2013 Report on the Common Tern (Sterna hirundo) at Oneida Lake

Report to the New York State Department of Environmental Conservation

Prepared by Ryan Rodriguez, Student intern
Elizabeth Craig and Dr. Paul Curtis, Supervisors
Department of Natural Resources
Cornell University
Ithaca, NY 14853
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Introduction/Background: The Common Tern (*Sterna hirundo*) is listed as a threatened species in New York State. This is largely due to a loss of suitable nesting habitat which is commonly associated with landfill-subsidized increases in gull populations which compete for similar nesting space (Mattison, 2006). This also applies to the Common Tern colony at Oneida Lake. The colony has been reduced to one nesting island on the lake, Little Island, which is reserved annually for terns by Cornell University. Cornell University has been monitoring and managing the colony since 1976, and has been implementing methods such as chick banding, adult recapture, and habitat enhancement through the addition of chick shelters, provision of additional nesting substrate, and seasonal installment of a gull-exclusion grid. Fieldwork during 2013 continued these management practices, including continued installation of artificial nesting platforms. This year we also initiated a geolocator study of adult terns, collaborated with a chick-aging study with researchers from Penn State University, and banded newly-hatched Double-Crested Cormorants from Long Island. The goals of the Cornell University efforts are focused on increasing tern numbers, and establishing a stable, self-perpetuating inland tern colony. The NYSDEC management goal for the Oneida Lake population is to have a stable population with at least 500 nests per year. High gull numbers have precluded terns from colonizing additional islands on the lake, and this management goal is sporadically achieved with Little Island's limited spatial capacity. Artificial nesting platforms were installed to provide increased surface area along the island and an alternative nesting substrate. Restoring the Common Tern to its native habitat enhances biological diversity and allows for the persistence of a species with its own intrinsic value.

Methods:

Artificial Nesting Platform Installation: Four, 4-foot (1.22 m) by 8-foot (2.46 m) plywood platforms were installed at the periphery of the island: 2 on east shore and 2 on the west shore. The platforms were installed just above water level (approx. 1 foot or 0.3 m). All 4 platforms included a 4-inch (10cm) wooden lip to prevent chicks from falling off, and the platforms were secured to metal stakes pounded into the rocky shoreline. The platforms were each covered with shell substrate to mimic the actual nesting islands.

Nest Monitoring: We labeled nests on the platforms and recorded nest contents on a weekly basis. We also banded chicks and recorded numbers of dead chicks found on the island and platforms. When the shell substrate was depleted, we refilled the platforms with shells. Reproductive success was evaluated based on hatching rates and the percentage of young that reached 7 days of age. This age is chosen because this is roughly the oldest age we can keep track of tern chicks in a nest before they become independent enough to leave the nest often and be potentially anywhere on the island, making it difficult to attempt tracking after if a chick from a specific nest is still alive.

Nest Labeling: We created nest flags using numbered marking tape tied to short metal stakes. We placed a flag at nests where we recaptured adults, and took particular note of marked nests that had adult terns with newly-attached geolocators. We monitored marked nests so that we did not accidentally retrap the same adult terns.

Chick Banding: We banded all the chicks we could find on the platforms and the island. We used bands provided by the USGS Bird Banding Laboratory. We placed the aluminum band on the right leg of each chick, and we recorded the chick's age. We also recorded the age and number of dead chicks found during every visit to the island, and whether the dead chicks were banded or not.

Geolocators: This was our pilot year of using geolocators. We placed the geolocator affixed to a yellow plastic band on the left leg of 10 different adult terns. Each tern we marked with a geolocator already had a USFWS aluminum leg band, and was actively nesting at the time of capture. We anticipate that over time we will able to learn about the migration routes and winter destinations for Common Terns nesting at Oneida Lake. For each tern, we also recorded the USFWS band number, head-bill length, wing length, culmen length and diameter, and the time it took for us to attach the geolocator to each tern.

Adult Recaptures: We recaptured adult Common Terns with either dip nets, or by using walk-in traps, and recorded their band numbers. Dip nets were used to capture birds in flight. Walk-in traps were used to capture adults incubating eggs. The PVC- frames covered with mesh netting were set over nests. The adults enter through a small hole on one side in order to incubate their eggs. We then approached quickly, removed the bird from the trap, and recorded its band number. Recapturing banded Common Terns was important for understanding the Oneida Lake population's survivorship, age distribution, and nest-site fidelity.

Tern Aging Guide: This summer we worked with tern researchers from Penn State University on a tern aging guide. We gathered different groups of chicks of various ages, and had researchers try estimating the ages on their own for the first few trials, and then estimate chick ages with a guide during the later trials, to determine usefulness and accuracy of the tern aging guide.

Gull Exclusion Grid: We erected a seasonal 20-lb-test (9.07 kg) monofilament grid in early April that was intended to reserve the island for the Common Terns. In recent years, Ring-billed Gulls (*Larus delawarensis),* have attempted to nest on Little Island, and directly compete with terns for space. Once the terns returned in sufficient numbers to defend the island independently, the grid was disassembled and removed.

Diet: We made visual notes of the fish species the terns were bringing back to the island while foraging. This was done on four different days, two times each day. These times are when we

first have approached and set foot on the island and during observations before we leave the island.

Other colonial waterbird species monitoring: Our research also included monitoring the other colonial waterbird populations on the lake. We monitored Ring-billed Gulls, Herring Gulls (*Larus argentatus*), Great Black-backed Gulls (*Larus marinus*) and Double-crested Cormorants (*Phalacrocorax auritus*) on Wantry and Long Islands. We performed dusk and daytime counts of roosting cormorants. We approached the islands via boat near sunset and counted cormorants with binoculars while offshore of the islands due to the cormorants' tendency to flush easily. We also estimated the number of adult gulls for each gull species during our cormorant counts. This year we also labeled nests and counted eggs for Double-crested Cormorants, tallied live and dead cormorant chicks, and banded the cormorant chicks at ten days of age or older.

Results:

Gull Exclusion Grid: After a two year gap without the gull exclusion grid, the grid was put in place and was highly effective in deterring Ring-billed Gulls. We only had to destroy two Ring-billed Gull nests on Little Island, both initiated by the same adult pairs. Common Terns occasionally got stuck in the monofilament grid, and one died. Therefore we took down the grid when approximately 300-400 terns returned and were able to defend the island. Overall the grid was very successful in keeping gulls off of the island.

Adult Common Tern Recaptures: We recaptured 38 banded, adult Common Terns (Figure 1). The age distribution of recaptured adults during the 2013 field season (Figure 2) was similar to previous years (Figure 3) with the trend of age six terns being the most commonly caught. Terns aged eight,seven, and three years also made up a major percentage of the recaptures.

Diet: We predominantly observed adult terns with yellow perch (*Perca flavescens*) in the early summer months, and gizzard shad (*Dorosoma cepedianum*) in the later summer months.

Nesting Data for the Common Tern Colony: The peak count was 579 nests on Little Island during the 2013 field season, and we banded 476 Common Tern chicks.

Other Oneida Waterbird counts: We conducted counts of Double- crested Cormorants throughout the summer. The Oneida Lake cormorants produced successful nests for the first time in more than 5 years. These nests were not destroyed by NYSDEC staff as has been the case in previous years. Twenty Double-crested Cormorant chicks were banded.

Geolocators: The 10 geolocators were successfully placed on adult terns. We continued to monitor the appearance of the terns with geolocators each time we were on the island to make

sure that the geolocator didn't alter nesting behaviors. The geolocator had no noticeable impacts on the terns, as they returned to their nests quickly after being banded, and they continued to care for their nest each time we visited the island. Due to a miscommunication, the geolocators were not turned on properly and are not logging data. However, we will be able to gather data on return rates for marked terns and turn the geolocators on next summer. Assuming terns with geolocators return and can be recaptured in 2014, we anticipate deploying at least 10 more units on new adult terns.

Discussion:

Although we didn't do extensive observations and studies of terns nesting on the platforms, there were some notable issues that we saw throughout the course of the breeding season. Due several early storms and windy conditions, terns nesting on the platforms were less successful this year than during the previous two summers. Waves often breached the platforms, as the water level on the lake appeared higher than usual. The wind not only blew water into the platforms, but waves also removed most of the substrate (e.g., sand and mussel shells) from the platforms that the terns require for nesting. Based on the 2012 platform study evaluating different heights, the terns appeared to have little to no preference between higher or lower platforms, and the hatching rates at different heights were similar. In future years, it would seem ideal to place all the platforms at least 2 feet above water level so the nests will be more protected from potential rough waters and windy conditions.

Although the peak nest count was high in 2013 (Fig.3), the number of surviving chicks was lower than for 2011 and 2012. Severe early summer storms impacted early nesting attempts, and many tern pairs were forced to renest. This concentrated nesting attempts in a shorter period, and resulted in a high peak count. High water and storms continue to be an important factor that most greatly influences tern nesting success each summer. Competition from gulls can be managed with the monofilament exclusion grid. The only ways to manage for storm events is either to lower the lake water level (may not be acceptable to stakeholders), or add rocky substrate to the island to increase its height above mean water level.

Due to the increased efficiency of tern banding during the past three years, we may start observing different recapture rates by age class. Increased banding efficiency likely explains the high surviving chick counts (Fig.5) during 2011-2013 compared to previous years. Although records of chick survival and age structure are still important to monitor each year, trends in survival and recapture information should be interpreted with caution. It is interesting to note that in decades of trapping adult terns (fig. 2) we have never recaptured an age 1 bird. It seems that terns do not return to the island to nest until at least age 2, so their behavior during the first two terns of life is unknown.

This year's Double-crested Cormorant count had the same population range as previous years. However, the cormorant counts showed more fluctuation this year as the population numbered varied by a large amount with each account in comparison to last year where each count had the population at nearly the same amount each time. The cormorants were able to nest successfully this summer since the NYSDEC felt the cormorant population was low enough to permit the cormorants to nest and did not oil the eggs to prevent hatching as done in previous years. The NYSDEC also set a limit of permitting no more than twenty nests on the island which the total nest count was well under. Had the nest count been over twenty, some nests would have been oiled so that no more than twenty nests can successfully have chicks. Next year assuming the same DEC policy is followed, the Cormorants may have an increase in successful nesting and be close to approaching the set limit of 20. This limit may be increased or decreased in 2014. If unaltered, the cormorants may have 17-21 successful nests.

Literature Cited:

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Mattison, P.M. 2006 Quantifying disturbance factors and effects in common terns (*Sterna hirundo*) using visual, audio, and reproductive data. M.S. Thesis, Cornell University, Ithaca, NY

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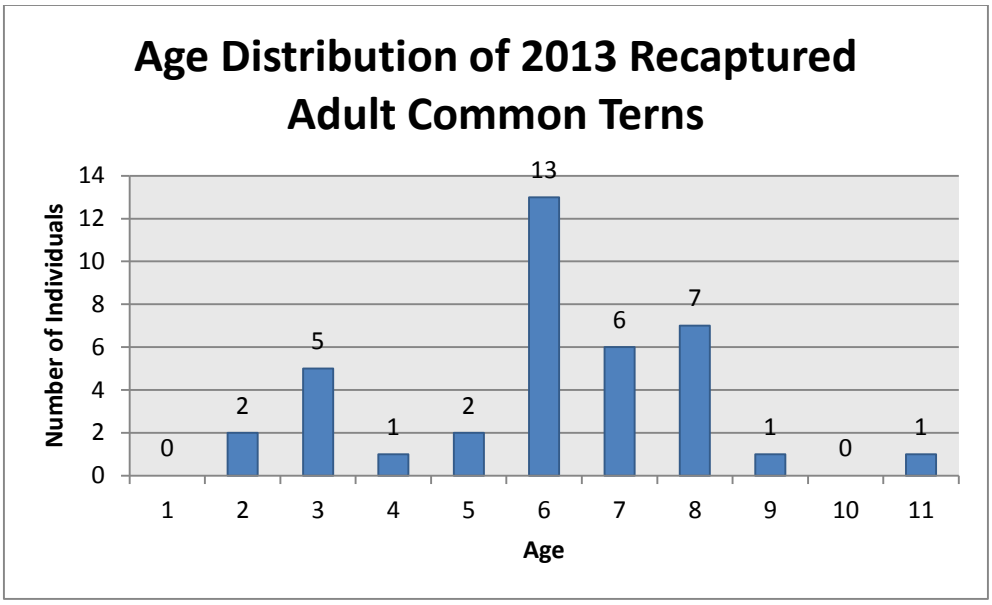

Figure 1: Age Distribution of recaptured adult Common Terns at Oneida Lake, 2013

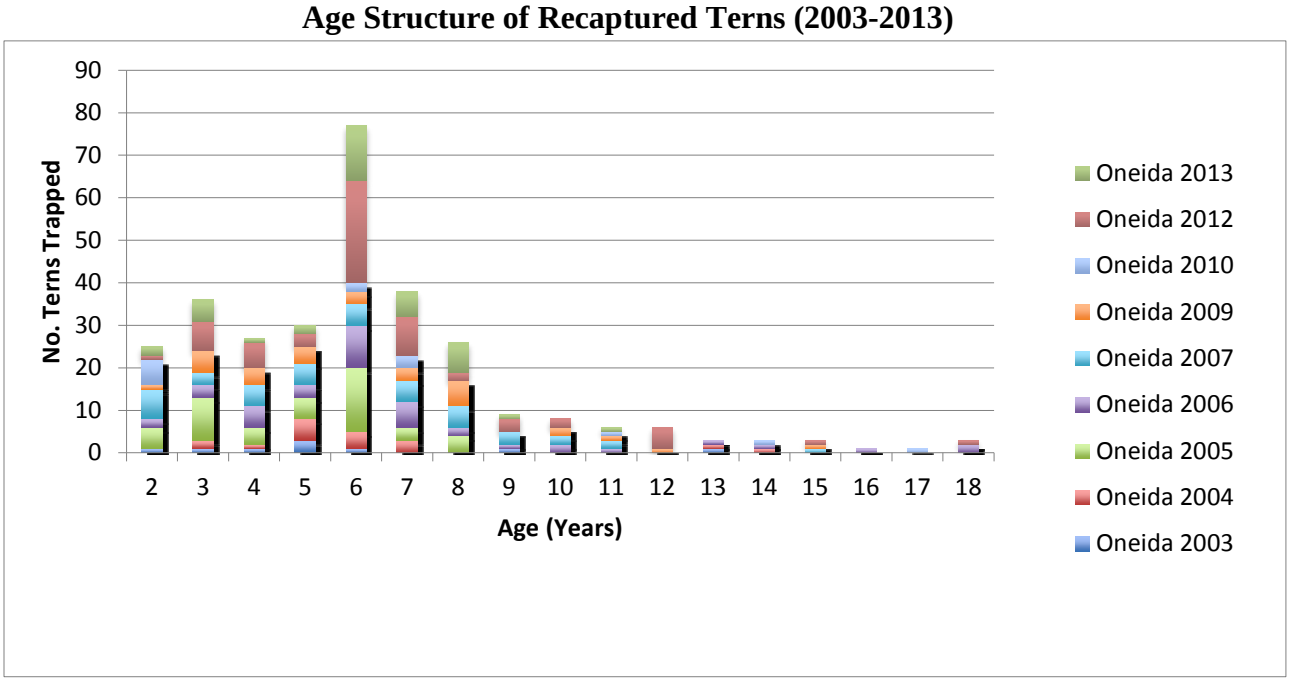

Figure 2: Age structure of recaptured Common Terns at Oneida lake (2003-2013)

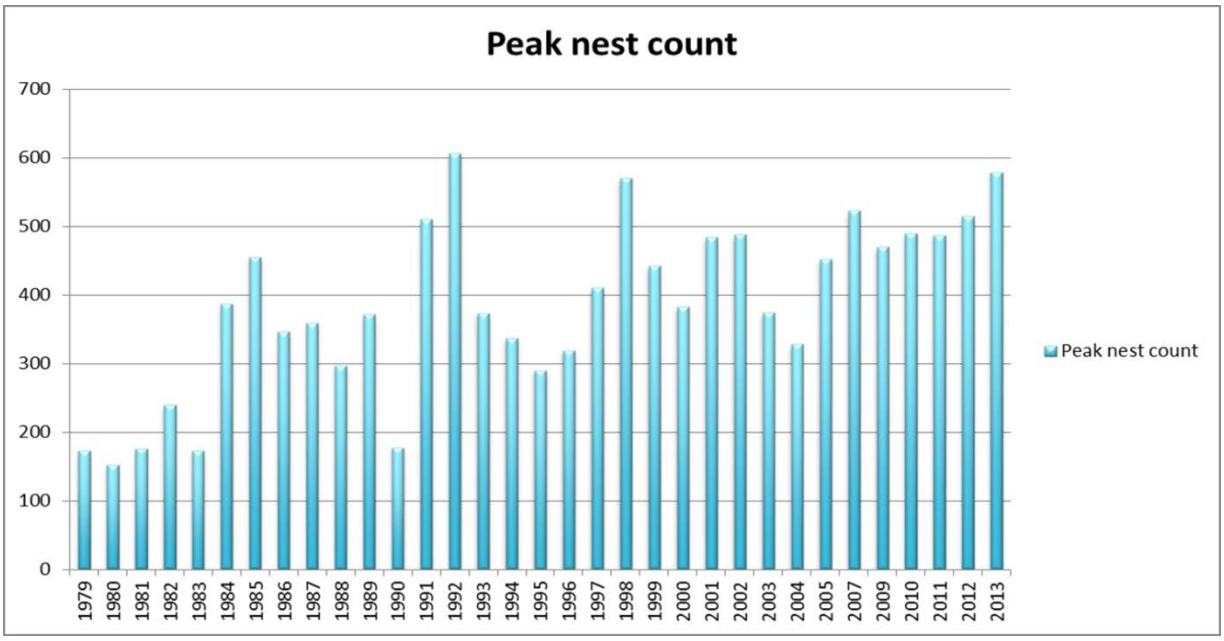

Figure 3: Peak Tern nest counts on Little Island, Oneida lake (n=579 nests in 2013)

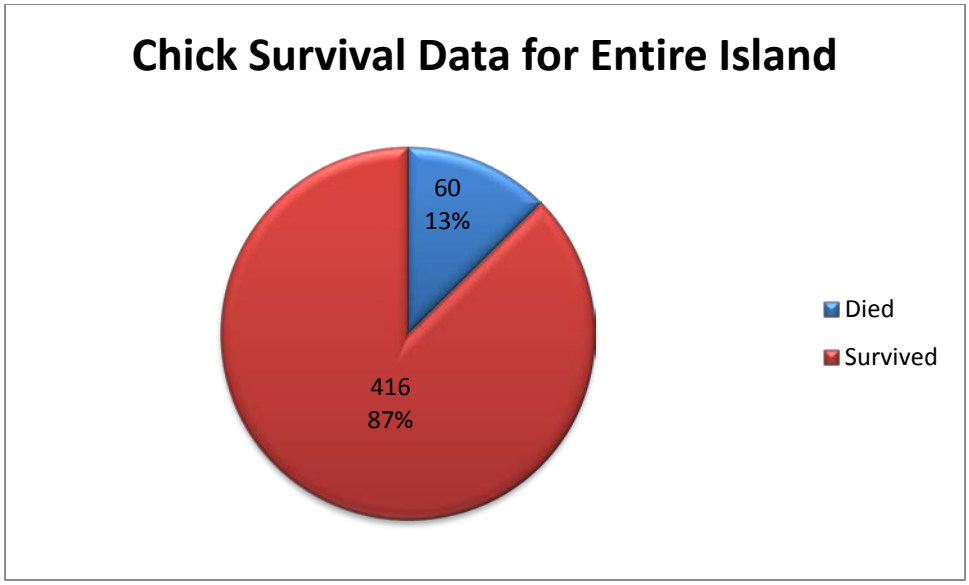

Figure 4: Common Tern chick survival data for Little Island, Oneida Lake, 2013

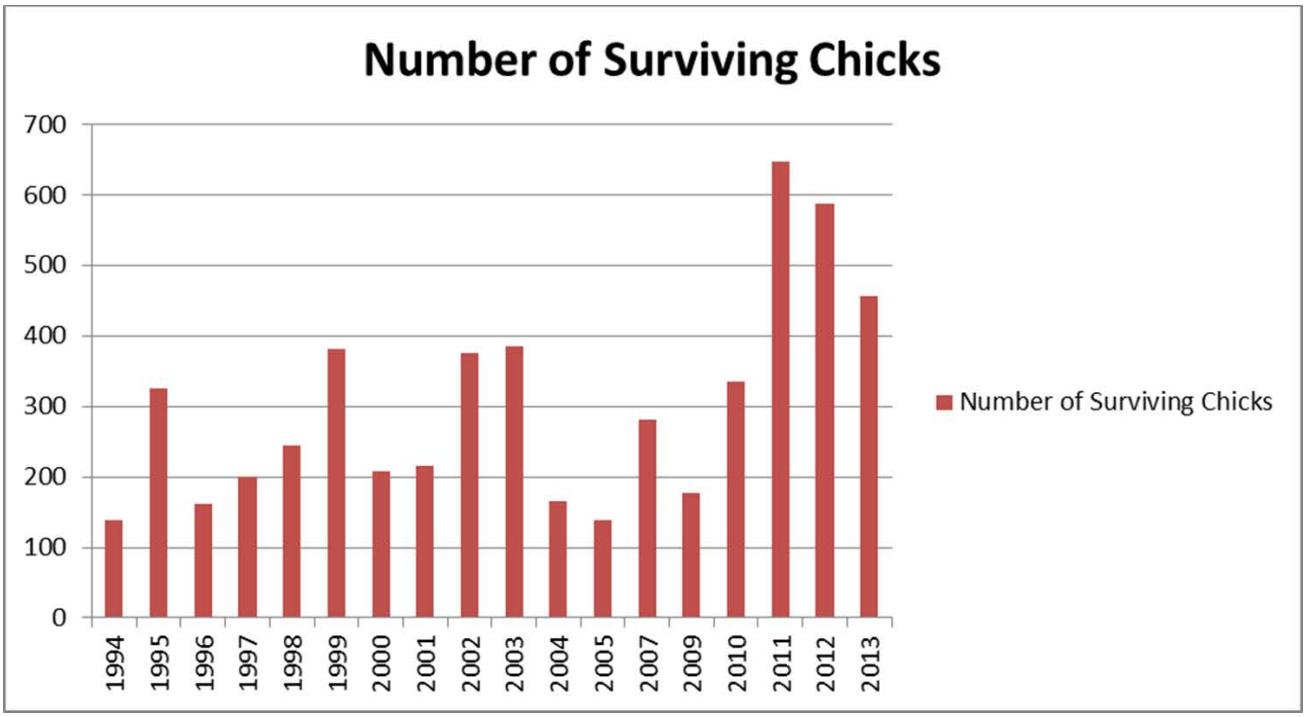

Figure 5: Past chick survival data for Common Terns at Oneida Lake

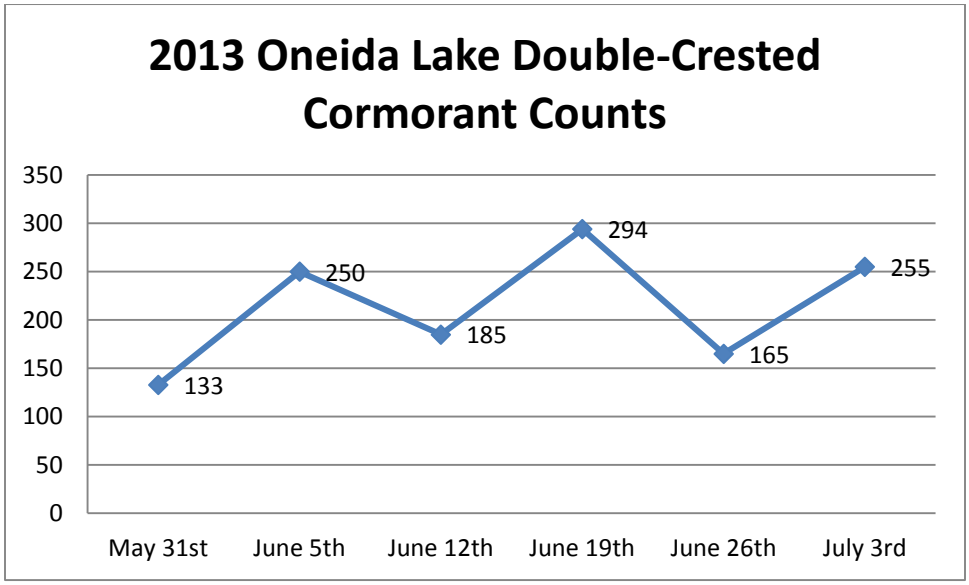

Figure 6: Double Crested Cormorant counts for Oneida Lake, NY, summer 2013