

# USE OF BLUEBIRD NEST BOXES IN COASTAL SOUTH CAROLINA

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*Abstract.*—On 2 February 1978 bluebird nest boxes were erected on a portion of the Buist Tract, a 40,000-acre tract of International Paper Company land located in Horry County, S.C. Boxes made of weathered Bald Cypress were placed at selected locations. Of the 17 boxes erected, 11 (64.7%) were occupied by bluebirds while the remainder were either occupied by other species or showed little or no indication of nesting activity. Approximately 68 young were produced the first season.

The status of the Eastern Bluebird (*Sialia sialis*) has been the topic of much controversy in recent years. Bluebirds are cavity nesters, and their population decline has reportedly been the result of two main factors: (1) clean farming coupled with the increased use of metal fence posts and (2) the increased and indiscriminate use of pesticides. Intensive forest management practices and increased competition from expanding populations of House Sparrows (*Passer domesticus*) and Starlings (*Sturnus vulgaris*) have also been mentioned as contributing to the bird's decline.

While there is no doubt that population levels of the bluebird have been reduced, it is possible that many people are looking for the species in habitats that no longer fulfill the bird's requirements. If this is true, then the apparent decline of the species might be greater than the actual decline.

On numerous occasions, we have observed many bluebirds in or near areas that had recently been clearcut. In coastal South Carolina, sightings in clearcut areas have been so frequent that we have recommended such habitat above all others to people interested in observing this species. Bluebird use of clearcut areas has been observed by others (Conner and Adkisson 1974; George Hurst, pers. comm. 1978).

In response to a concern for the bluebird population and in an effort to generate interest in the practical management of a nonconsumptive resource, a bluebird nest-box project was developed in late 1977. A portion of the Buist Tract, a 40,000-acre area of International Paper Company land in Horry County, S.C. was selected as the project site.

## DESCRIPTION OF AREA

Four predominant soil series occurring on the Buist Tract are the Echaws, Leon, Lyn Haven, and Johnston series. Like most coastal soils, these are moderately to very poorly drained, phosphorus deficient, and acid to strongly acid. The site index for Loblolly Pine (*Pinus taeda*) ranges from 85 for the Echaws series to less than 60 for the Johnston series.

Approximately 42% of the area involved in the project is composed of Carolina Bays. Another 38% consists of Loblolly and Slash Pine (*P. elliotii*) plantations. Natural pine, pine-hardwood, and hardwood stands occupy approximately 18% of the area while only about 2% is not forested.

Age of the forest stands varies from 0 to 36+ years. Mean DBH (average stem diameter, outside bark, at a point 4.5 feet above ground) ranged from 4 to 8 inches while mean total height ranged from 20 to 50 feet. Merchantable basal area (a measure of stand density) ranged from 10 to 70 square feet per acre.

Some typical plant species found in the Carolina Bays include Pond Pine (*P. serotina*), Pond Cypress (*Taxodium ascendens*), Cyrilla (*Cyrilla racemiflora*),

Fetterbush (*Lyonia lucida*), and Bamboo (*Smilax laurifolia*). Common understory plants outside the bay areas include Bitter Gallberry (*Ilex glabra*), Red Bay (*Persea borbonia*), Sweet Bay (*Magnolia virginiana*), Blueberry (*Vaccinium* sp.), and Red Maple (*Acer rubrum*).

In the spring of 1976, wildfire destroyed the timber on a large portion of the Buist Tract. As a result, the tract has been placed under an intensive forest management plan involving site preparation and planting.

## METHODS

Seventeen nest boxes (Fig. 1) were constructed of weathered Bald Cypress (*T. distichum*) at a cost of \$3.50 each, including labor and materials. Nails were used in assembling the boxes. Untreated wooden fence posts, approximately 6 inches in diameter and 10 feet high, were used to support the boxes. The cost of each post was \$1.50. Untreated posts were considerably cheaper than treated ones, thus allowing the project to proceed at a low initial cost. In addition, we wanted to eliminate even the slightest possibility of nest-box rejection resulting from the use of treated posts. Flexible aluminum offset plates (23 x 35 inches) were purchased at a local newspaper for 20¢ each. The sheets, used as predator guards, were wrapped around each post with the longer dimension parallel to the post and nailed in place approximately 1 foot below the bottom of the nest box. The absence of nest-box ventilation holes did not appear to be an important factor in this project as no active nests were abandoned during the study period. However, ventilation may have proved to be an important factor had the boxes been in a more exposed environment.

On 2 February 1978 nest boxes were placed at 17 different locations on the Buist. Site locations were relatively open pine stands that had been recently burned by prescribed fire. One box was selected in a 10-year-old pine plantation.

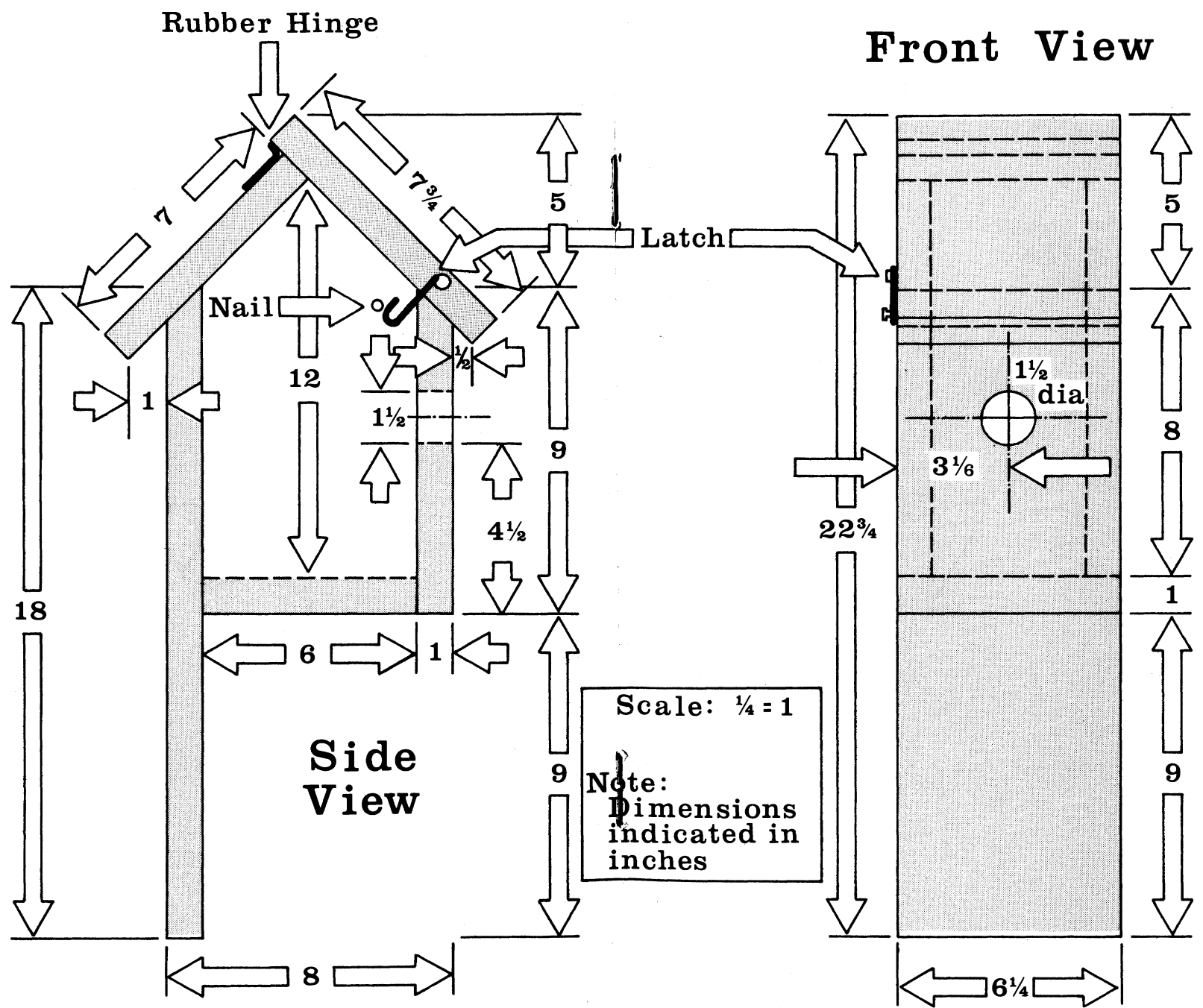
Boxes were erected 10 to 115 feet from the forest edge and usually faced an open area that had been recently clearcut and site prepared. Boxes were placed as near as 528 feet apart. Posthole diggers were used to excavate the soil and holes were dug so as to position the bottom of the box from 5 to 6.5 feet above the ground line. Sites having a dead or living shrub within 10 feet of the entrance hole were erected to provide a perch for the birds.

## RESULTS AND DISCUSSION

On 17 March 1978, the bluebird houses were checked but showed no sign of nesting activity. Most of the boxes were rechecked on 16 April and 7 of 13 boxes observed contained nests, some with eggs in them. One of the first boxes to have a nest and full clutch of eggs was located in the previously mentioned young pine plantation. Five juvenile birds fledged from this box on 4 May. Nesting activity seemed greatest from mid-April to late June. By 28 July, nesting activity was negligible.

Of the 17 boxes erected, 11 (65%) were occupied by Eastern Bluebirds, 1 (6%) was occupied by Carolina Wrens (*Thryothorus ludovicianus*), 2 (12%) had evidence of apparent nesting attempts, and 3 (18%) were not occupied at all. Six boxes produced two broods of bluebirds each with five boxes producing one brood each. Clutch size ranged from three to five eggs (average four). We estimate the number of fledglings to have been approximately 68. Nestling mortality occurred in only one instance and appeared to be an insignificant factor when considering overall survivability of the juvenile birds.

In approximately 50% of the boxes that were occupied and eventually fledged young, we removed the first nesting material. The remaining 50% had the first nest left in the box. Boxes that were not cleaned out after the first nesting did not seem to deter re-nesting attempts as new nests were constructed on top of the old ones.



# BLUEBIRD HOUSE

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OCT-78

Figure 1. Plan for the bluebird nest box used in the Buist Tract project.

In considering renesting attempts, there is some question as to whether the same adults used the same boxes for renesting. Although our observations were limited, we found a box that produced two separate broods and had five white eggs in each clutch. Because the occurrence of white eggs is somewhat unusual (Harrison 1975) we believe the same bird used the box for two consecutive nestings.

Of the three boxes that were never occupied and two that had apparent nesting attempts, each had similar surrounding vegetative characteristics. The presence of a large living shrub approximately 10 feet from the entrance of the box seemed to be a deterrent to nesting. On the other hand, similar areas having a dead shrub near the entrance seemed perfectly acceptable to nesting pairs. The dead shrubs were used quite frequently for perching before the adults entered the nest box. Indications are that a relatively clean understory enhances an area's attractiveness for nest-site selection. When erecting bird houses in any location, care should be taken to place them far enough away from taller vegetation to restrict predator access.

Because numerous factors influence the acceptable minimum distance between nesting pairs, it is not possible to make a broad statement concerning the proximity of one box to another. However, for this particular project, a minimum distance of 528 feet between boxes appeared at least in one instance to have caused adverse interactions between nesting pairs.

In order to get the most use from each box, it appears that boxes should be cleaned out as soon after the second nesting as possible. Nest material should again be removed in late winter or early spring of the following year in preparation for the new nesting season.

The occasional opening of a nest box for very brief periods seems to cause little disturbance to the nesting pair. Noise, however, should be kept to a minimum. Particular care should be taken when observing young birds in the nest in order to prevent them from becoming over excited and flying out of the nest prematurely.

While one would not typically think of a bluebird nest-box project as having any recognized hazards, some problems do exist. In order to avoid a severe case of "bird and heart in the throat disease," tap lightly on the side of the box before peering into the entrance hole. Wasps also present a problem in some areas as they find the underside of the hinged box lid an attractive nest construction site. While wasp nests did not seem to bother the nesting birds, they were certainly a deterrent to the human element.

## CONCLUSION

The Eastern Bluebird, like many other animal species, responded well to management. In regard to the erection of artificial nest structures in suitable habitat, the response is practically immediate. Such projects are relatively inexpensive and require little effort. They can, however, yield many positive returns.

Numerous plans and materials are available from which bluebird houses may be constructed. Excellent opportunities exist for involving local ornithological associations, garden clubs, schools, outdoor photographers, and other groups or individuals in the establishment and monitoring of such projects.

## ACKNOWLEDGMENTS

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*International Paper Company, Georgetown, S.C. 29440, 26 January 1979.* [Senior author's present address is Anderson-Tully Company, Vicksburg, Mississippi 39180.]

## ADDENDUM

Since initiation of the bluebird nest-box project in early 1978, nine boxes have to date been destroyed by Black Bears (*Ursus americanus*). This bear depredation became prevalent during the second year of study and has continued, thus preventing any acceptable comparison from being made between data for the first and subsequent years. Depredation typically occurred during the nesting season after the eggs were laid and/or the young had hatched. Damage to the boxes (Fig. 2) ranged from broken lids, fronts, and sides to complete removal of the box from the post. Regardless of the type of damage, claw and tooth marks were prominent on both the boxes and support posts. Two additional boxes disappeared from the original point of placement, but it is not known for certain whether bears or people were responsible for their removal.



Figure 2. The bluebird nest box at left shows the signs of bear depredation: front torn open, nest raked out on ground, and tooth and claw marks on the metal predator guard. (Photo by Willie H. Tomlinson Jr.)