

## DETRIMENTAL EFFECTS OF NASAL SADDLES ON MALE RUDDY DUCKS

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Nasal saddles are frequently used for long-term individual identification of waterfowl (e.g., Sugden and Poston 1968, Doty and Greenwood 1974) and researchers often assume that nasal saddles cause little or no physical damage or behavioral alteration. Nevertheless, some observers report ice build-up on nasal saddles of wintering waterfowl (Greenwood and Bair 1974). Joyner (1975) also mentioned possible detrimental effects of saddles on Ruddy Ducks (*Oxyura jamaicensis*). However, no quantified comparisons of the behavior of saddled versus unsaddled birds are available for any species. During a study of the Ruddy Duck mating system, I used nasal saddles on males and females and quantified the behavior of saddled and unsaddled birds.

### STUDY AREA AND METHODS

Ruddy Ducks were studied during summer, 1979, in the prairie pot-hole region near Minnedosa, Manitoba, Canada. Twenty-three males and 15 females were captured with decoy traps (Anderson et al. 1980) and marked with nasal saddles similar to those described by Doty and Greenwood (1974). I recorded displays and behaviors continuously during 253 one-hour observation periods, using 69 different focal males, and noted 30-sec intervals on the data sheet throughout the observation. Saddled males were observed for 102 h, unsaddled males for 151 h. Results below include only those behaviors occurring on or immediately before each 30-sec mark, allowing a comparison of time budgets of saddled and unsaddled males.

### RESULTS

Most marked birds never were seen after capture and only 11 of 38 saddled Ruddy Ducks were observed more than 5 times. Seven saddled females were observed after capture either paired with an unmarked male or accompanying a brood. Only one saddled male was ever observed paired for more than one day; he was paired with a saddled female with a broken wing.

Saddled and unsaddled males spent 78.6 and 70.2% of their time, respectively, in a combination of feeding and resting activities (not a significant difference,  $\chi^2 = 0.474$ ,  $df = 1$ ,  $P > 0.1$ ). Birds divided their remaining time among locomotory, reproductive, and maintenance activities. Differences in time budgets of paired and unpaired males with and without saddles among these three activity categories were evident (Table 1). No significant differences in any activity were observed between paired and unpaired males in the same saddle status (Table 1,  $\chi^2$  values from 0.004 to 1.15,  $df = 1$ ,  $P > 0.1$ ).

Although unsaddled males spent almost twice as much time in reproductive activities as did saddled males in the same pairing status, the

TABLE 1. Percent time spent per activity for male Ruddy Ducks in 1979 at Minnedosa, Manitoba.<sup>a</sup>

Activity	Reproduction	Locomotion	Maintenance
Paired males with saddles	9.9	29.3	60.7
Unpaired males with saddles	6.8	28.8	64.4
Paired males without saddles	16.4	48.8	34.8
Unpaired males without saddles	10.8	57.6	31.6

<sup>a</sup> Does not include resting and feeding.

differences were not significant (Table 1,  $\chi^2 = 1.61$  and  $0.91$ ,  $df = 1$ ,  $P > 0.1$ ). Saddled males spent significantly less time in locomotory activities (Table 1,  $\chi^2 = 4.87$  and  $9.6$ ,  $df = 1$ ,  $P < 0.05$  and  $0.01$ ) and more time in maintenance activities (Table 1,  $\chi^2 = 7.02$  and  $11.21$ ,  $df = 1$ ,  $P < 0.01$ ) than did unsaddled males. For paired and unpaired males with saddles, 37.6% and 38.1%, respectively, of time devoted to maintenance activities was involved in behaviors directed specifically toward the nasal saddle. Saddled birds vigorously scratched at the nasal saddle with their feet and also performed rapid bill-cleaning movements by swishing their bill in the water in a sideways motion. Neither behavior was observed in unsaddled birds; both were similar for all saddled birds, and did not change in frequency through the summer.

#### DISCUSSION

Saddled males spent so much time in maintenance activities, specifically directed toward the nasal saddle, that they could not devote the time that unsaddled males spent performing other activities. Bouts of swimming, feeding, and courtship often were interrupted by a bout of nasal saddle scratching lasting 1 to 45 sec. Saddled birds had difficulty adjusting to the nasal saddle, since the frequency of saddle-directed behaviors did not decrease during the 12 weeks that some males were observed.

Female Ruddy Ducks seemed to prefer males without saddles. Five males, individually identifiable by distinct cheek patch patterns, were paired before they were captured and saddled; all lost their mates to unsaddled males within 24 h. There are several potential explanations for these results: (1) females could have selected against saddled males, (2) saddled males could have been inferior in pair-forming and maintenance behaviors due to the saddle, or (3) intense male-male competition may normally result in frequent mate changes. The results are insufficient to distinguish among these possibilities; however, there was a noticeable, though nonsignificant difference in time spent in reproductive activities between saddled and unsaddled males (Table 1).

Nasal saddles have been used successfully on many medium to large waterfowl species without any noticeable abnormal behaviors: e.g., Gadwalls (*Anas strepera*; Blohm 1978), Northern Shovelers (*A. clypeata*; Sugden and Poston 1968), Long-tailed Ducks (*Clangula hyemalis*; Alison

1975), Mallards (*Anas platyrhynchos*), Canvasbacks (*Aythya valisineria*), Redheads (*A. americana*), and Lesser Scaup (*A. affinis*; Doty and Greenwood 1974). Smaller species such as Blue-winged Teal (*Anas discors*), Green-winged Teal (*A. crecca*), Buffleheads (*Bucephala albeola*), and Ruddy Ducks may have problems with the nasal saddle simply due to its large size relative to the bird's bill. F. Rohwer (pers. comm.) has observed Blue-winged Teal vigorously scratching at normal-sized nasal saddles.

Another explanation of negative effects of nasal saddles on Ruddy Ducks may be due to the unique shape of the bill and nares. In most *Anas* and *Aythya* species the bill is strong and the nares large. The Ruddy Duck has a fleshy spatulate bill with very small nares. After experiencing great difficulty in inserting nasal saddle pins through the nares, I believe that the pin irritates a Ruddy Duck's bill and nasal membranes more than it does those of other ducks.

These observations and those of Joyner (1975) strongly suggest that the use of nasal saddles on Ruddy Ducks and other small ducks should be re-evaluated. Any change in behavior or activity pattern of saddled birds should be documented. Alternate methods of long-term individual identification should be considered.

#### SUMMARY

Despite widespread use of nasal saddles as a method of long-term individual identification on many species of waterfowl, there have been few published comparisons of time budgets of saddled and unsaddled birds. I observed a significant difference in behavior patterns of saddled versus unsaddled Ruddy Ducks during a study of their mating system. Saddled birds spent more time in maintenance activities, less time in locomotory activities, and were less successful in obtaining mates than unsaddled birds. Nasal saddles have been used on many species of ducks without causing any recurring abnormal behaviors. However, these results suggest that nasal saddles should not be used on Ruddy Ducks and may be a problem with other small duck species.

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