

# Potential Effects of Increased Predation Risk on Nestling House Wren (*Troglodytes aedon*) Quality and Survival

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**ABSTRACT.** Risk of predation can be an important factor influencing reproductive success. Nesting birds that encounter repeated threats of predation may not be able to provide sufficient care for offspring, thus lowering mass of nestlings or number surviving to nest-leaving. I had the opportunity to examine the effects of a potential nest predator, the Blue Jay (*Cyanocitta cristata*), on House Wren (*Troglodytes aedon*) nestling quality and survival. Blue Jays were attracted to a food supplement intended for House Wrens. The presence of Blue Jays elicited nest defense behaviors by House Wren parents. In addition, House Wrens did not enter the nestboxes while Blue Jays were present at the feeders; therefore, time and energy that could have been devoted to caring for offspring was expended in nest defense. This potentially resulted in fewer offspring surviving to nest-leaving in one year and lower mean brood mass in another. These results were not observed after Blue Jays were prevented from feeding on the food supplement.

## Introduction

Predation risk is an important selective force in the evolution of morphological and behavioral adaptations in animals (see Lima and Dill 1990 for a review). For animals that exhibit parental care, an increased risk of predation during the breeding period may interfere with brooding and feeding offspring, thus potentially lowering reproductive success.

Short-term predation risk has been shown to alter parental effort in birds (Kalina 1989, Marzluff 1985, Simons 1988, Cavitt 1998). Parents confronted by real, model, or caged nest predators reduce the number of feeding trips to the nest (Dring and Dring 1984, Kalina 1989, Martindale 1982, Marzluff 1985, Simons 1988), engage in nest defense behaviors (Martindale 1982, Regelman and Curio 1982, Wiklund 1990, Cavitt 1998), and increase perching time near the nest site (Kalina 1989, Simons 1988, Cavitt 1998). All of these ac-

tivities reduce the time parents could otherwise allocate to feeding and caring for their offspring. It has been suggested that long term risk, or repeated threats of predation, may reduce reproductive success through decreases in food delivery to nestlings (Martin 1992) and consequently, age at nest-leaving (Harfenist and Ydenberg 1995).

The effects of long-term predation risk have rarely been examined. However, Wheelright and Dorsey (1991) tested this hypothesis by placing a model of a predator, the Herring Gull (*Larus argentatus*), on top of Tree Swallow (*Tachycineta bicolor*) nestboxes for two hours each day during the nestling period. They found no effect of the predator's presence on nestling mass or length of the nestling period, although parents never entered the nestbox while the gull model was in place. I had the opportunity to examine the long-term effects of a potential nest predator,

the Blue Jay (*Cyanocitta cristata*), on House Wren (*Troglodytes aedon*) nestling survival and quality. House Wrens were provisioned daily with mealworms (*Tenebrio molitor*), as part of a food supplementation experiment (Cavitt 1993, Cavitt and Thompson 1997) and during a portion of the study, Blue Jays were attracted to the supplement.

Blue Jays have long been known as nest predators (Bent 1946, Gates and Gysel 1978, Wilcove 1985) and their presence elicited alarm calls and nest defense behaviors from House Wren parents. Although House Wrens are cavity nesters, nestlings are still vulnerable to avian predators (Neill and Harper 1990), and the behavior of adult House Wrens suggested they perceived Blue Jays as a potential threat to their nests. If long term risk of predation can reduce reproductive success then nests to which Blue Jays were attracted should produce fewer nestlings or nestlings of lower mass than controls. In addition, an increased risk of predation may act to prolong incubation by reducing incubation constancy (Ricklefs 1993) or lengthen the nestling period if parents are distracted from feeding nestlings (Martin 1992).

## Methods

**Study Area and Species**—This study was conducted during the 1990-1992 breeding seasons on a population of House Wrens breeding in McLean County, Illinois (Money Creek Township, 25N, R3E), USA (40° 40' N, 88° 53' W). Drilling and Thomp-