

Protecting Nest Boxes and Purple Martin Housing from Snakes (and Other Climbing Predators)

by Lance D. Wood

The following is a revised, updated version of an article that was published almost twenty years ago in the North American Bluebird Society's (NABS) magazine. This article is reproduced here with the permission of the NABS.

Since the 1960's, I have been building, erecting, and monitoring nest boxes for Eastern Bluebirds at various locations in Virginia. Over the years I have gained experience and learned a great deal from veteran bluebird trail operators, such as Ron Kingston of Charlottesville, Virginia. I now maintain about 40 nest boxes that provide safe nesting sites, primarily for bluebirds and Tree Swallows (and also occasionally for Carolina Wrens, Carolina Chickadees, and other native cavity nesters). These trails are located on my family's farm in central Virginia near Charlottesville.

Based on my experience, I have concluded that, at least in Virginia, a large percentage of active bluebird nest boxes are raided every nesting season by snakes (primarily the common black rat snake, *Elaphe obsoleta*) and by raccoons and other climbing predators. This is hardly surprising, considering the fact that most bluebird nest boxes are placed in open, conspicuous locations (to reduce the threat from House Wren attacks, etc.). Thus they are easily found by a variety of predators. Some of those predators are intelligent animals (such as raccoons) that are likely to learn and remember that nest boxes sometimes contain readily available prey. A predator that has found a meal in one vulnerable nest box may investigate other boxes within its hunting territory. Because I do not want my nest boxes to serve as "feeding stations" for predators and "death traps" for native birds, and because I believe that practically all of the losses of birds, eggs, young, and incubating females from climbing predators can be prevented by installing effective predator guards, I urge the consistent use of predator guards on every nest box that we offer for the use of our native birds.

I believe that even conscientious bluebird trail operators who monitor their nest boxes regularly are likely to underestimate the number of active nests that are destroyed by snakes. This is the case because a snake usually leaves little or no evidence of its visit; the eggs and/or birds in the nest are swallowed whole and disappear. A snake's visit usually does not disturb a bird's nest to any noticeable degree. A bluebird trail operator may visit a nest box and note that the young bluebirds inside are within a few days of fledging. The following week the monitor visits again, notes that the young birds are gone, and believes that they have all fledged successfully. In fact, they may have all been eaten by a black rat snake, which left no sign of its visit.

The black rat snake is an abundant predator (even though they are infrequently seen) with a large geographic range. Black rat snakes do much of their hunting at night. They are extremely skillful climbers that can easily ascend any unprotected pipe or pole on which a nesting box has been mounted. If the surface of a mounting pipe is smooth and slick, the snake merely coils around the pipe, holding on with its powerful constrictor muscles and "inching up" the pipe, however far it needs to go to find birds or

eggs to eat. No doubt all native predators have a place in the ecosystem, and I would never kill any snake or other native predator, but I prefer to keep predators on the ground eating rodents and away from the birds that have occupied my nesting boxes.

To foil the many predators and enemies of bluebirds and other native cavity nesting birds, I employ a number of non-lethal anti-predator devices that work very well in combination; so well in fact, that my nest boxes virtually never lose an egg or a nestling to any predator.

So far as I have been able to determine, the most reliable form of climbing predator guard that can be used to protect nesting boxes, purple martin gourds or houses, etc., is some version of the Ron Kingston stovepipe guard, in its various forms and permutations. So I try to protect every new bluebird nesting box that I put up with a Kingston stovepipe guard. If you view the photos of my purple martin nesting structures at the website (www.purplemartinfieldday.org) you will note that every one of my martin gourd structures and houses is effectively protected from climbing predators by a magnified, "industrial strength" version of the Kingston stovepipe guard, made from large, inverted, galvanized trash cans. During the 23-year life of my martin colony, no snake, raccoon, other climbing predator has ever gotten past those "super barriers".

Various "spin-off" varieties of the Kingston stovepipe guard can be purchased commercially from a number of suppliers, such as the Purple Martin Conservation Association (PMCA). However, Kingston stovepipe guards are relatively easy to fabricate and use, so practically anyone can make that guard with a section of stove-pipe, some hardware cloth, and a few other simple supplies and tools. Directions for making and using Kingston stovepipe guards can be found at <http://nestboxbuilder.com/pdf/stovepipebaffle.pdf> and [Installing Kingston guard by Paul Kilduff](#).

In addition, some of my bluebird/tree swallow/chickadee nest boxes are protected by another form of predator guard which is relatively easy to make and use, so I will describe that alternative approach in the following text.

I attribute some of the success of my predation-control efforts to the following techniques that I use for some of my nesting boxes. (Note: All of the materials described below are readily available at any hardware, plumbing, or electrical supply store).

First, I mount my nest boxes in open grassland, at least 50 feet from brush or trees, about five to six feet above ground level, using one half inch or three quarter inch galvanized pipe. Some nest boxes are attached to the threaded top of the pipe using a pipe flange. Of course, to drive such pipes into the ground without damaging the fragile thread at the top of the pipe, one has to put a pipe union on the thread before driving the pipe into the ground. I mount other nest boxes on 3/4 inch galvanized steel pipe (usually the sort of pipe used as "rigid" conduit for electrical wiring). I attach each nest box to the steel pipe with three 3/4 inch steel pipe straps attached to the back of the nest box with sheet-metal screws.

After I have driven the seven or eight-foot long steel mounting pipe a couple of feet into the earth at the desired location, I cut a section of white, plastic PVC pipe about the same length as that section of the

steel mounting pipe that remains above ground after it has been driven into place, minus the length of the nesting box that must be strapped to the topmost part of that steel mounting pipe. (I use PVC pipe with an inside diameter of two inches or three inches; the bigger the better, but the larger diameter PVC pipe is more expensive.) I then place the plastic PVC pipe over and around the steel pipe by dropping the PVC pipe into place, so that it forms a sheath or casing around the steel pipe. The PVC pipe serves a number of useful purposes, as explained below, but the empty gap or airspace between the outer surface of the steel mounting pipe and the inner wall of the PVC pipe provides an inviting place for ants to establish a colony. This could be disastrous for young nestlings, since ants will swarm over hatchlings and destroy them while the young birds are nest-bound and helpless. To prevent this, one should bury the bottom end of the PVC pipe an inch or more below ground level, where ants will rarely discover an opening for a new colony. As added insurance against ants, at the top opening of the PVC pipe, one should fill the gap between the inner surface of the PVC pipe and the outer surface of the steel mounting pipe with wheel bearing grease to form an impassable barrier that ants will not climb past to attack young nestlings from inside the PVC pipe. A band of wheel bearing grease on the outside of the PVC pipe (or at the top of the steel mounting pipe where no PVC sheath is used) will prevent ants from climbing to the nest box and destroying nestlings from the outside of the mounting pipe.

At the top of the PVC pipe, I slide one or two large steel washers into place around the steel mounting pipe, covering the open top of the section of PVC pipe, to "seal in" the grease ant barrier. The washers provide additional, although not essential, support for the most important part of the predator guard: a four-foot square piece of heavy-duty, 1/2 inch mesh, galvanized steel hardware cloth (also called "rat wire"). The four-foot square section of hardware cloth creates a very effective barrier that blocks the ascent of climbing snakes and other predators, keeping the nesting birds safe and secure in their nesting box, which is mounted on the pipe just above the hardware cloth. Hardware cloth has several advantages for use as a predator barrier: it is readily available from hardware stores; it is inexpensive and easy to work with; and it is rarely damaged by wind, snow, sleet, or rain, since those elements pass through the mesh. I would not rely on a hardware cloth barrier smaller than four feet on each side, however, since I have seen large snakes get past three-foot square hardware cloth barriers.

For those concerned that a four-foot square hardware cloth barrier might make the monitoring, maintenance, and cleaning of a nest box excessively difficult, I can report that I have never found that to be a problem (although one must be careful not to get scratched by the cut wire edges of the hardware cloth). Although I use a light-weight, six foot aluminum step ladder to monitor my nest boxes mounted above eye level, the step ladder's paint can shelf easily pushes the flap of hardware cloth temporarily down, out of the way, until nest box monitoring is completed. In one way, a strong predator barrier system enhances nest box monitoring. Some bluebirders are understandably concerned that raccoons and other predators are likely to follow the human scent trail from nest box to nest box, raiding the boxes. If one has a fairly "predator-proof" system in place that legitimate concern can be lessened.

As a final measure of protection, I apply a band of wheel bearing grease around the outside circumference of the white PVC pipe about three or four feet above the ground level. So long as it is fresh and slippery, the grease makes it more difficult for a raccoon or other climbing mammal to ascend the smooth, slippery surface of the PVC pipe to raid the nest box. Unfortunately, neither the smooth

PVC pipe nor the band of grease around the PVC pipe will stop a climbing snake; they plow right past and through the grease. Nevertheless, the band of wheel bearing grease is very useful in monitoring the effectiveness of any predator/snake barrier system, because, in its ascent, a snake coats its belly and sides with grease. Thereafter, the snake leaves an unmistakable "grease trail" behind. Wherever it goes in its attack on the nest box, it clearly reveals just how far and in just what manner it advanced toward its final goal, i.e., the birds or eggs inside the nest box.

I am aware that the use of wheel bearing grease presents the objectionable problem of water pollution. To deal with that problem, I use as little grease as possible to achieve my goals; moreover, I believe that the vast majority of the grease stays on the PVC pipe, and that relatively little is washed off by rain. Unfortunately, I do not know of an appropriate substitute for grease. I would not want to use garden Tanglefoot® in place of grease, for fear that native birds and beneficial insects would be fatally ensnared in the sticky substance.

Over the years I have derived great satisfaction from "reading" the grease trail signs left behind by many snakes that have challenged my anti-predator barriers while attempting to raid my nest boxes. Thus far, not one snake has gotten past the final barrier of a four-foot square piece of hardware cloth. In contrast, a few large black rat snakes have occasionally gone over and past three-foot square pieces of hardware cloth. They have consumed whole families of House Sparrows inside the nest boxes attached above an experimental three-foot square barrier. Similarly, the tell-tale grease trail has clearly revealed that a number of large black rat snakes have gone over the patented Top Guard Climbing Animal Barrier®, which is sold commercially as an allegedly adequate protection against snakes and other climbing predators. While the Top Guard Barrier has its virtues and its uses, I would never rely on one unless I had firmly wired a four-foot square piece of hardware cloth on top of the Top Guard Barrier as an added protection.

Of course, I recognize that some persons would object for aesthetic reasons to the anti-predator devices that I use and recommend. Some would say that a traditional bluebird nest box mounted at the top of a wooden fencepost is more aesthetically appealing than the rather odd-looking combination of PVC pipe, hardware cloth, and nest box that I advocate. Given the fact that I also paint all of my nest boxes white (to reflect heat and prevent overheating under the hot summer sun), I must admit that my nest box/predator guard combinations are rather distinctive in appearance and rather eye-catching. Although I know that my approach is not for everyone, my response is simply that my primary concern is to protect the lives of "my" nesting native birds; I do not find my structures to be at all aesthetically objectionable.



Photograph by Lance D. Wood

Author's method of protecting bluebird boxes from climbing predators

Some of the other devices that are used to protect nest boxes from snakes (such as the soft, flexible, netting "snake traps" mounted on some nest box mounting pipes) are less noticeable, but are likely to kill the snakes that become enmeshed in them, unless the trapped snakes are released soon after they are ensnared. The barrier system that I use protects my nest boxes, but will not kill snakes or other predators, allowing them to continue to play their useful and necessary roles in the larger ecosystem.