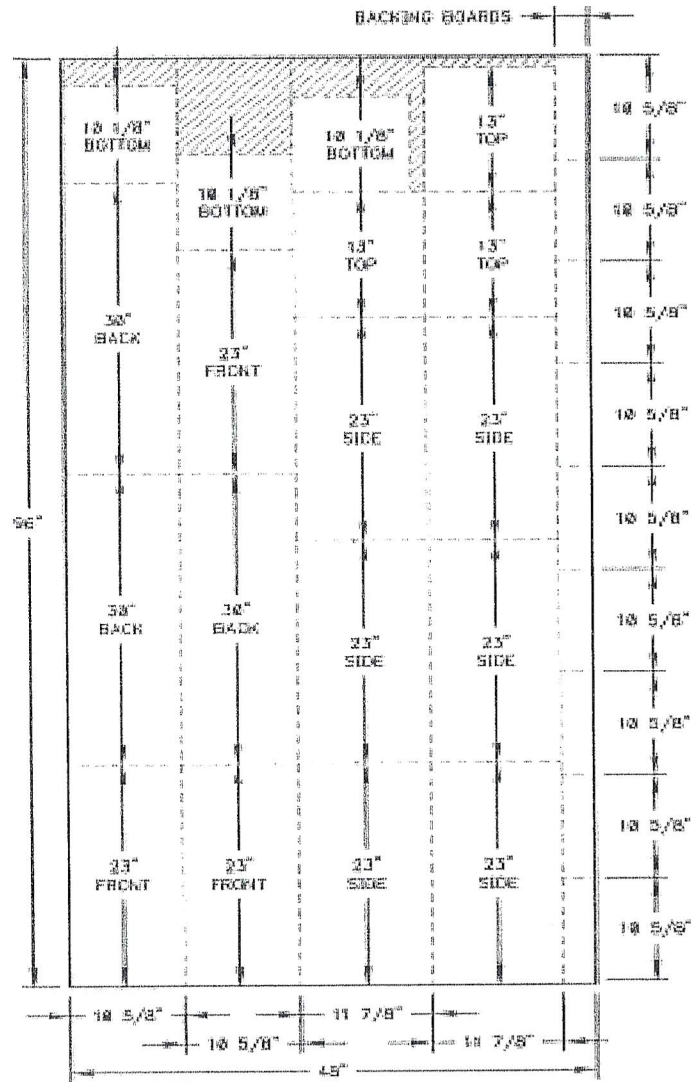


Nest Box Building Plans (continued)

PLYWOOD CUTTING GUIDE FOR 3 WOOD DUCK NEST BOXES

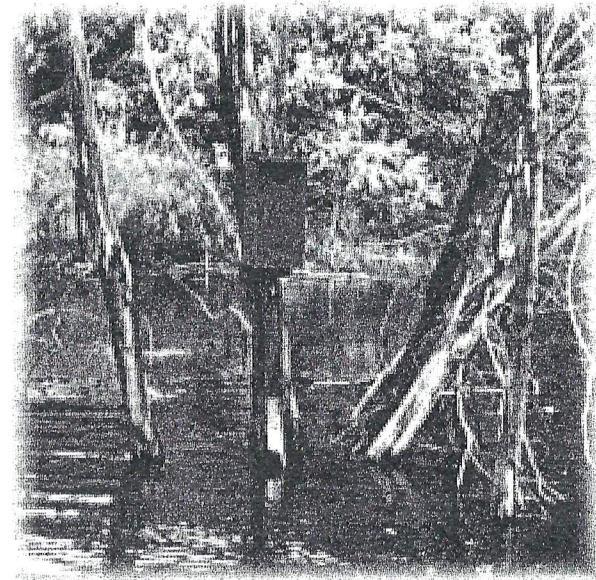


NOTES:

1. USE 5/8" EXTERIOR PLYWOOD
2. HATCHED AREAS INDICATE WASTE

Nest Box Placement

The best locations to place wood duck nest boxes are in wooded areas within 25 to 200 yards from small streams, ponds, coves, sloughs, and old river channels. Small bodies of water are preferred over large lakes and rivers. Wood ducks will nest a half-mile from water. However, the farther the nests are from water, the greater the danger the young ducklings face as they travel to the water. Boxes installed in densely wooded areas away from the shoreline are readily accepted by wood ducks and receive less predation and startling use than boxes in open areas along the shore.



Habitat near the nest boxes should include hiding cover for the ducklings. This cover might be emergent vegetation or branches and limbs of brush and trees hanging over or in the water. Logs, stumps, snags, and driftwood in the water near boxes add to the cover and provide loafing sites.

FIGURE 5: Template for cutting plywood sheet (makes three nest boxes).

Tips For Placing Nest Boxes

1. Boxes facing toward water, so wood ducks can easily see them while swimming or flying, tend to receive higher use than boxes facing away from water.
2. Wood ducks show no apparent preference to the direction boxes face (north, east, south, or west).
3. Place boxes high enough to be above the highest floodwaters.
4. Boxes placed at heights so that the bottoms of the boxes are at least 6 to 12 feet above the ground are readily used by wood ducks and are seldom bothered by humans.
5. Do not place a box where it will be difficult or dangerous for a person to install, check, or maintain the box.
6. Place boxes so that there is a clear line of flight to and from the entrance hole, or clear limbs to allow a clear line of flight.
7. Fasten boxes to trees or posts with 3" to 5" long $\frac{1}{4}$ " or $\frac{3}{8}$ " lag bolts or similar hanger bolts and large fender washers, rather than spikes or nails. These fasteners allow easier removal of the box if needed and can be loosened and adjusted as the tree grows.

Tips For Placing Nest Boxes (continued)

8. Use backing boards between the box and the tree to keep boxes from breaking apart in the future. Backing boards are scrap wood 3-4 inches wide and 8-10 inches long and vary from $\frac{1}{2}$ to 2 inches thick with a hole drilled in it. Place the top and bottom lag bolts through the top and bottom attachment holes in the back of the box, through a backing board (which acts as a cushion), and into the tree.
9. Mount boxes vertical or with a slight forward lean. Boxes with a backward tilt may prevent ducklings from climbing and exiting the box and also tend to collect more rainwater.
10. Boxes should be mounted firmly. Boxes hanging loosely to a tree or post are often rejected and not used by female wood ducks.
11. Before leaving each box, make sure there is 4" of wood shaving type nesting material in the bottom and that the lid is wired on tight.
12. Place boxes so they are at least 30 feet apart from each other or visually isolated from each other. Nest boxes erected too close together invite dump nesting and predation.
13. Make a record of the location of each nest box (by box number) and the support or type of tree it is attached to. It may be helpful to mark the location of the nest boxes on a map.

Predator Guards

Raccoons, and sometimes mink, can be serious predators of wood duck hens when they are incubating eggs. Raccoons will also eat the eggs. Predator guards provide some measure of protection from raccoons and mink.

Site-specific conditions may determine what type of predator guard would be most useful.

1. The 3 inch by 4 inch elliptical nest box entry hole is a good guard against raccoons in Washington State. Early nest box designers found that raccoons one year old and older could not enter holes 3 inches by 4 inches in size, but the hole size is just large enough so that wood ducks can enter it.

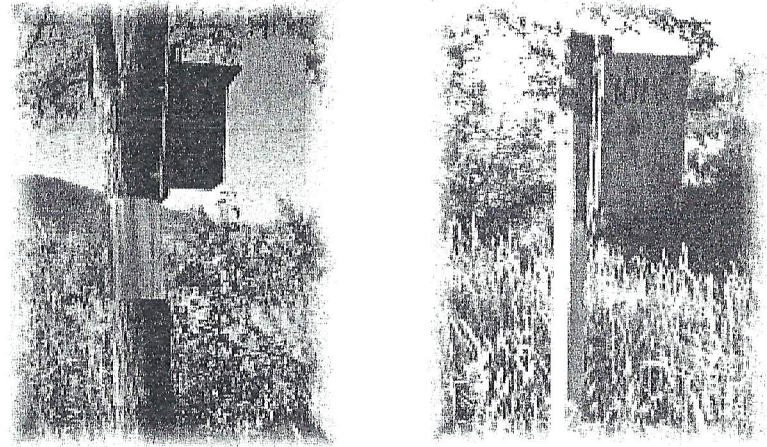
2. Sometimes the original 3" by 4" hole on the box becomes worn, damaged, or enlarged so as to allow raccoons entrance into the box. To fix this, screw a face plate (a piece of wood 7" by 11" and 5/8" or thicker with a cleanly cut 3" by 4" hole) onto the front of the nest box to align with the original entrance hole. This will form a "right sized" hole and slightly longer entrance tunnel that should restrict raccoons.

3. Boxes placed in trees surrounded by or standing in water tend to receive less predation.

4. A 2-3 foot wide piece of thin sheet metal wrapped around the trunk of the nest box tree and fastened with sheet metal screws will keep raccoons and mink from climbing the tree to get at the box. It is important that the predators cannot reach the tree from above the predator guard by branches and limbs from other trees.

Predator Guards (continued)

5. For boxes mounted on posts or pipes, a 3-4 foot long piece of PVC pipe 4-6 inches in diameter hanging below the box and around the post or pipe will keep raccoons from climbing the pipe. The post can also be wrapped with a length of sheet metal.



ABOVE: Metal wrap predator guard fastened around tree (left). PVC pipe predator guard slipped over post (right).

6. Inverted metal cones attached below boxes mounted on pipes or posts have been effective. However, the metal cone does not usually last as long as the nest box, after which the box becomes unprotected.

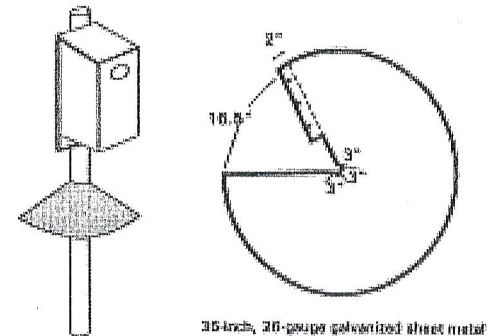


FIGURE 6: Inverted metal cone predator guard.

Nesting Material

Nesting material influences wood duck use of your boxes. Wood ducks do not carry nesting material into nest boxes, so managers must add it annually.

The best types of nesting material for nest boxes are wood shavings or small wood chips. Agricultural or Grange supply stores stock bales or bags of cedar or wood shavings under the name of "litter for livestock". This material is easily obtained and optimum in size. Wood ducks tend not to lay eggs in boxes with wood chips that are too large and coarse or too fine and powdery. Light colored nesting material reduces startling use of nest boxes.

Nesting material should be about 4" deep. If boxes contain more than 4" of wood shavings, the incubating hens sit too high within the box and are within reach of a raccoon from outside the entrance hole. If there is not enough nesting material in the box, the hen cannot cover her eggs as she lays them (one egg per day). Also, if there is not enough nesting material, the eggs do not receive enough insulation and protection during incubation.

Nesting material should be refreshed during the nesting season after a nest has been completed (hatched or destroyed). This sometimes allows a nest box to produce two nests during the same nesting season. Refresh nesting material prior to each new nesting season. Remove old eggs, nests, feathers, grass, and whatever else might have accumulated in the box. Discard this far from the nest box so it does not attract predators. Nest box cleaning is generally done during the annual box maintenance. Fewer nests, eggs, and ducklings are produced in nest boxes that are not checked and maintained regularly (Utsey and Hepp, 1997).

3. MAINTAINING A NEST BOX PROGRAM

A nest box program is like a vehicle: periodic maintenance is needed to keep it running right. Once you've put in the expense and effort to erect nest boxes, you want to keep them in good working order. Maintained nest boxes produce more ducks.

Pre-Season Nest Box Check

Prepare nesting boxes for each new nesting season in late winter or very early spring, before wood ducks start nesting. Some wood ducks start laying eggs by March tenth in western Washington and by April first in eastern Washington.

1. Move nest boxes that have not been used for several years and repair or replace damaged boxes.
2. Clean out or refresh old nesting material and remove debris or bird droppings that have accumulated in the boxes.
3. Prune branches that obstruct the boxes.
4. Add predator guards to boxes where predation may be a problem.

Items suggested for pre-season nest box checks

- Sturdy 8-14 foot ladder
- Leather gloves
- Wood shaving nesting material
- Hammer and assorted nails
- Battery-operated screwdriver and screws
- Socket wrench, sockets, lag bolts, & washers
- Pruning shears for trimming branches
- Extra box lids and extra wire
- Field data notebook
- Camera and film (optional)

Mid-Season Nest Box Checks

After your boxes are ready for the nesting season, you should prepare to check them several times during the nesting season. Your nest boxes will produce more wood ducks (and less starlings) if you check them during the nesting season. The number of times you check boxes will depend on how many boxes you have and how much time you have to check them. Checking boxes at two-week intervals is optimum. But check your boxes at least twice during the nesting season.

Starlings are bad for wood ducks and other cavity nesting wildlife. Starlings are not native to the USA. They compete with many native bird species for nesting cavities and are considered a nuisance. Starlings are not protected by laws in this country, and they and their nests may be destroyed.

Checking nest boxes during the nesting season allows you to remove and destroy starling nests and eggs. This keeps the boxes available for wood duck use and reduces the number of starlings that may be imprinted to your nest boxes in future years. Wood ducks will seldom use a box that a starling has half filled with nesting material. Starlings are very aggressive and will harass wood ducks away from nest boxes the starlings are using.

Checking nest boxes during the nesting season allows you to:

1. Keep the boxes available for wood duck use
2. Remove starling nests
3. Monitor boxes being used by which species
4. Determine the number of eggs laid and hatching success
5. Identify predation problems, and
6. Keep a record of what happens in each box.

End-of-Season Or Final Nest Box Check

This is the last, or sometimes the only, time that the nest boxes may be checked. These checks provide information concerning if the box was used, what species used the box, and the fate of the nest. This check also identifies predation problems and identifies boxes that may need attention before next year. The season ending nest box check alone does not maximize wood duck use of your nest boxes and does not lessen the number of starlings your boxes may produce.

A nest box program should be a continuing effort year after year. Recording and reporting your data should be part of that program. These records should include the location of each box so that others could monitor the boxes when you cannot. Keep a record of the use in each nest box to monitor the success of your nest box program annually. Records also help identify boxes that are regularly successful or unsuccessful. The unsuccessful boxes can be modified or moved.

An example of a record keeping form for nest box programs is included in this booklet. Modify or add to the form to meet your specific needs. Keep a record of the use and success of your nest boxes. Report the results of your nest boxes to the local office of the Washington Department of Fish and Wildlife and or the U.S. Fish and Wildlife Service.

Safety

Check and maintain wood duck boxes with a partner. Working in remote wooded areas along streams climbing ladders or trees can have natural hazards. A partner will help make the project safer and more efficient and fun.

