

# Feathery Competition on Golf Courses

On many golf courses, competition includes more than the game.

BY JEFF NUS

The USGA Turfgrass and Environmental Research Program has long supported [Audubon International's](#) effort to appreciate, understand, and maximize the usefulness of golf course out-of-play areas as wildlife habitat. In addition, the USGA provided grants to several research projects through the [Wildlife Links Program](#), clearly demonstrating that golf courses can provide needed habitat for many species of birds, mammals, reptiles, and amphibians, besides providing the playing surfaces for golfers.

A popular activity is the construction and placement of bluebird nest boxes that can bolster bluebird populations on golf courses (2). As noted by Dr. Mark Stanback, researcher at Davidson College (Davidson, N.C.) populations of eastern bluebirds have increased dramatically since bluebird nest box programs were first introduced around 1980 (3). However, wildlife ecologists know that the fierce competition for food and habitat creates a delicate balance between species. When conditions favor one species, the numbers of other species needing similar requirements often decline.

Populations of brown-headed nuthatches have exhibited steady declines in recent years from Virginia to east Texas and are federally listed as a Bird of Conservation Concern (1). To monitor nuthatch and bluebird populations in their area, Davidson researchers monitored nest boxes on seven golf courses from 2001 through 2011. The average number of boxes per course from 2004 through 2008 was 37.

The boxes were monitored weekly from early March through late July, and soiled nests were removed soon after fledging (3). Several species were



*Male eastern bluebird (photograph by A. Mercadante).*



*Brown-headed nuthatch (photograph by A. Mercadante).*



*Pole-mounted nest box with predator guard.*

found to use these nest boxes besides nuthatches and bluebirds. They included Carolina chickadees, house sparrows, tree swallows, tufted titmice, house wrens, and even southern flying squirrels. However, it was the rarity of nuthatches that had these scientists asking, “Why?”

Researchers acknowledge that population declines are likely due, in part, to extensive logging, which limits cavity-nest sites for this species, although they suspected other factors. “Habitat degradation continues to be the major cause of population declines for many birds. But we often lack a

nuanced understanding of how particular habitat deficits impact the birds in question,” says Dr. Stanback, project leader.

Dr. Stanback and his colleagues were determined to identify factors that were contributing to the lack of observed nuthatches in the sampled nest boxes, and to determine what, if anything, could be done to reverse this trend. The first question was, “Does competition with bluebirds over nest boxes prevent breeding by nuthatches?”

To answer this question, they had to exclude bluebirds from the nest boxes. The standard nest boxes were equipped with a 38-mm (1.5-inch) entry hole, which accommodates bluebirds and all other smaller cavity-nesters. Prior to the 2005 season, on approximately a quarter of the boxes on four of the golf courses, they replaced front plates with ones with 28-mm (1.1-inch) holes to exclude the larger bluebirds. Prior to the 2008 season, hole size was reduced on another one-third of the nest boxes on two additional courses. The results clearly showed that when competition from bluebirds for nest boxes was eliminated in this way, significantly more nuthatches used those boxes to successfully fledge their young.

“For several years my students and I observed occasional nesting attempts by brown-headed nuthatches on golf courses where we were studying bluebirds. However, most ended with bluebirds taking over the boxes. These usurpations prompted me to hypothesize that bluebirds were monopolizing golf course nest boxes, and that only by excluding them could we see what nuthatches were capable of,” explains Dr. Stanback. “Seeing so many successful nuthatch nests was very heartwarming. Nuthatches live in large family groups and are very charismatic — you can’t help but root for the little guys.”

Dr. Stanback and his colleagues note that nuthatches have been historically associated with mature pine forests, so the second question they wanted to investigate was, “To what extent is nest box occupancy by nuthatches dependent on the proximity

of pine forests?” Stanback and his team carefully categorized the nest box proximity to the three nearest pine trees and monitored the use of both these large- and small-hole nest boxes on four golf courses. They found that neither bluebirds nor nuthatches showed preference regarding pine density, although nuthatches used bluebird-proof nest boxes with smaller holes far more than expected.

“The conventional wisdom is that these nuthatches require mature pine stands,” says Dr. Stanback. “While I recognize that brown-headed nuthatches need some pines, I was surprised that the minimum was so . . . minimal. We had successful nuthatch nests in open fields with no pines in sight. The key really does seem to be prevention by bluebirds.”

The third question Dr. Stanback and his colleagues asked was, “Can bluebirds actively displace nuthatches from nest boxes?” To answer this, they increased the size of the entry holes (making them bluebird-accessible) on nest boxes that were previously bluebird-proof (having smaller entry holes) and contained nuthatch nests in 2007. The results were overwhelming. Nearly all of the 32 boxes used by nuthatches in 2007 were used by bluebirds in 2008 after the size of the entry holes was increased. In most cases, bluebirds evicted nuthatches that were beginning to build nests.

The results clearly indicated that nest box occupancy favored bluebirds when the entry hole was large (1.5 inches), but when bluebirds were excluded using smaller entry holes (1.1 inches), nuthatches readily occupied nest boxes. The researchers asked the next logical question, “Could pairing standard (with larger holes) boxes allow bluebirds and nuthatches to coexist?” In 2009, researchers paired up most of the nest boxes at the local six golf courses. Paired nest boxes were typically 10 meters apart and had one nest box with a small hole and one box with a larger hole, both nest boxes with large holes, or both with small holes.

Results indicated that bluebirds would not allow nuthatches to nest in adjacent larger-holed nest boxes, even

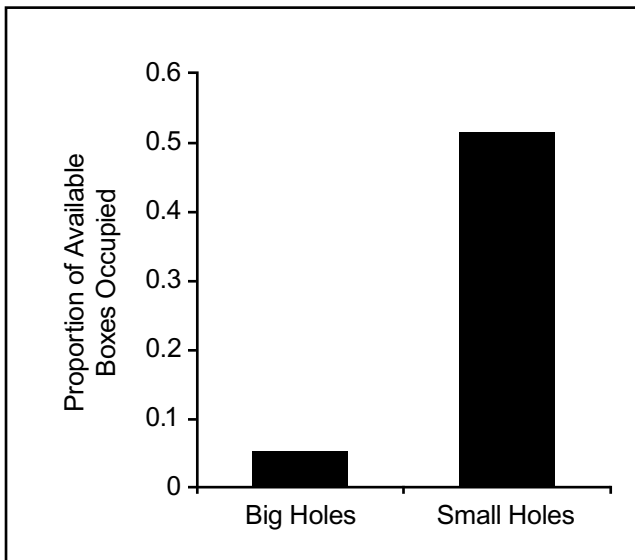
when bluebirds nested in only one of two larger-holed nest boxes. However, when the pair of nest boxes included one small and one large entry hole, nuthatches were able to nest in the small-hole nest box in 74 out of the 139 big/small box pairs. Thus, while pairing identical larger-hole boxes may be an effective strategy for some species, nuthatches appear not to benefit in any way from this practice.

“Nest boxes can be incredibly effective conservation tools,” says Dr. Stanback. “For example, bluebird

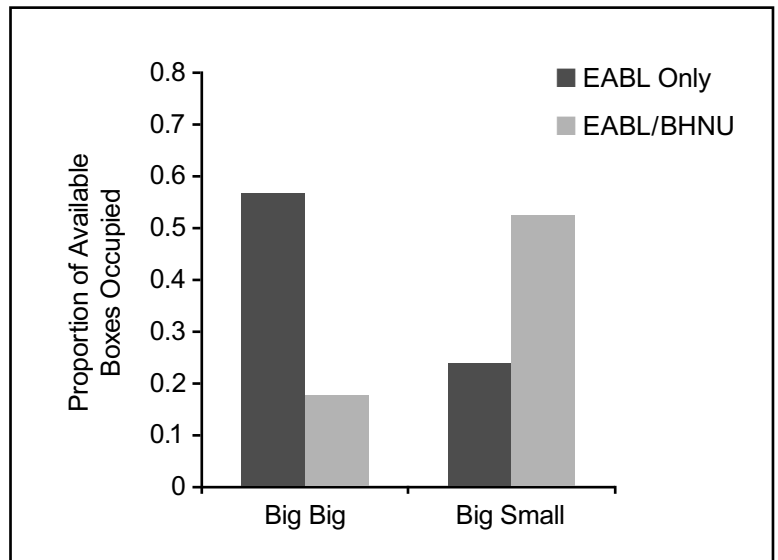
lovers have increased bluebird numbers dramatically in recent decades simply by making nest boxes available to them. However, bluebirds are almost *too good* at taking advantage of nest boxes. A golf course superintendent who installs 18 nest boxes may feel that he is doing something great for all birds. The fact is, 16 of those boxes will contain bluebirds, and if another 18 boxes are installed, it will probably just result in 16 more bluebird families. Brown-headed nuthatches need some boxes specifically set aside for them.



*Changing the size of the entry hole creates a bluebird-accessible nest box (left) versus a bluebird-proof nest box (right).*



Proportion of bluebird-accessible (big holes) and bluebird-proof (small holes) nest boxes containing successful nuthatch nests. Thirty percent of the boxes were made bluebird-proof by reducing the hole size (Stanback, 2011). Results show that nuthatches were successful in nesting only after the hole size of the nest box was reduced, restricting access by bluebirds, but still allowing access by nuthatches.



When researchers used pairs of nest boxes each with big holes (big-big), bluebirds (EABL) monopolized nesting and inhibited nesting by nuthatches, even if bluebirds did not nest in one of the big-holed nest boxes of the pair. When pairs of nest boxes had both a big-holed nest box and a small-holed nest box (big-small), nuthatches (BHNU) were able to nest successfully in the small-holed nest box, even when bluebirds nested in the adjacent big-holed nest box of the pair.

“Let me be clear. I’m not advocating that anyone ban bluebirds. However, I also believe that most bluebird lovers would be willing to set aside a portion of their boxes for the benefit of a charismatic, cooperatively breeding, and threatened southeastern endemic bird, too.”

After completing this work, Dr. Stanback and his colleagues are convinced that southeastern golf courses can make an impact in helping to bolster the populations of brown-headed nuthatches, especially courses that already provide nest boxes for bluebirds.

“I think southeastern golf courses offer real potential to help nuthatches, just as they have boosted bluebird populations. Most contain enough pines to harbor at least some nuthatches — and the spacing of trees and open understory that characterize many southeastern golf courses mimics aspects of their ancestral habitat,” explains Dr. Stanback. “Bluebird-proof nest boxes really work. At some of our courses, we have gone from zero to 20 successful nuthatch nests in just a few years. Moreover, participating golf courses can act as

critical ‘source populations’ that act to maintain or restore nuthatches to surrounding areas. Because the Southeast will continue to suburbanize, golf courses can help brown-headed nuthatches survive, and perhaps even thrive in this transition.”

This work demonstrates yet another instance where golf courses can assist Mother Nature. Dr. Stanback and his colleagues make the following recommendations to superintendents of the more than 4,000 golf courses in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and east Texas:

- Even golf courses without extensive pine stands can benefit brown-headed nuthatches by providing nest boxes.
- Nest boxes should be pole-mounted with predator guards and should be cleaned out each autumn.
- There is no need to pair boxes to increase occupancy by nuthatches.
- Every other box should have a one-inch entrance hole to accommodate brown-headed nuthatches (and Carolina chickadees), but exclude bluebirds and house sparrows.

- Consider retrofitting a number of existing bluebird-accessible boxes using a metal disc with a one-inch hole.

## LITERATURE CITED

Butcher G. S., D. K. Niven, A. O. Panjabi, d. N. Pashley, and K. V. Rosenberg. 2007. The 2007 Watch List for United States Birds. *American Birds* 61:18-25

Jackson, A. K., and D. A. Cristol. 2011. Tracking survival of bluebirds on golf courses. *USGA Turfgrass and Environmental Research Online* 10(6):1-7. ([TGIF Record Number 177045](#))

Stanback, M., E. Cline, W. Anderson, L. Bergner, P. McGovern, A. Mercadante, D. Millican, and J. Olbert. 2011. Bluebird-proof nest boxes increase brown-headed nuthatch breeding on southeastern golf courses. *USGA Turfgrass and Environmental Research Online* 10(18):1-12. ([TGIF Record Number 189040](#))

JEFF NUS, Ph.D., *manager, Green Section Research.*