

Non-traditional nest-box holes: Disaster or opportunity for bluebirders?

By Kevin L. Berner

For the last 13 years I have been testing traditional bluebird boxes as well as other boxes made in a variety of shapes and sizes using controlled methods to minimize bias or inaccurate conclusions. These tests have helped me identify which types of boxes cavity-nesting birds prefer. It also has allowed me to see if these same boxes exposed nesting birds to threats from predators, weathers, or competition from exotic species.

The tests described in this article were all done within Schoharie County, in east central New York. For many years this county has consistently documented some of the highest bluebird fledging levels of the state. The study areas have been described in depth in previous articles (Berner 1990, 1995, Berner and Pleines 1993).

All of my test boxes were in pairs at approximately five to 10 feet apart. In each pair, one box was a NABS-shaped box with an oval hole. Half of these boxes were paired with a Gilwood box and the others were paired with Troyer boxes. The NABS oval boxes had been the most successful design for many years and, as a result, were selected as the control box.

Bluebirds very strongly preferred Gilwood boxes in both 2001 and 2000 (Table 1). They were used more than four times as often as the NABS box with oval holes that they were paired with. Swallows used more NABS boxes, but this may in part have been because bluebirds occupied the Gilwood boxes before swallows initiated nesting.

Troyer boxes were selected by

bluebirds at approximately the same rate in 2001 as NABS oval-holed boxes, whereas in 2000 Troyer boxes were used about half as often as NABS boxes (Table 2). Swallows showed no preference between Troyer or NABS boxes in 2000, but used twice as many NABS boxes as Troyer in 2001. Wren and House Sparrow use was minimal in all boxes both years.

Discussion

A recent letter to the editor printed in *Bluebird* raised concerns about my



Photo by Hubert A. Brandenburg

use of nest boxes with holes larger than the standard 1.5-inch round hole promoted by Zeleny and others. My research over the last 12 years has showed that bluebirds show a consistent and significant preference for larger holes such as the oval-holed boxes commonly used in Peterson boxes and the large round holes more

recently designed for the Gilwood box. Dr. W. H. Davis also found that bluebirds preferred oval holes over slot boxes. Previously McComb et al had documented that bluebirds chose slot boxes over the standard round hole.

For years, some traditionalists have frowned upon the oval holes of Peterson boxes, stating that European Starlings can enter these boxes. The (Minnesota) Bluebird Recovery Program consistently fledges one of the highest numbers of Eastern Bluebirds of any state in the country, and the vast majority of their boxes are Peterson boxes. Their nest box reports show use by starlings of these boxes to be exceeding rare in spite of the fact that thousands of them exist across the state.

I have used Peterson boxes successfully for many years, monitoring a cumulative total of 241 boxes, and never once had a starling nest in any of them. I have had anecdotal reports of a limited number of starlings nesting in Peterson boxes in our area; however, in general, starlings will avoid such a small box. I have never heard a report of starlings killing bluebirds to take over a Peterson box as House Sparrows frequently do in any style of nest box.

There is absolutely no doubt in my mind that Eastern Bluebirds in my area prefer Peterson boxes over standard boxes with round holes. I have observed no disadvantage to this box design whatsoever relative to the welfare of bluebirds. The downward sloping front reduces the probability of rain entering these nest boxes, reducing the chances for the young.

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getting chilled, which in my area leads to a far higher mortality rate than starlings would ever create in a Peterson box.

Through years of testing, I determined that the key to the success of the Peterson box is the oval hole more than the shape of the box. Davis also observed this in his controlled tests. Bluebirds on my trails have preferred NABS style boxes with oval holes over Peterson style boxes, so I have shifted more of my boxes to this style.

Over six years, I have had the cumulative total of 202 of these boxes in the field. In this time, I have fledged hundreds of bluebirds from them while only once finding a starling nest. When I opened that box the starling could hardly move in it, and was readily captured and destroyed. I never have had another incidence of a starling nesting in these boxes although starlings are ubiquitous on my trails. I do not feel that one freak nesting in 202 opportunities is a problem worth worrying about.

For the last two years, bluebirds have used Gilwood boxes at an even higher rate than the NABS oval-holed boxes. No starlings have used any of these 42 small-cavity boxes during this period. The internal dimensions of these boxes are so small that a starling probably could not build a nest within them. The same would be true for Troyer boxes. I never had a starling attempt to nest in a Troyer box.

As I have stated in many previous articles, I haven't taken lightly the potential for starlings to enter these boxes. My students and I published results of tests designed to determine the starling's ability to pass through a variety of hole sizes commonly used

Box style	Number of boxes	Number of nesting attempts*			
		Bluebirds	Swallows	Wren	Sparrow
NABS oval	20 (41)	7 (11)	13 (29)	0 (0)	1 (1)
Gilwood	20 (41)	22 (47)	6 (13)	1 (1)	0 (0)

* A nesting attempt is defined as a pair building a nest and laying at least one egg.

Table 1. Numbers of nesting attempts in NABS oval and Gilwood nest boxes in 2001, with two-year totals in parenthesis.

Box style	Number of boxes	Number of nesting attempts			
		Bluebirds	Swallows	Wren	Sparrow
NABS oval	20 (41)	12 (29)	14 (26)	1 (1)	0 (1)
Troyer	20 (41)	11 (19)	7 (18)	3 (3)	0 (0)

Table 2. Numbers of nesting attempts in NABS oval and Troyer nest boxes in 2001 with two year totals in parenthesis.

on bluebird boxes.

These tests show undoubtedly that starlings can pass through the traditional size oval holes found in Peterson boxes as well as the Gilwood boxes. What my field tests of these boxes show, however, is that although starlings could pass through Peterson or Gilwood box holes, they strongly avoid nesting in these small boxes. I am certain that if I put Peterson or Gilwood style holes on boxes meant for Wood Ducks or flickers, starlings probably would nest in nearly every one of them. They do not seem to want to nest in the smaller boxes in my tests.

Contrary to the suggestion in the recent letter to the editor concerning my work, starlings are competitors, not predators, of bluebirds. There is a significant difference.

The letter writers also compared bluebird preference of large-holed boxes to the preference of children playing in streets. While children are certainly risking their lives as they place themselves in the path of traffic, I have observed no risk of a bluebird nesting in the non-traditional holed boxes.

As long as I find far higher box

use by bluebirds, while observing no detrimental effects, I will continue to test and use these new designs.

Bluebirds probably know their own nesting requirements far better than people do. They expend considerable amounts of energy seeking out and defending potential nest sites. I believe they know what characteristics they need to seek in order to successfully fledge young. It is presumptuous for humans to ignore the strong preferences that bluebirds display, feeling that humans know better what the birds need. Individual bluebirds making poor decisions are quickly eliminated from the gene pool. Their box preferences certainly include some understanding of what risks, if any, a particular cavity poses.

Those expressing their concern in the letter to the editor also expressed their view that NABS founder Larry Zeleny would never have tolerated the boxes that I have described. Zeleny years ago felt that no holes larger than 1.5 inches should be used in any bluebird boxes.

He actively fought against the use of 1 9/16-inch boxes for Mountain Bluebirds in the West. For years Duncan MacIntosh (Alberta) and Art

Aylesworth (Montana) argued for the need for 1 9/16-inch hole for that species. They both noticed that the adult Mountain Bluebirds feeding young would have badly ruffled feathers after removing their heads from nest boxes while feeding.

Enlarging the holes on their nest boxes to 1 9/16 inches immediately eliminated that problem. They also noted that Mountain Bluebirds were cramped in 4-inch x 4-inch boxes. Using boxes with 5-inch or 5.5-inch square floors and 1 9/16-inch holes lead to immediately radically higher nest box occupancy.

It is now widely accepted that the 1 9/16-inch hole is more desirable for Mountain Bluebirds.

Some of Zeleny's conclusions were probably based on heavy starling use of large-holed natural cavities and unusually large nest boxes. Since his death in 1995, advances have been made in knowledge about bluebirds and nest boxes. I suspect that, had he observed the data collected in recent years, he would have had an open mind about the new alternatives that are available for bluebirds.

Centuries ago many of the world's greatest scientists warned that sailors venturing too far into the ocean would fall off the edge of the Earth. Columbus and others following him accepted this risk when they left Europe, and then found that the Earth really was not flat. As knowledge of geography has advanced, so will that related to bluebirds.

The final answer to many bluebird questions are not all found in books published 25 years ago. While the letter writers said it was "obvious that these (Gilwood and Troyer) boxes will raise starlings," I have never heard of a case of that happening. If anyone could convince me that this is a problem, I too would recommend that the use of these

boxes be discontinued. If that sort of evidence can't be developed and these boxes are preferred over traditional NABS boxes, they should increasingly be used.

I believe the more important issue relative to starlings is not the size of the hole, but the size of the box. I trapped 57 starlings in my yard this summer. A short distance away bluebirds nested successfully twice in a NABS oval-holed boxes and twice more in a Gilwood box just outside my yard. In 2000, I trapped numerous starlings while bluebirds nested undisturbed in a Troyer box less than 40 yards away. I have seen no evidence that starlings have negatively impacted bluebirds in any of my boxes even as huge flocks of them are found throughout our county.

I base my conclusions about which nest boxes are desirable on my personal controlled research over many years and on the large data sets available from other state groups. Bluebirds Across Nebraska has found that the Troyer box is among their most successful box with no evidence of starling problems. Troyer boxes have a 1 3/16-inch slot, a size shown by McComb et al to exclude starlings.

I feel that as Gilwood boxes have similar exposure, they will be found to be highly attractive to Eastern Bluebirds while seldom if ever being used by starlings.

Variation over box preferences will exist throughout North America. Some boxes that are successful in one area may be less successful in other areas. Individuals with an open mind should conduct additional tests throughout the continent. There is no justification whatsoever at this time for avoiding the use of Gilwood or Troyer boxes based on threats from starlings.

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Literature used in preparation of this article:

Berner, K. L. 1990. Field tests of predator-deterrent nest box devices for acceptance of cavity nesting birds. *Sialia* 12: 123-128.

Berner, K.L. 1995. Comparison of use of several styles of nest boxes by cavity nesting birds. *Sialia* 17:127-135.

Berner, K.L. 1998. Dissecting the Peterson nest box. *Sialia* 20:11-13.

Berner, K.L. 1999. Starlings and oval-holed nest boxes. *Bluebird* 21(1):6-7.

Berner, K.L. 2001. Oval-holed, Troyer, and Gilwood nest boxes. *Bluebird* 23(2): 6-7.

Berner, K. L. and V.A. Pleines. 1993. Field tests of several styles of bluebird nest boxes. *Sialia* 15:3-11.

Davis, W.H. 1995. Testing the features of the Peterson box. *Sialia* 17:135-136.

Davis, W.H. 1997. That remarkable Peterson entrance. *Sialia* 19:48-49.

Lehmann, D.L. 1997. Controlled tests to determine if European Starlings can pass through various hole sizes. *Sialia* 19:125-131.

McComb, W.C., W.H. Davis, and P.N. Allaire. 1987. Excluding starlings from a slot entrance bluebird nest box. *Wildlife Society Bulletin* 15:204-207.