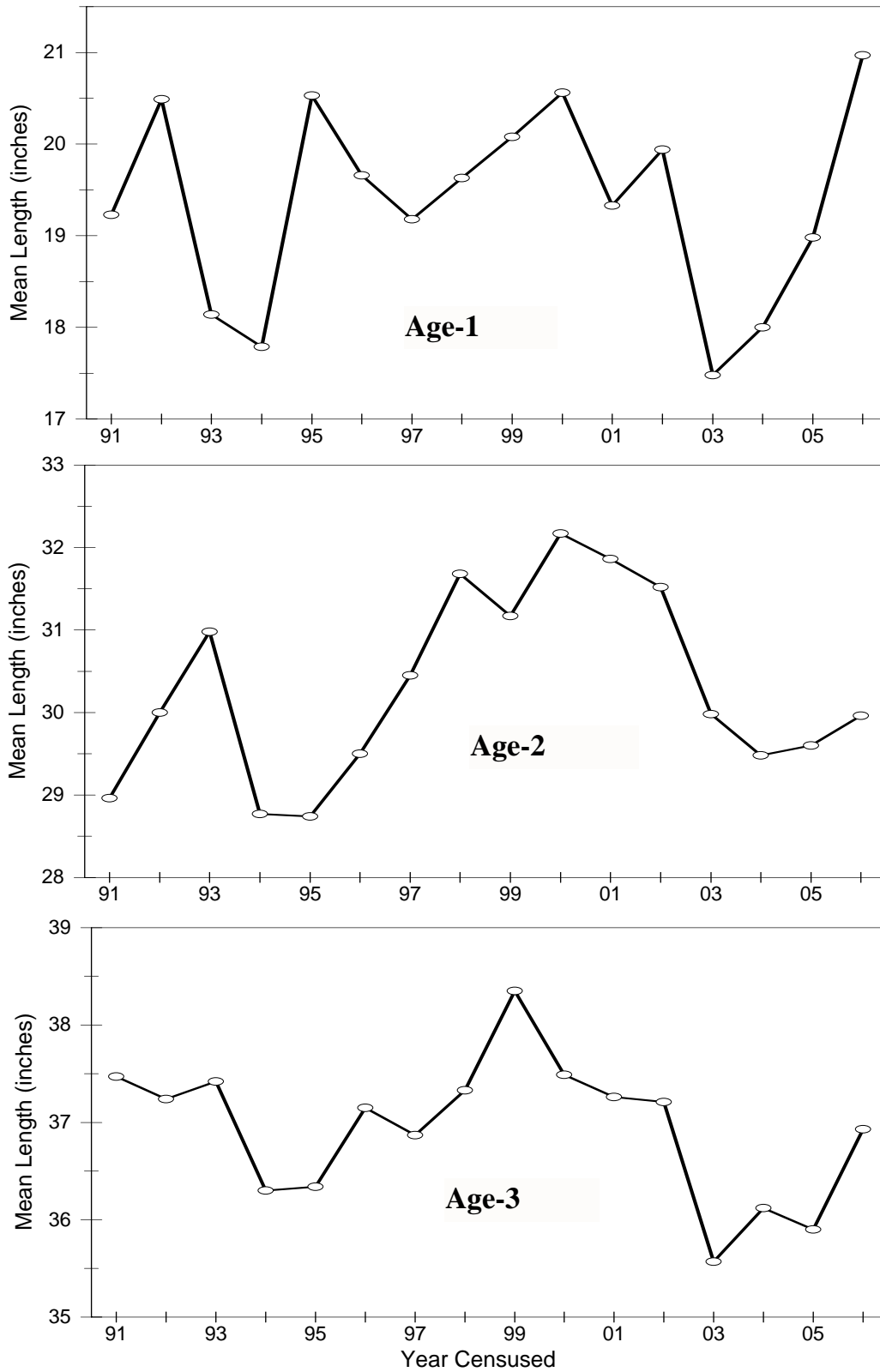


Figure A5. Mean length (total length in inches) of age-1, age-2, and age-3 Chinook salmon sampled in the month of August in the 1991-2006 DEC Lake Ontario fishing boat censuses.

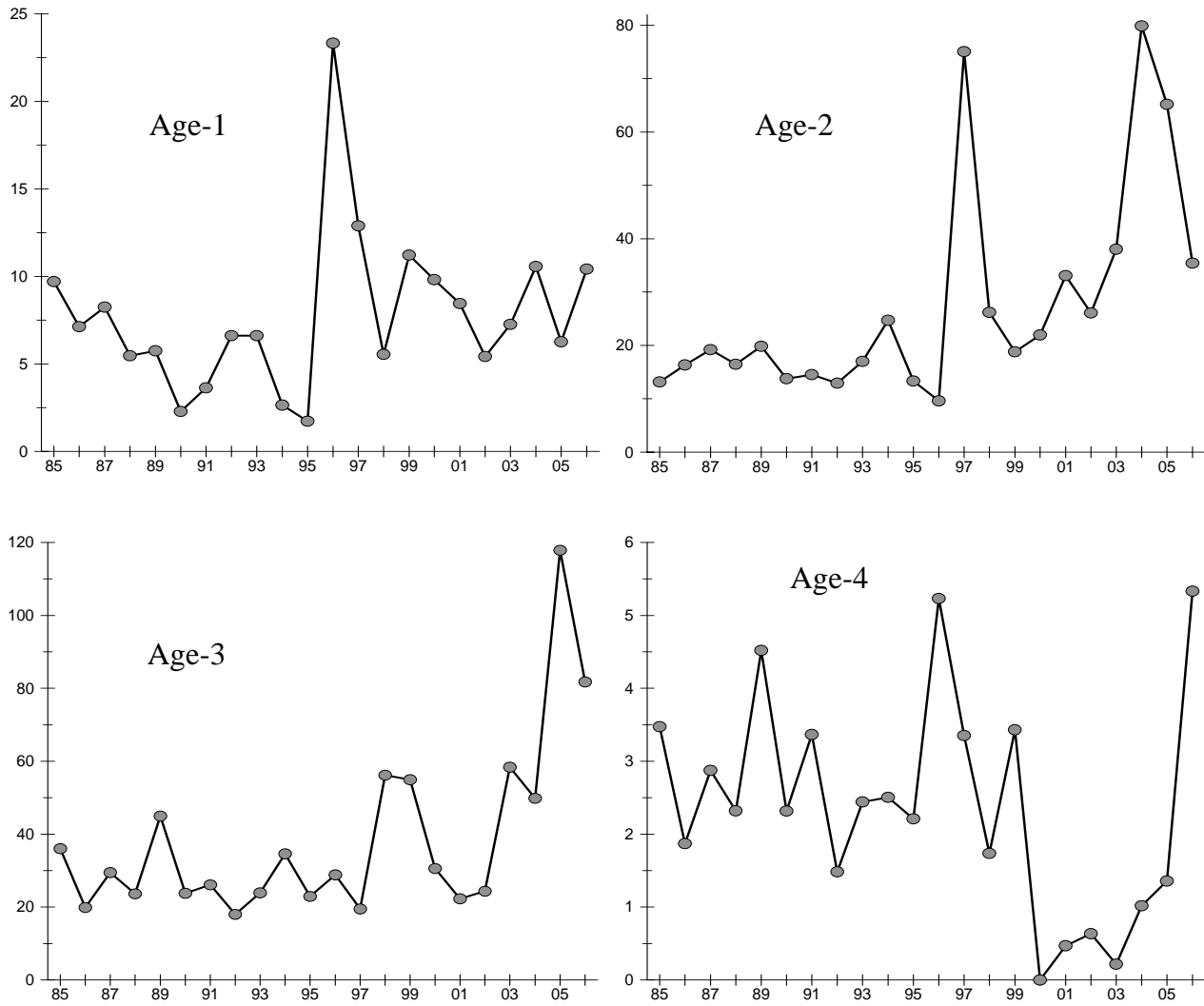


Figure A6. Relative harvest data for age-1, age-2, age-3, and age-4 Chinook salmon from the 1985-2006 DEC Lake Ontario fishing boat censuses. Relative harvest is defined as number harvested per 150,000 fishing boat trips targeted at trout and salmon, per 2,000,000 fingerling equivalents stocked. Relative harvest data in thousands on the Y-axis, year harvested (census year) on the X-axis.

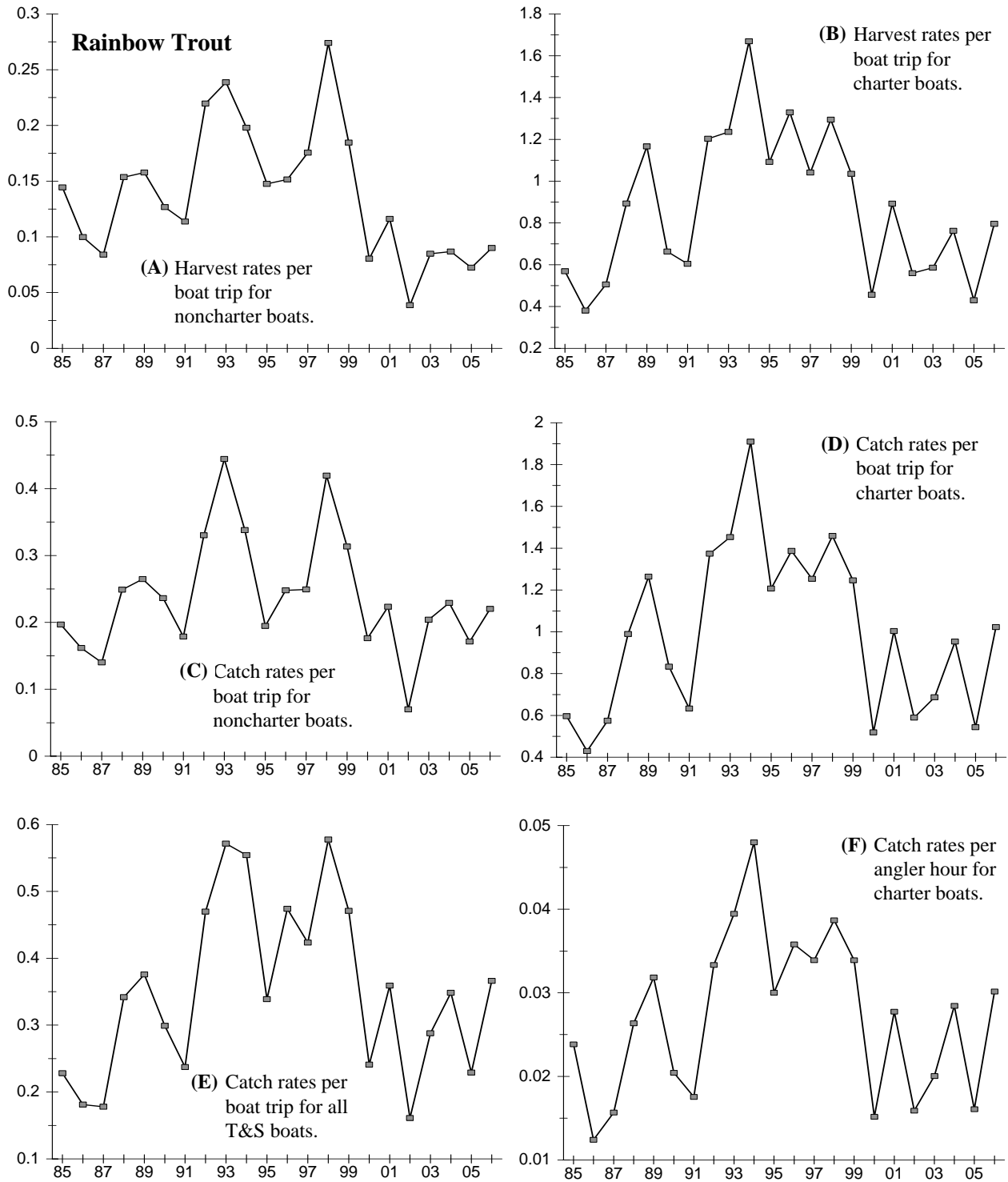


Figure A7. Rainbow trout harvest and catch rates among boats seeking any or all species of trout and salmon (T&S boats) from the 1985-2006 DEC Lake Ontario fishing boat censuses. Year censused on the X-axis, harvest or catch rate on the Y-axis. Shown are harvest rates per boat trip for noncharter boats (part A) and charter boats (part B); catch rates per boat trip for noncharter boats (part C), charter boats (part D), and all T&S boats (part E); and catch rates per angler hour for charter boats (part F).

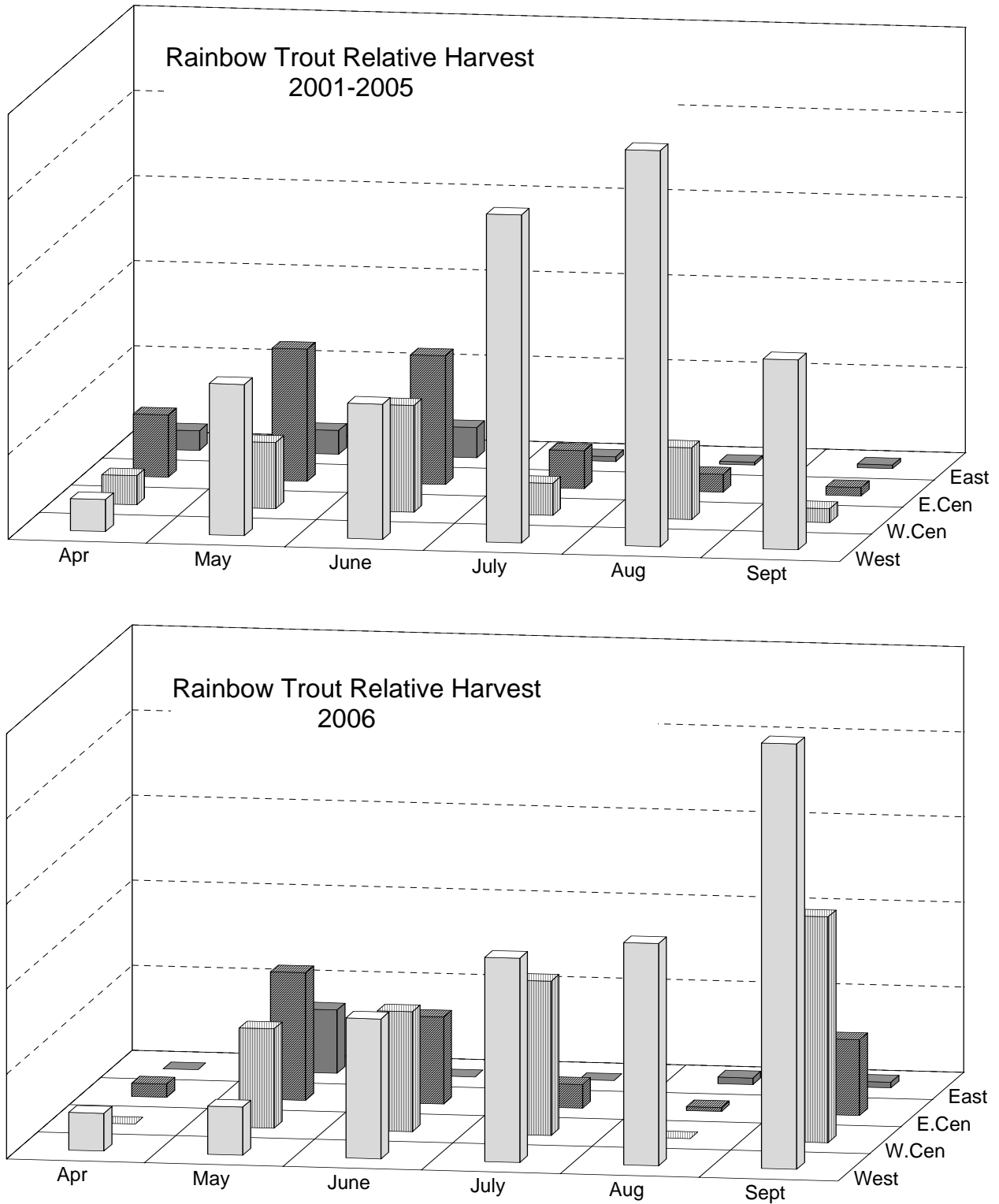


Figure A8. Rainbow trout relative harvest patterns per boat trip, by month and geographic area, for boats seeking any or all species of trout and salmon from the 2001-2005 and 2006 DEC Lake Ontario fishing boat censuses.

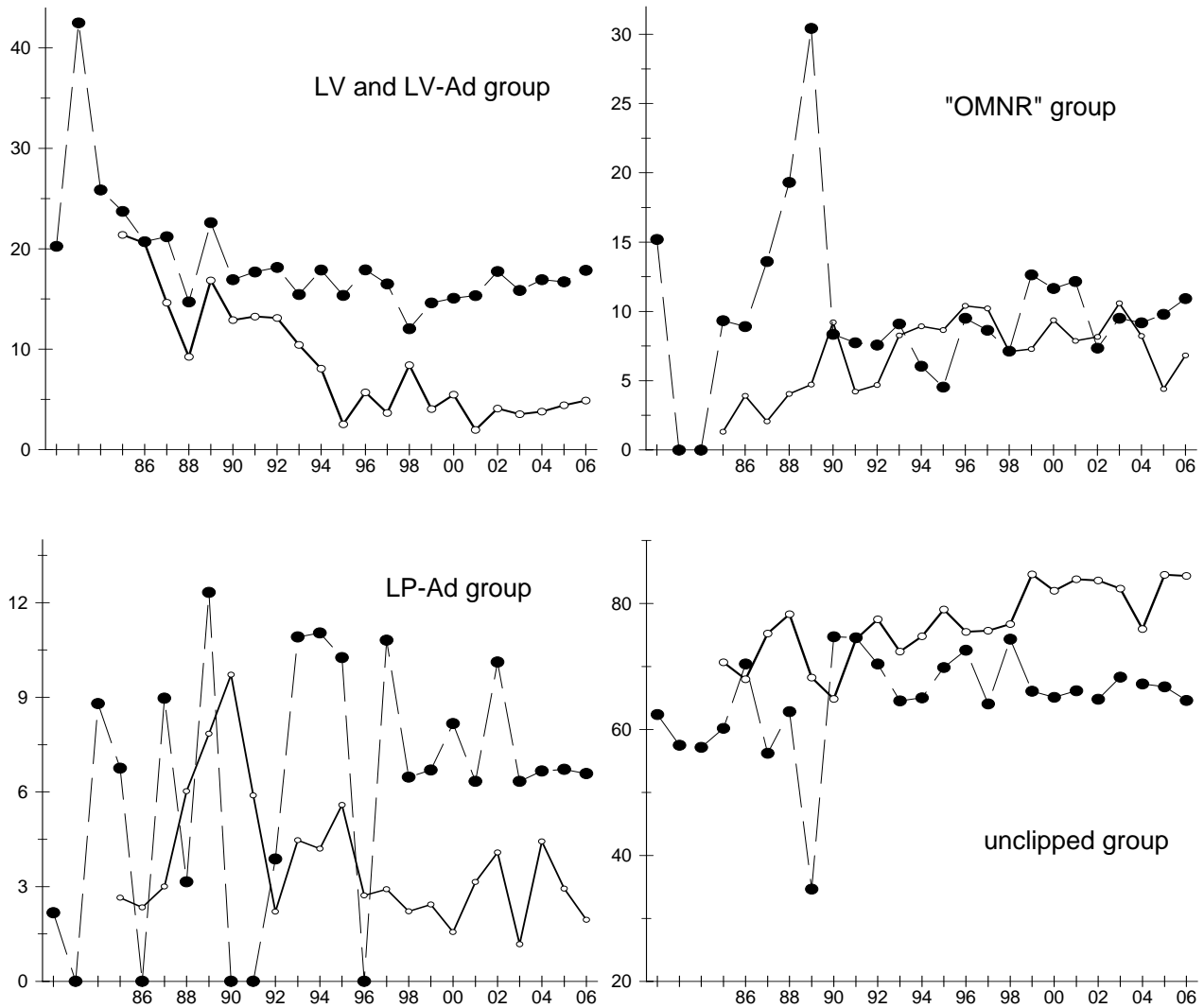


Figure A9. Percent contribution of unclipped rainbow trout and three fin clip groups in the 1985-2006 DEC Lake Ontario fishing boat censuses (dark solid lines with smaller open symbols), and percent contribution of these same unclipped and clipped groups to the total number of rainbow trout yearling equivalents stocked for the 1980-2004 year classes (dashed lines with larger black symbols). Percent contribution on the Y-axis, and year on the X-axis. For the fishing boat census, year is equal to the year the data were collected. For the year class stocking data, year is equal to the year when these fish would have been age-2, the age where harvest in the boat fishery is normally highest. For example, 2004 census data and the 2002 year class data (age-2 in 2004) are both plotted opposite year 04 (2004).

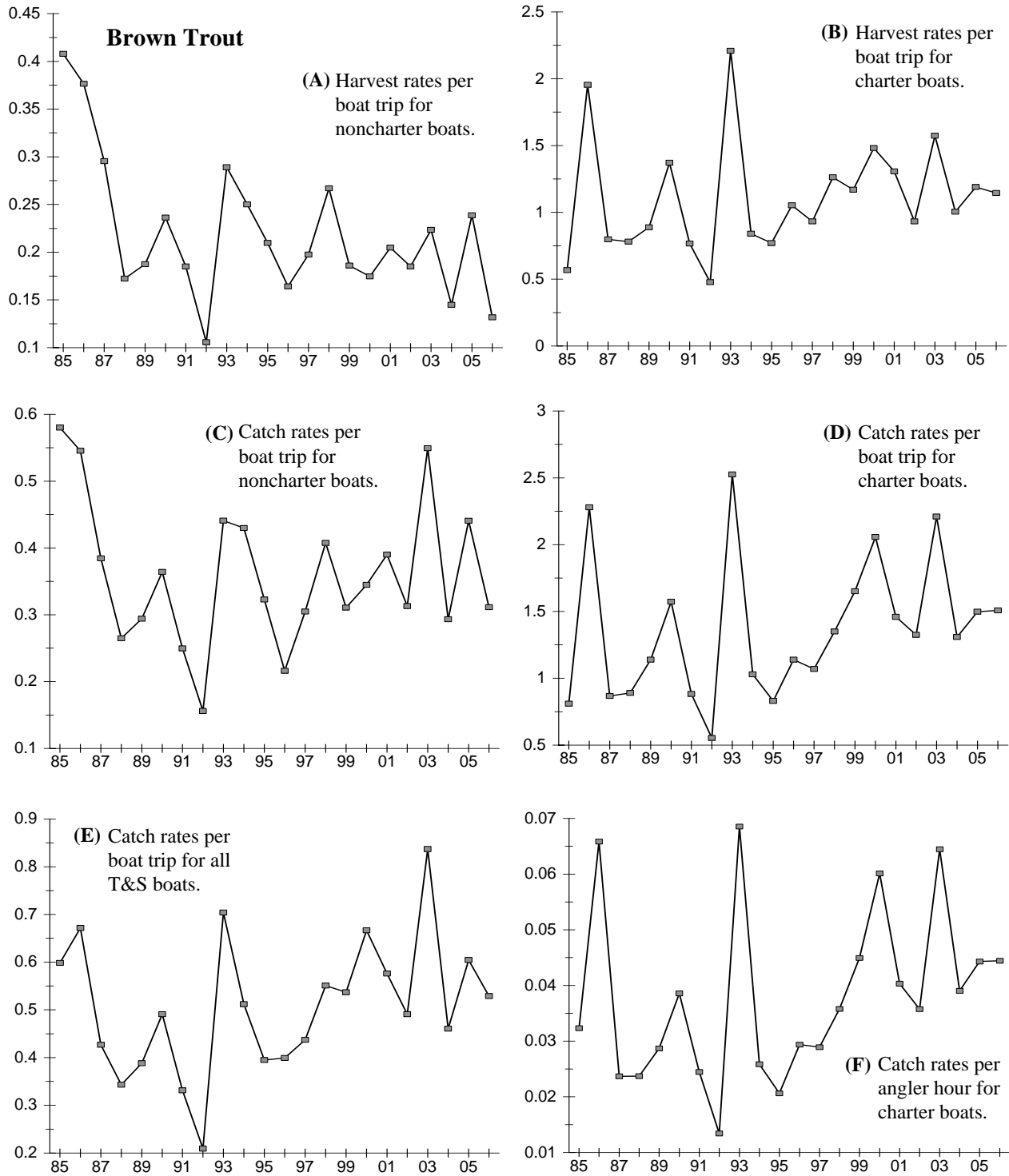


Figure A10. Brown trout harvest and catch rates among boats seeking any or all species of trout and salmon (T&S boats) from the 1985-2006 DEC Lake Ontario fishing boat censuses. Year censused on the X-axis, harvest or catch rate on the Y-axis. Shown are harvest rates per boat trip for noncharter boats (part A) and charter boats (part B); catch rates per boat trip for noncharter boats (part C), charter boats (part D), and all T&S boats (part E); and catch rates per angler hour for charter boats (part F).

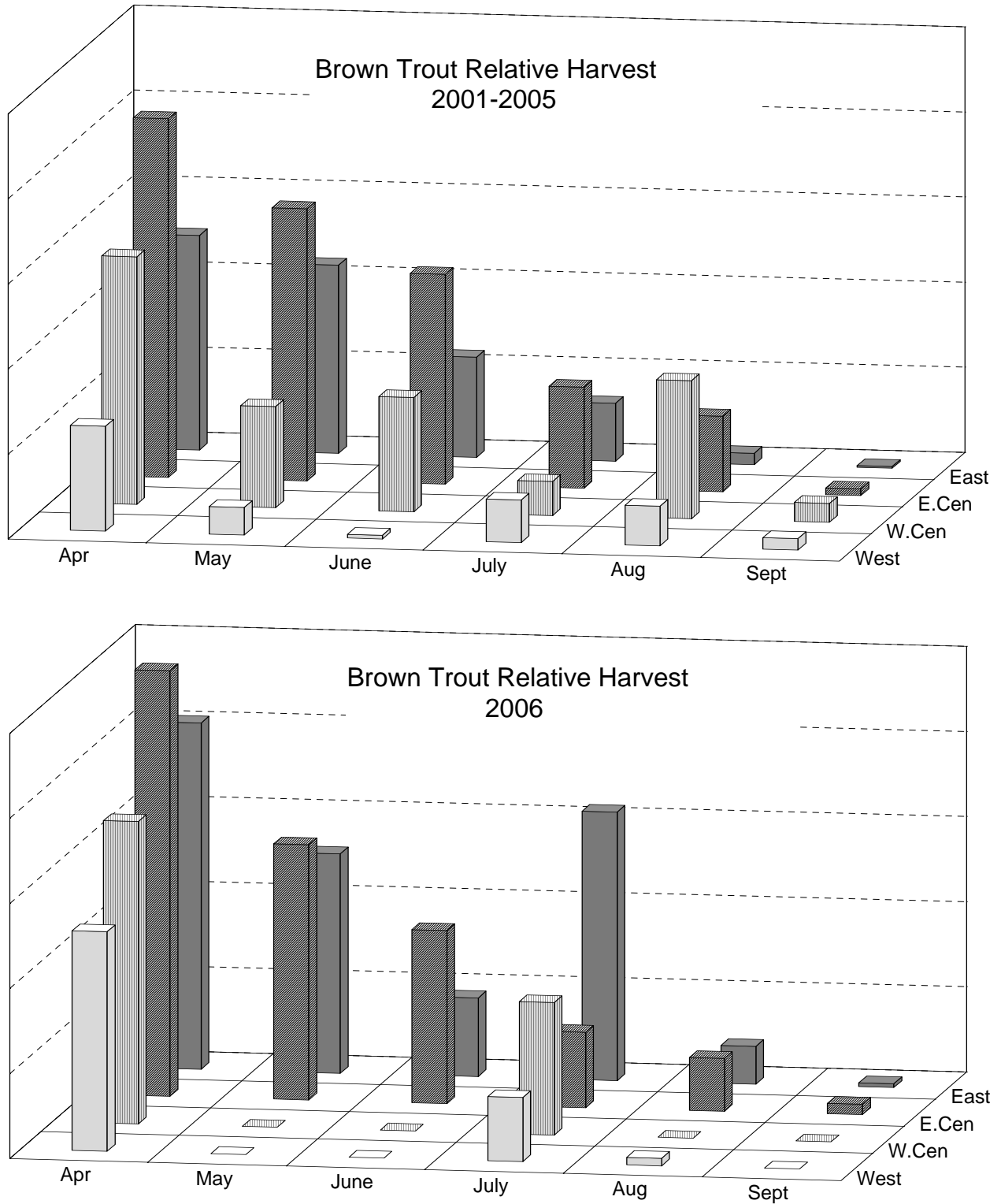
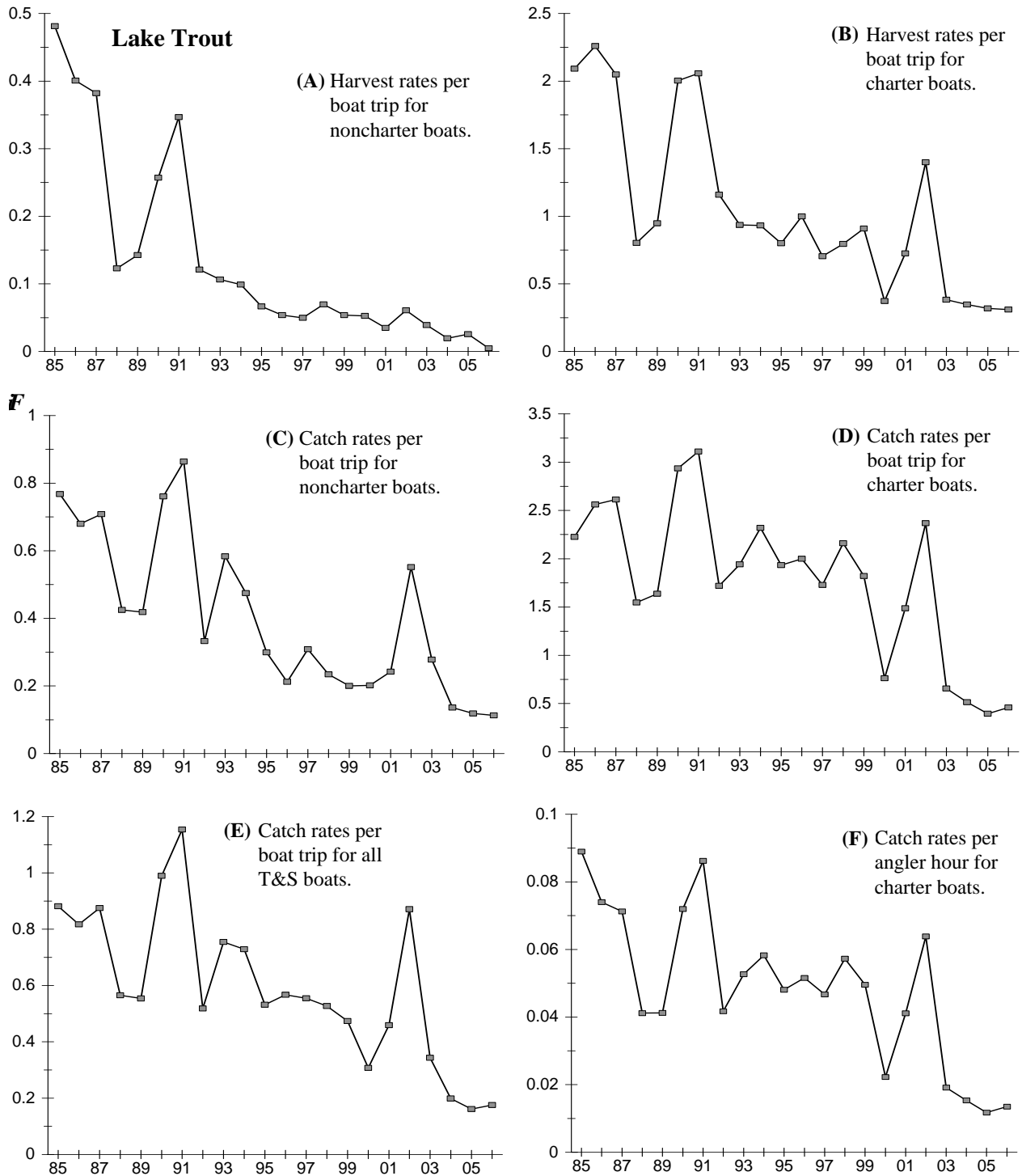


Figure A11. Brown trout relative harvest patterns per boat trip, by month and geographic area, for boats seeking any or all species of trout and salmon from the 2001-2005 and 2006 DEC Lake Ontario fishing boat censuses.



A12. Lake trout harvest and catch rates among boats seeking any or all species of trout and salmon (T&S boats) from the 1985-2006 DEC Lake Ontario fishing boat censuses. Year censused on the X-axis, harvest or catch rate on the Y-axis. Shown are harvest rates per boat trip for noncharter boats (part A) and charter boats (part B); catch rates per boat trip for noncharter boats (part C), charter boats (part D), and all T&S boats (part E); and catch rates per angler hour for charter boats (part F).

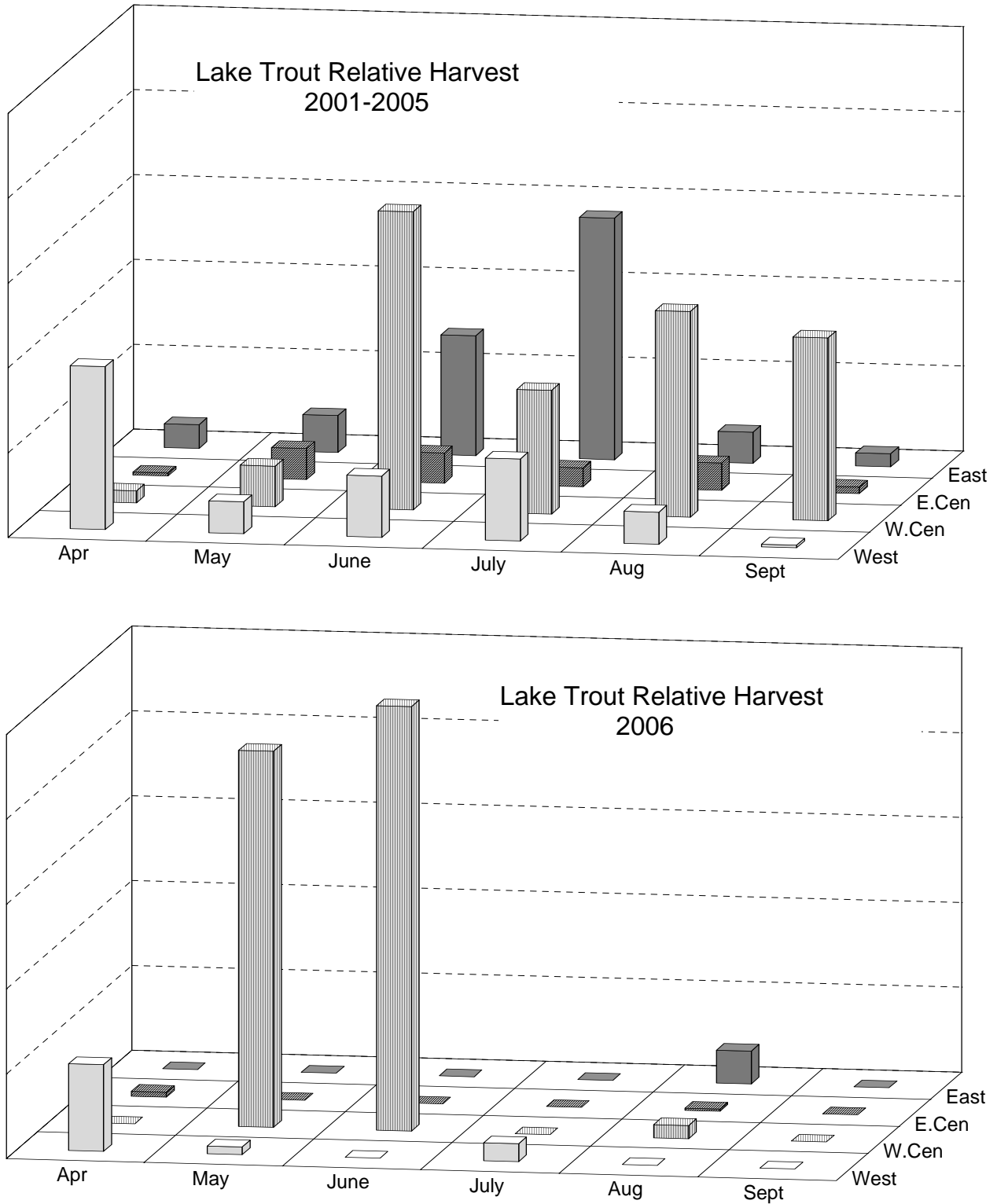


Figure A13. Lake trout relative harvest patterns per boat trip, by month and geographic area, for boats seeking any or all species of trout and salmon from the 2001-2005 and 2006 DEC Lake Ontario fishing boat censuses.

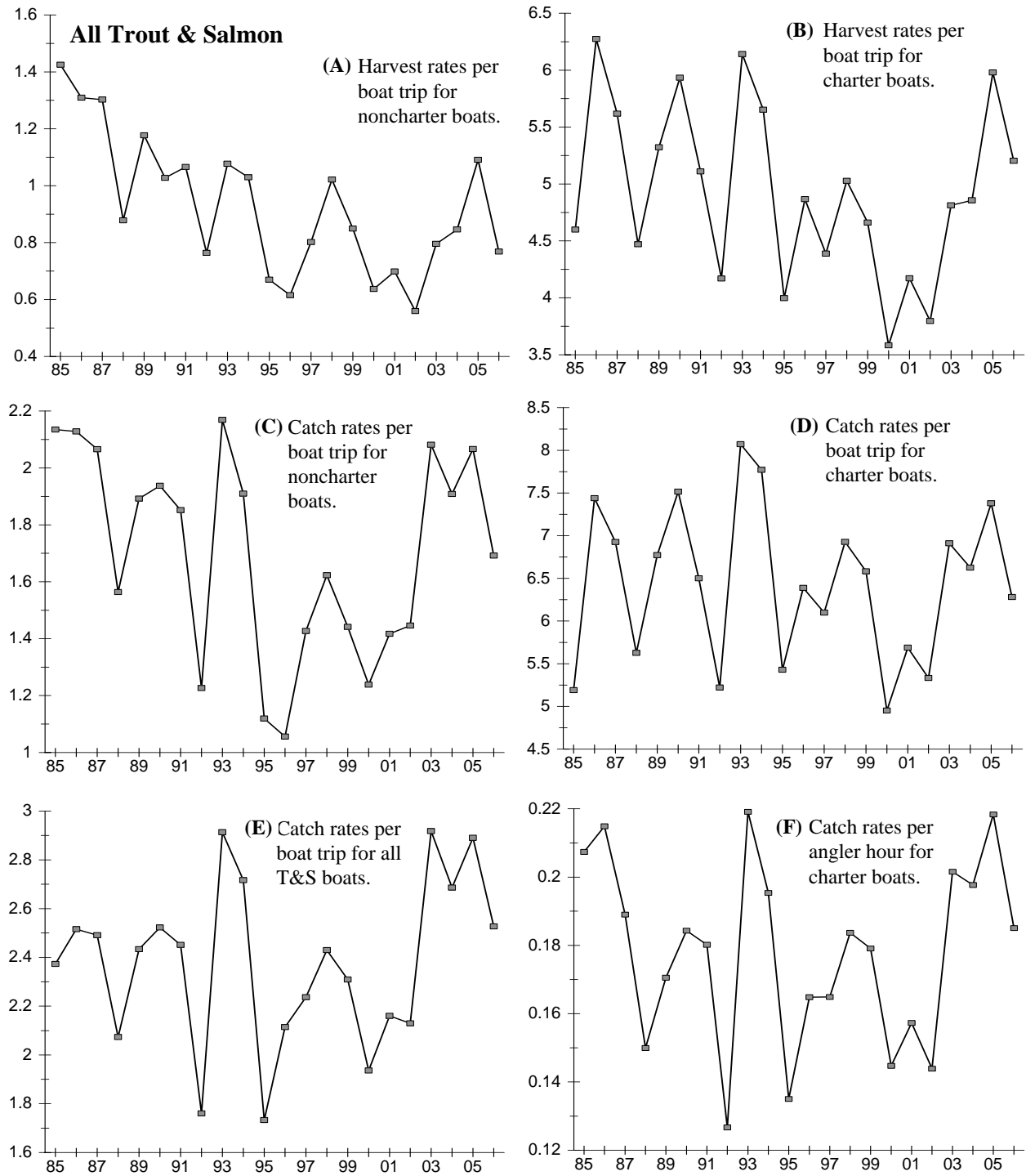


Figure A14. Harvest and catch rates for the total of all trout and salmon among boats seeking any or all species of trout and salmon (T&S boats) from the 1985-2006 DEC Lake Ontario fishing boat censuses. Year censused on the X-axis, harvest or catch rate on the Y-axis. Shown are harvest rates per boat trip for noncharter boats (part A) and charter boats (part B); catch rates per boat trip for noncharter boats (part C), charter boats (part D), and all T&S boats (part E); and catch rates per angler hour for charter boats (part F).

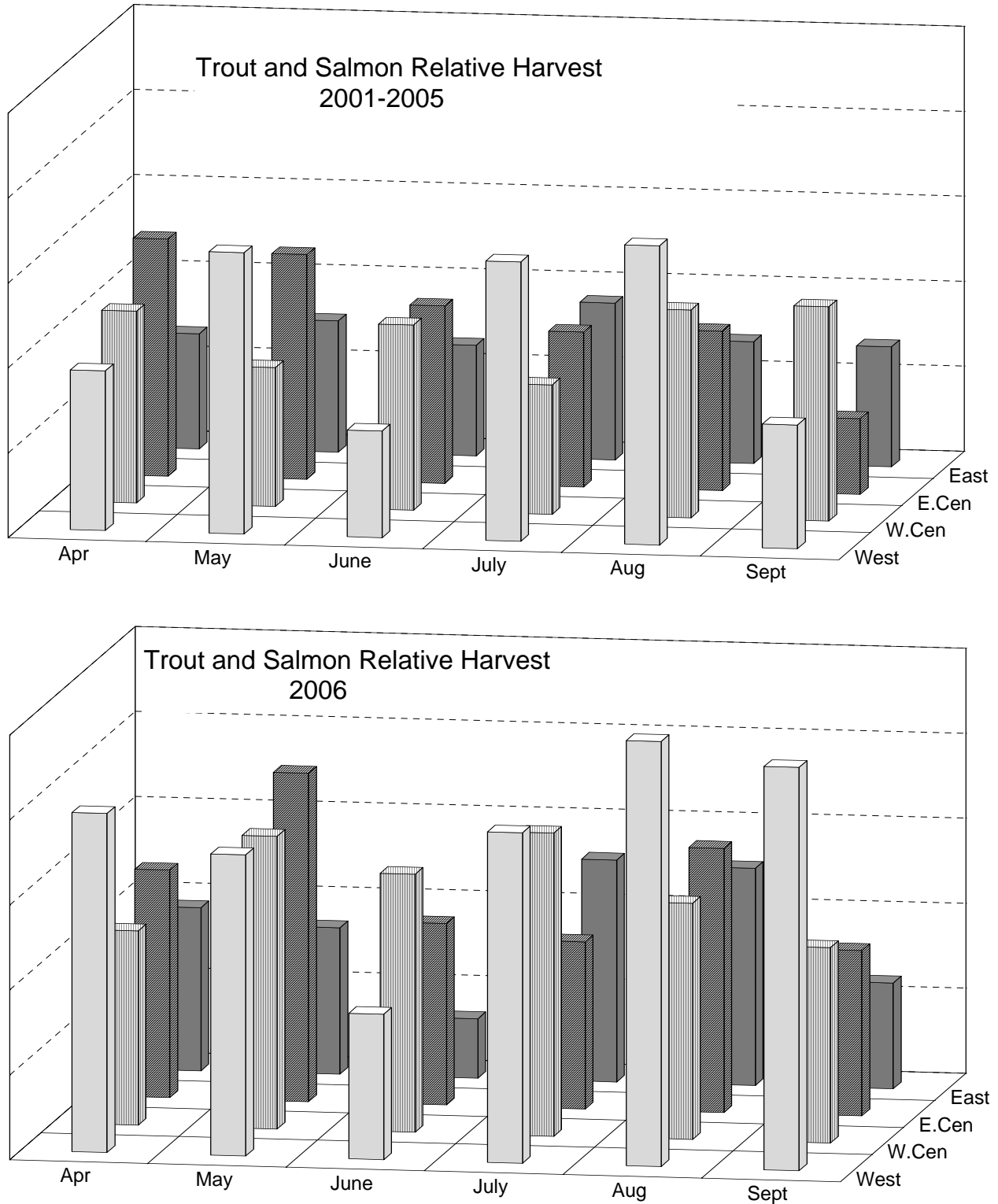


Figure A15. Total trout and salmon relative harvest patterns per boat trip, by month and geographic area, for boats seeking any or all species of trout and salmon from the 2001-2005 and 2006 DEC Lake Ontario fishing boat censuses.

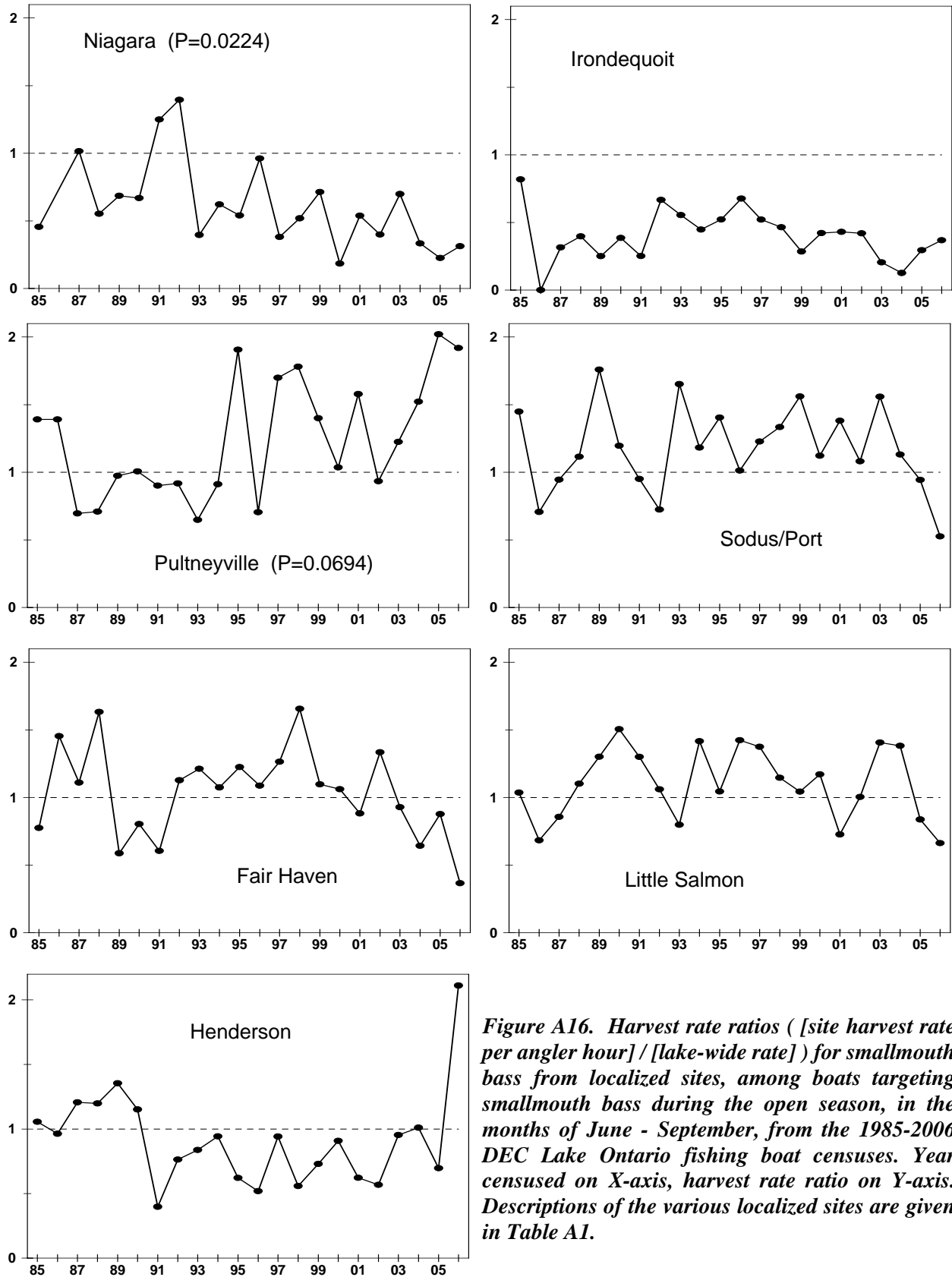


Figure A16. Harvest rate ratios ([site harvest rate per angler hour] / [lake-wide rate]) for smallmouth bass from localized sites, among boats targeting smallmouth bass during the open season, in the months of June - September, from the 1985-2006 DEC Lake Ontario fishing boat censuses. Year censused on X-axis, harvest rate ratio on Y-axis. Descriptions of the various localized sites are given in Table A1.