Introduction

Large gulls such as the Herring Gull (Larus argentatus) and the Greater Black Backed Gull (Larus marinus) have long been considered negative influences on alcids, including the Black Guillemot (Cepphus grylle). Great Duck Island—a seabird nesting island off the coast of Maine—only provides nesting sites for approximately 50 pairs of Black Backed Gulls and 1200 pairs of Herring Gulls, but also to an estimated 400 pairs of Black Guillemots. Our study compares the nest locations of gulls and guillemots on the island, in order to determine whether the presence of gulls affects the nesting distribution of the Black Guillemot.

Methods

During the summer of 2008 we located Guillemot nest sites using a combination of techniques, including flushing groups of guillemots by walking along the rocky berm and searching for individual nests beneath slabs and boulders. When flushing, birds on the rocks and in the water were counted. When searching for nests we watched for the emergence of guillemots from beneath rocky slabs and boulders and/or birds returning from foraging flights. Nests were then located through an exhaustive search of the surrounding area. Individual nests were mapped using a Trimble GPS, accurate to less than a meter. Additional nesting areas were derived from flush counts and data from previous years. We also recorded habitat parameters including maximum crevice width and depth. These measurements were compared with randomly selected crevices in areas containing guillemot nests and gulls and also in areas lacking guillemots and gulls. Gull nesting areas were determined by a search locating all nests of both gull species in early June.

Results

Of the 180 nests precisely located, 148 (82%) were in gull nesting habitat. This is probably a low estimate of the actual percentage of guillemots nesting within gull colonies on the island because there was a section of the island that had both gulls and guillemots nesting, which we could not census intensively because it was on private property.

There was a significant difference between the widths of actual guillemot burrows and the widths of randomly selected crevices if we eliminated the random crevices that were smaller than 5cm (the minimum burrow width) (U=1403.5, p<0.05). There was also a significant difference between the depths of burrows and the depths of random crevices (U=1689.5, p=0.002). The median depth of random crevices was 38 cm, while the median burrow depth was 49.5 cm—over 11 centimeters longer.

We contrasted burrow depths and widths in areas with no gulls with burrow depths and widths in areas with gulls. There was no difference in burrow depths (U=208.5, p=0.421) or widths (U=158, p=0.166) between the two areas.

The number of birds flushed from an area was found to be greater than actual nests in the crevices. In Fig. 3 area A, 281 and 323 birds were flushed on separate days and 69 nests were found when the area was searched intensively. In area B, 45 birds were flushed, and 11 nests were found in the area. In area C, 92 and 93 birds were flushed on separate days and 40 nests were found in the area.

Discussion

It seems logical that guillemots may select nesting sites at least partly based on the depth and width of the crevice. This is reinforced by the significant differences in these measurements when comparing actual nests and randomly selected crevices. However, measurements also indicate that guillemots do not consider the presence of gulls to be any more frightening than the absence of them—the depth and width measurements of burrows in areas with gulls are no different than measurements of burrows in areas without gulls. This proves wrong the popular belief that alcids consider gulls to be a major threat. The map of guillemot and gull nests (figure 3) adds further support to our conclusion: it shows that a majority of the guillemots nesting on Great Duck Island are nesting in areas also used by gulls. Our data from random samples of the width and depth of crevices in areas with both gulls and guillemots and areas with no gulls and no guillemots, suggests that nesting space is not in short supply and that guillemots live in gull nesting habitat not due to lack of space, but rather from preference.

One reason for this preference could be that corvids are more effective predators against guillemots than gulls are. This has been shown in studies of ducks in Scandinavia (Vaanannen 2000). Great Duck Island has a resident population of Ravens (Corvus corax) and Crows (Corvus brachyrhynchos), both of which are frequently seen on the periphery of the gull colony.

By nesting in the vicinity of the gulls the guillemots gain protection from and warning of predators such as crows and ravens. However, living in close quarters with gulls does not come without its costs. Gulls are known for kleptoparasitism and were, several times, seen to attack guillemots and steal the food they were carrying. There were also rare instances where the gulls would actually prey upon guillemots. These were extremely infrequent, though. For the most part, the larids and the alcids seemed to get along fine: guillemots would sit within a meter of gulls on the rocky berm, and only one or two might flush if a gull swooped down near them. In contrast, all guillemots in the general area flew into the water at the approach of a corvid, suggesting that the alcids considered crows and ravens a greater threat. Observations from previous years add to this hypothesis, suggesting that guillemots nesting outside gull colonies are more likely to have predated eggs. More qualitative observations, as well as more detailed studies of habitat, should be conducted in future years to strengthen our hypothesis.

When examining our methodology, we found that there were differences in results between flush counts and physical nest counts. Our flush counts, in general, garnered totals of between 2 and 5 times as many birds as physical nests found in a particular area. In an optimal situation we would have counted only 2 flushed birds per nest (one nest per pair). This discrepancy could be attributed to several things. It is possible that not all of the birds we counted were actually nesting in that area; they might simply have been loafing on the rocks, or nesting on the water between dives for food. They might not even have been nesting on the island at all. It is also possible that our nest-finding skills were at fault—it was very difficult to find nests in some areas along the shoreline due to the terrain, and even after numerous hours of searching we do not believe we found all of the nests existing in these trouble spots.

The shorter time required and lower disturbance caused by flush counts make them attractive in censusing, but the large discrepancy between flush counts and nest counts raise questions as to the comparability of counts using different methodologies.

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Literature Cited