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Glaucous Gull Predation on Dovekies: Three New Hunting Methods

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ABSTRACT. We describe three previously unreported methods that hunting glaucous gulls (*Larus hyperboreus*) use to capture nesting and fledgling dovekies (*Alle alle*). During the nesting period, the pale-gray and white gulls camouflaged themselves by perching with head lowered on remnant snow patches in the dovekie colony, trying to ambush flying adults. We observed two other glaucous gull hunting methods on the open fjord water after the dovekie fledglings had left the colony. Gulls approached young dovekies in a fast, low-level glide, presumably to surprise the prey, and attempted to snatch them from the water. Gulls also swam rapidly towards young dovekies, zigzagging among small ice floes, presumably to confuse the birds and catch them before they could dive. The methods described, representing technical foraging innovations, supplement the evidence that gulls are a bird family that displays a diverse foraging innovation repertoire.

Key words: glaucous gull, foraging innovation, hunting method, dovekie

RÉSUMÉ. Nous décrivons trois méthodes jamais signalées auparavant auxquelles recourent les goélands bourgmestres (*Larus hyperboreus*) pour capturer les mergules nains (*Alle alle*) aux stades de la nidification et de l'envol. Pendant la période de nidification, les goélands gris clair et blancs se camouflagent en se rabaissant la tête dans les restes de bancs de neige au sein des colonies de mergules nains afin d'essayer de piéger les adultes capables de voler. Nous avons observé deux autres méthodes de chasse de la part des goélands bourgmestres sur les eaux libres du fjord une fois que les mergules nains prêts à l'envol ont quitté la colonie. Les goélands s'approchaient des jeunes mergules nains en glissant rapidement et à faible altitude, vraisemblablement pour surprendre leurs proies, et essayaient de les arracher de l'eau. Les goélands se mettaient aussi à nager rapidement vers les jeunes mergules nains, en zigzaguant entre les bancs de glace flottante, probablement pour mélanger les oiseaux et pour les attraper avant qu'ils n'aient le temps de plonger. Les méthodes ainsi décrites, qui représentent des innovations techniques de chasse, s'ajoutent aux preuves qui attestent du fait que les goélands constituent une famille d'oiseaux dotée d'un répertoire de chasse innovateur et varié.

Mots clés : goéland bourgmestre, innovation de chasse, méthode de chasse, mergule nain

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INTRODUCTION

Gulls (Laridae) are adaptable, opportunistic, and omnivorous birds that have evolved highly diversified foraging methods. There is no gull species that specializes in just one food source and uses only one technique (Burger and Gochfeld, 1996). Despite a relatively small brain size in comparison with other bird taxa (Lefebvre et al., 2002), gulls are considered to be one of the four bird families (along with Corvidae, Accipitridae, and Muscicapidae) that show the most diverse foraging innovation repertoires (Overington et al., 2009).

The glaucous gull (*Larus hyperboreus*) is a highly adaptable species that forages opportunistically, through predation or scavenging or by stealing food from other birds. Its diet depends mainly on relative local availability (Cramp, 1998). This species often hunts for birds (e.g., Barry and Barry, 1990; Schmutz and Hobson, 1998; Samelius and Alisauskas, 1999; Bustnes et al., 2000). Locally on Svalbard, the dovekie (*Alle alle*) is an important component of the glaucous gull diet (Stempniewicz, 1995). Dovekies are available for gull predation as adults or subadults, eggs, chicks, and fledglings in different phases of the breeding period, and as a result, the gulls have developed a variety of hunting methods to capture dovekies in particular situations (Stempniewicz, 1983, 1995, 2001).

In this study, we describe three hunting methods used by glaucous gulls to capture dovekies during the nesting and fledging periods. To our knowledge, they have not been previously described.

DESCRIPTION OF OBSERVATIONS

We observed the hunting techniques of glaucous gulls during our study of their predatory pressure on a dovekie colony. Data were collected from the dovekie breeding colony on the Alkekongen slopes (79°34′ N, 11°04′ E) in

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Magdalenefjorden on northwest Spitsbergen during the 2008–09 nesting and 2009 fledging seasons.

During nesting, the pale-gray and white gulls camouflaged themselves by perching on small remnant snow patches in the colony, waiting with lowered head for opportunities to attack dovekie adults that had been flushed by other gulls. From this vantage point, gulls attempted to snatch dovekies as they landed or were flying low over the colony. We observed this method three times during the nesting period, but only in 2008, probably because of the persistence of small snow patches that year. None of these three attempts were successful.

Apart from snatching prey directly from the water, a technique widely used by gulls while in flapping or diving flight (Burger and Gochfeld, 1996), the gulls in Magdalenefjorden used two other hunting methods during the dovekie fledging period. These previously undescribed methods were used to capture dovekie fledglings swimming alone on the fjord after becoming separated from the escorting adults during previous gull attacks. The first method was a low gliding attack. When a gull patrolling the fjord using active, flapping flight spotted a dovekie fledgling, it did not approach the prey directly. The gull flew on for a short distance, then pulled up and glided back, descended to just above the water and, approaching the fledgling at speed, tried to snatch it from the water. If the dovekie managed to escape underwater, the gull repeated the whole action until successful, or in the end gave up. This method accounted for 42% of all observed attacks on dovekie fledglings swimming on the fjord (N = 24) and was successful in 40% of attacks. The second method was used by the gulls under specific conditions: when the whole fjord was covered by floating growlers and smaller fragments of ice. This was a swimming attack, during which gulls swam rapidly toward a fledgling in a series of zigzags. The gulls lowered their heads when close to the fledgling. This technique was used in 25% of all attacks on swimming fledglings (N = 24) and was successful in 33% of the attempts.

DISCUSSION

All the newly described hunting methods represent technical foraging innovations, which require a greater cognitive capacity than non-technical innovations (Overington et al., 2009). Two of the methods were used by gulls in specific local micro-climatic (persistence of snow) and ice (floating growlers) conditions, which confirm that the ability to innovate helps birds adjust their behavior to changing environmental conditions (Sol et al., 2005).

Glaucous gulls hunting for dovekies in a colony search actively for poorly hidden eggs, chicks, and adults, either by walking around or by perching immobile and attempting to ambush individuals leaving their nests (Stempniewicz, 1995, 2001). Perching immobile on small remnant snow patches, where the gull's plumage acts as camouflage, was an innovative behavior compared to perching on a contrasting dark background of scree. We are not sure whether the gull chose the vantage point on the snow patch deliberately. However, the choice of one of a few small snow patches among the snow-free areas in the colony and the observed attempts to snatch flying dovekies are suggestive of intentional action.

By performing a fast, low-level glide, the gull was presumably able to take its prey by surprise. A similar "stealth hunting" technique, i.e., hunting low over the ground or water surface trying to surprise the prey, has been described in falcons (Bengtson, 1971; Dekker, 1988, 1998, 2003). Also, gulls swimming rapidly toward young dovekies by zigzagging among small ice floes presumably confuse them as to the direction of the attack, making the decision to dive more difficult. Additionally, a dovekie could confuse a white-plumaged gull not swimming directly toward it with the slow-moving, snow-covered ice fragments, which could delay its recognition of the predator. It seems the zigzag track was not chosen because of the dense ice cover, as the ice floes were widely scattered enough to allow the gull to approach the dovekie in a straight line. A similar "stealthy" approach to prey has been recorded in the glaucous-winged gull (*Larus glaucescens*) hunting dunlins (*Calidris alpina*): a swimming gull with head held low approached and suddenly lunged at dunlins feeding along the edge of a salt marsh (Dekker, 1998).

Since the gulls observed were individually undistinguishable, it was impossible to estimate how many individuals were involved in the techniques reported. All the hunts were observed separately, and it cannot be ruled out that all of them were performed by just one, skilful individual with an extended repertoire of behaviors. Studies on predatory habits of large gulls (*Larus* spp.) in a colony of common terns (*Sterna hirundo*) showed that only a few individuals specialized in hunting for chick and adult terns (Guillemette and Brousseau, 2001).

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