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Egg Retrieval by Canada Geese: Apparent Interspecific Retrieval and Tests of Egg Displacement

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Egg retrieval, an innate behavioral pattern in which birds roll displaced eggs into their nests by using their bills, was first described in detail in the Greylag Goose (*Anser anser*) (Lorenz and Tinbergen 1939). Prevet and Prevet (1973) reported that egg retrieval occurred in numerous species of ground-nesting birds, including a number of species of Anseriformes, but made no reference to this behavior in Canada Geese (*Branta canadensis*). Kossack (1950: 644) thought it unlikely that Canada Geese retrieved eggs, because he found eggs lying outside and yet near their nests. This note reports: (1) an incident in which a Canada Goose apparently "retrieved" the eggs from a nearby Northern Pintail (*Anas acuta*) nest, and (2) the results of tests to confirm egg retrieval in Canada Geese and to determine the distance over which they would retrieve eggs.

On 24 April 1982, a pintail nest with four eggs was found 45 cm from the edge of a Canada Goose nest containing three eggs. The nests were on an island about 35 km southeast of Brooks, Alberta. Two days later, the pintail nest contained six eggs and the goose nest contained five. When the nests were checked 4 days later, the goose was incubating five goose eggs and five pintail eggs, having apparently rolled the pintail eggs into her nest. Only a small ball of nest material remained where the pintail nest had been. On 17 May the goose nest contained only the five goose eggs. A few small fragments of eggshell were found around the nest, and I surmise that the pintail eggs were either depredated by gulls [I observed California Gulls (*Larus californicus*) and Ring-billed Gulls (*Larus delawarensis*) eating duck eggs but very seldom goose eggs] or were accidentally broken and subsequently removed by the goose. In light of Prevet

and Prevet's (1973) hypothesis that egg retrieval may occur only after incubation has begun, it is interesting to note that the pintail eggs were not "retrieved" until after the goose had completed laying.

To investigate egg retrieval behavior in Canada Geese, egg displacement tests were conducted between 13 and 17 April 1983 on geese nesting in the area of the observation. One egg per nest was taken from 34 nests and placed at one of the following distances from the nest: 25, 50, 75, or 100 cm. The distance was measured from the center of the displaced egg to the outer edge of the nest bowl. The displaced eggs were marked with indelible ink and positioned so as to be readily visible from the nest. About 50% of the geese were laying at the time of egg displacement; virtually all, however, had finished laying when the eggs were checked 4-6 days later. Of the 32 geese that continued incubation, all 27 with eggs placed at 25-75 cm from the nest retrieved the egg (10 from 25 cm, 8 from 50 cm, and 9 from 75 cm). In one case the egg was rolled to the edge of the nest but not into the nest bowl. Four of the 5 eggs placed 1 m from the nest were retrieved. Prevet and Prevet (1973) found that 95 cm was about the maximum distance that eggs were retrieved by Snow Geese (*Chen caerulescens*). The tests reported here suggest that 1 m may be approaching the limit from which Canada Geese will retrieve eggs. They may not, however, retrieve eggs at much over 1 m; in 1983 a Mallard (*Anas platyrhynchos*) nest, located 110 cm from a Canada Goose nest, remained undisturbed by the goose. Kossack's (1950) impression that Canada Geese do not retrieve eggs may have been based on observations of eggs that were lying beyond the egg retrieval limit. The retrieval limit indicated here for

the western Canada Goose (*B. c. moffitti*) may differ greatly from that of other races of Canada Geese if the limit is proportional to the size of the bird.

The proximity of duck nests to goose nests reported herein may not have been accidental, as some ducks may be inclined to nest close to nesting geese to benefit from the goose's superior ability to deter predators (Long 1970, Giroux 1981). Egg retrieval by geese can result in the destruction of duck clutches laid within a goose's retrieval limit, and, consequently, there may be selection for ducks to situate their nests at some optimal distance from goose nests.

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Molts and Plumages of Gadwalls in Winter

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Previous studies of Anatinae during the nonbreeding season suggested that the attainment of the breeding (alternate) plumage may be related to the time of pair formation (Weller 1965, McKinney 1970, Armbruster 1982). In these studies, however, no attempt was made to quantify the timing and sequences of molt or to relate the timing of molt to the age or sex of the individual.

The plumage sequence of Gadwalls (*Anas strepera*) has been described by Bellrose (1978), and Oring (1968) traced the molt sequence of a captive flock of Gadwalls over a 2-yr period. In this study I describe the molt sequence of immature and adult birds wintering in Louisiana and relate the timing of molt to age, sex, courtship activities, and energetics.

Observations and collections of Gadwalls were conducted in southwest coastal Louisiana on Rockefeller and Marsh Island State Wildlife Refuges (SWR), Sabine National Wildlife Refuge (NWR), and on privately owned lands within 20 km of Rockefeller Refuge. These areas have been described in Paulus (1982).

I collected Gadwalls by shooting on Rockefeller and Marsh Island SWR from November 1977 through March 1978 and from hunters at Sabine NWR and marshes adjacent to Rockefeller SWR from November 1977 through early January 1978. Two studies were conducted to determine molt sequences of Gadwalls in winter. First, I examined hunter-killed birds

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externally and subjectively categorized the percentage of prealternate molt completed by immature and adult Gadwalls as 0-25% (early body molt), 26-50% (body molt nearly completed, lower rump molt underway), 51-75% (body molt completed, lower rump molt nearly completed), and 76-100% (rump molt completed, tertials renewed and fully elongated, head crest evident in males).

A second study involved the preparation of a pterylosis diagram, similar to that used by Billard and Humphrey (1972), for Gadwalls collected on Rockefeller and Marsh Island SWR. From this diagram, I determined the degree of molt for the entire bird and for each body region by internal and external examination of feathers and feather tracts, and I subjectively categorized the degree as none, light (only a few feathers growing), moderate (numerous new feathers growing), or heavy (nearly all feathers growing). Pterylosis diagrams and plumage analyses were limited to adults, because only a few immature birds were collected.

Age and sex were determined by internal examination of the gonads and bursa of Fabricius. The relationship between the percentage of prealternate molt completed, courtship activities, and time of pairing was determined during activity-budget observations of Gadwalls in Louisiana (Paulus 1984).

The prealternate molt for most adult males began on the breeding grounds or while the birds were migrating south, and by late January the prealternate molt was completed (Table 1, Fig. 1). Major areas of feather replacement for adult males during fall were the neck and humeral regions. Immature males were

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