

INSTRUCTIONS ON HOW TO BUILD, PAINT AND MOUNT A "BOLT" BLUEBIRD NEST BOX

A. HARDWARE ITEMS AND ACCESSORIES



Item 2 Screws

A1. NEST BOX CONSTRUCTION

1. 3 pcs. Small Brads for door stop - $\frac{1}{2}$ " length
2. 15 pcs. Galvanized Deck Screws - # 6 x $1\frac{5}{8}$ "
4 pcs. - assemble sides to back panel
3 pcs. - fasten floor to sides & back panels
6 pcs. - fasten roof supports to roof
2 pcs. - hinges for the door
3. 4 pcs. Galvanized Deck Screws - # 6 x $1\frac{1}{4}$ "
Used to fasten roof supports to side panels
4. 1 pc. Duplex (double headed) Nail - # 8 x $2\frac{1}{2}$ "

Note - Dip head in paint to deter rust.



Item 3 Screws



Item 4 Nail

5. 1 pc. Screw eye - $\frac{3}{4}$ "
6. 10" Heavy Cord or String
7. Waterproof glue - as required in section "C"

Note - Items 5 & 6 used to tether the Duplex nail to the box.



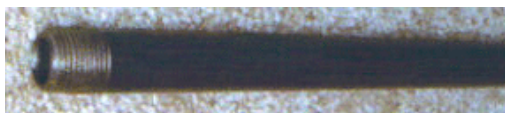
Item 9 Flange

A2. MOUNTING SYSTEM FOR NEST BOX

8. 1 pc. Water Pipe (galvanized or black) - $\frac{1}{2}$ " x 6 Ft.
9. 1 pc. Pipe Flange (galvanized or black) - $\frac{1}{2}$ "
When selecting pipe and flange confirm both are $\frac{1}{2}$ ".
10. 4 pcs. Flat Head Wood Screws - # 12 x $\frac{3}{4}$ "
Used to install pipe flange to the nest box



Items 11 & 12 PVC



Item 8 Pipe

A3. ANIMAL GUARD

11. 1 pc. PVC Pipe (smooth thin wall) - 4" x 24"
12. 1 pc. PVC Cap (thin wall) - 4"
13. 1 pc. Hex Head Sheet Metal Screw - # 6 x $\frac{1}{2}$ "
14. 1 pc. Split Ring Hanger - for $\frac{1}{2}$ " water pipe



Item 14 Hanger

(B) STEPS FOR FABRICATING BLUEBIRD NEST BOX

CAUTION – Use nominal 1" x 6" and 1" x 8" boards. Check boards to make sure they are sound, straight and not warped. All 1" x 6" boards must all be the same width of 5 ½"

SAWING (Figure 1)

1. Cut door to 4 3/8" x 9 3/4"
2. Cut back panel 4 1/2" x 10"
3. Cut two side panels 5 1/2" x 10"
4. Cut roof panel 7 1/4" x 8 1/2"
(Grain direction is 8 1/2")
5. Cut floor to 3 1/2" x 4 1/2"
(Grain direction is 4 1/2")
6. Cut 2 corners of the floor @ 45 degree angle on the 4 1/2" end.
7. Cut 2 roof supports 3/4" x 1" x 7" with 45 degree bevel on one end.
8. Cut door stop 3/8" x 3/4" x 3 1/2".

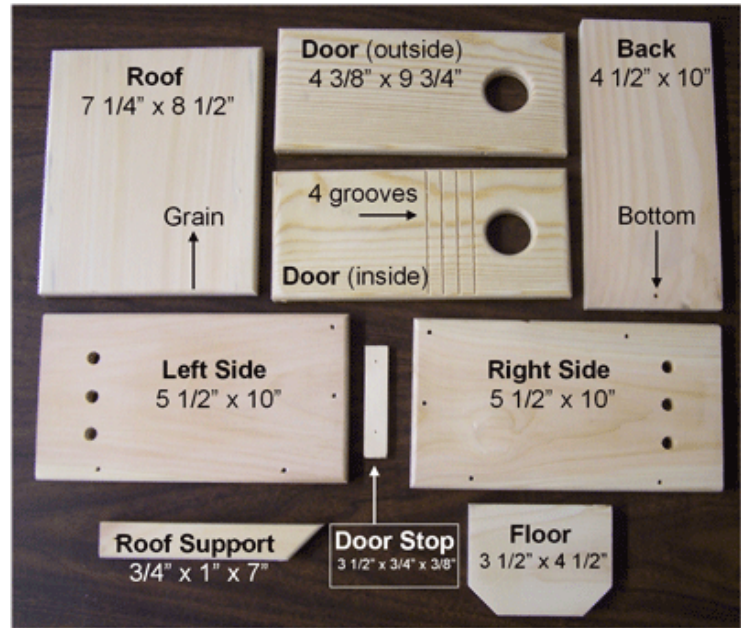


Figure 1: Bluebird Nest Box Parts

MARK FOR DRILLING AND SAWING

1. Mark door for 1 ½" hole with the center of the hole 2" from the top of the door and centered from the sides. (Figure 1)
2. Mark door for 4 saw cut grooves ½" apart on inside of the door starting 3 ½" from top. (The 1 ½" hole is at the top.) (Figure 1)
3. Mark back panel for 1 hole 3/8" from the bottom edge & centered to the sides for installing the floor. (Figure 1)
4. Mark left side panel (7 holes) and right side panel (8 holes). You must understand the hole patterns on each panel. (Figures 2 & 3)

Always keep left and right side panels separate during processing.

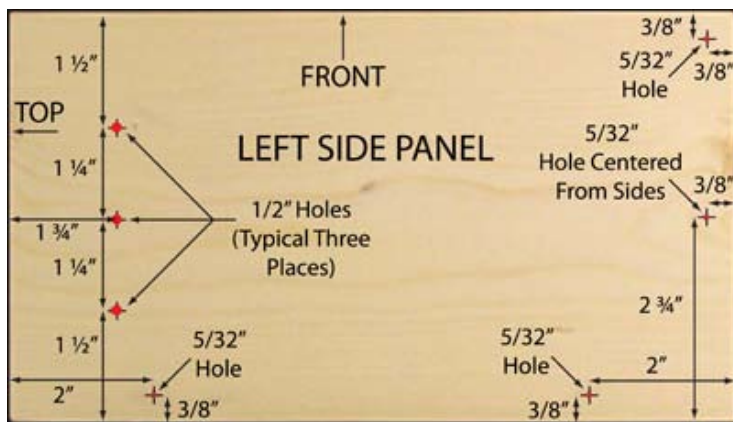


Figure 2: Left Side Panel - 7 holes

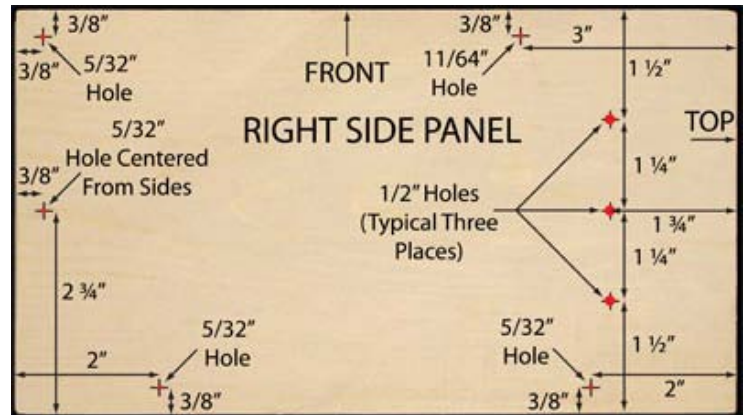


Figure 3: Right Side Panel - 8 holes

5. Mark 2 pcs. Roof Supports, the 1" side for 2 holes and the $\frac{3}{4}$ " bottom edge for 3 holes. Both sets of holes to be on the center line from the edges of the support. (Figure 4)

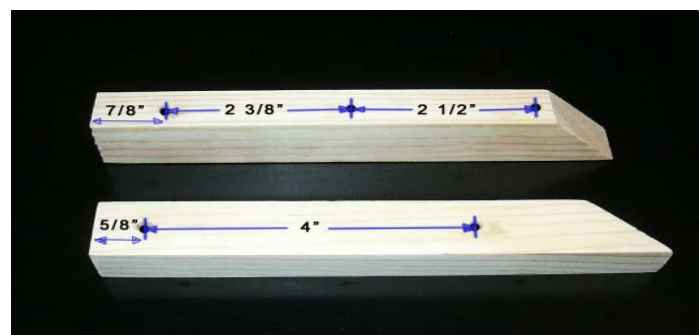


Figure 4: Roof Support

DRILLING & SAWING

1. Use 1 1/2" flat blade bit, Forstner bit or hole saw to drill the entrance hole in the door. Figure 1
2. Saw cut 4 grooves 1/16" deep on inside of the door as marked in item no. 2 of "Mark for Drilling & Sawing". Figure 1
3. Drill a 5/32" hole in the center line of the back panel as marked in item no. 3 of "Mark for Drilling & Sawing". Figure 1
4. Drill 5/32", 1/2" & 11/64" holes in left and right side panels as shown Figures 2 & 3.
5. Drill 5/32" holes 5 places in each roof support as shown in Figure 4.

SANDING & ROUTING

1. Sand all parts both sides and all exposed edges. (Omit only the floor and the door stop.)
2. Rout with 3/8" bit – (a) Door - All 4 edges on both sides and both sides of the 1 1/2" entrance hole.
 - (b) Side Panels - The front, rear and bottom outside edges of the left & right side panels.
 - (c) Side Panels - The inside front edges next to the door of the left & right side panels.
 - (d) Roof Panel - All 4 edges of the outside and 3 edges of the inside of the roof panel. (Omit the inside 8 1/2" back edge to be placed next to the back panel of the nest box.)
3. Rout with 1/8" bit - All edges including sloping edges of the roof supports.

(NOTE – IF ROUTER IS UNAVAILABLE, sand the above edges round to eliminate splinters.)

(C) STEPS FOR ASSEMBLING BLUEBIRD NEST BOX

1. Glue and nail door stop $\frac{3}{4}$ " from front edge and $\frac{1}{8}$ " down from the top of left hand panel. Use small brads. (Figure 5)
2. Glue & fasten left & right side panels to the back panel using #6 x 1 $\frac{5}{8}$ " deck screws. The $\frac{5}{32}$ " holes of the 3 panels must be to the left when installing the right and left side panel. Make sure all the top edges are flush or even. (Figure 6)

Note: Mini Benches on page 7 would help with items 2 thru 7 especially when building multiple boxes.

3. Place sub-assembly (item 2 above) on a flat surface so the floor side is down and the vent holes are up.
4. Apply glue to floor's side & back edges and spread sides of the sub-assembly as you slide it over the floor. The cut angles are to face the back of the sub-assembly. Fasten floor using 3 pcs. #6 x 1 $\frac{5}{8}$ " screws.
5. Attach the door using 2 pcs. #6 x 1 $\frac{5}{8}$ " deck screws. Align the door with sides and bottom edges while installing the screws. Center the door to the side panels by adjusting the hinge screws so the door closes without binding. (Figure 7)

NOTE: It is suggested you build a spacer for installing the door. Cut 2 pcs. 2 $\frac{1}{2}$ " x 8" and 2 pcs. 4" x 8". Nail them together to make a 4" x 4" x 8" rectangular tube. Drill a 1 $\frac{1}{2}$ " hole in one of the 3 $\frac{1}{2}$ " panels. Place spacer inside the box to locate the door. (Figure 7)



Figure 5: Position of Roof Support



Figure 6: Attaching Side Panel



Figure 7: Spacer Inserted in Box

6. Attach roof supports, one to each left and right side panel using 4 pcs. # 6 x 1 $\frac{1}{4}$ " deck screws. The slanted edge is toward the bottom of the box with the other end even or flush with the back of the box. (Reference Figure 8)

DO NOT APPLY GLUE FOR THIS INSTALLATION.

1. Place glue on the top edge only of the roof supports. Place roof panel on a flat surface (or in roof fixture, Figure 8) with the unrouted edge upward and to the back. Align the sub-assembly on the roof panel so the back edge is flush or even and centered to the edges of the roof panel. Put 6 pcs. #6 x 1 5/8" deck screws in the holes of the roof supports and tighten starting with the back screw on each side working forward.

2. Drill a 11/16" hole approx. 1" into the door's edge using the pilot hole in the right side panel for the door closing nail.

3. Place #8 duplex nail in 11/16" hole, install screw eye in right side panel near the roof and tie the 10" cord to the nail and screw eye.
NOTE - IF THE BOX IS PAINTED MAKE THIS INSTALLATION AFTER PAINTING.

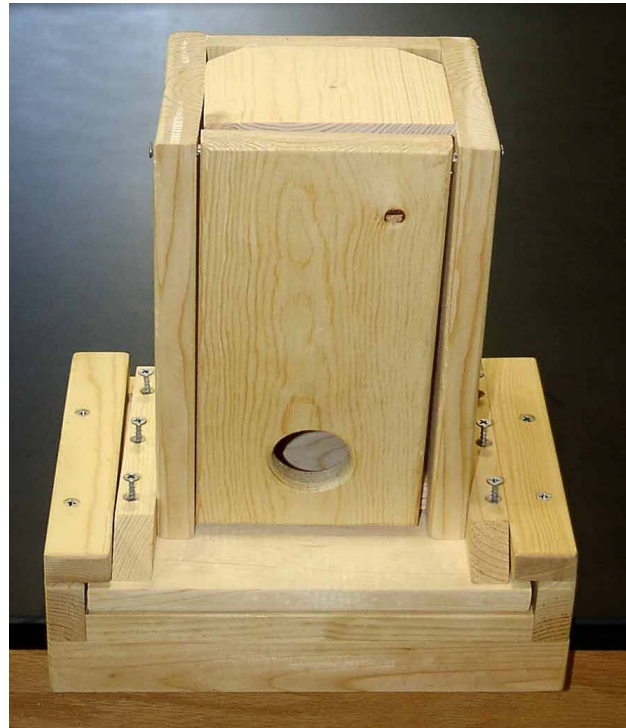


Figure 8: Roof Installation

(D) INSTALLING NEST BOX, PIPE & ANIMAL GUARD

EQUIPMENT REQUIRED - A moderate weight hammer, screw driver and wood block 2" x 4" x 6".

1. Drive the 1/2" x 6 ft. pipe approximately 12" to 15" into the ground using the wood block on the end to avoid damage to the threads.
2. Place the Split Ring Hanger on pipe about 4" from the top end.
3. Assemble the animal guard using the 4" x 24" PVC tube, the PVC cap and a 1/2" hex head sheet metal screw.
4. Place the animal guard on the pipe allowing it to rest on the Split Ring Hanger.
5. Install 1/2" pipe flange on bottom of the nest box using 4 pcs. # 12 x 3/4" FH wood screws. (Center flange on box floor.)
6. Install the nest box on to the 1/2" pipe by turning the flange on the pipe threads.
7. Turn the pipe until the nest box faces the desired direction. The entrance hole should face East or in an Eastward direction.

(E) PAINTING - NEST BOX, WATER PIPE, PIPE FLANGE AND ANIMAL GUARD

- 1. Paint only the outside surfaces of the nest box using earth tone colors as tan, brown, green, etc. (Bluebirds will use an unpainted nest box, however, painting will extend the useful life of the box for many years.)
- 2. If galvanized pipe and flange are used painting is not required. If black pipe and flange are used both should be painted. Painting the same color as the nest box would enhance their appearance.
- 3. Painting of the animal guard the same color as the box is recommended for appearance, however, if desired, it be could used unpainted.
- 3. BFEC suggests a green color paint called "Forrest Green". Specifications and a vendor for this paint are listed below.



Figure 9: Painted Assembly

Formula for "Forrest Green"

This paint for bluebird house and pipe has been used for years by folks who want their houses to blend in with the environment. Mt. Vernon hardware at 310 W. Vine St. can make this blend.

Colorant	OZ.	48ths	96ths
B Brown	1Y	1	1
D Green	1Y	9	1
H Bright Yellow		35	1
Null		0	0

VAPEX HP
Base Color 2
Size - One Quart

Custom Color Not Returnable

(F) MINI- BENCHES FOR BUILDING MULTIPLE BOXES

These fixtures will assist in the building of multiple boxes.

1. MINI- WORKBENCH AND A SPACER

This fixture helps support pieces when assembling the sides to the back and installing the floor, door, and roof supports. (Figure 1)

Lumber for this fixture should be $\frac{3}{4}$ " thick using the actual sizes listed below.

Base – 8" x 12" Back – 2" x 13 $\frac{1}{2}$ "
 Sides – 2" x 8" Bottom cleat - 1" x 13"
 Spacer - 1 $\frac{5}{8}$ " x 11 $\frac{1}{2}$ "

2. MINI- WORKBENCH TO ATTACH ROOF

This fixture helps to properly locate the sub-assembly on the roof panel. (Figure 2)

Lumber for this fixture should be $\frac{3}{4}$ " thick using the actual sizes listed below.

Base – 7 $\frac{1}{4}$ " x 8 $\frac{5}{8}$ " Back - 2 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ "
 Sides - 2" x 7 $\frac{1}{4}$ " Bottom cleat - 1" x 10 $\frac{1}{2}$ "

Top of sides – 2 pcs. 1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " – These fit on top of the sides and overlap the sides creating a channel in which the roof will slide.

When using this fixture place the cleat against the edge of your work bench. Slide the roof under the overhang side pieces to hold it securely in place. Position the sub-assembly on top of the roof panel.



Figure 1: Mini Workbench

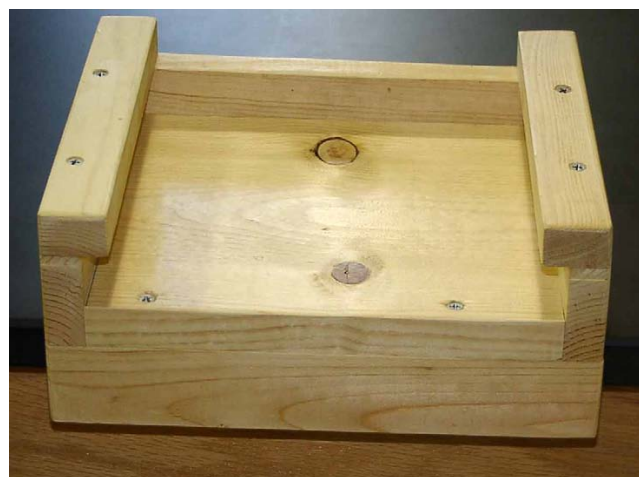


Figure 2: Roof Mini-Bench

END OF INSTRUCTIONS

CREDITS – Nest Box Design – Mel Bolt Mini Benches – Dale Glass

- Computer Presentation – Mel Bolt., Dale Glass, and Dave Heithaus
- Mel Bolt – Former Ohio Bluebird Society Wayne County Coordinator
- Dale Glass – Current Ohio Bluebird Society Knox County Coordinator
- Dave Heithaus – Land and Facilities Manager BFEC

NEST BOX LOCATION AND SETUP

1. Bluebirds require two to three acres per pair of birds. They will defend this area against other intruding bluebirds.
2. Nest boxes should be placed 300 feet apart.
3. Locate the nest box in an open area with low vegetation and perching sites. The perching sites may be trees, shrubs, power lines, etc. These will allow the birds to perch while searching for insects in the low grassy areas. (Bluebirds are primarily insect eaters)
4. The perching sites will provide cover for the young chicks after fledging from the nest box. They can fly about 100 feet in their maiden flight.
5. Install the nest box on a metal pole at the height of your eye level so that it is convenient for monitoring. If the ground is hard and dry, an undersized pilot hole made prior to driving the 1/2" water pipe will facilitate installation of the pipe.



6. Avoid placing the nest box near woodland edges and areas of overgrown vegetation, shrubs, etc. This type of habitat attracts House Wrens. Locate the box 100 to 150 feet away from them.
7. If the area around the nest box has climbing predators, i.e., raccoons, cats, snakes, squirrels, etc. protect the nest box with an animal guard or some other type of effective predator guard.

8. Install the nest box with the entrance hole facing eastward. This will shield the entrance from the westward wind, rain, or snow from going into the nest box. A wet nest or wet chicks could result in hypothermia to the chicks which could cause them to die. The eastward direction will also shield the box from the hot summer sun which could cause newly born chicks to overheat causing death.

MONITORING A BLUEBIRD NEST BOX

1. Monitoring a nest box means opening the door, observing the nest, eggs, chicks, etc. and making any correction which will assist the birds in raising their brood. Monitoring will not cause the parents to abandon the nest box nor will it result in harm to the chicks. (Figure 1)



Figure 1: Monitoring

2. Observe the type of nest in the nest box. Usually you will find Bluebirds, however, other birds such as House Sparrows, Tree Swallows, House Wrens and other small birds will occupy the nest box. (Figure 2)



BLUEBIRD



HOUSE SPARROW



TREE SWALLOW



HOUSE WREN

Figure 2

3. Make note of the day the first egg is laid and the day of the last egg. This will allow you to determine when the 14 day incubation begins. After 14 days of incubation the chicks will hatch and remain in the nest box another 18 to 21 days.
4. Two to three days after the chicks have hatched, remove any unhatched eggs from the nest. A broken egg in the nest will attract ants which will pester the chicks.
5. When the chicks are 12 to 15 days of age, do not monitor the nest box. When opening the door on some types of nest boxes the chicks are startled causing them to prematurely escape the nest box. Even if they are placed back into the box, they will continue to escape. Once on the ground their life is in jeopardy because of predators.

Nest boxes with the door hinged at the bottom are preferred because they allow monitoring up to the date of fledging. After 15 days open the door only enough to peek into the

box to confirm all is well with the chicks.

6. Bluebirds nest two times a year in Ohio. During the second nesting, a blowfly (green fly) lays its eggs in the nest at about the time the chicks are hatched. The larvae from these eggs feed on the blood from the chicks. During the second nesting before the chicks are 12 to 15 days old, lift the nest from the bottom looking to see if the blowfly pupa (a small elongated blackish shell) is on the floor of the nest box. (Figure 3)



Figure 3 Blowfly Larvae

7. When blowfly larvae are found in the nest box, the nest should be changed as outlined below.
- (a) Place the chicks in a container with a cover so they remain warm and calm in the dark area.
 - (b) Remove the old nest, place it in a plastic bag and include any larvae from the floor of the box.
 - (c) Make a new nest of dry grass, place it in the nest box and form a cup shape in the nesting grass.
 - (d) Return the chicks to the box, one at a time.
 - (e) Place your hand over the entrance hole for about two minutes to allow the chicks to settle down.
 - (f) Permanently dispose of the nest in the plastic bag in a manner so that the blowfly pupa cannot mature to adult flies.
8. House Sparrows are a continued threat to Bluebirds and the other small cavity birds. House Sparrows must not be allowed to nest in a Bluebird box. It is legal to limit their use. (Figure 4)



MALE



FEMALE

Figure 4 House Sparrows

8. House Sparrows will usurp the nest from the current occupier by pecking holes in the eggs, killing the young chicks or attacking & killing one or both adult birds.



Figure 5 Pecked Bluebird eggs



Figure 6 Sparrow killed Bluebird

9. Suggested passive ways of deterring House Sparrows from using the nest box follows:
 - a. Daily remove the nest material from the nest box.
 - b. Shake the eggs real hard and allow the female to incubate them until she abandons the nest.
 - c. Using a straight pin or safety pin to prick a small hole in each egg and allow the female to incubate them until she abandons the nest.
 - d. Replace the real eggs with fake eggs.
 - e. Plug the entrance hole for a period of time to allow the House Sparrow to find another location for nesting.
10. House Wrens (Figure 7) are also a threat to Bluebirds. They will usurp the nest by pecking holes in the eggs and tossing them to the ground. They will fill the box with sticks (twigs) and make a grass nest on top. They are protected by law so it is best to let them fledge their young and then remove the box to a more suitable location for Bluebirds.

11. . After the chicks fledge, remove the old nest from the nest box. This will remove any parasites, bird droppings, etc. from the box. Bluebirds will build a new nest for the second nesting.



Figure 7: House Wren

Predator Control Equipment

The Bolt sparrow trap (Figure 1) can be attached to the inside of the front door of a bluebird house (Figure 2) to capture sparrows that are trying to nest, destroy eggs or kill bluebirds. Use only if sparrows are a problem. These traps and more information about them are available from Mel Bolt at the following address:



Figure 1. Bolt Sparrow Trap

Mel Bolt
1515 Crosswind Ct.
Wooster, OH 44691

Phone: 330-262-0448

Email:

mellen@sssnet.com



Figure 2. Position of traps and guards



Figure 3. Modified Noel Predator Guard

The modified Noel predator guard (Figure 3) mounts over the entrance hole on the outside of the door with the mesh facing out (Figure 2). Bluebirds can easily glide through the mesh into the box, but raccoons, cats and other potential predators are deterred. The sharp points on the mesh and the distance they have to reach prevents them from attacking small birds.

To obtain one of these guards contact Mel Bolt at the above address.



Figure 3. Wasp Masher

If bluebirds are not using your nest box because wasps have built their nest under the inside of the roof you can easily make this wasp masher. Use a dowel or old broom handle cut 14" long. Attach a block of wood 2" square and at least 1 1/2" thick. Then mash away!

For ready made mashers contact Mel Bolt at: 330-262-0448 or Dale Glass at: 740-397-5573