

**2011 Report on the Common Tern (*Sterna hirundo*) at Oneida  
Lake**

Report to the New York State Department of Environmental  
Conservation

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Introduction/ Background: The Common Tern (*Sterna hirundo*) colony on Oneida Lake has been monitored since 1976 by Cornell University. The bird is a threatened species in New York State (Burger and Gochfeld, 1991). Due to the millinery trade and habitat loss, the Common Tern experienced a severe population decrease in the early 20th century (Kress and Hall, 2004). The Common Tern is a migratory bird (Kress and Hall, 2004) and a nesting colony utilizes Oneida Lake as its summer breeding grounds from early May to early September. Cornell University's work on Oneida Lake has been, and is currently focused on, increasing Common Tern numbers and aiding the birds in establishing a stable, self-perpetuating, inland colony. Restoring the Common Tern to its native habitat enhances biological diversity and allows for the persistence of a species with its own intrinsic value. Traditionally, Cornell has monitored the Common Tern population and provided the birds with several forms of habitat enhancement (Schwartz, 2010). During 2011, we continued our monitoring practices and efforts to increase their numbers. We also incorporated a new technique, namely experimental artificial nesting platforms (Dunlop *et. al*, 1991). The Oneida Lake colony is stable but space limited (Schwartz, 2010). The birds have the capacity to increase their numbers however there is limited suitable habitat on the lake.

#### Methods:

*Overview:* The field methods employed for this work broadly included observing the number of nests, nest contents, chick survival, banding chicks, and adult recaptures. To increase nesting success, we traditionally utilize several methods of habitat protection and enrichment. A gull exclusion grid is usually erected in early spring and removed upon arrival of the terns (Schwartz, 2010). This was not conducted in 2011 due to high water levels in early spring. Chick shelters (Figure 1), warning buoys (Figure 2) and extra nesting substrate are distributed on the island to improve nesting success and chick survival. This summer we incorporated nesting platforms as an additional means of habitat enhancement.

*Population monitoring:* We created nest flags using numbered marking tape tied to short metal stakes. We placed one flag next to each nest. In this way we kept track of the progress and fate of these nests. We recorded nest contents by returning to the island several days each week via small motorboat. On June 20, we recorded the peak number of tern nests for the year ( $n= 487$ ). Once the chicks hatched, we banded them, recorded their age, and their nest site. We were unable to associate older, more mobile chicks with a specific nest. We placed the bands on the chicks' right leg. We also recorded the age and number of dead chicks during every visit to the island, and whether the dead chicks were banded or unbanded.

Adult Common Terns were trapped by hand and using walk-in traps in order to record band numbers for previously-banded birds (Figure 3). During this procedure, we set PVC- frame, mesh-sided, walk-in traps over the nests. The birds enter through a small hole to incubate their eggs. We then approach quickly, removed the bird from the trap, and recorded its band number. Recapturing banded Common Terns is important for

understanding the Oneida Lake population's migration dynamics, age range, and survival.

*Nesting habitat enhancement:* We provided the terns with extra nesting material in the form of dry grass clippings. These clippings help the terns create more robust nests and enable them to utilize otherwise suboptimal areas of the island, thereby increasing the number of potential nests. As the birds are already space-limited, the intention is to allow them to utilize as much of the island as possible. We distributed the grass clippings uniformly across the island, being attentive not to cover preexisting nests. We transported the grass clippings in 15 – gallon (56.78 L) plastic garbage bags. We provided the extra nesting substrate during May, early in the nesting season. The grass clippings were obtained from the Cornell Biological Field Station lawns. We also provided wooden chick shelters to protect the chicks from predators and the elements.

*Nesting structures:* This year, a notable deviation from conventional management practices was that we did not set up the 20-lb-test (9.07 kg) monofilament grid in early April that is intended to reserve the island for the Common Tern. The water level on Oneida Lake was high during this period, and no gulls attempted to nest on Little Island. The terns were successful in establishing their colony on the island without the grid installment this year.

We conducted a pilot study to observe how the terns at Oneida Lake would respond to artificial nesting structures. The population is space-limited, and the addition of extra space would allow the birds to increase their numbers. We constructed two identical platforms made of 2X4s and plywood offsite. They were 4' (1.22 m) by 6' (1.83 m) and included a 4'' (10.16 cm) lip to prevent chicks from falling off. We then ferried them out to Little Island using the Cornell Biological Field Station's trawler. We transferred the structures to a smaller boat and brought them through shallow water to the island. Once on the island, we secured the structures using metal stakes and a stake driver. We attached the plywood platforms to the stakes with U-clamps, and incorporated cinderblocks as additional supportive material. We covered the plywood with burlap and obtained shell substrate from nearby Wantry Island. Our goal was to make the platforms as natural as possible for the birds. The platforms were anchored approximately one foot (0.3 m) off the east shore of the island, raised above the water level, and had one side tangent with the island. We then created an incline from the island to each of the platforms constructed of cobble-pebble sized rocks. The inclines ended flush with the lip of the platforms and created a natural ramp connecting the platforms to the island. This would allow the older chicks to leave the platforms and have access to the island. The platforms were raised higher than island level to protect them from flooding during storms. We installed the structures and also collected tern nest data on June 10, 2011 (Figure 4). The subsequent nests and chicks on the platforms were monitored using the same methods we used for the island.

*Diet:* We made field notes of the species of fish the terns were catching.

*Weather:* We recorded weather conditions each time we visited the island. In 2011, there were fewer storms and less precipitation than has been observed in recent years.

*Grassy Island:* In 2011, a small Common Tern colony was also established on Grassy Island, just offshore from the Cornell Biological Field Station. We implemented the same procedures described above for the small tern colony on Grassy Island. Two 15-gallon garbage bags full of dry cut grass were distributed to Grassy Island June 3, 2011.

*Other colonial waterbirds:* Our research also included monitoring the other waterbird populations on the lake. We monitored the Ring-billed Gull (*Larus delawarensis*), Herring Gull (*Larus argentatus*), Great Black-backed Gull (*Larus marinus*) and Double-crested Cormorant (*Phalacrocorax auritus*) populations on Wantry and Long Island. We banded gull chicks and performed dusk and daytime counts of the cormorants roosting on Wantry and Long Island. We also banded Herring Gulls, Ring-billed Gulls, and Great Black-backed Gulls, and recorded the number of nests per species and nest contents. We also monitored the number of nests and nest contents for cormorants. To conduct adult cormorant counts, we approached the islands via boat around sunset and conducted the cormorant counts using binoculars while offshore of the islands due to the cormorants' tendency to flush easily. We kept rough track of the number of adult gulls for each species as well. We performed these counts on June 10, June 11, June 15, June 16, June 20, June 27, July 5, July 10, July 16, July 27, July 31, August 2 and August 4. Cormorants had no successful nests this year, as for summer 2010.

### Results:

*Common Tern nesting success:* The peak number of Common Tern nests on Little Island was 487 (Figure 5). The number of surviving chicks was recorded at 647 (Figure 6). Chick mortality occurred in waves (Figure 7), and the survival of chicks on the island and platforms was relatively similar (Figure 8).

*Grassy Island:* After several thorough visits, we discovered only 2 chicks hatched at Grassy Island. June 28 we found a one-day-old chick, banded it and obtained a feather sample. On July 5, we banded another one one-day-old chick on Grassy Island. The terns that colonized Grassy Island experienced almost complete nesting failure. We tagged 86 nests as of June 20, 2011. However, as the summer continued, many of the nests were abandoned and a most contained broken eggs. The terns on Grassy Island did not exhibit the same intensity of mobbing behavior as the larger colony on Little Island. They also lacked the confidence of the large group and abandoned their nests quickly. The vegetation on Grassy Island became very dense and tall by the end of the summer. The dense vegetation cover, small island size, and proximity to the mainland were all factors that led Grassy Island to be a suboptimal colonization site. When we visited Grassy Island on August 4, we did not observe a single Common Tern, and the island was apparently abandoned.

*Adult Common Tern recaptures:* We captured and recorded band information from 36 banded adult Common Terns (Table 1). The Oneida Lake Common Tern population shows incredible site fidelity. According to their band data, all of the birds we captured were born on the island. Their ages ranged from 5-14 years of age (Figure 9).

*Nesting structures:* On July 5, Platform 2 had 12 nests with eggs, and Platform 1 had 15 nests with eggs. We continued to monitor the nests. From July 10- August 4, we banded 31 chicks on Platform 1, and 28 chicks on Platform 2. We recaptured and recorded band information for adult terns on both platforms.

*Injuries and deformities:* We noticed that two of the adults that nested on the platforms had leg deformities or injuries. One adult was missing half of its left leg (Figure 10) and the other adult seemed to have a broken leg that had healed at an angle (Figures 11 and 12). These 2 birds each had their own nest. The individual with the broken leg was nesting on Platform 2.

On July 10, we banded a 5-day-old chick from nest 205 with malformed feet (Figure 13). We recaptured this individual several times later in the season, and it seemed to be developing at a normal rate. On July 27, we banded a 14-day-old chick with bumble foot that was on Platform 1. On August 4, we banded a 5-day-old chick with a noticeable cross-bill (Figure 14).

*Diet:* There was a high incidence of Small-mouthed Bass (*Micropterus dolomieu*), Yellow Perch (*Perca flavescens*) and American Gizzard Shad (*Dorosoma cepedianum*). June 28, a 3-inch (7.5 cm) Yellow Perch found. July 10, several 1.5- to 2-inch Small-mouthed Bass and Yellow Perch observed on island as well as in the bills of the birds as they brought back their prey to the island. On August 4, we noted the birds were bringing back Yellow Perch and Gizzard Shad.

*Other colonial waterbirds:* The peak number of Herring Gull nests recorded was 143, with 80 nests on Long Island, and 63 nests on Wantry Island. We observed 7 Great Black-backed Gull nests, 6 on Long Island and 1 on Wantry Island. We recorded 49 Ring-billed Gull nests on Long Island (Figure 15). We conducted Double-crested Cormorant counts throughout the summer (Figure 16). On June 6, we observed 2 cormorant nests on Long Island, one containing 2 eggs and the other containing 1 egg. We continued to monitor these nests, but the eggs never hatched. Wantry Island had no successful cormorant nests this season.

*Other bird observations:* We recorded many mallard (*Anas platyrhynchos*) nests, nest contents, and dead adult mallards. On June 6, we observed 2 Ruddy Turnstones (*Arenaria interpres*) on Little Island. On June 9 we found a dead adult Common Tern on Grassy Island. The bird was partially eaten in such a way that suggested the predator was a mink (*Neovison vison*). July 1 we found an unbanded, dead adult Common Tern on Little Island. We also noted a Red-winged Blackbird (*Agelaius phoeniceus*) nest on Grassy Island on June 9. On June 10, we noted a White Pelican (*Pelecanus erythrorhynchos*) offshore of Wantry Island. On July 5, we found one adult ring-billed gull on Long Island.

July 10 we found a recently-deceased adult Herring gull with no visible wounds. On July 10, we also observed a Spotted Sand Piper (*Actitis macularius*) on Long Island (Figure 17). July 11, 2 ospreys (*Pandion haliaetus*) were sited near Little Island. On July 19 we sited 8 Caspian Terns (*Hydroprogne caspia*) and 2 Bonapart Gulls (*Chroicocephalus philadelphia*) on Long Island (Figure 18). August 4 we noted 9 Caspian Terns, 1 Greater Scaup (*Aythya marila*) and one White-winged Scoter (*Melanitta deglandi*) on Long Island. We repeatedly observed a pair of Black Terns (*Chlidonias niger*) on Little Island for several weeks (Figure 19). Terns form both mono-specific and mixed-species colonies (Burger and Gochfeld, 1991). The presence of a large Common Tern colony may have attracted the Black Tern pair to Oneida Lake.

### Discussion:

*Nesting platforms:* Our observations of the 2 adult terns nesting on the platforms with abnormal feet question the quality and physical condition of the birds that utilized the platforms. Were the handicapped Common Terns a coincidence, or indicative that terns which colonized the nesting platforms were less competitive and could not secure space on the main island? The platforms were not erected until much of the island nesting space was occupied by terns, so the individuals nesting on the platforms may have been late arrivals to the breeding grounds, or individuals unable to compete for nesting territory on the island.

The young chick with the cross-bill, and the bird born with deformed feet, may be indications of contaminants in Oneida Lake. Common Terns are income breeders (Bond and Diamond, 2010) and therefore the nutrients incorporated into their eggs are derived from their current, summer habitat. As such, deformities and lesions in chicks may indicate local environmental contamination on Oneida Lake. Abnormal development will likely affect their survival and fitness.

The nesting platforms on Little Island yielded encouraging results. The chick survival rates on the island and platforms were similar (Figure 8). This indicates the platforms provided adequate nesting habitat for the birds. With no negative side effects on chick survival, we demonstrated that the platforms function as suitable additional nesting area. As the terns are space-limited, the addition of extra surface area for nesting may be instrumental in increasing the population size of the Common Tern colony on Oneida Lake.

*Common Tern nesting success:* The breeding season for 2011 yielded a peak of 487 total nests. The survival rate of the chicks was also very high. There were few large storms, and little precipitation this summer. We feel this contributed to high chick survival. Our data also shows no significant difference in mortality between banded and unbanded chicks, indicating that our banding activity has no negative effects on the young birds.

Grassy Island proved to be an unsuitable nesting environment for the terns. While the island has been colonized previously, as for past years, the terns had no nesting success in 2011.

*Cormorant observations:* The spike in cormorant numbers towards the end of the season was likely due to migrating birds passing through. As in 2010, cormorant numbers remained relatively low and stable throughout the summer.

*Management Recommendations and Future Research:* The addition of artificial nesting platforms to Little Island provided promising results. We hope to continue experimenting with these structures. Our current data suggests that the platforms could aid the Oneida Lake Common Tern colony in increasing population numbers. Future research is needed to understand the specific effects of the platforms.

### **Literature Cited**

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Kress, S. W., and C. S. Hall. 2004. Tern management handbook- coastal northeastern United States and Atlantic Canada. U.S. Department of Interior, Fish and Wildlife Service, Hadley, MA.

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Table 1: Adult Recapture and Banding Data for Common Terns on Little Island, Oneida Lake, NY in 2011.

Dates of Adult Capture	No. of Banded Adult Birds Captured
June 6, 2011	3
June 15, 2011	10
June 20, 2011	6
July 1, 2011	4
July 5, 2011	5
July 10, 2011	6
July 16, 2011	1
July 27, 2011	1



Figure 1: One form of habitat enrichment that we utilized was the addition of chick shelters to the Little Island, Oneida Lake, NY in 2011. Photo credit: Laura Mortelliti.



Figure 2: A method of habitat protection that we have implemented for several years is floating buoys with warning signs near Little Island, Oneida Lake, NY in 2011. Photo credit: Laura Mortelliti.



Figure 3: Our method of adult recapture incorporated the nest cages shown above. These are PVC- frame, mesh sided walk-in traps used at Little Island, Oneida Lake, NY in 2011. Photo credit: Laura Mortelliti.



Figure 4. Platforms 1 and 2. The birds quickly utilized the platforms and nested on them at Oneida Lake, NY in summer 2011. Photo Credit: Elizabeth Craig and Laura Mortelliti.

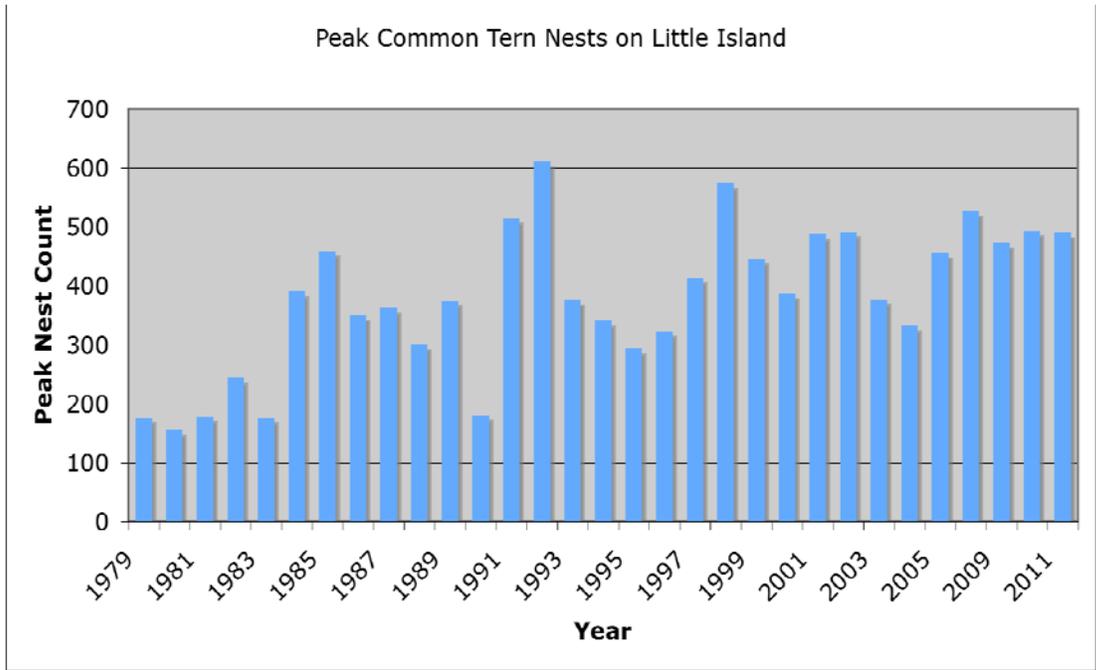


Figure 5. Peak counts of Common Tern nests on Little Island, Oneida Lake, NY. The peak number recorded for 2011 was 487 nests.

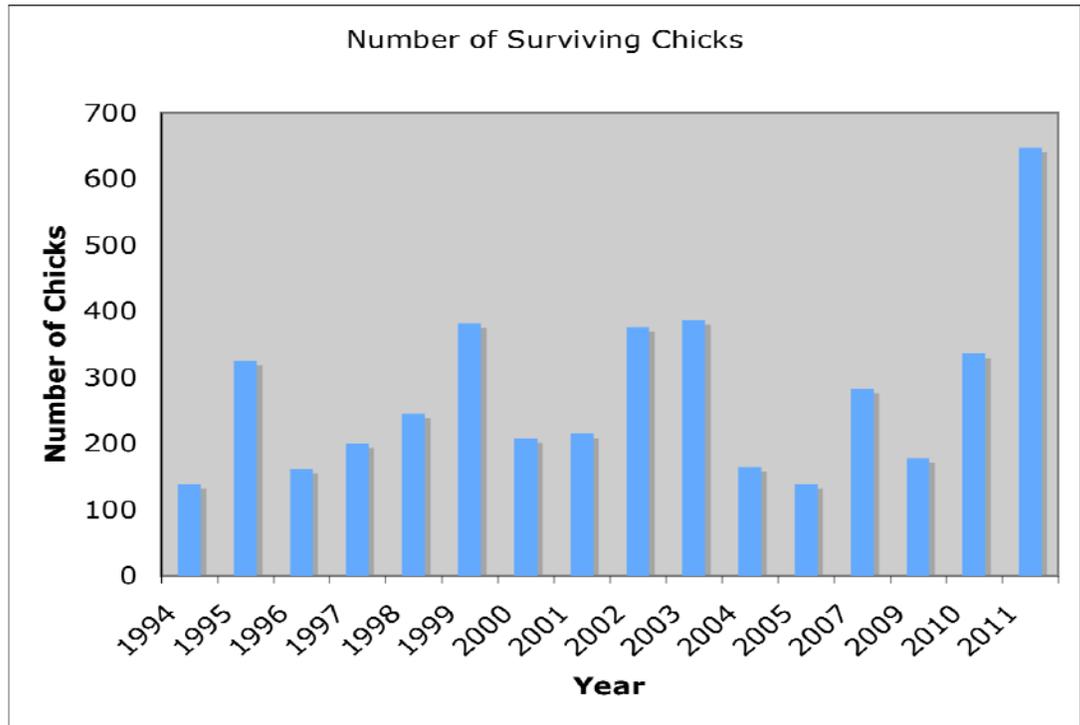


Figure 6. Number of surviving chicks on Little Island, Oneida Lake, NY. The total number recorded for 2011 was 647.

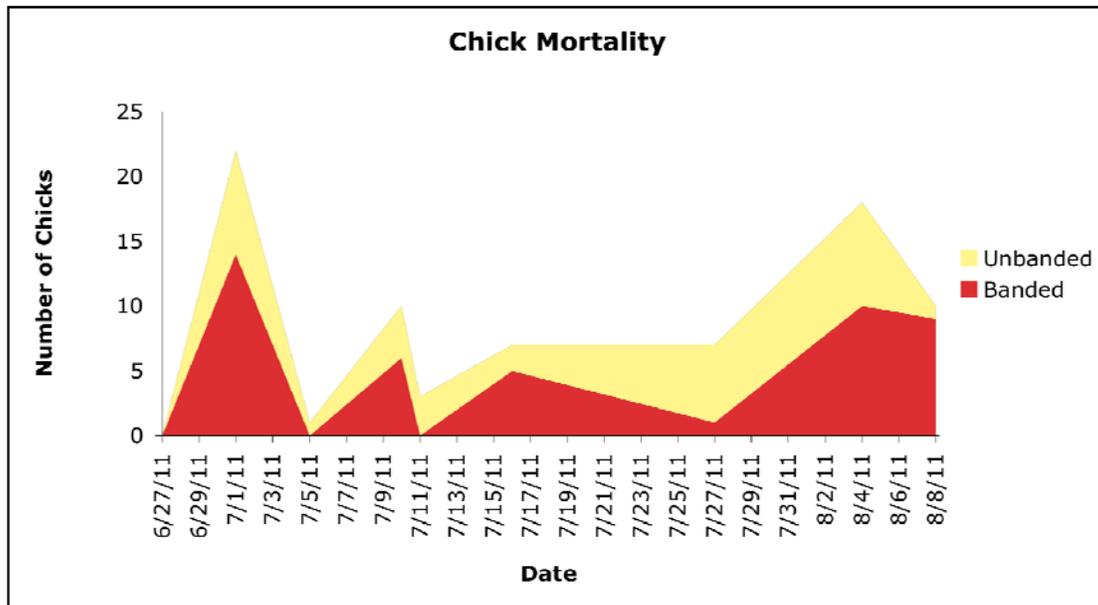


Figure 7: Chick mortality over the course of the field season on Little Island, at Oneida Lake, NY in summer 2011.

### Chick Fate

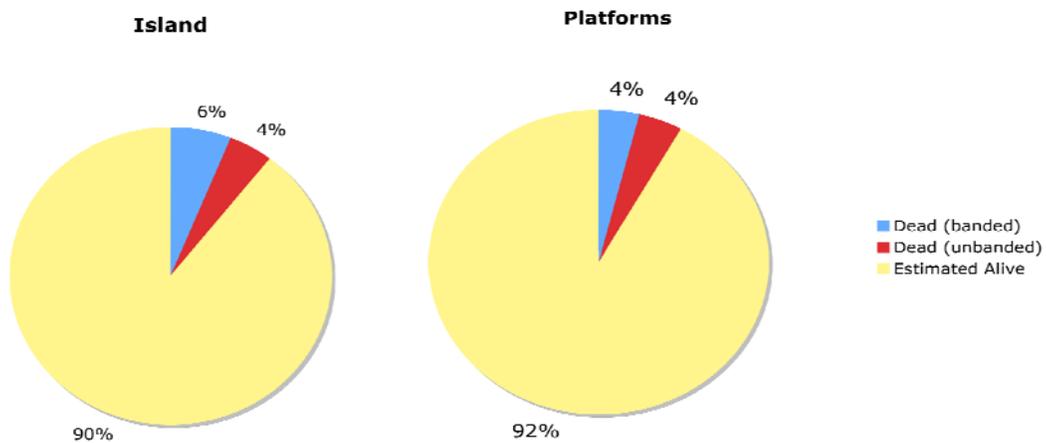


Figure 8: Chick fate over the course of the field season on Little Island, at Oneida Lake, NY in summer 2011.

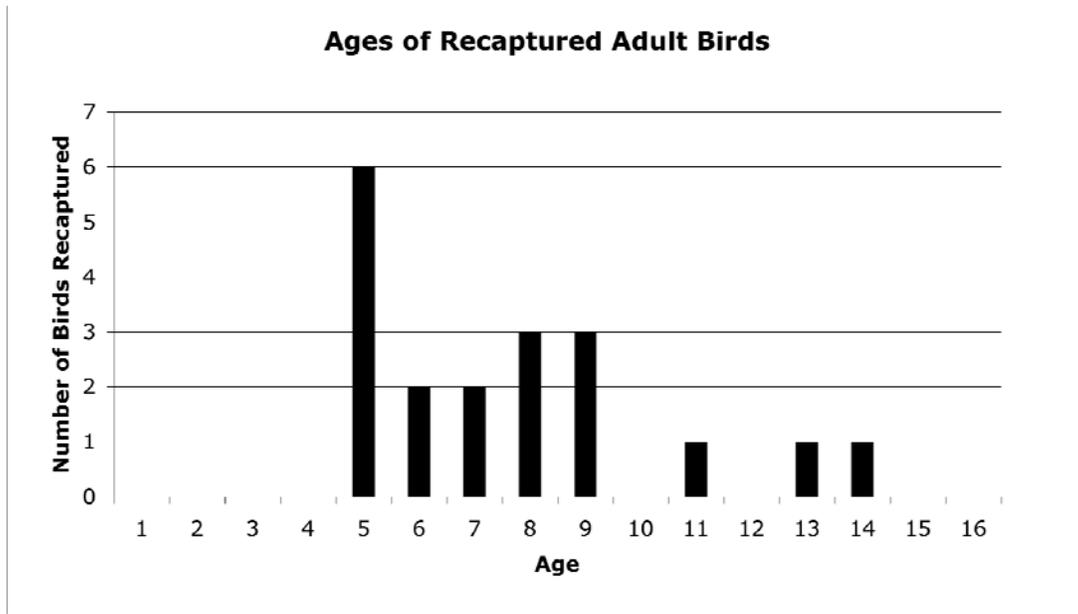


Figure 9: Ages of recaptured adult Common Terns on Little Island, Oneida Lake, NY in summer 2011.



Figure 10: We noticed two birds that nested on the platform exhibited physical defects. This bird was missing the bottom half of its left leg. Photo Credit: Elizabeth Craig



Figure 11: Individual nesting on Platform #2 appeared to have a broken leg that healed at an angle. Photo credit: Laura Mortelliti.



Figure 12: Individual nesting on Platform #2 appeared to have a broken leg that healed at an angle. Photo credit: Laura Mortelliti.



Figure 13: Photos of Common Tern chick with deformed feet at Oneida Lake, NY. This bird was first observed on July 10, 2011 on Little Island. The bird appeared otherwise healthy. Photo credit: Laura Mortelliti.



Figure 14. Five-day-old chick banded on August 4, 2011 with cross-bill on Little Island, at Oneida Lake, NY in summer 2011. The bird appeared otherwise healthy. Photo credit: Laura Mortelliti.

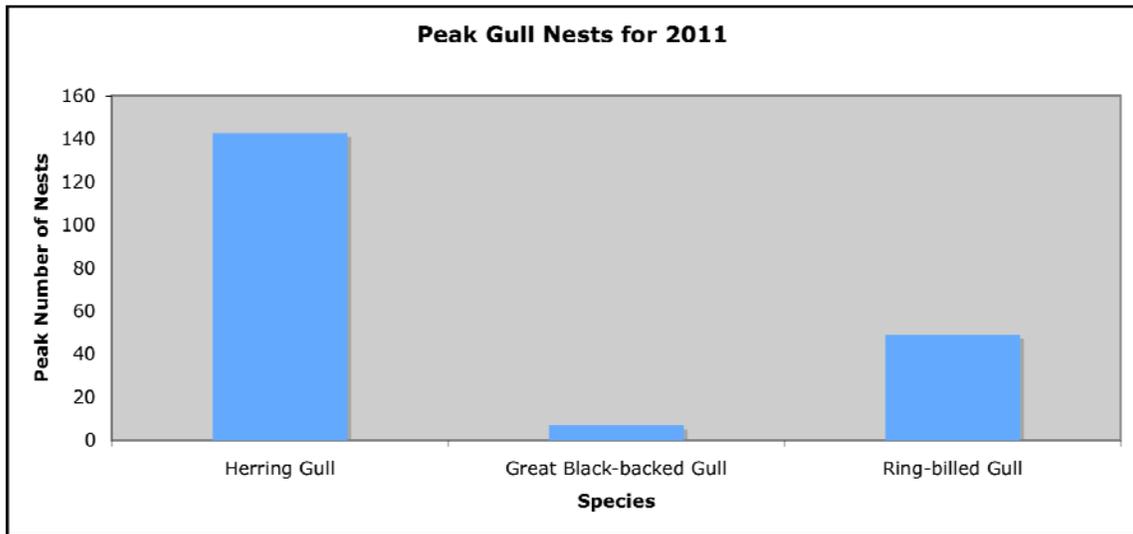


Figure 15: Peak gull nest counts for summer 2011 at Oneida Lake, NY. A total of 143 Herring Gull nests, 7 Great Black-backed Gull nests, and 49 Ring-billed Gull nests were recorded.

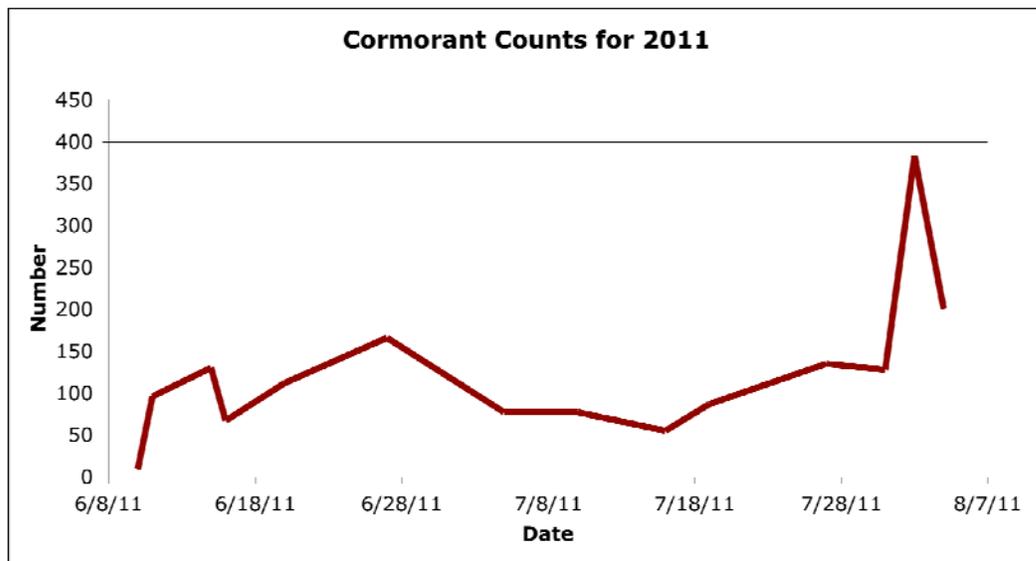


Figure 16: Double-crested cormorant counts over the course of the field season at Oneida Lake, NY in summer 2011.



Figure 17: On July 10, 2011, we observed a Spotted Sandpiper and its nest on Long Island. On July 19, we also spotted 3 juvenile Spotted Sandpipers and concluded they were the hatched young from the nest we had recorded earlier in the season. Photo credit: Laura Mortelliti.



Figure 18: On July 19, 2011, we sited 8 Caspian Terns, 2 Bonaparte Gulls, and 1 adult Spotted Sandpiper on Long Island, Oneida Lake, NY. On August 4, we noted 9 Caspian Terns, 1 Scaup and 1 White-winged Scoter on Long Island. Photo credit: Laura Mortelliti.



Figure 19. Black Tern (*Chlidonias niger*) observed on Little Island, Oneida Lake, NY. We noted the presence of a pair of Black Terns for a window of about 2 weeks in the middle of the 2011 field season. Photo credit: Laura Mortelliti.