J. Field Ornithol., 64(3):337-340

USE OF WOOD DUCK DECOYS IN A STUDY OF BROOD PARASITISM

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Abstract.—Plastic Wood Duck (*Aix sponsa*) hunting decoys were used to test the effect of conspecifics near simulated nests on nest site selection by brood parasitic females. Wood Duck and Common Goldeneye (*Bucephala clangula*) eggs were laid in simulated nests only when Wood Duck decoys were floating nearby ($P < 0.05$). Two of the parasitized nests were later incubated. Decoys may be effective in simulating the presence of ducks in other behavioral studies involving waterfowl.

UTILIZACIÓN DE SEÑUELOS DE *AIX SPONSA* EN UN ESTUDIO DE PARASITISMO REPRODUCTIVO

Sinopsis.—Se utilizaron señuelos plásticos de *Aix sponsa* para determinar el efecto de conespecíficos, cerca de nidos simulados, en la selección de nidos por parte de hembras parasíticas. Hembras de *A. sponsa* y de *Bucephala clangula* pusieron huevos en nidos simulados sólo cuando hubo señuelos de la primera especie cerca de estos nidos ($P < 0.05$). Los huevos de dos de los nidos parasitados fueron luego incubados. El uso de señuelos podría ser muy efectivo en simular la presencia de patos en otros estudios de conducta.

Brood parasitic behavior of Wood Ducks (*Aix sponsa*) has received a great deal of attention (e.g., Clawson et al. 1979, Heusmann et al. 1980, Morse and Wight 1969, Semel and Sherman 1986). Studies examining the population-wide distribution of parasitically-laid eggs have found that brood parasitism increases with increasing nest densities (Clawson et al. 1979, Haramis and Thompson 1985, Jones and Leopold 1967), although many nest boxes may remain unused (Morse and Wight 1969, Semel and Sherman 1986). Haramis (1990), Heusmann et al. (1980), and Semel and Sherman (1986) have all suggested that this pattern of egg-laying results from parasitic females following conspecifics to their nest sites. These studies reported a "decoying effect" of Wood Ducks on one another. Here, I used Wood Duck decoys to test experimentally the effect of conspecifics near simulated nests on the brood parasitic behavior of Wood Ducks.

METHODS

I conducted the experiment from 15 Apr. to 15 May 1989 in a 366-ha managed pond on the Creston Valley Wildlife Management Area in southeastern British Columbia. For details of the study area, see Butler et al. (1986). About 10% of the 165 nest boxes on trees or posts are used annually by breeding Wood Ducks (Wilson 1990).

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TABLE 1. The number of eggs laid by brood parasites in nest boxes under three nest treatments on the Creston Valley Wildlife Management Area.

Treatment	# boxes		# eggs laid	# clutches incubated
	Provided	Used[a]		
Control	27	0	0	0
"Eggs"	26	0	0	0
"Eggs and models"	24	4	10	2

[a] $G = 8.41$, $P < 0.05$.

Each day, I randomly selected three nest boxes from the subset of unused boxes located within 10 m of water, and randomly assigned each to one of three groups: (1) control, (2) eggs or (3) eggs and models. Control boxes were not manipulated. "Eggs" boxes were provided with six hard-boiled, small chicken eggs arranged in the bottom of the nest box and covered with sawdust, a behavior typical of Wood Ducks during early egg-laying. I put eggs in the "eggs and models" boxes in the same manner, and floated a male and female Wood Duck decoy 5–10 m in front of each box. I used life-size hunting decoys (Carry-lite Inc., Milwaukee, Wisconsin) that I had modified with red and white acrylic paint to resemble more closely the plumage of Wood Ducks. Each box was used only once during the experiment. If a randomly selected box already contained a duck nest, I used the closest available empty nest box that had not been used previously in the experiment.

Experimental boxes were left undisturbed for 3 d and then checked for duck eggs. I then moved the chicken eggs and models to new boxes. I marked any eggs laid and monitored the nest until no more eggs were added, or until the eggs hatched.

I compared groups with a 3×2 G-test of independence, applying the Williams' correction for sample size (Sokal and Rohlf 1981).

RESULTS

Four nest boxes were deleted from the analysis because eggs and/or models disappeared from the boxes during the 3-d experimental period. "Eggs and models" boxes were used significantly more often by brood parasites than the "eggs" treatment or control boxes ($G = 8.41$, df = 2, $P < 0.025$, Table 1). One of the brood parasites was a Common Goldeneye (*Bucephala clangula*); if this observation is deleted, the test is still significant ($G = 6.10$, df = 2, $P < 0.05$). After models and chicken eggs were removed, egg-laying continued in two of the boxes parasitized by Wood Ducks. One nest received a continuous sequence of seven eggs after the experiment and eventually hatched. The other nest had a 1-d and a 3-d interruption in egg-laying and was abandoned during incubation. The final clutch size of both nests was 11 eggs. In the third box, and in the box parasitized by the Common Goldeneye, one additional egg was added to each but the clutches were not incubated.

DISCUSSION

Although only eight parasitic Wood Duck eggs were laid in three nest boxes during the study, I believe this experiment supports the "decoying effect" proposed by Haramis (1990), Heusmann et al. (1980), and Semel and Sherman (1986). Previous studies have shown that Wood Duck brood parasites prefer laying eggs in active nests (Clawson et al. 1979, Haramis et al. 1983). Results from these studies suggest that the presence of host birds is important for the selection of egg-laying sites by parasites. Semel et al. (1988, 1990) found that nest boxes in highly visible locations were parasitized more frequently, and suggested that Wood Duck pairs with highly visible nest sites may themselves be more visible and therefore be more likely to attract the attention of parasitic females. Weller (1959) reported that Redhead (*Aythya americana*) brood parasites found host nests by searching nesting cover for nesting sites and by observing the nest-building and egg-laying behavior of other ducks.

At least one Wood Duck parasite probably continued to lay eggs in the same box after removal of the chicken eggs and eventually incubated the clutch. This behavior was suspected in a second nest, although the 3-d interruption in egg-laying may indicate that another female took over the box and nested normally. Eadie (1989) found that parasitic Barrow's Goldeneyes (*Bucephala islandica*) continued to lay eggs in host nests after the removal of host females, but never incubated the clutches. He also found, however, that females incubated half the clutches initiated in boxes containing "decoy eggs." Heusmann et al. (1980) reported similar results in a study of Wood Ducks. Perhaps females can switch from parasitic to normal nesting behavior if they detect that a nest containing their eggs has been abandoned by the host.

The results of this experiment suggest that Wood Duck decoys can be used successfully to simulate the presence of conspecifics. Although my sample size was small, the density of Wood Ducks on the study area was low, and a high frequency of brood parasitism was not expected. It was not possible to repeat the experiment in 1990, due to a very low rate of nest initiation (Wilson 1990). I encourage other researchers to use this technique to investigate the behavior of Wood Ducks and other waterfowl.

ACKNOWLEDGMENTS

I thank the Creston Valley Wildlife Management Area for logistical support. C. Pineau assisted with fieldwork. This research was supported by Natural Sciences and Engineering Research Council of Canada (NSERC) grant A0239 to N. Verbeek, an NSERC post-graduate scholarship and a Simon Fraser University graduate fellowship. J. Eadie, M. Haramis, G. Hepp, B. Semel, M. Sorenson and N. Verbeek made comments on earlier versions of the manuscript.

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Received 22 Apr. 1992; accepted 15 Jul. 1992.