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# Evaluation of Predator Guards for Black-Bellied Whistling Duck Nest-Boxes<sup>1</sup>

Raymond L. Urubek<sup>2</sup>

Abstract. I evaluated the effectiveness, suitability, and expense of 2 styles of predator guards for black-bellied whistling duck (Dendrocygna autumnalis) nest-boxes. Guards evaluated were galvanized bottomattached shrouds and razor-ribbon wire. Both guards were effective against ground dwelling predators. The group not fitted with guards suffered a 55% overall depredation rate.

## INTRODUCTION

Large-scale erection of artificial nesting structures for waterfowl has been a management tool for at least 4 decades (McLaughlin and Grice 1952, Belrose 1976). Most of these artificial nest structures were constructed to benefit wood ducks (McLaughlin and Grice 1952, Strange and Cunningham 1971, Bellrose 1976). Predation by ground dwelling species, primarily raccoons (Procyon lotor), and to a lesser extent avian species has often negated the beneficial effects of nestboxes (Bellrose et al. 1964, Bolen 1967b).

The black-bellied whistling duck is a Neotropical species whose northern breeding distribution extends into southern Texas and regularly occurs as far north as Refugio County (Belrose 1976). Whistling ducks adapt readily to artificial nest structures (McCamant and Bolen 1979). Efforts to provide artificial nest-boxes for whistling ducks began in the early 1960's (Bolen 1967b) and have become more common in recent years (O'Kelley 1987). O'Kelley (1987) found that proper predator deterrents, reduced competition for nest-boxes, and proper density and location of boxes could increase the efficiency of a boxmanagement program. Bolen (1967 b) classified nest box failures into 2 groups, abandonment and predation.

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My focus in this paper is an investigation of predation. Unlike the wood duck, whose major nest predator is the raccoon, snakes, particularly the Texas rat snake (Elaphe obsoleta) destroy more nests than any other single predator (Bolen 1967a). Although Bolen (1967a) ranked the raccoon second among nest predators, he felt that they were the most important predator because of the cunning and methodical manner in which they destroyed bird nests.

Information presented here was collected during the Welder Wildlife Foundation's yearly nest box maintenance and refurbishment program. I stress that this information should be approached from a demonstration viewpoint rather than that of a scientific study. There were unequal sample sizes, and many interconnected variables that make statistical analysis of the results questionable.

## DEMONSTRATION AREAS

Two oxbow lakes and 5 stock ponds were used in this demonstration. All sites were located within the boundaries of the Welder Wildlife Refuge. The 3,158 ha refuge is located 40 km north of Corpus Christi in San Patricio County, Texas. The Aransas River, a permanent waterway, forms the north and east boundaries. The refuge lies in a transition zone between Gulf Prairies and Marshes and South Texas Plains (Gould 1975). Over 1400 species of flowering plants and ferns occur in this area, mostly of tropical and subtropical origin. Drawe et al. (1978) and **Drawe (1988)** further describe the soils and vegetation found on the refuge. The 30 **year average** annual rainfall is 91 cm.

Monthly rainfall means indicate a bi-modal pattern with peaks in spring and early fall (Low 1970, Kie 1985).

#### METHODS

Data presented here were collected from nest boxes erected before 1982, in 1982, in 1987, and in 1988. Table 1 presents the number and type of boxes available during the 1987 and 1988 breeding seasons.

Table 1.--Nest-boxes and predator guards available during the 1987 and 1988 nesting seasons.

Box and Guard Type	1987	1988
Wooden-Single Box		
Metal shroud	11	11

Boxes erected prior to and including 1982 were of the type described by Bolen (1967a) and included single box units and units that employed 2 nest boxes per pole (fig. 1). Nest structures erected in 1987 included a modified version of Bolen's nest box (1967a, fig. 2) and a modified plastic bucket (Griffith and Fendley 1981) (fig. 3). Boxes obtained from the Texas Parks and Wildlife Department's Wood and Tree Duck Production Project (fig. 4) were erected in April 1988.

Predator guards were of two types; galvanized metal shroud (Bolen 1967b, fig. 1), and razor ribbon wire (fig. 5). Plastic 5-gallon buckets and modified Bolen boxes were not fitted with guards.

Each box was checked in early spring. Old nesting material was removed and a fresh bed of pine bark mulch was installed. Boxes were subsequently **examined for** usage at 2-3 month intervals **through the** nesting season. Each box was checked an average of 3 times per year. Nest predators were identified following the criteria of Reardon (1951).

#### RESULTS AND DISCUSSION

Overall nest box use by black-bellied whistling ducks was 85% and 45% for the years 1987 and 1988, respectively.

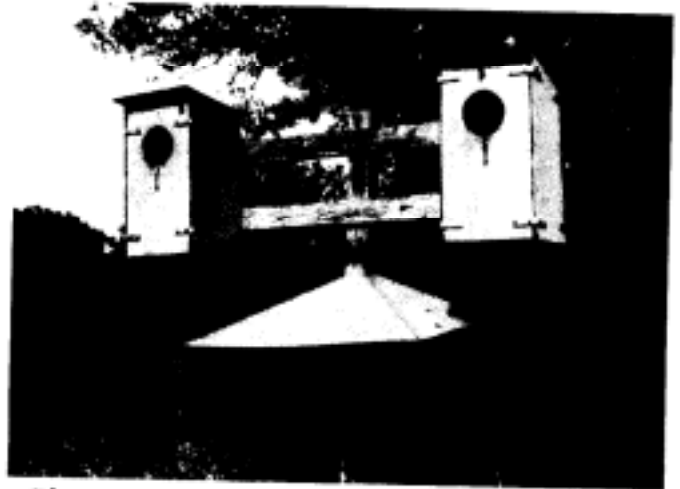


Figure 1.--Wooden-double box unit adapted from Bolen (1967a), with metal shroud.

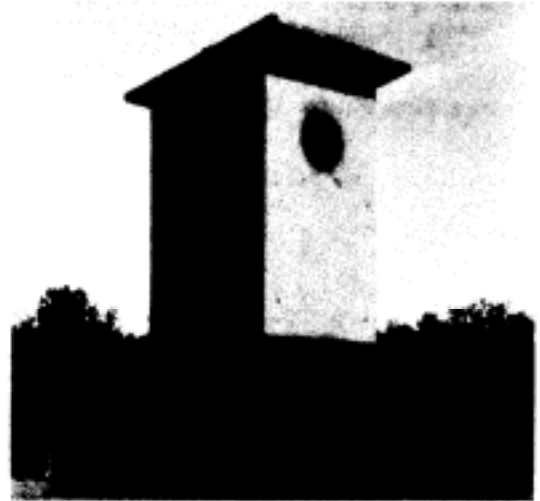


Figure 2.--Wooden-single box modified from Bolen (1967a), shown without predator guard.



Figure 3.--Modified Griffith and Fendley (1981) plastic 5-gallon bucket nest-box.

McCamant and Bolen (1979) reported an 81% overall whistling duck nest-box use during the 12-year period 1964-75. The low use of boxes in 1988 was caused by drought conditions that left the oxbow lakes dry and water levels of the smaller ponds very low.

Predation was limited to unprotected wooden boxes (55%). Bolen (1967a) found predation rates in unprotected boxes and natural cavities of 23% and 41%, respectively. I suggest that the predation rate observed is higher because of an abnormally large raccoon population and because boxes were placed immediately adjacent to the ponds. McLaughlin and Grice (1952) reported an overall raccoon predation rate of 41% on wood duck nest boxes; however, considering only boxes placed in swamp areas the predation rate rose to 78%. Rat snakes were found in 1 unprotected box and on the ground at the base of a box fitted with a metal shroud. A western cottonmouth (Agkistrodon piscivorus) was found on the ground at the base of a box protected by razor-ribbon wire. There was no evidence of raccoon or snake predation on nests in plastic boxes where the distance from mounting pole to entrance hole was greater than 330 mm. Galvanized metal shrouds are expensive (\$28); however, they are the most durable and can be manufactured to fit the mounting structure. Razor ribbon wire is an inexpensive (\$4) alternative if the mounting structure will accept it. Although no accidents have been reported from the use of razor ribbon wire, I suggest its use be restricted to remote areas. If a predation problem arises while using plastic buckets, an inverted 5-gallon bucket (fig. 6) is an inexpensive (\$1/unit) solution and can be modified to fit many existing mounting structures. In the south Texas climate I expect the longevity of plastic buckets, razor ribbon wire, and galvanized metal shrouds to be 3, 5, and 8 years, respectively.



Figure 5.--Razor-ribbon wire guard, shown as mounted on Texas Parks & Wildlife box.

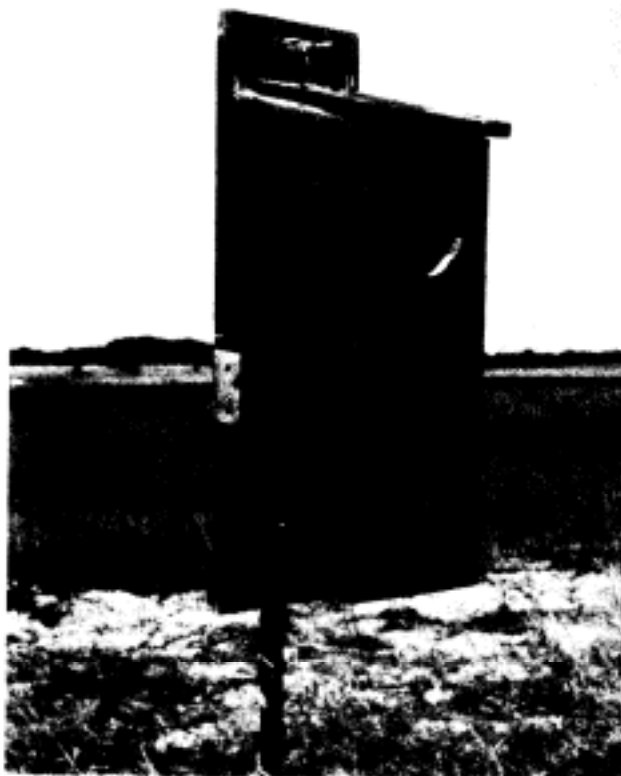


Figure 4.--Nest-box provided by the Texas Parks and Wildlife Dept., shown with razor-ribbon wire guard.

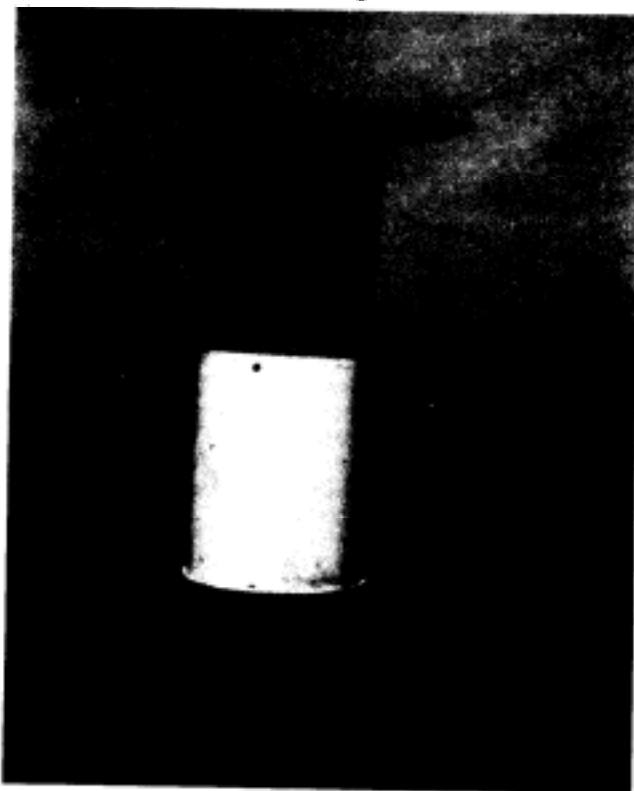


Figure 6.--Modified plastic 5-gallon nestbucket (Griffith and Fendley 1981), showing additional bucket mounted at base of nest-bucket.

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