

Great Black-Backed Gull Predation on Common Eider Ducklings on Great Duck Island, Maine, USA



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Introduction

The increasing number of Great Black-Backed Gulls (*Larus marinus*) in the North-eastern United States has led to concern about their impact on other species of seabirds. Great Black-Backed Gulls (GBBG) are more aggressive predators than the more common Herring Gulls (*Larus argentatus*), and there is particular concern about their impact on Common Eider (*Somateria mollissima*) ducklings (Mawhinney and Diamond, 1999). During the summer 2007 I conducted research on Great Duck Island (GDI) to investigate the extent of GBBG predation on Common Eider ducklings.

In 2007 GDI (lat. 44° 8' N, long. 68° 10' W) supported a mixed colony of Herring Gulls (~1200 nests), Great Black-Backed Gulls (55 nests) and Common Eiders (19 nests). In addition, the island serves as a nursery for Eider crèches from nearby Little Duck Island, which has traditionally supported over 1200 eider nests. Most of the research was focused on a single Common Eider nursery in the southern intertidal zone of GDI that adjoins a major gull sub-colony.



Common Eider crèche, Photo by John Anderson 2006



Great Black-Backed Gull, Photo by Mikus Āboliņš – Ābols 2007

Methodology

I observed eider crèches from the top of GDI lighthouse tower with 10x50 binoculars and a spotting scope from June 21st through July 20th, 2007 for total of 45 hours. I followed the activities of a single crèche at any one time, but recorded the numbers of birds in all crèches visible. The number of Eider ducklings, the accompanying females, predation attempts and successes by gulls, weather conditions, and qualitative observations of bird behaviour were recorded. The number of predation attempts and depredation events was later multiplied by daylight hours (Mendenhall and Milne 1985) and days of observation to estimate the total number of predation events.

Approximately every three days I walked through the gull colony adjoining the intertidal nurseries in search for remains and pellets originating from avian prey. The location of every item was recorded with a Trimble Differential GPS. All collected corpses and pellets were removed from the colony and buried to exclude replication and to reduce the risk of gulls taking the remains back to the colony. Pellets were later analyzed to determine prey species. The number of pellets containing Eider duckling remains was multiplied by a correction factor in Mawhinney and Diamond (1999) to account for unfound pellets.



Common Eider Nursery on Great Duck Island, photo by Mikus Āboliņš – Ābols 2007

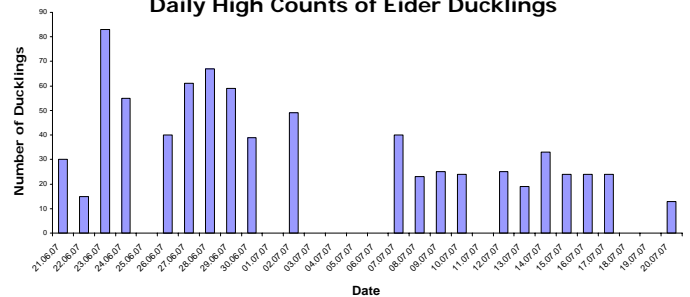
Results and Analysis

During the first week of observations the maximum number of eider ducklings observed from the lighthouse ranged from 15 to 83 ($\bar{x} = 47.3$, s.d. = 24.2) and it continued to fluctuate throughout the season (see graph). During the last week of observations the number of ducklings ranged from 17 to 33 individuals ($\bar{x} = 23.6$, s.d. = 7.1). Judging from the number and size of crèches present in the nursery, crèches frequently mixed during the first week of observations and migrated between various sections of the GDI coast throughout the season. In 45 hours of observation, I observed 8 predation attempts on Eider ducklings by GBBG and 2 by Herring Gulls. Of the predation attempts by GBBG, 2 were successful. The estimated loss of eider ducklings over a period of 30 days is the number of observed depredation events multiplied by the daylight hours during which the eider ducklings are vulnerable to predation (Mendenhall and Milne, 1985) = 22 ducklings.

Results cont.

I found 30 gull pellets containing bird or mammal residues in the gull colony. Most of these pellets were found in or close to GBBG loafing areas and nests and thus were assumed to have been expelled by GBBG. 5 of the pellets contained eider duckling remains, 1 contained an adult eider skull, and the rest contained remains of other birds and mammals. Using Mawhinney and Diamond's (1999) estimate, the death of approximately 25 – 70 ($\bar{x} = 47.5$) ducklings can be attributed to GBBG predation judging by pellet numbers. Eider females leading the crèches always expressed aggression or wariness towards all GBBG perching or flying nearby, whether or not the gulls exhibited any predation intent. However, quite often crèches voluntarily approached GBBG to a distance of 2 meters when using a passage between tide pools. During these events none of the GBBGs attacked or showed any predation intent.

Daily High Counts of Eider Ducklings



Discussion

It is difficult to determine the absolute level of predation by GBBGs on Eider ducklings because Eiders are free to move between multiple nurseries. In the absence of marked individuals the fluctuation of the number of ducklings present at the observation site may be due to immigration and emigration, predation or other sources of mortality. Judged by my estimates from observations, GBBGs may be responsible for the deaths of 22 eider ducklings during 2007. If pellet contents are used instead of direct observation of mortality, GBBGs may have taken 25 – 70 ducklings ($\bar{x} = 47.5$). The higher estimate however assumes that there was no immigration or emigration of ducklings or gulls and that GBBGs were the sole source of duckling mortality. Previous studies on GDI have found that 55% of Eider crèche survives to fledging in close proximity with GBBGs. (Spruce, 2006). The high survival rate might be attributed to low numbers of ducklings present during the study (Mendenhall and Milne, 1985).

A study by Mawhinney and Diamond (1999) in the Gulf of Maine and Bay of Fundy found that GBBGs were responsible for the loss of more than 90% of ducklings. This is in sharp contrast with the findings on GDI, where the survival rate to fledging can be as high as 55%. The high rate of Eider duckling survival on GDI might be explained by the low density of GBBGs – 51 pairs nest on the island of which 27 pairs nest adjacent to the observed nursery. In addition, all of Mawhinney and Diamond's birds were heavily disturbed by marking and radio-tagging activities of researchers, whereas crèches on GDI could be observed with minimal disturbance from the lighthouse.

The differences in the predation rate may also be attributed to the individual preferences of GBBGs with respect to their prey (Åhlund and Götmark, 1988). On GDI, some GBBGs exhibit a tendency towards specific prey type, thus, the presence of specialized gulls focusing on Eiders ducklings might increase the mortality rate of ducklings. Out of 11 eider duckling remains and pellets, 6 were found in one location, suggesting that on GDI certain GBBGs predate on eider ducklings more than others. Finally, Mendenhall and Milne (1985) in Scotland saw differences of 0.5% – 55% ($\bar{x} = 10.4\%$) fledging success for Eiders breeding close to gull colonies during 13 years of study, suggesting that Eider ducklings vary greatly in their survival rates, and this cannot be explained by the impact of predation alone.

Therefore, the predation rate of GBBGs on Eider ducklings may vary greatly over temporal and spatial scale, depending on the number of gulls nesting close to Eider nurseries, the presence of "specialist" gulls, and the number of eider ducklings present at the nursery.

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