

Nocturnal Predation on Common Terns by Great Black-backed Gulls

JOSEPH J. NOCERA^{1,2} AND STEPHEN W. KRESS³

¹Department of Biological Sciences, Central Connecticut State University, New Britain, CT 06050 USA

²Current address: Department of Biology, Acadia University, Wolfville, Nova Scotia, Canada B0P 1X0

³National Audubon Society Seabird Restoration Program, 159 Sapsucker Woods Road, Ithaca, New York 14850 USA

Internet: skress@audubon.org

Abstract.—We observed nocturnal predation by Great Black-backed Gulls (*Larus marinus*) on eggs and chicks of Common Terns (*Sterna hirundo*) at a restored tern colony on the coast of southern Maine. Dissection of a nocturnal predatory gull in 1994 revealed two 7d old chicks, 3 embryonic chicks and 5 eggs. Further observations implicating nocturnal predation by gulls on tern eggs in 1995 confirmed that Great Black-backed Gulls can raid tern nesting colonies during moderate to low nocturnal light conditions. Received 21 May 1996, accepted 27 August 1996.

Key words.—Common Tern, *Sterna hirundo*, foraging time, Great Black-backed Gull, *Larus marinus*, Maine, nocturnal predation, Stratton Island.

Colonial Waterbirds 19(2): 277-279, 1996

Increased New England gull populations have contributed to tern (*Sterna* spp.) population declines (Cavanagh and Griffin 1993) through competition for nest sites and predation on chicks and eggs (Burger 1979, Morris and Hunter 1976). Herring Gulls (*Larus argentatus*) and Great Black-backed Gulls (*L. marinus*) are the principle predators that contribute to declines in Maine tern populations (Kress 1983).

Gulls are well known diurnal predators of terns (Hatch 1970, Nisbet 1975, Becker 1995). Such predation can lead to almost total reproductive failure as evidenced by Becker's (1995) finding of 44-94% of tern chicks taken annually by gulls. Likewise, Hatch (1970) estimated a predation rate of 0.48-1.2 chicks being eaten by gulls during daylight from each pair of terns per season.

It is also well known that nocturnal avian predators such as Great Horned Owls (*Bubo virginianus*; Nisbet 1975, Morris and Wiggins 1986), Black-crowned Night-herons (*Nycticorax nycticorax*, Morris and Hunter 1976, Shealer and Kress 1991), Short-eared Owls (*Asio flammeus*) and Long-eared Owls (*A. otus*; Sudmann, *et al.* 1994) markedly decrease tern productivity. However, there are no previous records of Great Black-backed Gulls preying on tern chicks and eggs at night. Here we present the first record of nocturnal predation by Great Black-backed

Gulls on Common Tern (*S. hirundo*) eggs and chicks.

METHODS

Stratton Island is a 17 ha island located two miles south of Prout's Neck, Maine (43°30'N, 71°20'W). Common Terns and Roseate Terns (*S. dougallii*) were re-established to Stratton Island in Saco Bay, Maine in 1987 using decoys, sound recordings, and gull control following the methods described by Kress (1983). The island provides tern nesting habitat along a cobble beach that is edged by beach pea (*Lathyrus japonicus*) and quack grass (*Agropyron repens*). Gull control (under permit from U.S. Fish and Wildlife Service) consists of egg and nest destruction on 12.75 ha within and adjacent to the area encompassing the tern colony. In this area, shooting is limited to gulls that remain for more than approximately 5 minutes in the area above the high tide line. Gulls nest without disturbance on the remaining 4.25 ha of Stratton Island and on adjacent Bluff Island (approximately 500m away). In 1995, 342 pairs of Great Black-backed Gulls and 238 pairs of Herring Gulls nested on Stratton and Bluff Islands. No gull census was conducted in 1994, but 1994 daily gull counts were similar to those in 1995, indicating that the gull population had not fluctuated.

We monitored the Common Tern colony (203 pairs in 1994 and 265 pairs in 1995) from an elevated wooden blind on the edge of the colony. We used U.S. Navy "Starlight" night vision goggles with a magnification of 3× that intensify ambient light by 1000× to monitor predator activity in the colony each night from 2000h to 0330h. We watched the colony every night from 19 June to 22 July 1994 for a total of 202 hours, and from 27 June to 6 July 1995 for a total of 72 hours.

RESULTS

Only Great Black-backed Gulls were observed preying upon tern chicks and eggs at

night. Evidence of such nocturnal predation was found on 29 June 1994, during our eighty-eighth hour of observation at 0300h, when researchers observed a Great Black-backed Gull enter the tern colony and prey on Common Tern eggs and chicks. Some mobbing of the gull by the terns ensued, but with less aggression and persistence than similar encounters during daylight. During this observation, weather conditions consisted of partly cloudy skies with little ambient light from the moon, as this was one night from the beginning of the last quarter.

At 0430h, when dawn provided sufficient light, the gull was shot at approximately 25 m. A necropsy of the gull's crop revealed two Common Tern chicks (approximately 7 d old), three embryonic chicks, and five tern eggs. This incident occurred during the peak hatching period of the tern colony in which the oldest chicks were 12 d old. There was no subsequent nocturnal predation during the summer of 1994.

The Stratton Island tern colony increased by 64 pairs in 1995. This expansion led terns to colonize a small rock outcrop that is connected to the island at low tide. A high count of 21 Common Tern pairs were known to be simultaneously nesting there on 26 June. We observed a Great Black-backed Gull enter this small subcolony on our first night of observation, 27 June, as well as on 28 June, 29 June, and 3 July where it was subsequently mobbed by the nesting terns. There were no hatched chicks in this subcolony, all 21 nests were still in the incubation stage. We were unable to determine whether this was one individual or up to four gulls. A morning assessment of nests showed an overnight loss of 13 tern eggs from five nests on three of the four nights (Table 1). This provides only circumstantial evidence of gull predation on tern eggs, as the gull(s) were not collected.

However, no other potential predators were observed in the subcolony during our continuous observations from dusk to dawn each night, which implicates the observed Great Black-backed Gull(s) as the egg predator. We ended our observations on 6 July after observing the subcolony for 29 hours without any nocturnal predatory event.

DISCUSSION

Only Great Black-backed Gulls preyed at night on tern chicks and eggs. In contrast, Herring Gulls were only seen preying on tern chicks in daylight. This difference may be explained by the relative lack of success of Herring Gulls in catching chicks while being mobbed, whereas Great Black-backed Gulls tend to be more persistent and successful while under attack (Hatch 1970). Great Black-backed Gulls appear to be more nocturnal than Herring Gulls and are capable of spending extended periods of time in an aggressive tern colony looking for prey in low light conditions. Although mobbing levels by terns decrease later in the night (Nisbet and Welton 1984), the terns on Stratton Island did not entirely cease mobbing at night.

This was the first collection and subsequent dissection of a nocturnal, predatory Great Black-backed Gull. The age of the tern chicks that we recovered from the dissection, when compared with the age of the oldest in the colony (12 d), supports the observation that young terns (under 7 d old) are more vulnerable to gulls because they have not yet moved into tall vegetation (Becker 1995).

Our observations of predation by gulls during nights with low levels of moonlight and some cloud cover lead us to believe that Great Black-backed Gulls are more effective nocturnal predators on young tern chicks than previously thought. Our observations

Table 1. Predation on tern nests attributed to Great Black-backed Gulls in 1995.

Date	Cloud Cover/Wind	Moon phase	Predation
27 June	clear and breezy/>10 mph	1 night from new	3 eggs lost from 1 nest
28 June	clear and breezy/>10 mph	new	3 eggs lost from 1 nest
29 June	clear and calm/<5 mph	1 night after new	7 eggs lost from 3 nests
3 July	50% cloudy/>10 mph	first quarter	<i>L. marinus</i> in colony, no predation observed

suggest that some Great Black-backed gulls are able to forage from 16 (Hatch 1970) to 24 hours a day, in a wide range of light conditions by day and night.

However, predation of tern chicks and eggs by Great Black-backed Gulls was only witnessed at night. The only diurnal predation observed in this study was by a Herring Gull in 1995 taking one approximately 5 d old chick. Combined predation rates were not high enough to affect the reproductive success of the tern colony as evidenced by a productivity (chicks fledged per nest) rate of 1.9 (N=30, SD=1.0) in 1994 and 2.3 (N=45, SD=0.76) in 1995. This indicates that gull predation on terns may be limited to a few individual gulls and that gulls may not severely impact tern productivity.

ACKNOWLEDGMENTS

This project was funded by grants and contributions to the Seabird Restoration Program of the National Audubon Society. Gull control was conducted under a U.S. Fish and Wildlife Service depredation permit (#PRT691789). We thank all of the researchers that spent long and uncomfortable hours making these observations: Donna Ramil, Chris Hymes, Edmund Hearne, Erik Anderson, Amy Cook and Jennifer Niese. Our gratitude also goes to the Prout's Neck Audubon Society, Prout's Neck Association and Prout's Neck Yacht Club for their generous donations of time and support. We also thank Sally and Charles Lee, Herb Pratt and Godfrey Rockefeller for their many courtesies. We also extend our thanks to the U.S. Navy Reserve in Brunswick, Maine for the use of the night vision goggles.

Sylvia Halkin, Barbara Bowen and Krista Amey provided valuable comments that improved the preparation of this manuscript. The comments of Peter H. Becker and an anonymous reviewer on the final manuscript are gratefully acknowledged.

LITERATURE CITED

- Becker, P. H. 1995. Effects of coloniality on gull predation on Common Terns (*Sterna hirundo*) chicks. *Colonial Waterbirds* 18(1): 11-22.
- Burger, J. 1979. Competition and predation: Herring Gulls versus Laughing Gulls. *Condor* 81: 269-277.
- Cavanagh, P. M. and C. R. Griffin. 1993. Responses of nesting Common Terns and Laughing Gulls to flyovers by large gulls. *Wilson Bulletin* 105(2): 333-338.
- Hatch, J. J. 1970. Predation and piracy by gulls at a ternery in Maine. *Auk* 87: 244-255.
- Kress, S. W. 1983. The use of decoys, sound recordings and gull control for re-establishing a tern colony in Maine. *Colonial Waterbirds* 6: 185-196.
- Morris, R. D. and R. A. Hunter. 1976. Factors influencing desertion of colony sites by Common Terns (*Sterna hirundo*). *Canadian Field-Naturalist* 90(2): 137-143.
- Morris, R. D. and D. A. Wiggins. 1986. Ruddy Turnstones, Great Horned Owls and egg loss from Common Tern clutches. *Wilson Bulletin* 98: 101-109.
- Nisbet, I. C. T. 1975. Selective effects of predation in a tern colony. *Condor* 77: 221-226.
- Nisbet, I. C. T. and M. J. Welton. 1984. Seasonal variations in breeding success of common terns: Consequences of predation. *Condor* 86: 53-60.
- Shealer, D. A. and S. W. Kress. 1991. Nocturnal abandonment response to Black-crowned Night-heron disturbance in a Common Tern colony. *Colonial Waterbirds* 14: 51-56.
- Sudmann, S. R., P. H. Becker and H. Wendeln. 1994. Short-eared Owl *Asio flammeus* and Long-eared Owl *Asio otus* as predators in Common Tern *Sterna hirundo* colonies. *Vogelwelt* 115: 121-126.