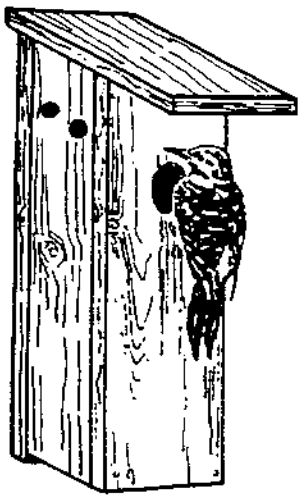
Urban Wildlife Series
Washington Department of Wildlife

NEST BOXES FOR BIRDS

As a tree dies, sections of it decay and become hollow. These cavities are dry and warm, serving as secluded nurseries for many young birds. In Washington, about 43 different kinds of birds nest in holes in dead or dying trees. Of these birds, 15 often occur in city parks and around homes. The more common ones are chickadees, nuthatches, flickers, swallows and wrens.

Putting up nest boxes can help these cavity-nesting birds. Your artificial nest helps make up for natural homes that are lost when too many trees in a bird's habitat are removed. These cavity-nesting birds can, in turn, help you by eating insects that may harm your trees and bushes. Being concerned about wildlife also shows good stewardship for our state's irreplaceable natural resources.

This publication covers nest box building materials; design, construction and placement; pest proofing; tips on attracting birds to your yard, and facts about cavity-nesters.



Materials

You can buy a bird house through special mail order suppliers, the National Audubon Society or local garden and nursery stores. Or you can build one following the guidlines and plans in this publication. Whether you buy it or build it, here are some important things to keep in mind.

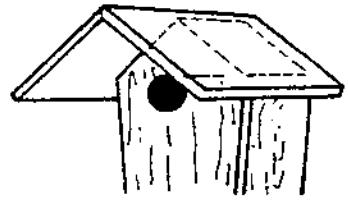
Wood is the best material to use for bird houses. It's a good insulator, it's available and easy to use, and it blends in well with the landscape. Three-quarter-inch thick boards are the easiest to work with. Softwood like pine is fine for smaller nests, but cedar and redwood may be used for larger boxes. If you use plywood, make sure it is exterior grade. A well-constructed house should last 10 to 15 years.

Use galvanized nails to build houses if necessary, but remember that they loosen up as wood expands and contracts in extreme weather conditons. Cedar and redwood nest boxes should probably be made with concrete coated or ring shank nails. These nails won't allow the boards to loosen up. Screws also work fine.

Design

ENTRANCE HOLE: The design and construction of a bird house needs to be bird-specific. The most important part of that bird house is the entrance hole. If the hole is too small, the desired bird won't be able to enter. If it's too big (and this is more likely) undesirable wildlife -- like house sparrows, starlings, squirrels or cats – can get in and harm or evict the intended bird.

As a rule, house sparrows can't enter a nest box if the entrance hole is less than 1.25 inches in diameter. Starlings can't enter if the hole is less than 1.75 inches in diameter. The entrance hole sizes in this publication are designed to exclude these pests wherever possible.



ROOF: Roofs need to be built with enough of a slant to shed water. The top front edge of the roof should overhang at least 3 inches to protect the entrance from driving rain or snow, and to keep cats from reaching in from above.

Provide a hinged side or roof so houses can be easily checked and cleaned out each year. (Annual cleaning reduces the possibility of spreading parasites and diseases from year to year.) Hinges should be rust-proof. Duck and owl box roofs kept shut with a hook and eye can be opened by raccoons. It's much better to use paired roofing nails with large heads or duplex nails on the side of the roof and the upper edge of a side. Wiring these nails together will keep the bird house shut and raccoon-proof.

DO NOT use wood treated with green preservative. The green copper-based preservative, when exposed to water, can produce poisonous vapors.

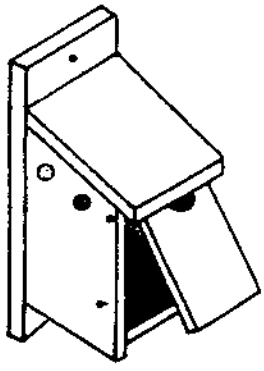
DO NOT paint, stain or treat a nest box with creosote.

DO NOT use tin cans, milk cartons or metal for nests. Metals quickly heat up to lethal temperatures on warm spring and summer days, overheating the eggs and killing the birds. Commercial plastic wood duck houses are also acceptable but they should be placed in shady locations.

SIDES AND SEAMS: Natural tree cavities have rough interior surfaces that give young birds traction, especially when climbing out of the nest. A bird house can mimic this rough surface below the entrance hole with grooves, cleats, hardware cloth or a similar surface that can be gripped by the bird's feet.

Don't nail the sides to the top of the floorboard. The sides of a bird house should enclose the floorboard. This keeps rain from seeping into the crack between sides and floor and then into the nest. Placing the floorboard 1.25 inches above the bottom of the sides also keeps moisture from seeping in from below.

All seams that won't open should be water tight. Exterior glue or caulking materials work well for this.



VENTILATION HOLES: At least two 1/4-inch holes should be drilled near the top of the right and left sides of all bird boxes to let air circulate. This is especially important for small nest boxes. Drainage holes are also important. Drill at least four 1/4-inch drain holes in the floor of the house. This will help drain moisture that manages to get inside.

Placement

WHEN: Some birds begin courtship and nesting activities as early as February, but most birds select nest sites from late March through May. This is also the time when most migrating birds return to Washington. Nest boxes can be set out as you notice new birds arriving.

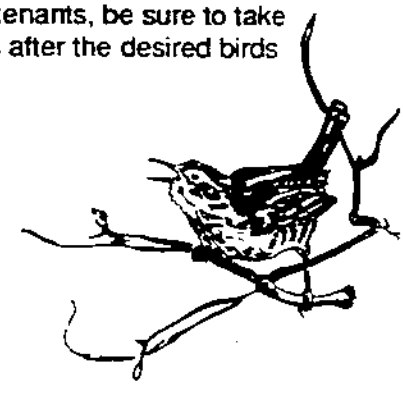
However, newly made bird houses need to be set in out in winter to weather and air out. To prevent house sparrows and European starlings from setting up house in them before other species of birds arrive, put netting or wire over the entrance hole.

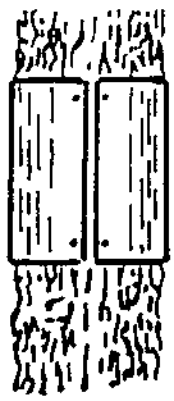
WHERE: The nest box should be somewhat concealed, in partial shade and placed where predators can't get to it. Check to be sure the birds have an adequate, clear flight path near the entrance hole. If possible, the entrance should face away from the prevailing wind. It usually helps to put the box on a habitat edge: between a group of trees and low-growing bushes, or between bushes and a open meadow, lawn or water.

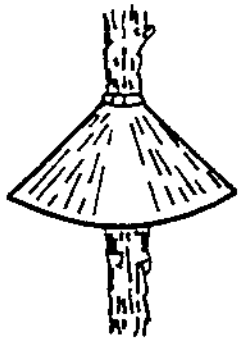
All nest boxes should be firmly attached to a support post or a tree. When attaching a nest box to a live tree, use lag screws and washers. These screws can be gradually loosened as years pass, allowing the tree to grow without any deformities.

HOW MANY: A good rule of thumb is to allow 1/4-acre between most bird houses. Because most birds are territorial, the average-sized yard will probably only hold one nesting pair of a particular species. Territory size varies among birds—house sparrows and tree swallows require only several feet of space, robins need less than half an acre, while chickadees and nuthatches usually need several acres. Other birds, like purple martins and wood ducks, don't defend territories. That's why martin houses are the "apartment" type.

Territories change from year to year, so a well-designed and well-placed nest box will eventually be used if birds you're trying to attract are found in your neighborhood. If a nest box isn't used for some time, birds nesting nearby may be defending the area from other birds of the same species. It may help to set out several nest boxes (for a certain species) in different places so birds can pick the best site. If you don't want house sparrows or European starlings to be your next tenants, be sure to take down unused houses after the desired birds have settled in.







Pest Proofing

Natural enemies pose the greatest threat to birds using man-made nest boxes. Metal poles used for mounts or a sheet metal guard encirling trees or wooden poles helps protect birds from cats and squirrels. Suspending nest boxes from wires beyond the jumping range of these predators is also effective.

Perches aren't really needed. If left on a nest box, perches will attract house sparrows and starlings. The exception might be wood ducks. For them a slab of wood with the bark attached placed horizontally under the entrance hole can make landings easier.

House sparrows and European starlings usually won't nest within ten feet of the ground. Placing nest boxes four to five feet off the ground and in brushy areas will discourage these pests.

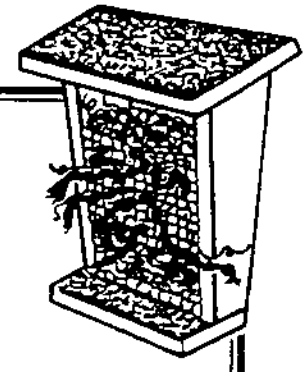
If you want to get rid of house sparrows or European starlings that are nesting in a bird house, it is legal to remove their nests and destroy the eggs. (Unlike most birds, these species are not protected by any state or federal law.) Nests may have to be removed five or six times before sparrows or starlings finally abandon the house.

Small animals, like mice, squirrels, bees and wasps, may also decide to move into a nest box. If you don't want them there, remove the nest to discourage them.

When the nesting season is over, open an unseamed panel on the nest box and leave it that way throughout the winter. This prevents deer mice from using it as a winter home. Otherwise these mice may "defend" their box from returning songbirds in the spring by killing and eating them if the birds enter "their" box.

If raccoons are stealing eggs from a nest box, place one or two boards with the proper entrance hole drilled in them over the original hole. This makes a short tunnel into the nest. The raccoon's arm may still get into the box, but it won't be able to bend it down to reach the eggs or chicks.

TIPS ON ATTRACTING BIRDS



- Plant native trees and shrubs for food and shelter
- Avoid using insecticide sprays whenever possible
- Leave grass and bush cuttings for nesting material
- Provide clean water in shallow, gently sloping containers
- Plant colorful wildflowers that will attract insects for birds to eat
- Leave 1-inch to 4-inch lengths of string or yarn for nesting material
- Set out chopped apples, raisins, prunes or oranges to entice fruit-eating birds

Facts about Cavity-nesting Birds

WOOD DUCK: Inhabits woodland streams and ponds during summer; not common in urban areas. Nest is a bare cavity, lined with down. Lays 8-10 white or creamy eggs.

AMERICAN KESTREL: Inhabits open areas with scattered trees; not common in urban areas. Nest is a shallow scrape in a cavity. Lays 4-5 mostly-white eggs. Eats rodents and insects.

BARN OWL: Uses a variety of habitats. Nest is a shallow hollow in a cavity. Lays 4-7 white eggs. Eats rodents.

SCREECH OWL: Widely distributed in forests, parks, orchards and woodlots. Nest is an unlined tree cavity. Lays 4-5 white eggs. Eats rodents.

NORTHERN FLICKER: Lives in open or sparsely wooded areas. Nest cavity is usually excavated in live wood. Lays 6-8 glossy white eggs. Eats insects, especially ants.

HAIRY WOODPECKER: Inhabits mature woodlands, especially deciduous forests; uncommon in urban areas. Nest cavity is usually excavated in live wood. Usually lays 4 glossy white eggs. Eats insects.

DOWNY WOODPECKER: Inhabits open woodlands and natural parks; more comon than hairy woodpecker in urban areas. Nest cavity is usually in dead wood. Lays 4-5 glossy-white eggs. Eats insects.

VIOLET-GREEN SWALLOW: Common in urban areas during summer. Nest is a cup of dry grasses lined with feathers and fine materials placed in a crevice in buildings, old woodpecker holes or bird houses. Lays 4-5 white eggs. Eats flying insects.

TREE SWALLOW: Widely distributed in summer, usually near water. Less common than violet-green swallow in urban areas. Nest is a cup of grasses lined with feathers in a natural cavity, old woodpecker hole, or a crevice in a building. Lays 4-6 white eggs. Eats flying insects.

PURPLE MARTIN: Widely distributed in summer, in past near human settlements, but now rare in the state due to habitat losses and competition from house sparrows and starlings for nest sites. Nest is placed in crevices in rocks, trees or buildings, or in old woodpecker holes. Lays 4-5 white eggs. Eats flying insects.

CHESTNUT-BACKED CHICKADEE: Inhabits coniferous forests. Nest is made of moss, with a cup of fur, feathers and fibers. Lays 6-7 white eggs, sometimes speckled. Eats insects in summer, seeds in winter.

BLACK-CAPPED CHICKADEE: Inhabits open areas with scattered trees; common in urban areas. Nest and diet similar to chestnut-backed chickadee. Lays 6-8 white or creamy eggs.

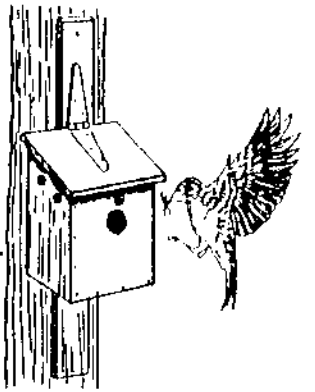
RED-BREASTED NUTHATCH: Found in mixed forests; not common in urban areas. Nest is a cavity in dead wood, with a cup of grasses, rootlets and fur. Tree resin is smeared around the entrance hole. Lays 5-6 white or creamy eggs, usually speckled. Eats insects and seeds.

HOUSE WREN: Widely distributed in areas with shrubby cover; uncommon summer resident in urban areas. Nests in any cavity, including the pockets of pants hanging on a clothesline. Lays 6-8 white, finely speckled eggs. Eats insects.

BEWICK'S WREN: Inhabits open woodlands and thickets. Nest is a bulky cup in any cavity. Lays 5-7 white eggs, often speckled. Eats insects.

WESTERN BLUEBIRD: Inhabits woodland clearings and open areas; rare in urban areas. Nest is a slight cup in a cavity, made of dry grasses and a few feathers. Lays 4-6 blue eggs. Suffers from loss of habitat and competition for nest sites from starlings.

Nest Box Specifics

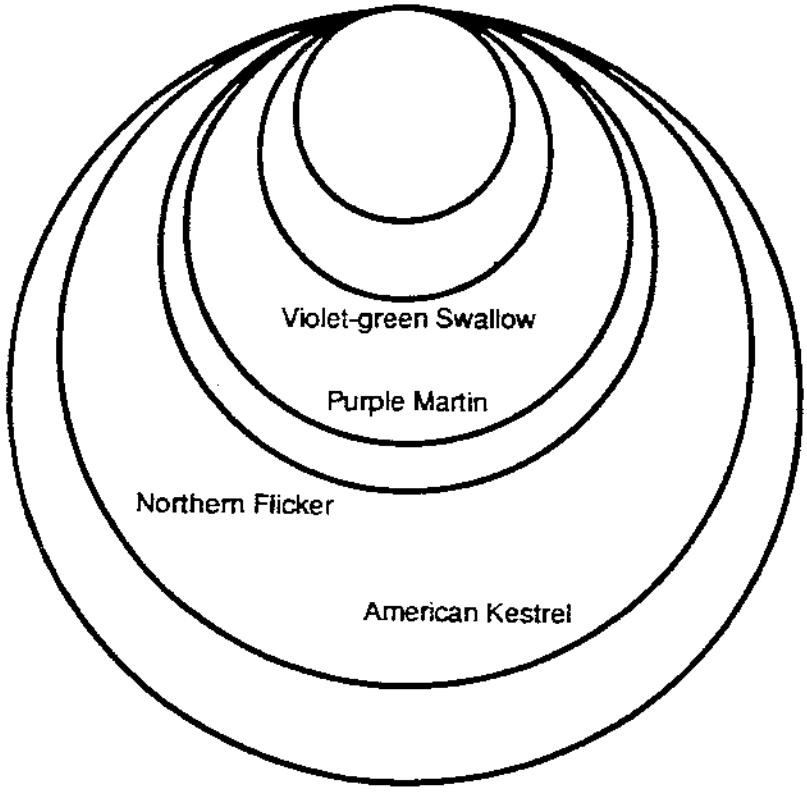


SPECIES	Floor of Cavity (Inches)	Depth of Cavity (Inches)	Entrance above Floor (Inches)	Size of Entrance (Inches)	Height above Ground (feet)	SUGGESTIONS FOR PLACEMENT
American Kestrel	8 x 8	12-15	9-12	3	10-30	In open areas near fields or watery areas.
Barn Owl	10 x 18	15-18	0-4	6	12-18	Near buildings, barns or open fields.
Barn Swallow	6 x 6	6	*	*	8-12	Put 2-3 shelves together under building eaves near water.
Bats	3.5x7.25	12	In floor	1 x 7.25	12-15	Place easterly for morning light only, tar paper sides
Chickadees	4 x 4	9	7	1.125	4-15	In wooded areas or old orchards, prefer rustic houses.
Downy Woodpecker	4 x 4	9	7	1.25	5-15	Open wooded areas on dead trees, pack with wood shavings.
Flicker	7 x 7	16-18	14-16	2.5	6-30	Open wooded areas on dead trees, pack with wood shavings.
Hairy Woodpecker	6 x 6	12-15	9-12	1.625	12-20	Open wooded areas on dead trees, pack with wood shavings.
Nuthatches	4 x 4	9	7	1.125	5-15	In wooded areas or old orchards, prefer rustic houses.
Purple Martin	6 x 6	6	1	2.25	10-20	Use a colony of houses together with pond or stream nearby.
Robin	6 x 8	8	*	*	6-15	In shaded parts of trees or under eaves of house or shed.
Screech Owl	8 x 8	15-18	9-12	3	10-30	Open wooded areas on dead trees.
Tree Swallow	5 x 5	6-8	4-6	1.5	4-15	Place 2-3 boxes together on a post or dead tree near water.
Violet-Green Swallow	5 x 5	6	4-6	1.5	10-15	Place under eave of house.
Western Bluebird	5 x 5	8	6	1.5	5-10	In open sunlit areas on fence posts or trees.
Wood Duck	12 x 12	22	17	3.5-4	10-20	Place facing water, add four inches of wood shavings.
Wrens	4 x 4	6-8	6	1-1.25	4-10	In any partly sunny spot, may be hung from a tree limb.

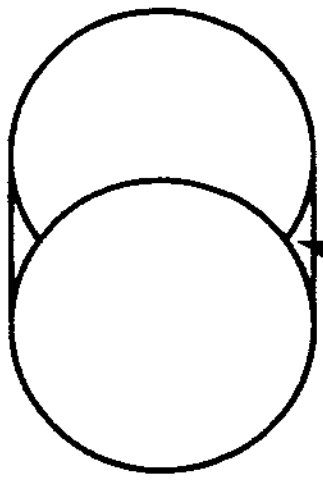
* *Two or more sides open*

Entrance Hole Cut-outs

TRACE ON TO WOOD WITH CARBON PAPER



Screech Owl and Saw-whet Owl



Western Bluebird and Tree Swallow

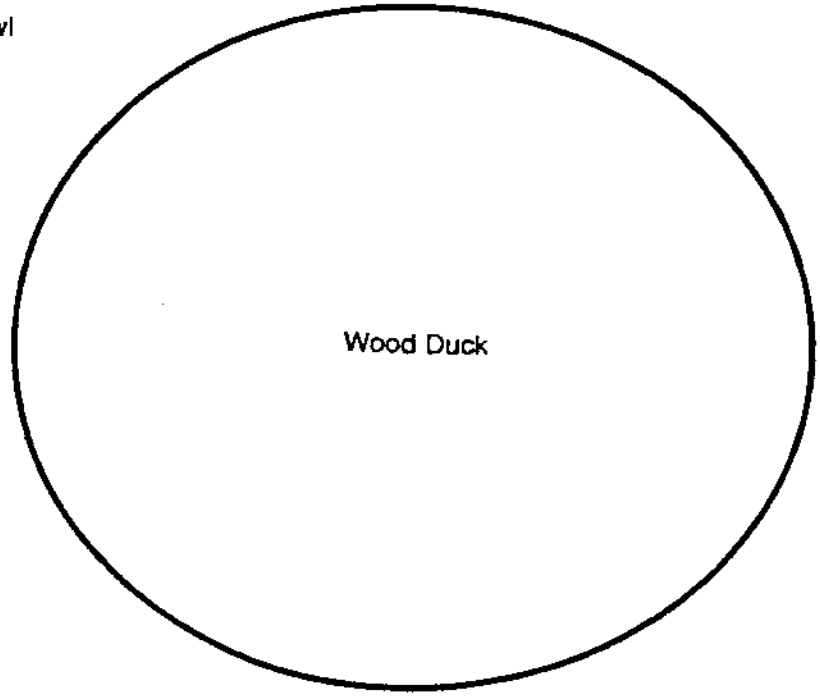


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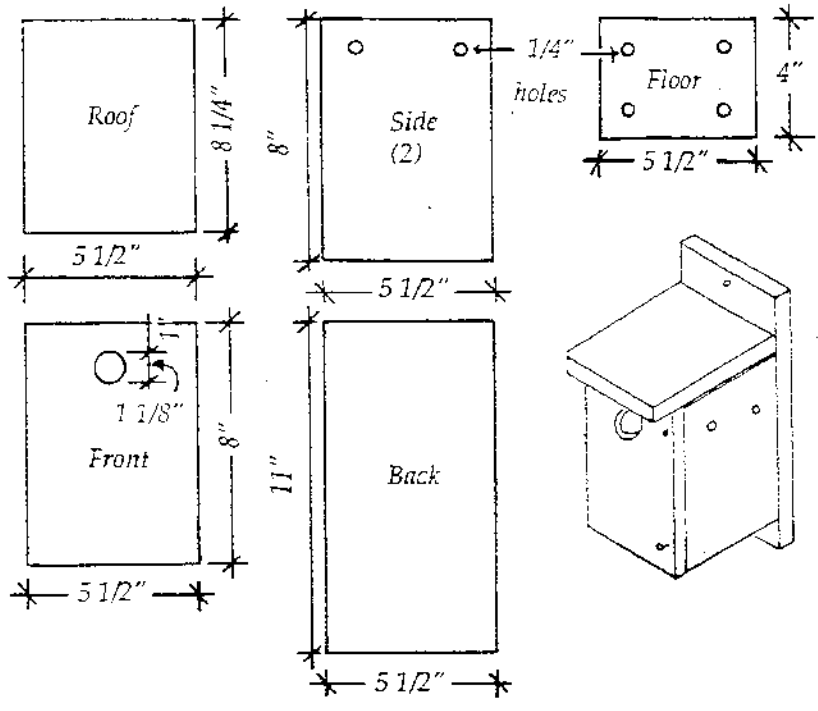
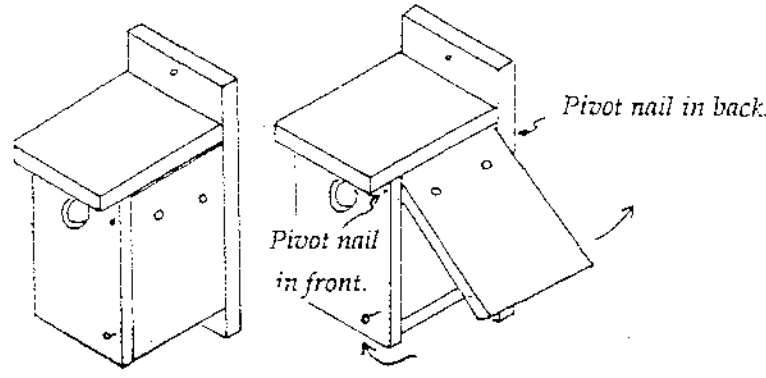
Figure 1

House Wren, Black-capped Chickadee*, White-breasted Nuthatch, Prothonotary Warbler, Deer Mouse, Flying Squirrel and White-footed Mouse Nest Box*





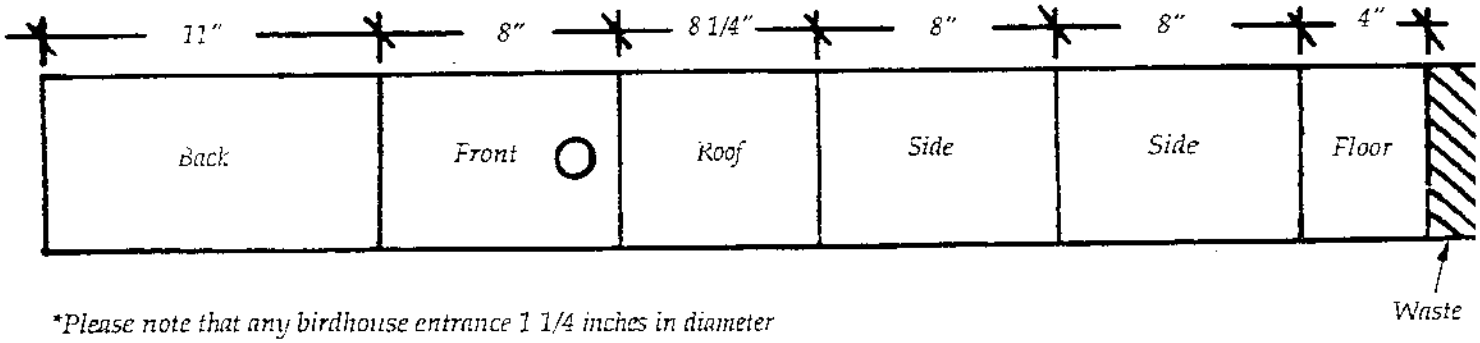
Note: Entrance hole diameter is 1 1/8".

(An entrance hole diameter of 1 1/4" is needed for the white-breasted nuthatch and flying squirrel.)

Use one nail or screw at bottom to close side. Nail or screw holds side closed.

Two "pivot" nails allow side to swing out for cleaning.

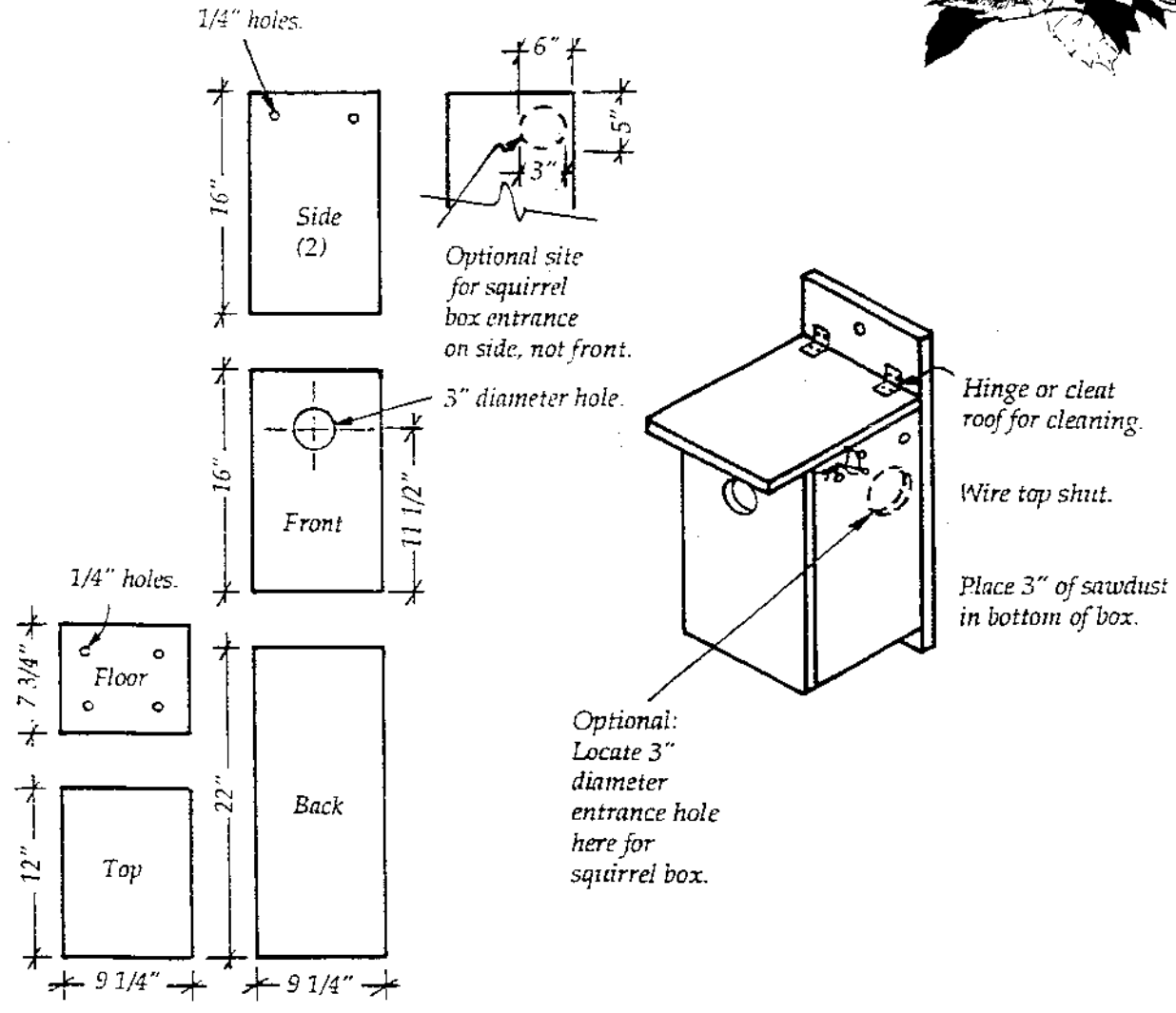
Lumber: One 1" x 6" x 4'0".



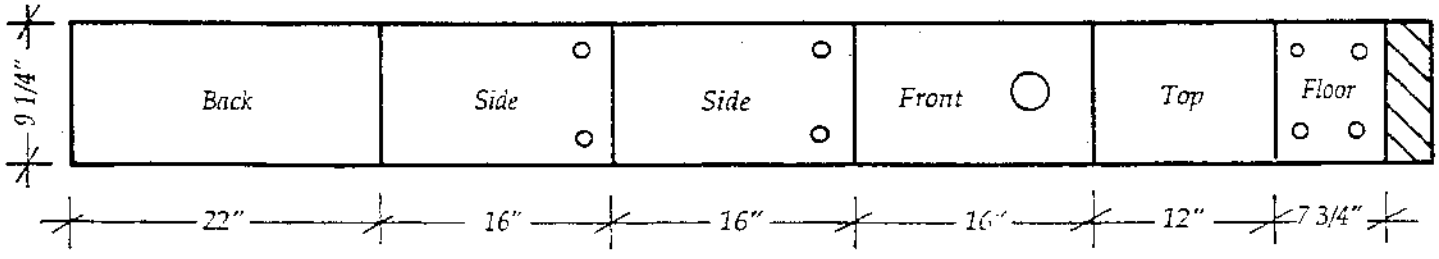
**Please note that any birdhouse entrance 1 1/4 inches in diameter or larger will admit house sparrows! All wren and chickadee nest boxes should have an entrance hole of 1 1/8 inches in diameter.*

Figure 3

American Kestrel, Northern Screech-owl, Northern Saw-whet Owl, Boreal Owl, Gray Squirrel, Red Squirrel, and Fox Squirrel Nest Box



Lumber: One 1" x 10" x 8' 0"



BAT HOUSES

Building a Successful Bat House (see accompanying drawings)

Most bats prefer houses that are open on the bottom with internal *vertical* slots. Each slot should be at least 24-26 inches high and the total width of the house should be no less than 11 ½ inches. Internal roosting slots must be made of roughened boards spaced ¾ to one inch apart (larger bats will use the larger openings and smaller bats the small openings). The lumber must not be treated with any wood preservatives or paint. All internal facings should be roughened so bats can grip the surfaces with their claws for climbing and roosting. The ability to move up or down within the house is necessary so the bats can adjust to daily and seasonal fluctuations in temperatures inside the house. Also, placing an "attic" in the bat house will provide more opportunities for temperature regulation and control.

***NOTE**: Sometimes wasps or other insects will move in instead of bats. You can remove them by spraying with a blast from a high-pressure hose. **Never use pesticides**, which can harm any bats that may move in later. If the problem becomes uncontrollable, moving the house is the best option.*

Where to Place the House

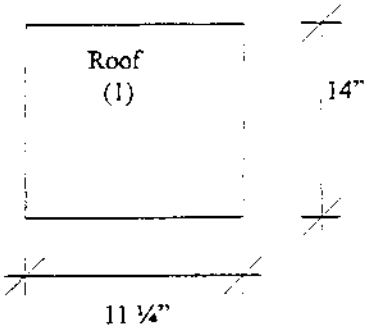
The best place to put a bat house is where it will receive the maximum amount of morning sun. Most bats can tolerate temperatures up to 129 degrees F, so bat houses should be mounted on the east or south facing exposures of buildings and trees, where it is hottest during the summer. Heights of 10-15 feet or higher are best (the higher the better). Make sure the houses are placed in areas away from the prevailing winds and are not obstructed by vegetation. Bats need open space for flying in and out of their houses. Bats eat ALOT of insects, so houses are most successful when placed near bodies of water, usually within 1 mile. You can also put more than one house on the same structure, which allows bats to move from one house to another depending on the season and their need for temperature regulation.

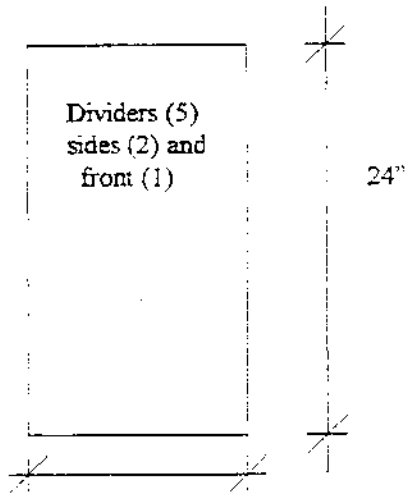
***NOTE**: Be aware that since the bat house is open on the bottom it is self-cleaning. Even though bat guano is an excellent fertilizer for gardens, you may not want it all over your deck.*

When to Put the House Up

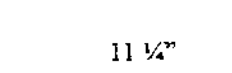
Bats are usually in hibernation from November through mid-April, and will most likely be using mines, cliffs and caves, and it is unlikely they will utilize bat houses during this period. Consequently, this is the best time to put up your bat house. The point is to make available potential summer roosting sites as soon as the bats come out of hibernation.

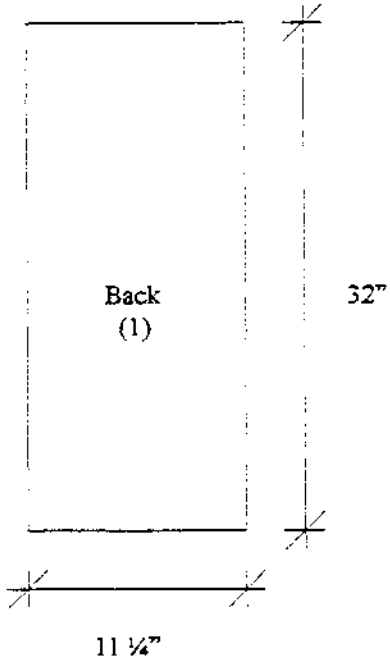
It is unclear as to how soon your new bat houses will be used. Some have reported bats moving in within a few days of installation. Other times it may take an entire season before any activity is observed. Be patient. However, if the house never seems to get any use, try moving it to

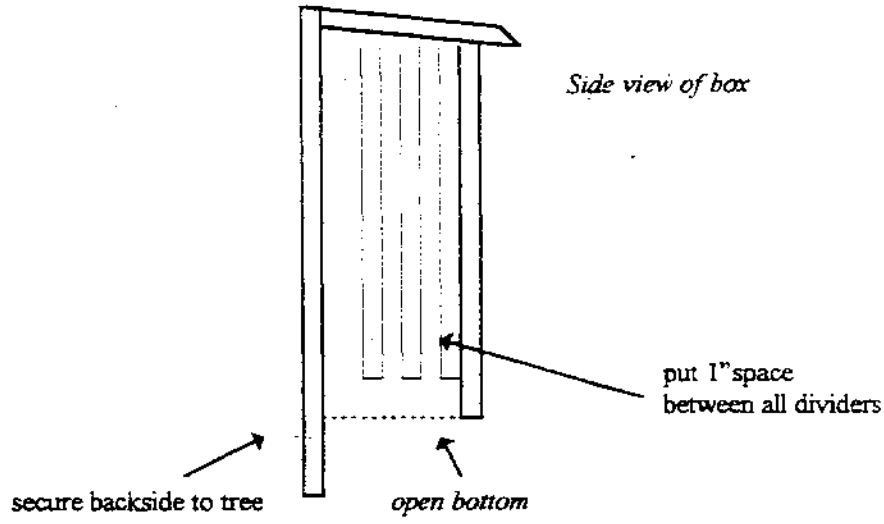




Lumber: Two 1" x 12" x 10' rough sawn or with all interior surfaces roughened.







Note: Caulk all external seams and joints so tight fitting.