

**Prospect Park Lake Creel Survey, 2014**  
**Final Report**

**Melissa K Cohen**  
Reg. Fisheries Manager  
**Dwane Binns**  
Fish & Wildlife Technician

FEDERAL AID IN SPORTFISH RESTORATION  
**Grant: F-62-R-1**  
Warmwater Fisheries  
**Study Number 2**  
Warmwater Fisheries Research & Management

**NYS Department of Environmental Conservation**  
**Bureau of Fisheries**  
**Region 2**  
**47-40 21<sup>st</sup> Street**  
**Long Island City, NY 11101**

**February 2016**

## Abstract

A creel survey of shoreline anglers was performed at Prospect Park Lake in Kings County, NY from May 05 – November 04, 2014. The survey was used to estimate angling pressure, catch rates, species targeted, angling methods, angling demographics, and anglers' perceptions about fishery-related issues at Prospect Park Lake. This report compares results from the 2014 creel survey with those from a 2001 Prospect Park Lake Creel survey.

Angler effort was estimated to be 16,761 hours and 305 angler hrs/acre. A creel clerk conducted 372 interviews and received 33 complete angler trip postcards. Interviewed anglers targeting all fish reported catching 0.94 fish of any species/hr and 0.39 Largemouth Bass/hr. Those anglers targeting Largemouth Bass (57%) reported a catch rate of 0.57 Largemouth Bass/hr. The highest catch rates were observed in July for all fish combined (1.46 fish/hr) and Largemouth Bass only (0.62 fish/hr).

Most anglers were male and lived in Brooklyn. Ethnic composition was mainly African Americans (32%), Caucasians (31%) and Latinos (25%). The majority of anglers were between 19 and 49 years of age. The most heard comments from anglers (43%) regarded the amount of trash in and around the lake. Twenty-three percent of anglers thought the lake should receive more stocked fish and fourteen percent of respondents requested increased enforcement of fishing regulations. Almost all anglers (81%) were satisfied or very satisfied with the quality of fishing at Prospect Park Lake.

Angler effort from this study was similar to that found for the 2001 study. Angler catch rate for all fish in this study was greater than twice that determined from 2001 creel survey data and Largemouth Bass catch rate was found to be approximately 20% greater in 2014 than that found in 2001. Data from recent electrofishing surveys correlates with angler reported catches for all fish. While Largemouth Bass catch rate was found to be below 0.5 fish/hr for the 2001 creel survey and 0.57 fish/hr for the 2014 creel survey, electrofishing data collected around the years of those surveys (2002 and 2014) yielded relatively high catch rates for Largemouth Bass including those in quality (greater than twelve inches) and preferred (greater than fifteen inches) sizes classes indicating a healthy bass population exists in Prospect Park Lake. This lake has several woody islands, inaccessible to anglers and likely used as fish refuge areas. Keeping these areas intact may contribute to the present and future health of bass populations and could serve as a model to implement in other lakes and ponds whose bass populations are less robust.

## Introduction

Prospect Park Lake is an approximately 55-acre water body in the south-southwest area of Prospect Park, Brooklyn. It is the sole publicly-accessible fishable freshwater body in Brooklyn and one of the most fished lakes in New York City (NYC) (Van Maaren 2003). The lake was created during construction of the park which was originally designed by Frederick Olmstead and Calvert Vaux in 1860. Prospect Park Lake and the surrounding park is managed by the Prospect Park Alliance (Alliance) who partners with the NYC Department of Parks and Recreation to preserve the park's natural environment, restore its historic design and provide public programs and amenities for the millions of people who utilize the park annually. Balancing quality fishing opportunities for anglers with the needs and desires of other park users is one of the Alliance's many responsibilities.

Both New York State (NYS) and NYC regulations for nearly all lakes and ponds in NYC prohibit any take of fish and allow fishing year-round. Barbless hooks are required under New York City regulations to minimize harm to fish, and fishing-related litter must be properly disposed of. In addition, over the last 15 years, the NYS Department of Environmental Conservation Bureau of Fisheries (DEC Fisheries) has taken an active role in assessing the lake's fish populations via boat electrofishing and two angler creel surveys.

DEC Fisheries performed electrofishing surveys of Prospect Park Lake in 1997 and 2002 and then biannually since 2008. Fish species usually found during these surveys are Largemouth Bass (*Micropterus salmoides*), Black Crappie (*Pomoxis nigromaculatus*), Bluegill (*Lepomis macrochirus*), Pumpkinseed (*Lepomis gibbosus*), Golden Shiner (*Notemigonus crysoleucas*), Yellow Perch (*Perca flavescens*), Brown Bullhead (*Ameiurus nebulosus*), Common Carp (*Cyprinus carpio*) and American Eel (*Anguilla rostrata*). Anecdotal information suggests Chain Pickerel (*Esox niger*), Koi (*Cyprinus carpio*) and Goldfish (*Carassius auratus*) are present in the upper pools.

Most Prospect Park anglers target Largemouth Bass (Van Maaren 2003) and DEC Fisheries data provide evidence of this lake's potential as a favored Largemouth Bass fishing location in NYC. Survey data between the years 2008 – 2014 shows bass from Prospect Park Lake have the highest average length and weight of any NYC waterbody surveyed by DEC Fisheries. Additionally, of all NYC water bodies surveyed, Prospect Park Lake yields the highest average electrofishing catch rate of bass 12 and 15 inches in length. Other fish species targeted by anglers are Bluegill, Pumpkinseed and Black Crappie. A few anglers have provided information on catching Chain Pickerel although this species has yet to be caught or observed during a DEC fishery survey of this lake. DEC fish stocking records indicate Prospect Park Lake was last stocked in 2000, with Chain Pickerel, only. The lake was also stocked in 1999 with Largemouth Bass, Bluegill, Pumpkinseed, Brown Bullhead and Golden Shiner.

A creel survey of Prospect Park Lake anglers was performed in 2001 and has served as the only DEC angler creel survey of a NYC freshwater lake or pond (VanMaaren 2003). Information from that survey indicated Prospect Park Lake receives greater fishing pressure, per acre, than the estimated annual angling effort (hours/acre) averaged for 11 ponds on Long Island (Kozlowski and Williams 1990). Other information included degree of angler-awareness of the fishing license requirement, fishing regulations and other DEC fisheries management actions, and angler recommendations of agency actions to be taken to improve fishing at Prospect Park Lake.

This current 2014 creel survey is significant for several reasons. As the second creel survey of Prospect Park Lake it provides a picture of fishing activity for comparison with that measured in 2001 and can also be compared with future creel surveys such as that implemented in two Central Park waters in 2015. Detecting changes in angler effort is particularly important to Region 2 DEC Fisheries as the I FISH NY program aims to promote angling throughout the five boroughs. Angler creel survey data coupled with regular electrofishing survey data will be useful to anglers and DEC Fisheries in fishing promotion in NYC. Additionally, assessing angler attitudes towards fishing-related issues could help steer local and state management activities in and around the lake.

Prospect Park, accessible by subway, bus and motor vehicle, receives more than ten million visits per year from a wide variety of users ([www.prospectpark.org](http://www.prospectpark.org)). While the lake offers the best freshwater fishing opportunities within miles, anglers remain just one of many sizable user-groups. The drive surrounding the lake is extensively traveled by runners, walkers and cyclists. The Park also has heavily-used basketball courts, softball and baseball fields, an ice skating and rollerblading rink, tennis center, bridle path for horseback riding, and parade grounds used by football and soccer teams. Prospect Park has its own zoo and, during nice weather, is densely populated with people picnicking and barbecuing. Other important user-groups include birdwatchers and dog walkers, the latter of which have a designated area of pond for dog bathing.

With such a wide variety of user-groups, many of which have numerous participants, it is not surprising for occasional conflicts to occur between groups, some of which may rise to the level requiring administrative action. In conflicts involving angler groups, information on angler effort may be of use and lead to solutions involving promulgation of rules, posting of signs or other administrative actions. The information collected during this creel survey, including the number of anglers fishing at a given time throughout the spring, summer and beginning of fall seasons as well as practices and opinions of anglers at Prospect Park Lake, could be used to help determine resolution(s) to conflicts between anglers and other user-groups of Prospect Park.

## **OBJECTIVES**

1. Estimate angler effort and catch rate at Prospect Park Lake from May 5<sup>th</sup> through October 31<sup>st</sup> for comparison with the 2001 creel survey and existing electrofishing data.
2. Assess angler opinions and knowledge of fishing, regulatory and other park issues for dissemination to others to manage Prospect Park for all users as optimally as possible.

## **Site Description**

The main water source to Prospect Park Lake is NYC drinking water, which is piped into the northern end of the Lullwater which flows into the main body of the lake (Figure 1) (American Lake & Wetlands Services, Inc. 1997). Small ponds exist north of the Lullwater but fishing activity in these areas was not included in this study. Lake water depth is kept at a stable level through the use of a standpipe operated by Alliance staff. Water is released through a standpipe to street sewers if necessary. Maximum water depth in the main body of the lake is approximately seven feet. Orthophosphate (phosphoric acid) is added to the city's water supply by the NYC Department of Environmental Protection to form a

protective layer on the contact surface of inlet pipes to help prevent lead and other potentially harmful metals from leaching into drinking water. Unfortunately, this nutrient input of phosphorous stimulates overgrowth of algae, leading to eutrophic conditions (Fogg 1973). Duckweed (*Lemna sp.*) proliferates at certain times of the year.

Two distinct habitat types surround Prospect Park Lake. The peninsula and northern area are dominated by a mixed species hardwood woodland that, in some areas, hinders shoreline access. The upland area bordering the southern portion of the lake below the peninsula is a mix of urban development and interspersed woodland. The lake transitions from a semi-narrow channel to a completely open lake basin. Included in this area are three islands in close proximity to one another near the southern shoreline (Figure 1).

## Methods

This survey of shoreline anglers was conducted between May 5 and November 4, 2014. A creel agent surveyed every weekend day and two random weekdays between Monday and Friday excluding Tuesdays, which was reserved for office work. To cover the entire fishing day, two shifts were established and randomly selected among the two weekdays and two weekend days. The early shift consisted of three angler counts occurring at 07:00, 11:00 and 13:00 hours. The late shift consisted of three angler counts occurring at 11:00, 15:00 and 17:00 hours. Start position around the perimeter of the lake and travel direction (clockwise vs counterclockwise) were randomly selected. All randomizations were performed using RANDBETWEEN function within Microsoft<sup>®</sup> Excel 2013.

One creel survey agent completed the entire survey. Assessment of number of anglers per shift was a modification of the Roving Creel Survey method described in Pollock et al. (1997). This modified protocol entailed walking the lake perimeter (duration of this walk was approximately 45 minutes) and counting actively fishing people only as they were passed by the creel agent. This produced a near instantaneous count for the survey as per the roving-roving creel survey design (Pollock et al. 1997).

After the creel agent completed the count, all anglers were approached and interviewed. Anglers were read the questionnaire and the clerk filled in the responses (Appendix A). The questionnaire gathered demographic information such as gender, age, ethnicity, hometown and zip code. Additional information included species targeted and caught, length of angling trip, tackle equipment used, and knowledge of angling regulations. The 2001 creel survey used questionnaires in English, Russian and Spanish; this survey used only an English language questionnaire and this met our objectives as language differences impeded only one interview. To preserve angler anonymity, unique angler identification numbers (IDs) were assigned to every angler encounter regardless of whether or not the angler had been previously interviewed. Angler ID consisted of date, survey shift of encounter and interview number for that shift. For example, 0510201411-01 denotes May 10<sup>th</sup>, 2014, survey period 11:00, first angler interviewed. Angler questionnaires were completed for every angler even if they had been previously interviewed (Appendix A). Pre-stamped postcards were offered to each angler interviewed; these requested the time of day their fishing trip ended in addition to any fish caught after their interview (Appendix B). This postcard was requested to be sent to DEC Fisheries as a way of obtaining complete angler trip information for every angler willing to participate. While complete angler trip

information would be ideal, only 7.3% of interviewed anglers returned complete trip postcards thus this information is only supplemental to the main analysis of angler statistics. Interviews continued until all counted anglers were interviewed or the next survey shift count started. In the instance where interviews were still in progress when the next angler count period arrived, the creel agent would immediately start the next angler count from their present location, following the daily specified travel direction

All catch data was reported by anglers, rather than observed by the creel agent, as NYC and New York State regulations prevent harvesting fish.

Angler effort was calculated by multiplying the average of all instantaneous angler counts in a day by the number of daylight hours (fishable hours) in each day. The amount of daylight hours in a day varies among months, therefore corrected daylight hour values were derived from the average number for daylight hours per day for each respective month (Timeanddate.com 2015) was used.

Angling effort for Largemouth Bass was calculated by multiplying total effort by the ratio of anglers interviewed who said they were targeting Largemouth Bass (0.57). Monthly angling efforts were similarly calculated.

Due to utilization of the roving-roving design daily effort is estimated using equations 1-5

$$e_i = I_i \times T_m \tag{1}$$

With  $I_i$  indicating the average of the instantaneous counts for each survey day and  $T_m$  being used for fishable hours corrected for each surveyed month

$$\hat{E}_1 = N_1 \bar{e}_1 \tag{2}$$

$$\hat{E}_2 = N_2 \bar{e}_2 \tag{3}$$

$\hat{E}$  denotes total effort for the survey period for each stratum (weekend vs weekday),  $N_x$  is the number of days per stratum and  $\bar{e}_x$  is the average daily effort for that stratum.

Therefore, overall effort is

$$\hat{E} = \hat{E}_1 + \hat{E}_2 + \dots + \hat{E}_n \tag{5}$$

Catch rates were calculated according to the mean of the ratios method, which is the appropriate method of catch rate estimation when performing a roving creel survey utilizing incomplete angling trips (Pollock et al. 1994). This method estimates catch rates by dividing the total number of fish reported in creel agent interviews by the total fishing time recorded per interviewee up to the time of the interview. Specifically for the roving method we utilized equation 6 to estimate catch rate (Pollock et al. Angler Survey Methods 1994; Pollock et al. 1997),

$$\hat{R}_{2r} = \frac{1}{n} \sum_{j=1}^n \frac{C_j}{L_j} \quad (6)$$

with  $C_j$  indicating the incomplete catch reported by the  $j^{th}$  angler and  $L_j$  indicating the incomplete trip length of the  $j^{th}$  angler interviewed.

Largemouth Bass catch rates were calculated using incomplete largemouth bass-only catch data calculated similarly to total catch data formula, above (equation 6):

$$\hat{R}_{2rl} = \frac{1}{n} \sum_{j=1}^{nl} \frac{C_{jl}}{L_{jl}}$$

With  $C_{jl}$  indicating the incomplete catch reported by the  $j^{th}$  angler catching Largemouth Bass and  $L_{jl}$  indicating the incomplete trip length of the  $j^{th}$  angler interviewed who caught Largemouth Bass.

Incomplete trips less than or equal to 30 minutes were not included as per analysis recommendations by Pollock et al. (1997).

## Results

**Angling Effort:** Angler effort was estimated to be 16,761.47 hours from 94 days of angler counts over the survey period of May 5, 2014 – November 4, 2014. Average overall angler hours per month was estimated to be 2,793.6 hours, estimated weekday monthly effort was 1,564.3 hours and estimated weekend monthly effort was 1,229.3 hours (Table 1). Estimated overall angler effort was highest in the month of June (total hrs= 4,726) and progressively declined through October (1,019 hours) (Figure 2 and Table 1).

Overall, 56% of fishing effort occurred during weekdays and 44% on weekends but this varied among the months of the study period. During May, effort was divided evenly (50%/50%) between weekdays and weekends but effort was higher on weekdays during June, July and October. Alternatively, fishing effort was greater during the weekends in August and fairly evenly divided between weekdays and weekends during September (Table 1). Average trip length was estimated at 2.4 hours (SE = 0.10) (288 angler interviews) for incomplete trips longer than 30 minutes and 6.4 hours (SE = 0.66) for complete trips.

There were 1,943 anglers counted during the 94 survey days. The highest number of anglers were counted at 1 pm on the weekends. The highest weekday angler counts were at 5 pm. Weekend 7 am counts were slightly more than four times greater than weekday counts for this time (Table 2). Average angler counts were higher for weekends versus weekdays for all count times (Figure 3).

**Species Targeted:** More than half the anglers interviewed targeted Largemouth Bass (56.5%) (Table 3). As with overall estimated monthly effort, Largemouth Bass fishing effort was highest in June, progressively declining through October. As with estimated overall monthly effort, Largemouth Bass fishing effort was greater on weekends in May, August and September but overall effort was higher on weekdays.

Most of the remaining anglers surveyed indicated they were mainly interested in catching any fish species (25.8%) (Table 3). A few anglers targeted Smallmouth Bass, although observations of this species have not been recorded.

**Catch Rates:** In total, 372 interviews were conducted but only 288 interviews were used in catch rate estimation because trips lasting less than 30 minutes were excluded. Catch rates observed for all fish were highest in the month of May and July (Figure 4 and Table 5). Largemouth Bass catch rate increased from May to June then rose sharply in July and subsequently decreased the remaining months of the survey (Figure 4, Table 6). Average catch rates were 0.94 fish/hr (SE = 0.12) for all fish, 0.38 fish/hr for Largemouth Bass caught by all anglers and 0.57 fish/hr for Largemouth Bass caught only by those anglers targeting bass exclusively. Incomplete trips (288 interviews), only, were used to determine catch rates (Tables 5 and 6). Anglers caught a total of 505 fish, as reported from 288 interviews, just over half were Largemouth Bass (n=257, 50.4%). Bluegill, Pumpkinseed, Black Crappie, Yellow Perch, Golden Shiner and Brown Bullhead comprised the rest of the catches (Table 7). Estimated total number of fish caught, using catch rates and estimated monthly angling effort, from May through October 2014, was 15,589 and the total number of Largemouth Bass caught during this period was estimated to be 6,628 (Table 8).

**Demographic/ Angler Awareness:** Most of the anglers were male (97.8%) and resided in Brooklyn (87%) but the fishery attracts a small population from other NYC boroughs, New Jersey and Long Island; one angler resided in Canada. Most anglers were either African American (31.5%) or Caucasian (30.9%), with slightly fewer Hispanics (24.7%). All age groups participated in angling at Prospect Park, with the bulk of participants distributed among three age groups: 19-29 (25%); 30-39 (19%); and 40-49 (23%). One angler identified himself to be in the 80+ year age category (Table 9).

Almost all anglers reported awareness of the fishing license requirement (84%) and catch-and-release regulations (98.6%) (Table 10). Approximately half the anglers surveyed (51%) were aware that DEC performs fishery surveys of Prospect Park Lake and 71% were aware of the line recycling containers installed by the Prospect Park Alliance.

Most anglers used spinning reels (72%). Other types of angling equipment used included baitcasting rods (28%), fly rods (8%), spincasting rods (3%), and primitive rods and line (1%) (Table 11). The majority of interviewed anglers (76.5%) fished with one rod and 11.6% fished with two; 2.2% were using 5 rods. One percent of anglers used line-only. Eighty percent of anglers used artificial baits; most of the 19% using natural baits reported using earthworms and waxworms, others used chicken, shrimp, crickets and dough (Table 12).

### **Angler Comments**

Nearly half (43%) of angler comments concerned too much trash, including discarded fishing line, both in and around the lake. Trash-related comments included requests for more trash and line recycling receptacles (Table 13). Requests to stock fish comprised 23% of angler comments and 14% of those surveyed desired increased enforcement of regulations including those regulations not specific to fishing. Remaining comments concerned manipulation of fish habitat, adverse interactions with dogs, and increased signage. The majority of anglers (80.6%) were either satisfied or very satisfied with their angling experience at Prospect Park Lake: 4 or 5 on a scale of 1 to 5 with higher numbers corresponding to higher satisfaction (Table 14).

## Discussion

### Angler Effort

Anglers spent an estimated 16,761 hours fishing Prospect Park Lake during the six month survey period. This approximates angler effort estimated from the 2001 survey at Prospect Park Lake (16,964 hrs.) (VanMaaren 2003). When angler hours are averaged over acreage the lake received approximately 305 hrs/acre in 2014. Angler effort per acre for the 2001 survey was estimated to be 298 hrs/acre. Nassau County water bodies surveyed in 1990 and 1999 received 205 hrs/acre (1990) and 231 hrs/acre (1999) over 8 months of survey effort (Kozlowski et al. 1990; Kozlowski 2003) therefore Prospect Park Lake received approximately one third more fishing effort than that expended at comparable Nassau County waters.

Angler counts indicated more anglers fished Prospect Park Lake during the weekdays as opposed to weekend days. This is similar to results from the 2001 creel survey which also found more fishing activity during weekdays rather than weekend days (Figure 5). A difference in fishing schedules between the 2001 and 2014 surveys was a greater amount of effort shown at 7 am on weekends in 2014 than was shown in 2001.

### Catch Rates

With a catch rate of 0.94 fish/hr, Prospect Park Lake is likely to provide suitable catch and release angling for anglers of all experience levels (Shupp D.B. 1972). The observed catch rate would be higher if short span angler trips ( $\leq 30$  mins), omitted as per Pollock et al (1997), are included: 1.00 fish/hr for all fish and 0.60 fish/hr for those targeting Largemouth Bass. When catch rates for all fish and Largemouth Bass are calculated by month, rates are higher in July than in June despite the latter having higher average and total angler hours. The difference between June and July is substantially greater when all fish are compared but the difference remains discernible for Largemouth Bass alone.

The all fish catch rate of 0.94 fish/hr for the 2014 creel is greater than twice that found during the 2001 creel survey, which anglers reported to be a poor year for fishing (VanMaaren 2003). DEC electrofishing survey data from 2014 showed high catch rates for both Bluegill and Pumpkinseed. Electrofishing catch rates for Bluegills were almost twice as high in 2014 as catch rates in 2008, 2010 and 2012 fish surveys, correlating with the high angler catch rates in that same year.

Largemouth Bass catch rates for 2014 were higher than those from the 2001 creel survey: 0.57 fish/hr vs. 0.37 fish/hr, respectively. Electrofishing catch rates for Largemouth Bass are high relative to other water bodies surveyed (Perry 2014) (Perry 2014): 77 bass/hr in 2014 compared with a statewide average of 17 bass/hr (Perry et al. 2014). Additionally, size indices determined from electrofishing data indicate Prospect Park Lake has large-sized bass. Proportional Stock Density (PSD) of bass from our 2014 electrofishing survey was 85, meaning 85% of fish captured over eight inches in length were twelve inches or greater. Relative Stock Density (RSDp) was 25, meaning 25% of fish captured over eight inches in length were fifteen inches or greater. Both are greater than the statewide averages of 55 for PSD and 19 for RSDp (Perry et al. 2014). As mentioned in the 2001 creel survey report, the Prospect Park Lake shoreline is not 100% accessible and fishing from boats is prohibited leaving numerous refuge locations for fish, especially around islands. DEC Fisheries staff has collected a substantial number of bass from island locations during electrofishing surveys. Fish occupying these areas could lead to more challenging

angling than at other New York City lakes and ponds such as the Harlem Meer in Central Park which offers nearly 100% shoreline access to fishery resources.

### **Species targeted and high preference for largemouth bass**

In this survey the majority of anglers (57%) targeted largemouth bass over all other species combined. A smaller but significant portion of anglers (26%) opted to angle for any fish species within Prospect Park Lake with the remainder of anglers targeting smaller *Centrarchids* (sunfish). Results from the creel survey performed in 2001 at Prospect Park Lake and the Nassau County creel survey indicate these anglers had similar preferences for Largemouth Bass (65% for Prospect Park Lake) / 40% for Nassau County) and angling for any fish species available (27.5% for Prospect Park Lake / 25% for Nassau County), (Kozlowski et al. 1990; VanMaaren2003). Since a majority of anglers prefer to fish for Largemouth Bass, decisions on management of natural resources affecting this resource should thoroughly consider bass-anglers.

### **Demographics**

Anglers of several ethnicities fish the lake, with the majority being composed of African Americans, Caucasians, and Hispanics, similar to the racial composition of the county (Kings) according to recent census statistics (The United States Census Bureau 2014). In addition, an important fact gleaned from this survey is that the majority of anglers (83%) are regular anglers who have fished within and outside of NYC. This may indicate that at least some experienced anglers select Prospect Park Lake as one of their main destinations.

More anglers of this 2014 survey over those surveyed in 2001 indicated an awareness of fishing-related regulatory issues at Prospect Park Lake. Just over half (54.3%) of anglers surveyed in 2001 stated they were aware of the New York State fishing license requirement whereas 84% of those surveyed in 2014 indicated awareness of this requirement. Possibly some surveyed anglers may have felt it necessary to state they were aware of this even if this was not the case in order to avoid a potential enforcement action (despite the fact our creel agent was not in a position to enforce regulations). An increase from 65.7% of anglers in 2001 to 98% of anglers in 2014 stated they supported catch and release regulations which were only a NYC requirement in 2001; New York State did not require catch and release, only, until 2002.

### **Angler Comments**

The majority of anglers offered multiple ideas on ways to make Prospect Park Lake more enjoyable for anglers. By far the most requested change was a decrease in trash, both in and around the lake, specifically near the shoreline. Fourteen percent of respondents wanted increased enforcement of fishing regulations, a change from comments reported in the 2001 report which cited lack of enforcement as the biggest complaint. Possibly anglers are seeing DEC Environmental Conservation Officers in the park more frequently. This complaint could be further addressed with outreach making anglers aware of Environmental Conservation Officer contact information available on the DEC website. Such action could also lead to fewer infractions of fishing regulations.

## Conclusions

1. The relative good health of Prospect Park Lake's Largemouth Bass population may be attributable to refuges available to these fish. While making angling more challenging, refuge areas may decrease vulnerability to angling and predation by birds and other predators.
2. Current catch and release regulations have likely contributed to the health of Prospect Park Lake fish populations.
3. While 23% of anglers surveyed thought more fish should be stocked in Prospect Park Lake, nearly 15 years of electrofishing data shows this lake to have strong, healthy fish populations. It is important to make this known to anglers and to refrain from additional stocking which could disrupt existing fish populations.
4. Nearly half of angler comments concerned trash in and around the lake. This issue could be addressed through working with the Prospect Park Alliance, especially since this concern is likely shared by other users of Prospect Park.
5. With an estimated 16,761 hours of angler effort over a six-month period in 2014, and a comparable 16,964 estimated hours for 2001, Prospect Park Lake remains an important NYC freshwater fishing resource.

## Recommendations

1. Maintain fish refuge areas at Prospect Park Lake. Consider creation of fish refuge areas at other New York City waterbodies to help increase health of fish populations.
2. Conduct angler outreach emphasizing the importance of using line recycling and trash containers. Outreach should also make anglers aware of the healthy fish populations of Prospect Park Lake, which require no supplemental stocking at this time, as well as Environmental Conservation Officer contact information for reporting violations.
3. NYS and NYC catch and release fishing regulations should remain in place.

## Works Cited

American Lake & Wetlands Services, Inc. 1997. *Prospect Park Lake Diagnostic/Feasibility Study Final Report*. Internal report, Brooklyn: Prospect Park Administration Office.

- Fogg, G. E. 1973. "Phosphorus in primary aquatic plants." *Water Research* 7 (1-2): 77-91.  
(<http://www.sciencedirect.com/science/article/pii/0043135473901541....> Science direct excerpt from book).
- Kozlowski, Gregory E, and Kyle N Williams . 1990. *Nassau County Angler Survey*. Internal Creel Survey Document , Setauket, New York: New York State Department of Environmental Conservation, Division of Fish and Wildlife, Bureau of Fisheries, Region 1.
- New York State Department of Environmental Conservation, Division of Fish, Wildlife & Marine Resources. 2003. *1999 Nassau County Creel Survey*. Internal Creel Survey Report, Setauket, New York: New York State Department of Environmental Conservation, Division of Fish, Wildlife & Marine Resources.
- Perry, P.C., J.J. Loukmas, W.L. Fisher, P.J. Sullivan, and J.R. Jackson. 2014. Characterizing the status of black bass populations in New York. Final Report. New York State Department of Environmental Conservation, Albany, New York.
- Pollock, Kenneth H, Cynthia M Jones, and Tommy L Brown. 1994. *Angler Survey Methods* . Bethesda, Maryland : American Fisheries Society.
- Pollock, Kenneth H, John M Hoenig, Cynthia M Jones , Douglas S Robson, and Colin J Greene. 1997. "Catch Rate Estimation for Roving and Access Point Surveys." *North American Journal of Fisheries Management* 11-19.
- Prospect Park Alliance Home Page*, Prospect Park Alliance, Web. Accessed 19 Nov. 2015
- Shupp, D B. 1972. "Urban fishing-new recreation for the cities: three years of BSWF involvement nationally." *USFWS IND* Mimeo.
- The United States Census Bureau. 2014. *State and County Quick Facts*. December 4. Accessed February 2, 2015. (<http://quickfacts.census.gov/qfd/states/36/36047.html>).
- Timeanddate.com. 2015. *Timeanddate.com*. February 2. Accessed January 22, 2015. (<http://www.timeanddate.com/sun/usa/new-york>).
- VanMaaren, Chris. 2001. *Prospect Park Lake Creel Survey 2001*. internal Lake Creel Report, Long Island City, New York: New York State Department of Environmental Conservation.
- VanMaaren, Chris. 2003. *Prospect Park Lake Creel Survey 2001*,. internal Lake Creel Report, Long Island City, New York: New York State Department of Environmental Conservation.

## Figures



Figure 1. Prospect Park Lake, Brooklyn, NY

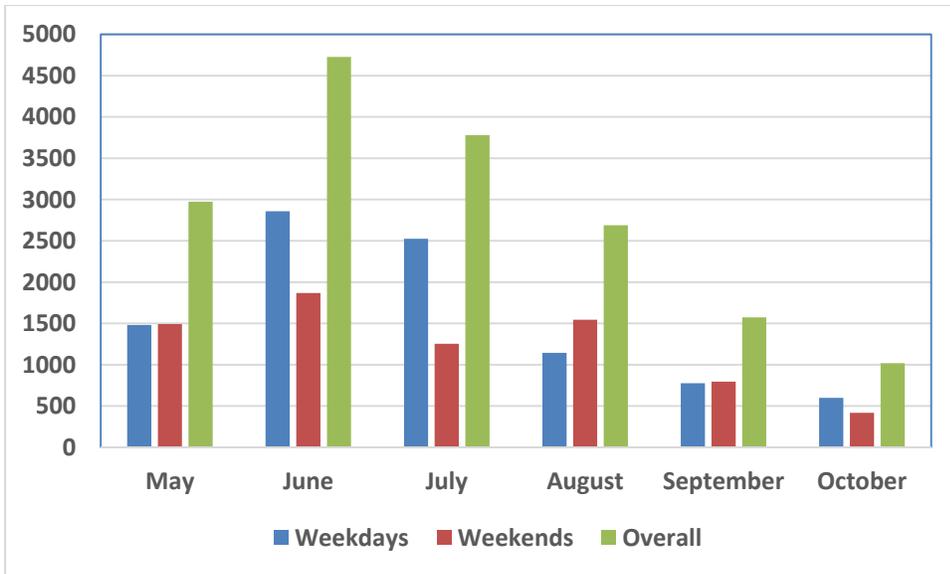


Figure 2: Estimated monthly fishing effort for angler at Prospect Park Lake, NY during May 5 – Nov. 4 2014

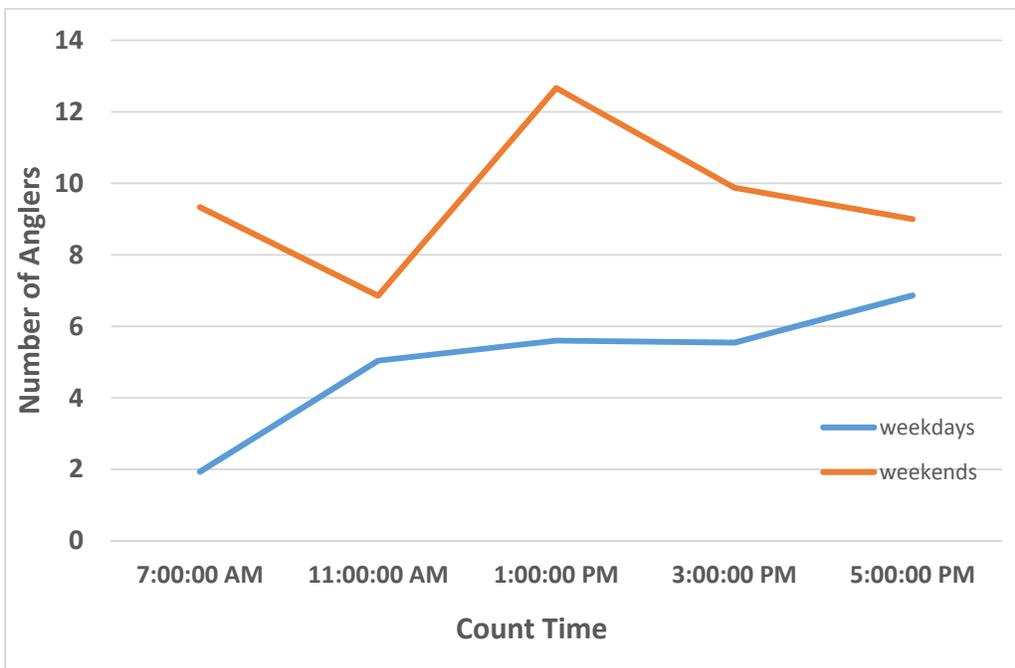


Figure 3: Number of anglers counted over count times

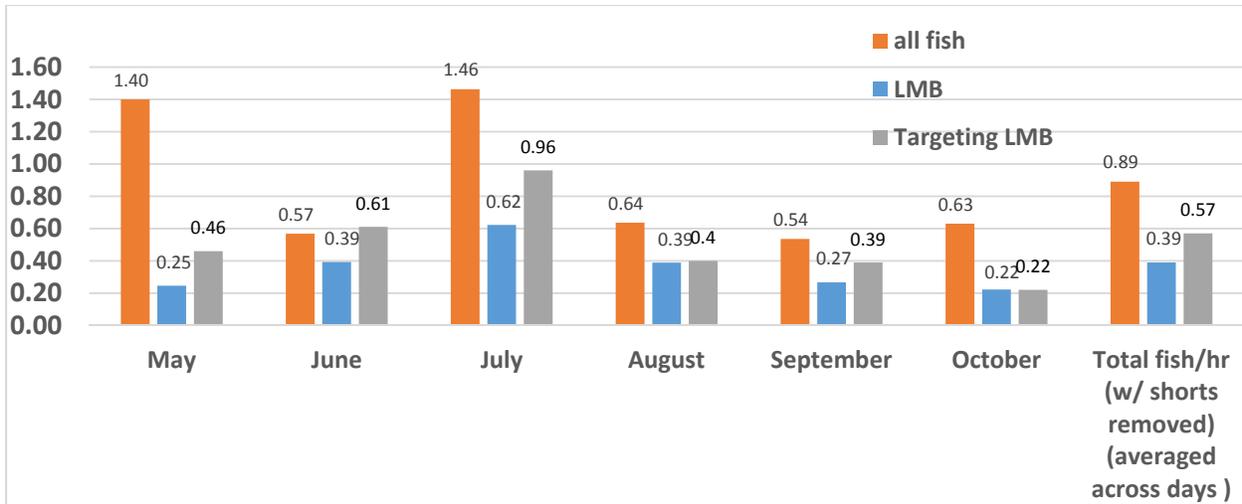


Figure 4: Catch rate summaries of all fish and Largemouth Bass (LMB) reported by anglers 5/5/14 – 11/2/14

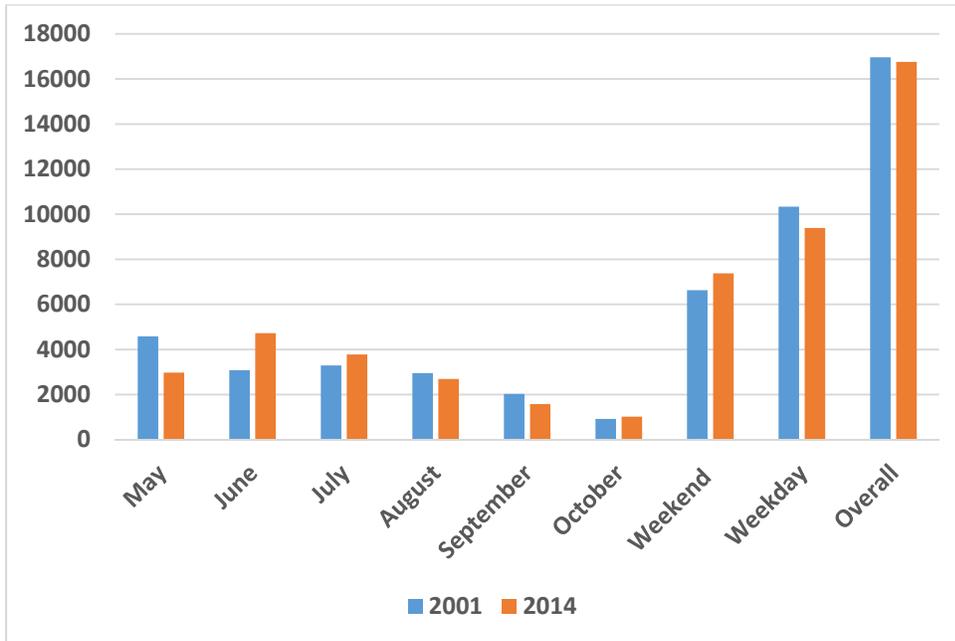


Figure 5. Estimated angler effort compared between 2001 and 2014 creel surveys

## Tables

**Table 1. 2014 Monthly Estimated Angler Effort (total hours) Summary.** Standard errors in parentheses.

Month	Weekday	Weekend	Overall
May	1480.89 (284.52)	1493.33 (606.67)	2974.22 (518.24)
June	2858.33 (405.07)	1867.5 (216.61)	4725.83 (470.58)
July	2525.42 (420.92)	1254.25 (101.34)	3779.67 (12.04)
August	1144.50 (151.43)	1545 (221.60)	2689.50 (513.93)
September	777 (177.30)	796.5 (182.61)	1573.5 (93.94)
October	599.70 (221.55)	419.05 (114.10)	1018.75 (268.08)
Average	1564.3 (379.99)	1229.3 (217.65)	2793.6 (228.38)
Total hours	9385.84	7375.63	16,761.47

**Table 2. 2014 Average Instantaneous angler counts**

Time Period	07:00	11:00	13:00	15:00	17:00
Weekday	1.9	5.0	5.6	5.5	6.9
Weekend	9.3	6.9	12.7	9.9	9.0
Overall	4.7	5.9	8.3	7.6	7.9

**Table 3. 2014 Fish Targeting Preferences by Anglers**

Species	Number of anglers targeting a species	Percentage of anglers
Largemouth Bass	234	56.5%
Common Carp	5	1.2%
Black Crappie	19	4.6%
Bluegill	23	5.6%
Pumpkinseed	13	3.1%
Smallmouth Bass	4	1.0%
Golden Shiner	4	1.0%
Yellow Perch	2	0.5%
Chain Pickerel	2	0.5%
Brown Bullhead	1	0.2%
Anything	107	25.8%
Total	414	100%

**Table 4. 2014 Largemouth Bass Monthly Estimated Angler Effort (total hours) Summary.** Standard errors in parentheses.

Month	Weekday	Weekend	Overall
May	844.11 (162.18)	851.20 (345.8)	1695.31 (295.40)
June	1629.25 (230.89)	916.99 (123.47)	2546.24 (268.23)

July	1439.49 (239.92)	714.92 (57.77)	2154.41 (142.94)
August	652.37 (86.32)	880.65 (126.31)	1533.02 (292.94)
September	442.89 (101.06)	454.01 (104.09)	896.90 (214.19)
October	427.29 (141.62)	238.86 (65.03)	666.15 (155.08)
Overall total hours	5435.40	4056.63	9492.03

**Table 5: All fish catch rate summary with standard errors of all interviewed Prospect Park Lake anglers between 5/5/14-11/2/14 utilizing mean of ratios (individuals/hr) method for incomplete roving-roving surveys**

Month	Mean of ratios (indiv./hr)	SE (indiv./hr)
May	1.40	0.35
June	.57	0.16
July	1.46	0.74
August	.64	0.15
September	.54	0.28
October	.63	0.18
Overall	.94	0.12

**Table 6: Prospect Park Lake Largemouth Bass catch rate summary utilizing mean of ratios (individuals/hr) method for incomplete roving-roving surveys with standard errors**

Month	Mean Catch Rate (indiv./hr), all anglers	SE (indiv./hr)	Mean Catch Rate (indiv./hr), anglers targeting bass	SE (indiv./hr)
May	.25	0.55	0.46	0.18
June	.39	0.66	0.61	0.12
July	.62	0.90	0.96	0.18
August	.39	0.67	0.40	0.10
September	.27	0.52	0.39	0.16
October	.22	0.40	0.22	0.11
Overall	.39	0.69	0.57	0.06

**Table 7: Fish species caught with percent of entire catch reported by Prospect Park Lake anglers between 5/5/14-11/2/14**

Species	Number of Times Species Caught	Percentage of Total Catch
Largemouth Bass	257	50.9%
Black Crappie	10	2.0%
Bluegill sunfish	187	37.0%
Pumpkinseed sunfish	17	3.4%
Golden Shiner	24	4.8%
Yellow Perch	5	1.0%
Brown Bullhead Catfish	5	1.0%
Total	505	100%

**Table 8: Estimated number of all fish and largemouth bass caught per month from Prospect Park Lake between 5/5/14-11/2/14 calculated from catch rates and estimated monthly fishing effort**

Month	Estimated # All Fish Caught	Estimated # Largemouth Bass Caught
May	4163.91	743.56
June	2693.73	1843.07
July	5518.31	2343.40
August	1721.28	1048.91
September	849.69	424.84
October	641.81	224.13
Overall	15588.73	6627.91

**Table 9: Ethnicity and age structure of anglers at Prospect Park Lake, NY in 2014**

Ethnicity	Percentage of Anglers	Age	Percentage of Anglers
African American	31.5%	0-18	8%
Caucasian	30.9%	19-29	25%
Hispanic	24.7%	30-39	19%
Asian	8.1%	40-49	23%
Native American	0.5%	50-59	14%
Middle Eastern	0.8%	60-69	6%
N/A	2.4%	70-79	5%
Other	1.1%	80+	0%
Total	100%		100%

**Table 10: Anglers' knowledge of various fisheries management policies while angling at Prospect Park Lake, NY in 2014**

Policy/Management Practice	Yes	No
Aware of catch and release regulations	98.6%	1.4%
Support catch and release regulations	99.65%	0.35%
Aware of license requirement	84%	16%
Aware of line and tackle recycling containers	71%	29%
Aware of DEC fishery surveys	51%	49%
Fished outside NYC	81.34%	18.66%

**Table 11: Percentage of anglers utilizing specific reel and bait types while angling at Prospect Park Lake, NY**

Reel Type	Percentage of Anglers	Number of Rods Used	Percentage of Anglers
Spincaster	3%	1	76.5
Spinning	72%	2	11.6
Baitcasting	28%	3	5.4
Fly	8%	4	4.3
Primitive	1%	5	2.2
Line only	1%		
Total	100%		

**Table 12: Bait types used by anglers with percentages**

Bait Type	Percentage of Anglers
Artificial	80%
Natural (multi-type)*	19%
None	1%
Total	100%

\*"Natural" baits consisted mainly of earth- and waxworms. Others were dough, crickets, shrimp & chicken.

**Table 13: Percentage of angler comments out of 212 comments received (only trips >30 minutes included)**

Angler Comment	Percentage of Angler Comments Received
Excess trash in and around the lake & not enough containers (including those for line recycling)	43% (n=74)
Stock fish, both gamefish & baitfish	23% (n=40)
Enforce regulations including those not specific to fishing (i.e. smoking, littering in the park)	14% (n=24)
Manipulate fish habitat, including algae removal	13% (n=22)
Increase fishing access, includes allowing boats	7.6% (n=13)
Adverse dog interactions (off leash, in the water)	7% (n=12)
Increase signage	6.4% (n=11)

**Table 14: Percentage of angler's level of satisfaction on an increasing satisfaction scale of 1 to 5 while angling at Prospect Park Lake, NY in 2014**

Satisfaction Level	Percentage of Anglers
5	44.6%
4	36.0%
3	12.6%
2	3.8%
1	1.1%
N/A	1.9%

## Appendix A

### Angler Interview Questionnaire

New York State Department of Environmental Conservation  
 Bureau of Fisheries, 47-40 21<sup>st</sup> St., Long Island City, NY 11101  
 718-482-4022 fwfish2@gw.dec.state.ny.us



**2014 Prospect Park Lake Angler Survey Questionnaire**

Survey #: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ New Interview \_\_\_\_ Repeat Interview \_\_\_\_

**Demographic Data (all interviews)**

1. Male \_\_\_\_ Female \_\_\_\_
2. Age: (0 – 18) \_\_\_\_ (19 – 29) \_\_\_\_ (30-39) \_\_\_\_ (40-49) \_\_\_\_ (50 – 59) \_\_\_\_ (60 – 69) \_\_\_\_ (70 – 79) \_\_\_\_ (80+) \_\_\_\_
3. Ethnicity: \_\_\_\_\_
4. Home borough/town: \_\_\_\_\_
5. Zip code: \_\_\_\_\_

**Fishing Trip Related Questions (all interviews)**

6. At what time did you begin fishing today? \_\_\_\_\_
7. Is your fishing trip complete for today? If so, then list time: \_\_\_\_\_
8. What species of fish are you targeting today? \_\_\_\_\_
9. Types and numbers of fish caught today:

Species	Number caught	Size, if known
Largemouth bass		
Chain pickerel		
Bluegill		
Pumpkinseed		
Black crappie		
Yellow perch		
Carp		
Other		

10. Type & number of fishing rod(s) used today: spincasting \_\_\_\_ spinning \_\_\_\_ baitcasting \_\_\_\_ fly \_\_\_\_ # of rods \_\_\_\_
11. On this fishing trip which of the following have you fished with? Artificial lures \_\_\_\_  
 Natural baits \_\_\_\_ type(s) of natural bait \_\_\_\_\_
12. What changes at Prospect Park Lake would improve your fishing experience? \_\_\_\_\_  
 \_\_\_\_\_

**General Fishing Questions (new interviews only)**

13. On a scale of 1 to 5, with 5 being very satisfied, how satisfied are you with the overall quality of fishing at Prospect Park Lake? (circle) 1 2 3 4 5
14. Are you aware a NYS fishing license is required for anglers over the age of 15? \_\_\_\_\_

**OVER PLEASE**

New York State Department of Environmental Conservation  
Bureau of Fisheries, 47-40 21<sup>st</sup> St., Long Island City, NY 11101  
718-482-4022 fwfish2@gw.dec.state.ny.us



15. Are you aware the Prospect Park Alliance has implemented measures to minimize harm to wildlife by encouraging safe removal and disposal of fishing line and tackle? \_\_\_\_\_
16. Are you aware the DEC Bureau of Fisheries conducts fishery surveys of Prospect Park Lake? \_\_\_\_\_
17. Would you be interested in participating in the DEC Angler Diary Program? \_\_\_\_\_ (if yes provide informational flyer to angler)
18. Are you aware current fishing regulations require catch and release, only? \_\_\_\_\_
19. Do you support current catch and release regulations? \_\_\_\_\_
20. Have you ever fished outside of New York City? \_\_\_\_\_

21. **Please feel free to provide comments**

---

---

---

**Thank You!**

**OVER PLEASE**

Appendix B

Complete Angling Trip Postcard



PROSPECT PARK LAKE CREEL SURVEY

Date: \_\_\_\_\_ End time of fishing trip: \_\_\_\_\_

**1. Indicate fish caught (after interview) below:**

(do not include entire day's catch)

species	# caught	species	# caught
largemouth bass	<input type="text"/>	black crappie	<input type="text"/>
chain pickerel	<input type="text"/>	yellow perch	<input type="text"/>
bluegill	<input type="text"/>	carp	<input type="text"/>
pumpkinseed	<input type="text"/>	other: _____	<input type="text"/>

check here if no fish were caught:

**2. Mail or text photo of completed card to (917) 613-8260**

Questions? call 718-482-4022 or email [fwfish2@gw.dec.state.ny.us](mailto:fwfish2@gw.dec.state.ny.us)

THANK YOU FOR YOUR PARTICIPATION!

Angler ID: \_\_\_\_\_

## Appendix E

### Results from 2001 Prospect Park Creel Survey

**Table 15: Average counts of Prospect Park Lake anglers per time of day count between 5/5/2001-11/4/2001**

Time Period	07:00	10:00	11:00	14:00	15:00	18:00
Weekday	3.9	6.6	5.0	8.4	6.5	8.1
Weekend	6.6	10.6	8.7	12.7	13.5	8.9
Overall	5.6	9.1	6.2	10.9	8.8	8.3

**Table 16: Prospect Park Lake monthly angler effort for all fish and monthly effort for anglers targeting Largemouth Bass between 5/5/2001-11/4/2001**

Month	Monthly Angler Effort (hrs)	Monthly Angler Effort Targeting Largemouth Bass (hrs)
May	4581	2748
June	3076	2122
July	3289	1968
August	2953	2102
September	2028	1847
October	922	740
Weekday	6630	4581
Weekend	10332	7206
Overall	16964	11774

**Table 17: Catch rate summary of all fish and specifically Largemouth Bass reportedly caught at Prospect Park Lake between 5/5/2001-11/4/2001. Rates were determined utilizing mean of ratios (fish/hr) method for incomplete roving-roving surveys with standard deviations (fish/hr)**

Month	Total Mean of ratios (fish/hr)	SD (fish/hr)	LMB mean of ratios (fish/hr)	LMB SD (fish/hr)
May	.78	.47	.68	.39
June	.41	.38	.37	.37
July	.41	.25	.35	.16
August	.54	.27	.45	.25
September	.24	.15	.24	.15
October	.15	.18	.09	.13
Overall	.44	.36	.37	.31

**Table 18: Fish targeting preferences reported by Prospect Park Lake anglers between 5/5/2001-11/4/2001**

Species	Percentage of anglers
Largemouth Bass	65
Carp	3
Black Crappie	3
Bluegill / Pumpkinseed	1
Chain Pickerel	0
Brown Bullhead Catfish	.5
Anything	27.5

**Table 19: Percentage of tackle types used as reported by Prospect Park Lake anglers between 5/5/2001-11/4/2001**

Reel type	Percentage of anglers	Bait type	Percentage of anglers
Spincaster	3.3%	Lure	77.7%
Spinning	82.9%	Flies	1.3%
Baitcasting	11.6%	Bait	21.0%
Fly	2.2%		

**Table 20: Demographics of anglers at Prospect Park Lake, 5/5/2001-11/4/2001**

Ethnicity	Percentage of anglers	Age	Percentage of anglers
African American	30.8%	<15 yrs old	7.4%
Caucasian	30.2%	16-30 years old	29.6%
Hispanic	24.5%	31-45 years old	35.0%
Asian	5.8%	46-60 years old	23.8%
Other	8.7%	61-75 years old	3.3%
		>75 years old	0.9%
Male	95.2%		
Female	4.8%		

**Table 21: Angler awareness of management practices in 2001**

Question	Yes	No
Do you support the parks Department's No-Kill (Catch and Release) Policy?	65.7%	34.3%
Are you aware that the park stocked pickerel here last fall?	47.0%	53.0%
Are you aware that lead weights cannot be used in city parks?	46.1%	53.9%
Are you aware that the state requires that anglers 16 years of age or older need to have a fishing license?	54.3%	45.7%

