Notes

Observed Herring Gull Kleptoparasitism of American Black Ducks

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Abstract

Herring gulls *Larus argentatus* were observed to kleptoparasitize American black ducks *Anas rubripes* feeding on fiddler crabs *Uca pugnax* in coastal New Jersey. Although widespread in Laridae, kleptoparasitism has never been described between these two species. Over two winters of intensive 24-hour behavioral observations, this interaction was observed on two occasions during similar tidal conditions. Although this appears to be a rare interaction with limited energetic consequences, we note that quantifying these uncommon interspecific interactions is a benefit of thorough behavior observations, which may refine estimates of daily energy expenditure.

Keywords: herring gull; kleptoparasitism; American black duck

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Introduction

American black ducks *Anas rubripes* are believed to have sustained a long-term population decline beginning in the 1950s (Grandy 1983; Rusch et al. 1989; Conroy et al. 2002). One factor suggested to explain this decline is a loss in both quantity and quality of wintering habitat (Conroy et al. 2002). Coastal New Jersey, United States, consistently winters a large proportion of the Atlantic flyway black duck population. Although black ducks have declined in nearly all other states, annual midwinter estimates in New Jersey have remained relatively consistent (Klimstra and Padding 2009; *Supplemental Material*, Reference S1; http://dx.doi.org/10.3996/062011-JFWM-035.S1). Thus, the importance of coastal New Jersey as a wintering area has increased with the decline of black ducks elsewhere. Additionally, in recent years, there has been a concerted effort to better understand factors limiting black duck bioenergetic maintenance and therefore ultimate effects on carrying capacity (Cramer 2009; Plattner et al. 2010). During this time, both breeding and wintering herring gull *Larus argentatus* populations have increased in New Jersey (Sauer et al. 2011; National Audubon Society 2010). We report previously undocumented kleptoparasitic interactions between herring gulls and American black ducks in coastal New Jersey and discuss the implications for wintering black ducks.

Methods

In a companion study of black duck bioenergetics modeling, behavior was quantified during diurnal, crepuscular, and nocturnal periods through 6-hour behavioral observation sessions. Observation sessions

occurred in Atlantic and Ocean counties, New Jersey, between October and February from 2009 to 2011. Diurnal observations were made using an 8×42 pair of binoculars while nocturnal observations were made using a generation 3, 6× night vision scope (Morovision MV 760 Generation 3 Pinnacle). Any waterfowl detected within 200 m were identified to species and observed behavior was quantified using an instantaneous scan sampling methodology (Altmann 1974). Behavior categories consisted of feeding, sleeping, loafing, comfort, swimming (25%), comfort (1.8%), and flying (1.8%) alert, flying, walking, agonistic, and courtship. This was repeated every 10 min for the duration of the 6-h observation period. Environmental conditions (temperature, wind speed, cloud cover, and precipitation) were recorded on the hour. Temperature and wind speed were measured using a handheld anemometer (Kestrel 1000 series). The tidal stage (high, low, ebb, and flood) was recorded for each scan. The position, observer, presence of birds on arrival, hunting season designation (open vs. closed), sunrise and sunset times, and moon phase were also recorded. Any disturbance event that altered the behavior of the birds while being scanned was identified and recorded. Because of the 1,936 h of behavioral observations, we were in a position to record rare behavioral patterns and interspecific interactions.

Results

On 13 February 2010 we were conducting black duck behavioral observations at dawn in high marsh habitat on Edwin B. Forsythe National Wildlife Refuge (39°27′2.68″N, 74°25′17.61″W) in Galloway, New Jersey. Black ducks were foraging in submerged salt hay grass *Spartina patens* flooded as a result of a new moon high tide (spring tide). The majority of the flock was feeding (40 of 56 individuals), primarily by tipping up, with the remainder swimming (25%), comfort (1.8%), and flying (1.8%). The food item we observed being consumed was fiddler crabs *Uca pugnax*. When a large fiddler crab was caught, the duck would surface with the crab in its bill and vigorously shake the crab. As sunlight increased, several (three to five) herring gulls landed amongst the dispersed ducks, with approximately one gull among 10 black ducks. When a black duck near a gull would surface with a crab, the gull would immediately charge the duck by flying directly at it. The black duck would respond by flying away with the crab held in its bill. The gull would continue to pursue the black duck until the duck dropped the crab, often after a flight of approximately 50–300 m. Once the black duck dropped the crab, the gull would land and consume it. No gulls were observed foraging independently for fiddler crabs or other prey. This kleptoparasitic interaction continued over a 30-min period occurring seven times with different black duck and herring gull combinations. While herring gulls were kleptoparasitizing black ducks, the majority of the observed 48–55 black ducks remained feeding (63.9%) and swimming (27.9%), however the proportion of black ducks recorded as alert (2.3%) and flying (3.2%) increased. Kleptoparasitism by herring gulls was also observed in flocks of black ducks feeding out of the 200-m observation range for the duration of the high tide submerging the high marsh.

On 19 January 2011 kleptoparasitism between herring gulls and black ducks was observed at the same location. As in 2010, the high marsh was flooded, this time due to an east wind in conjunction with a high tide occurring during the full moon phase of the lunar cycle (spring tide). A flock of 17 black ducks was under observation during diurnal hours (10:00). When the kleptoparasitism occurred the black ducks were feeding (41.2%), swimming (47.1%), and alert (5.9%) in the flooded high marsh. We observed a single instance of kleptoparasitism in which a black duck surfaced with a fiddler crab in its bill, was charged by a herring gull, and flew a short distance before the crab was dropped. In this instance the tide was not as high as in 2010, therefore the opportunity for kleptoparasitism to occur was limited.

Kleptoparasitism was also noted to occur while we were conducting nonobservational fieldwork. We anecdotally noted that when black ducks were feeding in the flooded high marsh, both herring gulls and ring-billed gulls *Larus delawarensis* were often dispersed amongst the feeding black ducks. Similar to the observation sessions just described we observed both species of gulls chasing black ducks with food items in their bills.

Discussion

Kleptoparasitic behavior takes place when particular ecological or behavioral conditions are present such as large concentrations of hosts, large quantities of food, large high-quality food items, long prey-handling time, food supply predictability, food visibility, or food shortage (Brockmann and Barnard 1979). Kleptoparasitism is widespread in birds, particularly among gulls (Brockmann and Barnard 1979; Martinez and Bachmann 1996). Previous researchers have noted gulls generally stay 3–7 m away, only attack at the moment the food item is available by rushing at the host, and chase over a short distance by running or flying until the food item is dropped (Brockmann and Barnard 1979; Martinez and Bachmann 1996). These behaviors are consistent with our observations. Kleptoparasitism of other wintering waterfowl by gulls has been described primarily with diving ducks, particularly mergansers (Lamore 1952; Grace 1979; Chavez-Ramirez 1994; Walley 2006). Grace (1979) reported one instance of a ring-billed gull attempting to rob a mallard *Anas platyrhynchos* of a small fish.

Previous American black duck research noted competition and predation with herring gulls. Harrison et al. (2000) described trouble with herring gulls during preseason (July–September) banding efforts on Smith Island, Chesapeake Bay, Maryland. Herring gulls were noted to both compete with black ducks for corn bait and also attempt to predate trapped ducks. The authors had greater success trapping black ducks during nocturnal and crepuscular periods and attributed this to competition with herring gulls (Harrison et al. 2000).

Kleptoparasitism between black ducks and herring gulls could potentially result in two negative consequences for wintering black ducks. First, robbery of food can have negative impacts on a host's energy intake rate (Amat and Aguilera 1989). Although we were unable to measure whether the kleptoparasitism reduced the

amount of fiddler crabs consumed by black ducks, any loss of food items at a potentially limiting time of year could be detrimental. Barnard and Thompson (1985) report that northern lapwings *Vanellus vanellus* spent more time feeding due to kleptoparasitism from black-headed gulls *Larus ridibundus*. Similarly, gull kleptoparasitism could cause black ducks to spend a longer time feeding to meet energy requirements. Second, black duck energy expenditure could have been increased. Flight is the most energetically expensive behavior, approximately 12 times resting metabolic rate (Wooley and Owen 1978). Therefore, each kleptoparasitic interaction would have theoretically decreased black duck energy reserves while simultaneously increasing energy requirements.

Although kleptoparasitism by herring gulls has the potential to reduce the energy available for individual wintering black ducks and increases energy expenditure, it is unlikely it has a large influence on the total energetic carrying capacity of black ducks wintering in coastal New Jersey. Because this interaction only appears to consistently occur when spring tides flood the high marsh (approximately twice a month) and black ducks are feeding on fiddler crabs (a bulky food item that requires substantial handling time), the energetic significance of this interaction is limited. If the proportion of herring gulls to black ducks increases, this behavior might become more common and could theoretically lead to negative energetic consequences for black ducks. Nevertheless, our extensive behavioral observations allowed us the opportunity to quantify rare, but potentially significant interspecific interactions at the individual level and will allow future researchers to refine estimates of daily energy expenditure.

Supplemental Material

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Reference S1. Klimstra JD, Padding PI. 2009. Atlantic Flyway harvest and population survey data book. Laurel, Maryland: U.S. Fish and Wildlife Service.

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