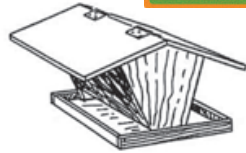


BIRD FEEDERS



COMBINATION FEEDERS

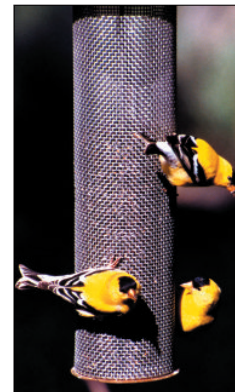


AMERICAN MARTEN (*Martes americana*). Boxes for this secretive member of the weasel family have been placed in mixed conifer forests in the Mt. Hood National Forest by USFS biologists. For information contact www.fs.fed.us/r6/mthood.



East Cascades Audubon Society Guide

to
Nesting Boxes
Bird Feeders
Bat Roost
Butterfly Shelter



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All photos by the author unless otherwise noted.
Bird feeder drawings courtesy of Oregon Department of Fish & Wildlife

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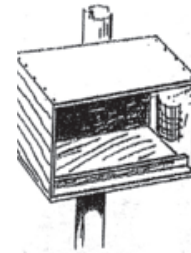
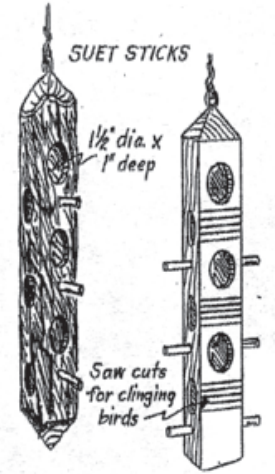
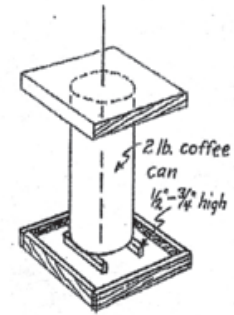
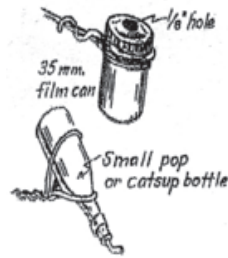
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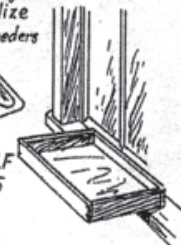
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BIRD FEEDERS

HUMMING BIRD FEEDERS



TV dinner trays compartmentalize feeders



Feeders can often become crowded in winter... Don't allow deer to get hooked on your bird feeder. Cracked corn has been reported to make them very sick! And **PLEASE DO NOT FEED THEM** — anything!

Food is important for birds, but don't forget to have plenty of fresh water for your birds, especially in winter.



Seeds - In the depths of winter, many insect-eating birds become seed-eaters through necessity. Seeds, mixed with suet or peanut butter, will supply most of the nutrients birds require in winter. Choose from the following list of foods: • Sunflower (black) • Millet • Wheat • Popcorn • Rice • Oatmeal • Hempseed • Buckwheat • Cracked Corn • Chopped nuts • Bread crumbs • Dried fruit • Raisins • Birdseed mix • Peanuts • Dog biscuits • Rabbit food • Thistle seeds for goldfinches (see cover photo).

WATER



Clean, fresh water is more important than food in winter! Robins especially require large amounts of water when they are feeding on juniper berries. A small, economical bird-bath heater is available in most feed stores. Birds — like you and me — get very thirsty in cold weather. A (slowly) dripping water supply is ideal.

HUMMINGBIRD NECTAR

A solution of 1 part sugar to 4 parts water **WITHOUT FOOD COLORING** will work well for all hummingbirds. **DO NOT USE HONEY**; hummingbirds can not digest honey. **DO NOT ATTEMPT TO KEEP HUMMERS AT YOUR FEEDER AREA IN FALL.** It is best to supply hummers a quick burst of energy for their travels south, but not encourage them to become dependent on you for food all winter. Hummers consume all kinds of insects and spiders as a part of their normal diet and can not make it through the winter on sugar water unless they receive a food supplement.

PLACEMENT OF FEEDERS

Place feeders out of the wind, in a warm spot in winter, and a cool place in summer. Birds do not enjoy wind under their feathers. Squirrels can often be serious competitors for bird food. If you can supply a feeding area for squirrels, and discourage them from entering bird feeders, you will have made the best move possible. Make every attempt to provide escape routes for birds, especially from feral cats. If you have a stray cat hanging around your feeders, borrow (or rent) a live-trap from your local bird supplies store or Department of Fish & Wildlife and capture the animal, then take it to the Humane Society. Don't worry about natural predators, such as bird hawks (Accipiters) picking birds off your feeders, they have to eat too... Besides, the pressure on the birds weeds out the sick and injured individuals.

WHY NESTING BOXES?

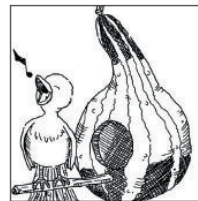


The image of the Barn Owl on the cover of this guide, swooping out of a Wood Duck nesting box on Sauvies Island Wildlife Management Area says it all: nesting boxes are replacements for nesting cavities in trees. Over the last 100 years, trees suitable for cavity-nesters have disappeared at an alarming rate. They have been removed from forests and farms for a plethora of reasons: clearing the land for agriculture, fire prevention, firewood for homes, mistaken ideas of “Forest Health,” forest products, fence posts, landscape architecture, and many, many other reasons. The result is that cavity-nesters throughout the US have lost their nesting substrate.

One of the most famous recoveries of a song bird species through the use of nesting boxes is the Eastern Bluebird. In the mid-30's they were on the brink of extinction, about to follow the Passenger Pigeon—not because they were sold by the millions to restaurants as a delicacy—but because the once abundant dead and dying trees woodpeckers and other cavity-nesters used were taken to the sawmill or otherwise removed from most of the forests in the mid-west and eastern parts of the US. In addition, the steel fence post replaced the old wooden fence posts woodpeckers used as a last resort, and bluebirds used for nesting later on.



Bluebirds are secondary cavity-nesters, as their beaks are not strong enough to excavate trees. Therefore, they rely on naturally occurring cavities, or those made by woodpeckers, or on nesting boxes. The availability of nesting sites in the early days was closely tied to land use.



Today, nesting boxes are primarily used for conservation endeavors or recreational bird watching. In colonial times — even before the American Revolution — people put up bird houses, often made of clay (fired or bisque) or gourds. In the days before pesticides, farmers put up nesting boxes around their fields to control pests. In fact, more than 75% of a bluebird's diet (prey) consists of a wide variety of insects, especially when raising young, while the fruit they eat during the winter is not suitable for human consumption..

Woodpeckers are usually the species that chip out tree cavities to roost in and raise young each season. Other cavity nesters, such as nuthatches, wrens, titmice, flycatchers, bluebirds, swallows, small owls, and ducks and other species—such as bats, chipmunks and other small mammals—use tree cavities



Some bird species that nest in tree cavities will use wood birdhouses IF the box size, design, and entrance holes conform to their specific needs, and IF the bird houses are properly mounted at appropriate heights in suitable habitats and regions.

In North America, about 55 bird species will nest in bird houses and at least 15 will nest on platforms.

Many bird species we might expect to find only in forests or open country are found in cities, The Red-tail Hawk—Pale Male of New York City fame—being an example. Since birds have that unique ability to fly, they appear suddenly in areas where they were previously absent. The correct bird house design in the right area can attract a bird pair to nest; also many birds that do not migrate south in cold weather look for boxes to roost in at night.

Wooden birdhouses with ventilation, water drainage, a means to mount securely, and access to the interior for cleaning is vital for success. Investigate species intrinsic to your area and nesting box dimensions intended for those specific species. It is a general rule of thumb to NOT paint or stain birdhouses because of the danger of chemical pollutants harming the occupants

When mounting a wooden bird house, in addition to placement for a specific species, consider accessibility for convenience and safety when monitoring and cleaning. Be sure houses are securely mounted. Don't crowd an area with nesting boxes (because of territorial factors it is best to put up a bluebird box where it CAN NOT be seen by another box). Wrens may build nests in several boxes before selecting one, but too many boxes may deter other birds. Mounting the nesting box in fall or winter will give the box a chance to weather before spring, and be available when the birds return.

Place 1 or 2 inches of dry PINE CHIPS in the box. (Available in garden stores.) Sawdust will not ventilate, or dehydrate as well as chips and chips are easier for birds to rearrange or pack in and out. Fill a box intended for flicker clear to the top; they will excavate the chips. Do not place bird houses near bird feeders, and place them facing NORTH, out of prolonged direct sunlight.

Monitoring bird houses is important, but be careful not to disturb the birds during nest building, incubation, or brood-rearing. If you observe the boxes regularly and everything seems OK, and if birds are gathering nest materials, or feeding their young and you can hear the hungry young birds calling for more food, there is really no reason to open nesting boxes.

Make sure there isn't something in them other than intended guests, such as house (English) sparrows or starlings. Nesting boxes also attract squirrels, chipmunks, weasels, mice, snakes, and harmful insects. House Sparrows move into



FEEDING WILD BIRDS

There are three vital components that birds require in all seasons: food, water, and shelter. In winter, water is as important as food and shelter.



Correct feeding requires varying the diet with the seasons. Summer feeding is usually unnecessary, but will bring more birds to the feeding area for people to enjoy. Winter is the important time for feeding. A danger to the species is that at times birds may concentrate around the feeders

in larger numbers than the area can support. It is vital to keep in mind that when you feed birds — in summer or winter — they become your responsibility. In winter, feeding must continue until the time when natural foods are again available. If you have towhees coming to your feeder like this handsome spotted species, all the work is worthwhile!

BIRD DIETS

Feeding birds is largely an art which must be learned through experience and observations. Your local library, Department of Fish and Wildlife office, and feed stores can supply additional information. On the basis of diet, birds may be roughly separated into seed-eaters and insect-eaters. However, most birds fit into both categories at some part of their lives. The use of several different feeders, or combinations, should satisfy the requirements of all.

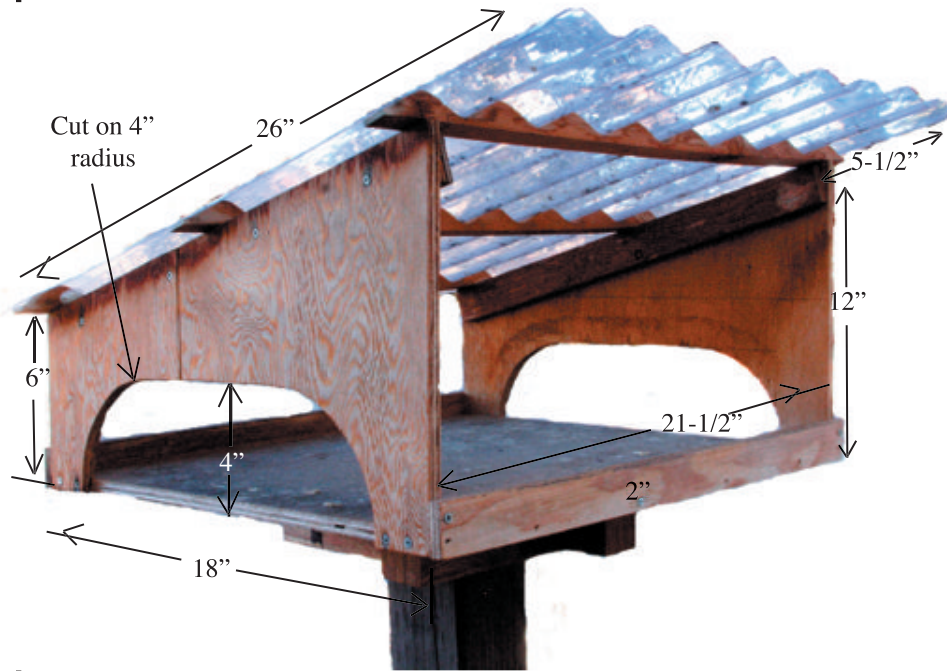
BIRD FOODS

Suet - Insect-eaters, such as nuthatches and woodpeckers, will consume large amounts of suet when adult and immature insects are not available. (Note: Avoid 'stringy' suet as it's hard for birds to eat. The best way to offer suet to birds is to melt it down in a double-boiler, pour into molds, and allow to cool. The molds can then be set on a board, hung from trees, or placed on the top of posts. Suet/seed cakes can be made by pouring the melted suet over a varied seed mix and stirring into molds and allowed to cool.)

Peanut Butter - Sometimes it's possible to find peanut butter that is substandard and less costly to purchase. Blend a varied seed mix into the peanut butter and make into cakes. Stuffing the blend into large pine cones or egg cartons and hanging them from tree limbs or feeder supports works quite well. If tree squirrels discover it they'll think they've died and gone to heaven.

Grit - Sand, very fine gravel, or crushed charcoal may be added in very small amounts to the suet/seed cakes or feeder to aid in digestion.

Natural Selection Bird Feeder "Brightlight"



Materials: Make from exterior plywood, NOT CHIPBOARD. Make bottom from 5/8" sheet, balance from 1/2" plywood. Use screws when possible. Wiggle Board works good for roof support. 5-1/2" roof overhang works good to keep out most moisture. All measurements are typical; make to suit your needs, but maintain scale for bird safety and health.

CLEANING FEEDERS

It is vital that you clean all bird-feeding equipment at least twice a year. Various bird-diseases could get started if you allow the feeders to build up with bird-droppings and old, uneaten food. Cleaning the feeders with a weak solution of warm water & bleach and allowing them to dry thoroughly before placing them back into operation will usually prevent diseases from breaking out among your birds. Be sure to rinse the feeder after cleaning. Evening Grosbeaks, Crossbills, Pine Siskins, and finches are especially sensitive to bird diseases. Try to discourage (English) House Sparrows and European Starlings from using your feeding area.

homes with 1-1/2" or larger openings and starlings will use anything larger than 1 1/2". Hole size is vital to prevent starlings from taking over a box. For example, a Western Bluebird can get through a 1-9/16" hole, but a starling can not.

There is debate whether one species should be favored over another. We know not to interfere with Natural Selection, but House Sparrows and European Starlings are not native to the US. Since they were introduced, their populations have increased to unnatural numbers, displacing native species. They are also agricultural pests, spreading parasites and disease, and they defile buildings in towns and cities throughout most of North America. They are not protected by law as are other migratory birds. I have a battle every spring with House Sparrows competing with Mt. & Western Bluebirds for the boxes at my place, and my problems are not unique.



Nest boxes are often contaminated with parasites, waiting for more inhabitants. (On the left is a photo of the webbing of a kestrel nestling's underwing with a host of parasites.) Feeders can spread parasites and disease as well. Remove all used nesting debris after the young have fledged and clean nesting boxes and

feeders with a mix of 90% water and 10% chlorine bleach. This is especially true of American Kestrels. Of the over 200 kestrel nesting boxes in use by kestrels in a study underway through the help of Don McCartney and East Cascade Audubon Society in Bend, OR, over 50 have been contaminated with a variety of bird parasites. Cleaning them annually has helped reduce the parasite levels.

Bird baths and feeders absolutely must be cleaned regularly. If they are not, it would be better not to have one at all.



Now, lets get busy!



Here's lookin' at ya'

A SELECTION OF BIRDS THAT NEST IN TREE CAVITIES & WILL USE NESTING BOXES

(• = Known to nest in Oregon)

DUCKS

- Wood Duck
- Barrow's Goldeneye
- Common Goldeneye
- Bufflehead
- Common Merganser
- Red-breasted Merganser
- Hooded Merganser

RAPTORS - FALCONS

- Aplomado
- American Kestrel
- Merlin (?)

PARROTS

- Rose-ringed Parakeet
- Budgerigar
- Canary-winged Parakeet
- Monk Parakeet
- Red-crowned Parrot
- Yellow-headed Parrot
- Thick-billed Parrot

TROGONS

- Elegant Trogon
- Eared Trogon

OWLS

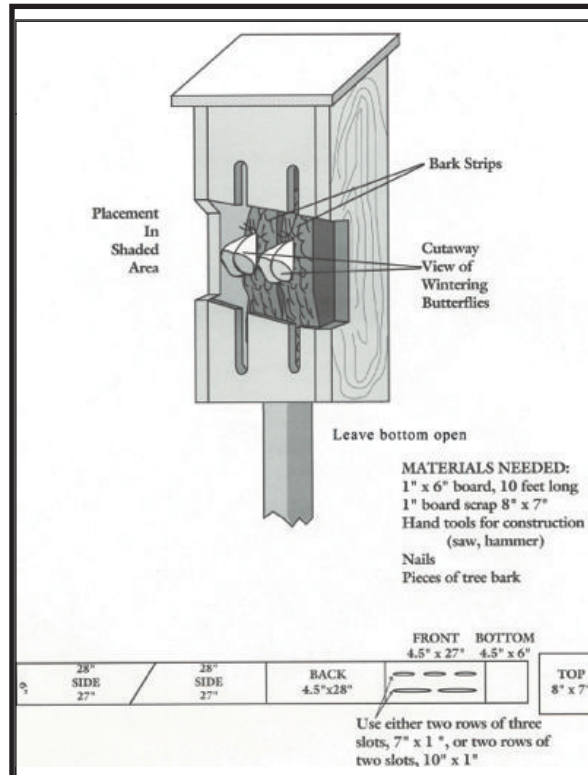
- Barn Owl
- Barred Owl
- Great Gray Owl (Platform)
- Screech Owl
- Whiskered Owl
- Flammulated Owl
- Elf Owl
- Pygmy Owl
- Saw-whet Owl
- Boreal Owl (?)
- Burrowing Owl (Will use artificial burrow)



Typical wood duck nesting box. Camp Polk Preserve, Sisters, OR

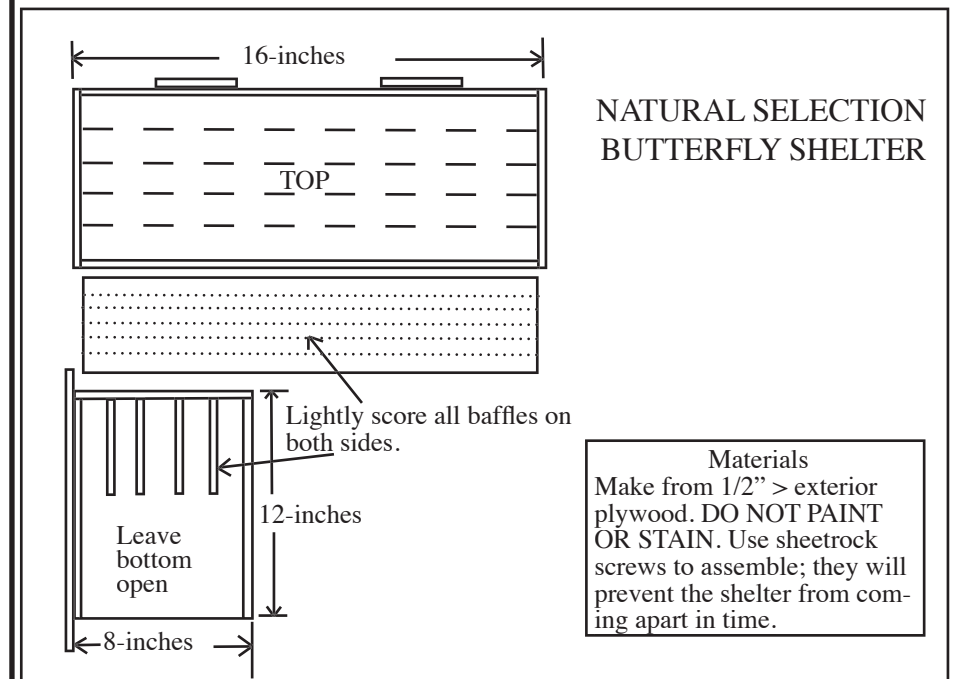


Western Screech Owl using a gray squirrel box, Black Butte Ranch, Oregon



Shelters like the two shown here are safe places for the Mourning Cloaks and Tortoiseshells to spend winter. Tests have been made on usage, but have not been used, if yours is occupied, please contact the North American Butterfly Association.

Typical natural winter shelters are under logs and rocks and inside hollow logs, both lying on the forest floor and standing. They will also be found inside unheated outdoor buildings, such as woodsheds, clinging to split pieces of wood.



Butterfly Shelters

In the northern latitudes of the US, most native butterflies winter over as eggs, caterpillars, or chrysalids. However, the Mourning Cloak and the California Tortoiseshell can withstand the rigors of winter providing they have a safe shelter protecting them from the direct forces of winter. In addition to metamorphosis, one of the most astonishing biological processes in Nature, the ability of butterflies to survive the cold of winter that, in some areas of the USA



Mourning Cloak

can reach well below-zero is equally fascinating. The wintering-over butterfly, whether caterpillar, chrysalid, or adult, contains a type of “antifreeze,” the colder it gets, the better the antifreeze.



Calif. Tortoiseshell

But what about the Monarch and its look-a-like cousin, the Queens and Viceroy, you may ask? Well, the Monarch is really a tropical butterfly and to save its skin it migrates south in winter. The Eastern population spends winter in the well-known area of Eastern Mexico, while their Western counterparts head for the coastal areas of California and Mexico where they shelter in the foliage of the eucalyptus trees, in areas such as Santa Cruz, CA. Third-Stage



Monarch

Viceroy and Queen caterpillars winter over inside curled up leaves.



Viceroy



Monarch in flight



Monarch Visitor Center, Natural Bridges State Park, Santa Cruz, CA.

KINGFISHERS

- Belted Kingfisher
- Ringed Kingfisher
- Green Kingfisher



WOODPECKERS



- Golden-fronted Woodpecker
- Red-bellied Woodpecker
- Gila Woodpecker
- Flicker (Northern)
- Red-headed Woodpecker
- Acorn Woodpecker
- White-headed Woodpecker
- Lewis' Woodpecker

White-headed woodpecker at nesting cavity. Cold Springs Camp Ground, Oregon

- William's Sapsucker
- Red-breasted Sapsucker
- Yellow-bellied Sapsucker
- Downy Woodpecker
- Hairy Woodpecker
- Three-toed Woodpecker
- Black-backed Woodpecker
- Ladder-backed Woodpecker
- Red-cockaded Woodpecker
- Nuttall's Woodpecker
- Strickland's Woodpecker
- Ivory-billed Woodpecker
- Pileated Woodpecker



Miriam Anderson & Don McCartney holding Don's “natural” flicker nesting box. Fill the box with pine shavings.

FLYCATCHERS

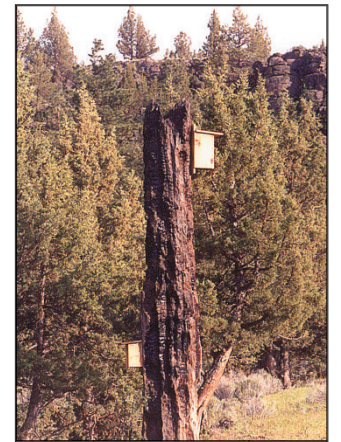
- Eastern Kingbird
- Western Kingbird
- Ash-throated Flycatcher

SWALLOWS

- Tree Swallow
- Violet-green Swallow
- Rough-winged Swallow
- Bahama Swallow
- Purple Martin

CHICKADEES

- Black-capped Chickadee
- Carolina Chickadee
- Mountain Chickadee
- Mexican Chickadee
- Chestnut-backed Chickadee
- Boreal Chickadee



Both boxes are active: Kestrels on top, bluebirds beneath.

CREEPERS & NUTHATCHES

- Brown Creeper
- White-breasted Nuthatch
- Red-breasted Nuthatch
- Brown-headed Nuthatch
- Pygmy Nuthatch



WRENS

- House Wren
- Bewick's Wren



THRUSHES

- Eastern Bluebird
- Mountain Bluebird
- Western Bluebird

Pictured above is a bluebird nesting box with a "McCartney/Anderson Mealworm Balcony" attached. If you would like to have the joy of watching bluebirds dine on mealworms, place the box near a window and place mealworms in the balcony occasionally. Be warned, once you start feeding mealworms, the birds are "hooked.". They may even attempt to get into your refrigerator and help themselves.

STARLINGS

- Hill Myna
- European Starling

WEAVERS

- Eurasian Sparrow
- House Sparrow

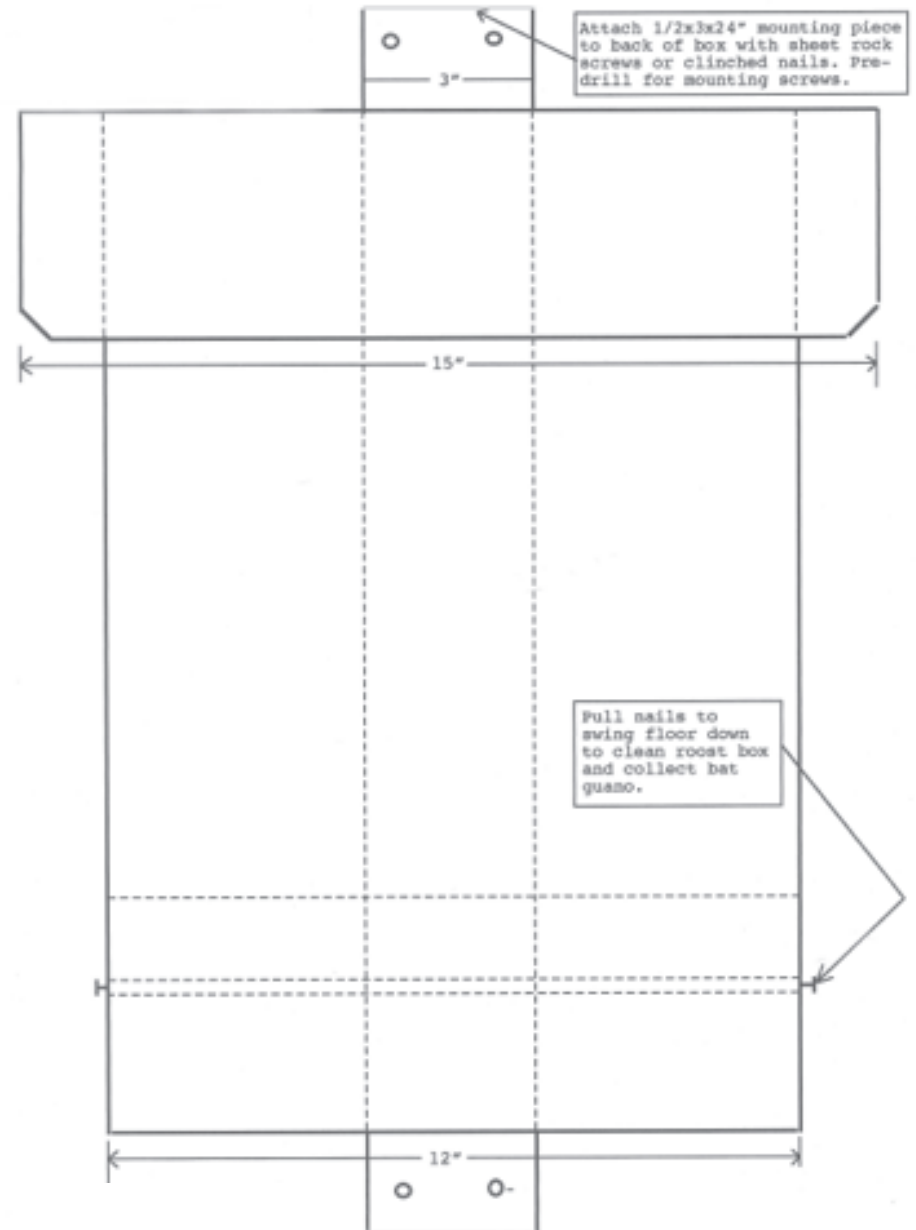


Ash-throated Flycatcher nesting boxes near Sisters, OR (Photo courtesy of Don McCartney)



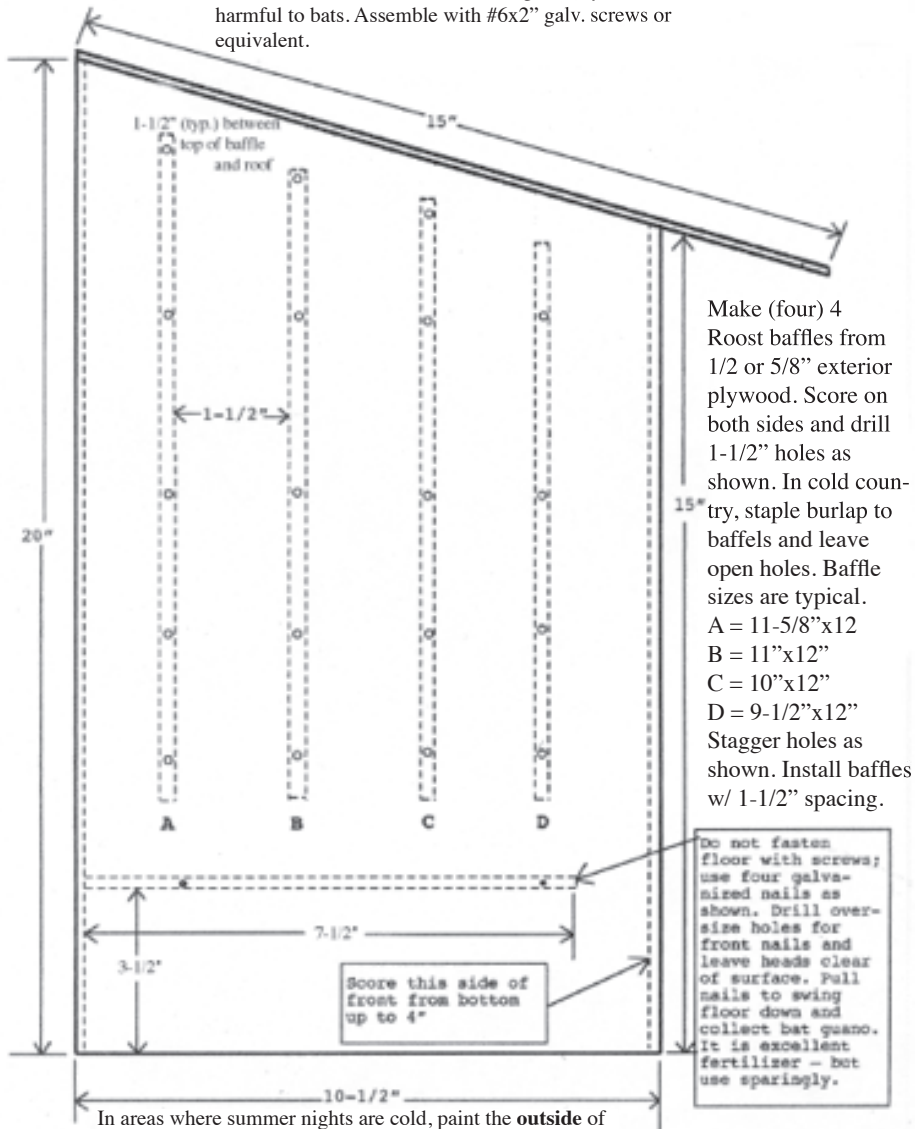
Mountain Bluebird at nesting cavity

NATURAL SELECTION BAT ROOST





Make bat roost box from 5/8" exterior plywood. DON NOT USE CHIPBOARD-the glue may be harmful to bats. Assemble with #6x2" galv. screws or equivalent.



In areas where summer nights are cold, paint the **outside** of the roost with non-toxic, flat-black paint, and place roost on south side of buildings.



Great Horned Owls



We don't give a hoot about nesting boxes or feeders; we use old hawk's and magpie nests — or what ever is handy... And we eat whatever we want. But if you want us to nest with you, just place a 3x3 ft. platform of hog wire in a tree and place few sticks and grass on it. If a Red-tailed hawk doesn't move in, we will — or maybe we will anyway!

(See Page 26)



The following photos are just a few of the birds that will use nesting boxes. In these days of nesting habitat loss, the more boxes you make, the better off the wild birds will be.



Northern Saw-whet Owl



Mt. Chickadee



House Sparrow traps (above) used temporarily at the entrance work very well for eliminating the obnoxious pests that compete with native birds. Using a **large Victor rat-trap** will help to remove European Starlings that compete with native cavity nesters, such as flickers.



Common Flicker



Flicker in a human dwelling



Western Bluebird nesting in firewood



Violet Green Swallow

- NATURAL SELECTION BAT ROOST -



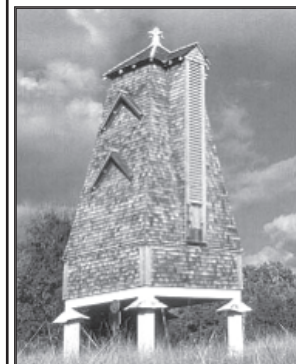
Baffle with scoring and holes to allow bats to move through the box easily.



NOTE: Where nights are cold in summer, it is a good idea to staple burlap to the baffles (leaving holes open) and paint the outside of the roost with organic flat black paint..



Placement of baffles inside the bat roost.



The first known bat houses were built over a century ago in Texas. In his 1925 book, *Bats, Mosquitoes, and Dollars*, Dr. Charles A. Campbell, a physician in San Antonio, Texas, described his decades of work designing and testing artificial bat roosts to combat malaria-spreading mosquitoes.

By studying bats' natural roosts, Dr. Campbell contended, he could "build a home for bats in a scientific manner to meet the requirements of their most singular habits." He quickly discovered, however, that this was no easy task. He concluded that bats preferred larger structures where they could roost high above the ground, and he set to work designing a new type of roost: a "bat tower," which was most successful.

A FEW THOUGHTS ABOUT BATS



First, please be tolerant of the bats and their chosen location. Most, if not all, of the bats we have in the NW are migratory in one way or another. While occupying the area around your home, bats are destroying myriad pestiferous insects. Unfortunately, the fear of rabies has caused more problems for people than the bats themselves. In reality, the chances of contacting a rabid bat is far less than being involved in a fatal vehicle accident.

That said, however, it is prudent to stay away from a bat crawling about in the daylight. That is not “normal” behavior and contact should be avoided. If the

opportunity presents itself, and it can be done safely, place a box over the bat and contact the local wildlife office or health department.

If bats are utilizing an old shed, barn, or outbuildings and causing no problems, allow them to remain for the summer and assist you with “pest control.” If you collect the bat guano (droppings), it can be used in your garden as a fertilizer (in very small amounts).

WHAT TO DO IF BATS ARE ROOSTING IN UNWANTED LOCATIONS

Where bats are not welcome, the Natural Selection Bat Roost box will substitute for a natural roost. However, there are steps that must be taken to insure (a) a positive situation when encouraging bats to leave the unwanted location, and (b) placement of the roost box to insure the safety and health of the bats once they occupy the artificial roost.

REMOVING BATS FROM AN UNWANTED LOCATION

1 - Identify the entrance bats are using to gain access and plug same, **BUT ONLY AFTER THE BATS HAVE GONE FOR THE NIGHT** and there are no babies inside th bldg. (Pressurized Styrofoam works well for blocking the entrance.) Bats are capable of entering a structure through a crack less than 1/2” in width. Closing off the entrance must be done when the bats first arrive. If you wait too long, the females may leave their pups inside when they go out foraging for insects at night.

2 - Place the *Natural Selection Bat Roost* at the highest point on the SOUTH side of tree or building. Do not locate it near a security light. If it is possible to place the roost box near the sealed entrance the bats will move in quickly.

NOTE: There are electronic devices on the market that claim to keep bats away. If you find one that works, please let me know!

TYPICAL NESTING BOX

CUT LIST (Typical)	Bluebird, etc	Kestrel, etc
Bottom	6”x6”	8”x8”
A - Mounting piece	17”	25”
B - Back	6”x11”	8”x 19”
C - Front	6”x 9”	8”x 18”
D - Roof	11”	14”
E - Roof	10”	13”
F - Mounting Piece	2”	3”
H - Entrance Hole	1-9/16”	2-1/2”
H - Entrance Hole, small owls	4”	
H - Entrance Hole, chickadee	1-1/4”	
H - Wood Duck	4” Oval	
H - Barn Owl	4” Round	

- ATTENTION -

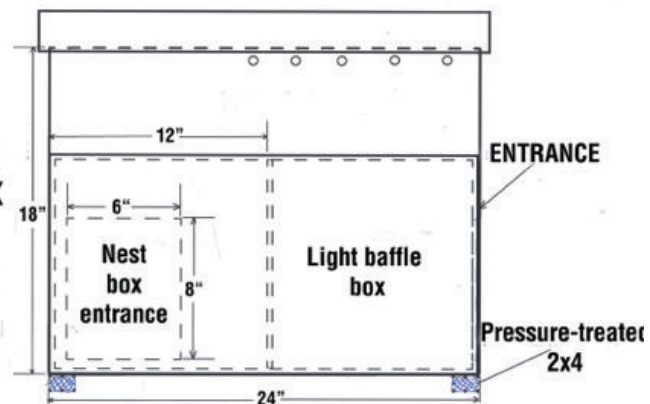
Place about 5 strips of soft Western Juniper bark on top of the wood chips. It's a natural insecticide and may be of great help eliminating parasites.

NESTING BOX SPECIFICATIONS

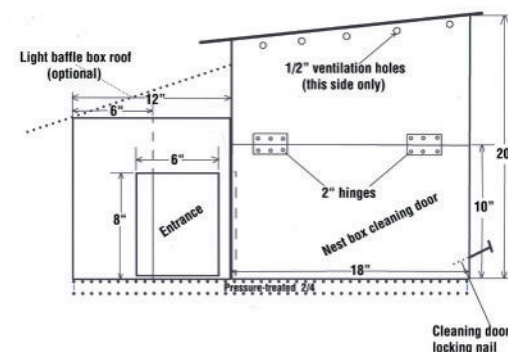
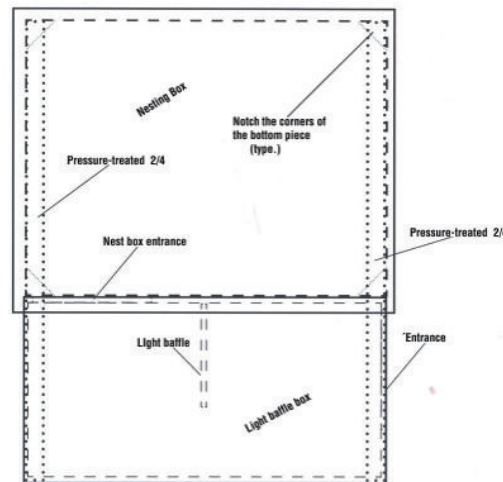
SPECIES	Floor of Cavity	Depth of Cavity	Entrance Above Floor
MT. BLUEBIRD	6" x 6"	8"	6"
ASH-THROATED FLYCATCHER	6" x 6"	8"	6"
WESTERN BLUEBIRD	6" x 6"	8"	6"
CHICKADEE (All species)	5" x 5"	8" - 10"	6" - 8"
NUTHATCHES (All species)	Same as chickadee		
HOUSE WRENS	Same as chickadee		
TREE SWALLOWS	Same as bluebirds		
VIOLET GREEN SWALLOWS	Same as bluebirds		
FLICKERS (See page 2)	7" x 7"	16" - 18"	14" - 16"
SMALL WOODPECKERS	6" x 6"	8" - 10"	6" - 8"
SCREECH OWL	8" x 8"	15" - 18"	12" - 14"
SAW-WHET OWL	Same as screech owl		
FLAMMULATED OWL	8" x 8"	12"	10"
BARN OWL (See pages 21 & 22)	8" x 8"	20"	10"
GREAT HORNED AND GREAT GRAY OWLS (See page 23)			
BURROWING OWL (See pages 15 & 16)			
KESTREL	8 x 8"	15" - 18"	12" - 24"
WOOD DUCK	8" x 10"	24"	16"

BUILDING SUGGESTIONS: The best building material is 1/2" or thicker, exterior plywood. Builders will usually save cut off (rems) of plywood. If you ask them to allow you to collect the rems for nesting boxes they will usually agree. **DO NOT** use chipboard; it may contain chemicals that could harm animals using nesting boxes or roosts. If possible, use screws to assemble boxes, feeders, and roosts, or galvanized nails. **NOTE:** The hole size for bluebirds is too small for starlings to get in.

TURKEY VULTURE NEST BOX



Make from 1/2" > exterior plywood, do not use chipboard—chemicals in the glue may harm nesting birds. Paint exterior with non-toxic dark (brown) paint—**DO NOT** paint interior. Place a small amount of sand in the light baffle box and 2" of PINE shavings in the bottom of the nesting box. Place in the shade among rocks with the entrance facing north.



TURKEY VULTURE

For those interested in observing Turkey Vultures as they raise their young, or conducting research and wanting to have access to young and adult birds, the TV Nesting Box is an excellent tool.

The female incubates the eggs (usually two) during the hours of darkness, when access to the box for inspection or research is easiest. **CAUTION:** For the welfare of the birds, one must use the utmost care when handling adults and nestlings. Regurgitation is a given, so wear protective clothing, and biting is also a way of life when TVs are handled. The **LAST** thing anyone wants is a flesh wound from a TV. Wear protective clothing and thick, but supple leather gloves — the stuff TVs carry around in their mouth is enough to gag a maggot.

To ease cleaning of the nesting box after usage, it is best to place a sheet of plastic in the bottom and bring the sides up to at least 2-inches to hold the 2-inches of pine shavings added to the box. It is also a good idea to fold the top over and staple it to the sides of the box at 3” spacing.



Adult TV in flight (L). Roger Watkins showing us a TV egg, and what the environment is like in a typical nest. Below a 4-week old TV out for his first look at the sunlight in front of a typical dark cleft in rocks.



Size of Entrance	Height above Ground	<i>IT IS BEST TO HAVE ENTRANCES FACING EAST OR NORTH. One box should never see another (except swallows and Ash-throated Flycatchers)</i>
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1-9/16”	10 - 15 feet	Place on fences, buildings, etc.
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1-9/16”	10 - 15 feet	Place near water feature, do not crowd
---------	--------------	--

1-9/16”	10 - 15 feet	Place near water feature, do not crowd
---------	--------------	--

1-1/4”	5 - 15 feet	Forest edges
--------	-------------	--------------

Same as above

Same as above

1-1/4”		Place near water, OK to crowd
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Same as bluebirds

2-1/2”	10 - 20 feet	Stuff with pine chips, place in trees
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1-1/4”	10 - 20 feet	Place at forest edge
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4”	10 - 30 feet	Edge of fields and forest
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2”	10-15 ft	Set back 50 yards from meadows
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2”	Same as kestrel	
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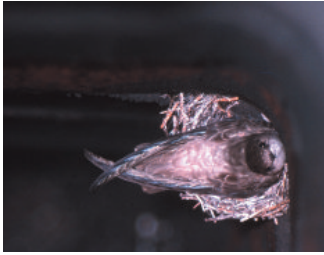
6”	15 - 20 feet	Agricultural areas on buildings
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2-1/2”	8 - 20 feet	Edge of forest and fields
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4” oval	○ 15 feet	Place entrance facing water
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On large boxes, either “score” the inside of the front panel from the entrance to the floor, or staple a 2” strip of 1/4” galv. hardware cloth to the same area. This will make it easier for the fledglings to exit the box. **DO NOT USE PAINT, STAIN, OR WOOD PRESERVATIVE ON NESTING BOXES, PLATFORMS, OR FEEDERS.** Place entrance hole facing north and, except for swallows, do not place a box where it can see another box. Nesting platforms should be about 50 feet above the surface. Place bat roosts under eaves of buildings on south side.

VAUX'S SWIFT NESTING (BOX) TOWER



Research by Evelyn Bull and others at the USFS NW Research Station in LaGrande have developed a nesting (box) tower for Vaux's Swifts. At first it will appear as "overkill," it's so huge, but when considering the swift's nesting requirements, it fits perfectly. (Evelyn is a retired USFS Wildlife Biologist who has done considerable work with cavity-

nesting species of the NW.)

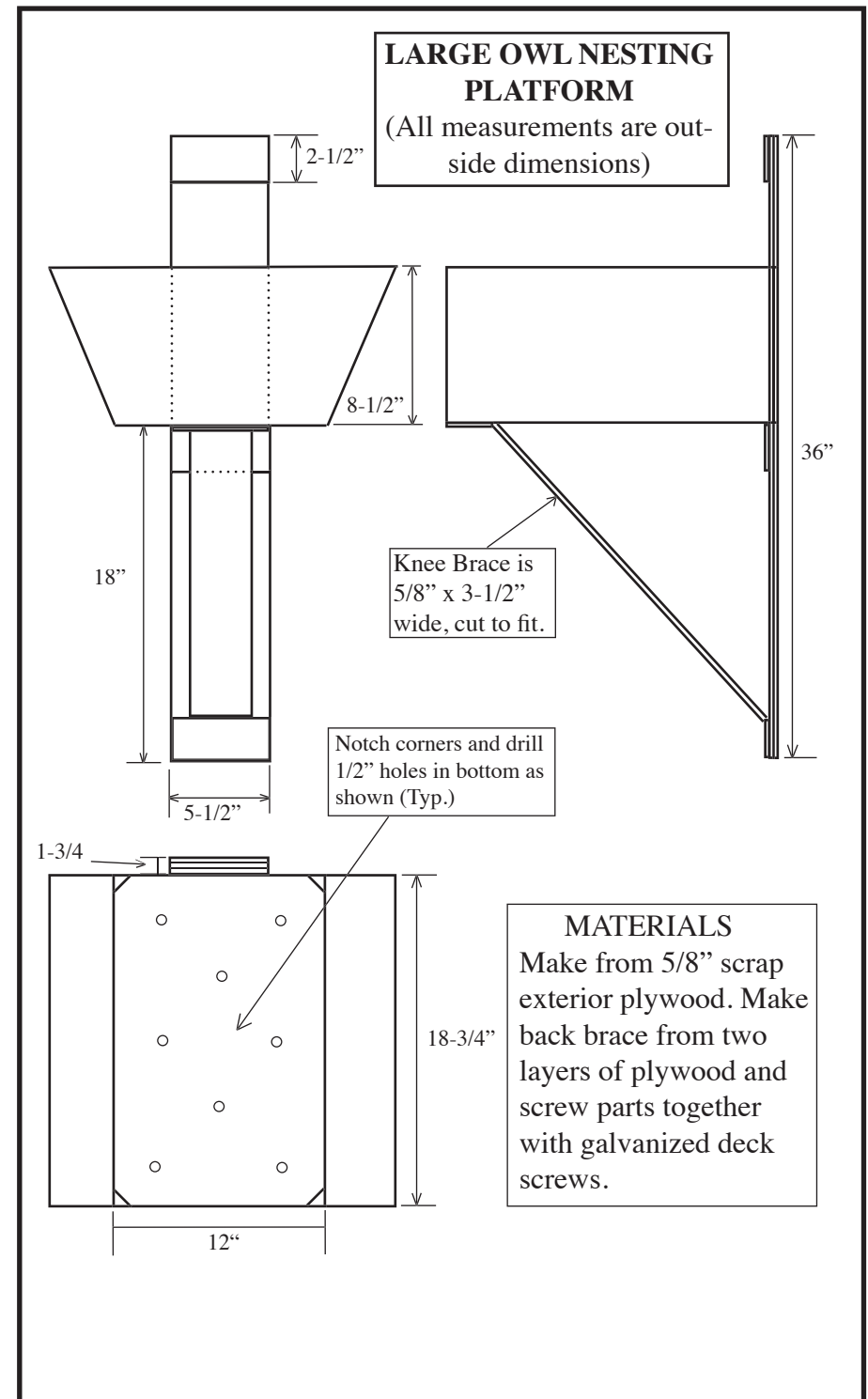
You'll need to find a team that can climb trees to mount the towers in the correct place, or perhaps place it against the outside wall of an outbuilding. Placed in the proper location, the nesting tower works, and you'll be helping the Vaux's Swift immeasurably.

Nesting towers are constructed from rough-cut PINE boards, 8x12 in. x 12 ft., and put together with exterior deck screws (and wood glue if you like). The inside surface of the front board is scored to enable the youngsters to climb out of the entrance hole. Small slats are nailed into the corners of the box every 0.4 m to provide a ledge for a more secure nest (after all, the nest of sticks is held in place by swift spit). Note: Exterior plywood is not used due to the propensity for porcupines and tree squirrels to gnaw the material to shreds. (This happened to 10 Screech Owl nesting boxes placed in the B&B Burn.)

The entrance hole is designed to resemble that made by a Pileated Woodpecker. The hole is large enough for the swift to fly directly into the box, a feature Bull found to be necessary for box usage.

As it is with all the nest boxes in this publication, the roof has a slant to it to allow rain and snow to run off easily. The length of the overhang of the roof is also important for keeping moisture out of the nesting area. The bottom of the box is hinged with two nails and a third used as a lock to keep it in the closed position (as illustrated). If the box is checked annually for usage, it should be cleaned after the birds depart.

Use a non-petroleum-based brown stain on the OUTSIDE of the tower (leave a 1/2" space around the entrance hole untreated), otherwise it'll stand out like a sore thumb, no matter where you put it. If you decide to make several boxes and place them in a place like the B&B Burn near Sisters, staining the towers is necessary to keep them from being targets for the nuts who must shoot something. You must also contact the Wildlife Biologist of the Sisters District for permission and suggestion of placement.



When the platform is placed in the tree, it is best to insure a clear flying space between the nest and the field it is facing by trimming a few branches close to the trunk. This will also eliminate any projections that could harm the birds as they fly to and from the nest platform.

If the platform is placed in the side of a hay shed, barn or other out-building, it is best to mount it on the NORTH or EAST side of the structure. Sunlight can heat up the box and even kill babies if the platform is placed on the south, or west side of a structure or tree with thin branches. There are—thanks to 14-year old Jesse Thornton of Sisters and family—five such platforms now installed (Fall of 2008) in the B&B Burn on USFS lands in the Sisters District of the Deschutes National Forest in Oregon.



The platform must be charged with sticks and grasses about half way up to the top. It will be packed down as the female incubates her eggs and the young tromp around on it. The shape and size of the platform is especially suited to help keep young Great Gray Owls from becoming “branchers” (leaving the nest) too early. They remain in the nest until fledged which provides a greater survival rate of young owls.

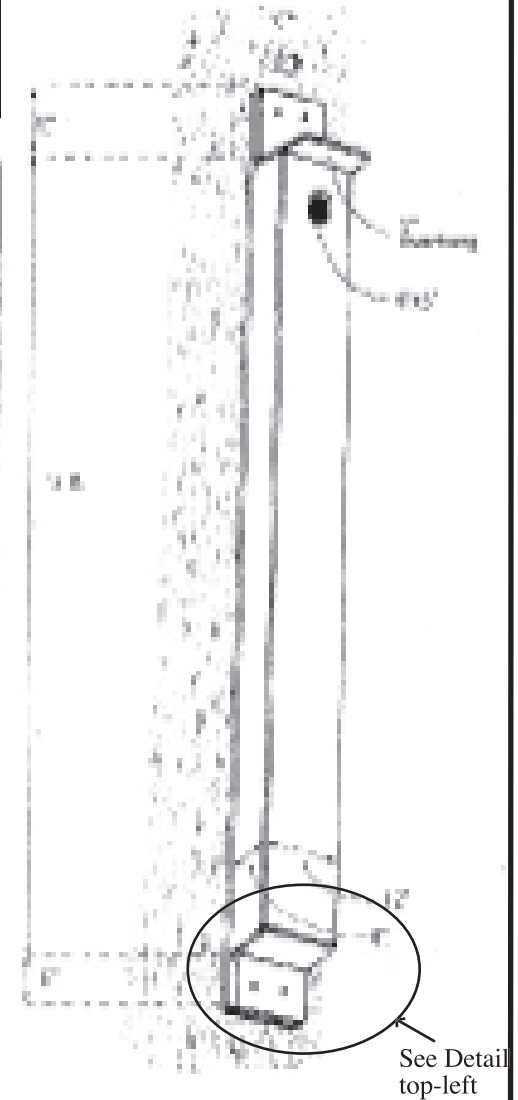
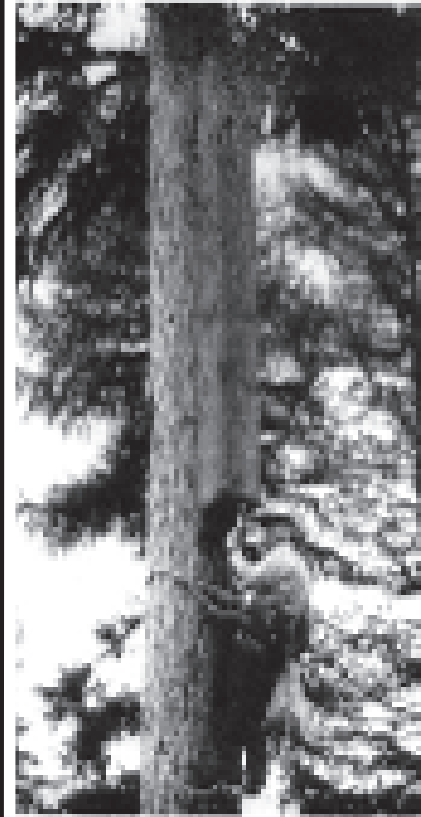
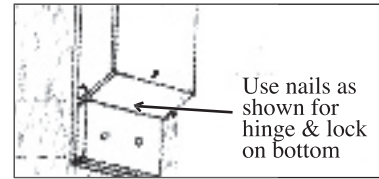
(Most GGO nests are so small the young either fall or are pushed out of the nest at an early age. If the



normal habitat of a “jackstraw” understory is lacking, the young owls can not make their way up off the forest floor to some degree of safety and consequently are killed by ground predators or, if out on the end of a leaning blowdown, are taken by goshawks.



VAUX'S SWIFT NESTING (BOX) TOWER



BURROWING OWL

Athene cunicularia



Burrowing owls are medium-sized birds, bigger than a robin, smaller than a Red-tailed Hawk. They are the only owl in the New World that nests in an underground burrow. These small owls can be found year-round in parts of the Caribbean, Florida, and Central and South America. During the summer breeding season, the northern race can be found nesting in open flat areas throughout North-western Canada, Washington, Oregon, Wyoming, Montana, Idaho, Nevada, Northern and Central California, and Northern Arizona.

Because the owls are subterranean nesting birds, ground squirrels and especially badgers are a vital part of the owl's dependency on burrows. Changing management practices for public and private lands has had a serious impact on the availability of burrows for these owls, resulting in their disappearance in some areas.

There are only two small areas of Oregon where Burrowing Owls can be found nesting in colonies: Near Boardman on the Columbia River and spotty areas of Northern Lake County, east of Christmas Valley.

(It is considered wise management by biologists studying Burrowing Owls to assist their nesting success by placing artificial burrows near agricultural areas that have an abundance of small rodents and insects.)

Several experiments have been carried out attempting to design an artificial nesting burrow that will accommodate the owls, and the following design by Saskatchewan Resource and Management of Canada seems to be the easiest to fabricate and install, and the most successful for the owls.

Burrowing Owls consume about anything smaller than themselves, from insects to toads, frogs, rodents of many varieties, and on rare occasions, ground nesting birds.

In areas of large hay farms, the artificial burrows should be placed near the edge of fields where vehicle traffic and irrigation water will not disturb them.

The platform illustrated is hopefully large enough for the young owls to remain in to fledging age.)



You may purchase the 5/8" exterior plywood, or have it donated, but I have found it to be more environmentally friendly to ask contractors building homes and other structures to set aside the "rems" into an out of-the-way-location then you can pick up the material when the contractor thinks best. I have never been turned down...

If, in the process of fabricating and placing a nesting platform you have any questions, please feel free to contact me ; email: jimnaturalist@gmail.com



While on the subject of artificial nesting platforms for owls, nesting boxes also work well for the smaller variety of owls, such as Flammulated, Boreal, Saw-whet, Pygmy, and Screech. In addition to the five GGOW platforms in the B&B Burn, there are



also 10 Screech Owl nesting boxes erected by Andrew Stahn and Scouts of Troop 188 in Sisters as part of Andrew's requirements for Eagle Scout. Specifications for small owl nesting boxes can be found on pages 17 thru 20.



BIG OWL NESTING PLATFORM

A word about “Big Owls.”



There are two species of owls that will use the nesting platform described in this section: the Great Horned and Great Gray, (and perhaps Northern Spotted and Barred Owl).

To my knowledge, owls of North America do not “build” nests, but use those of other birds and flat spots in trees that will hold eggs. Small forest owls use woodpecker cavities. Short-eared Owls nest on the ground, while Long-eared Owls nest typically in hawk’s, crow’s, and magpie nests.

The first and foremost of big owls is the largest owl in North America, the Great Gray Owl, *Strix nebulosa* (GGOW). These gray ghosts of the forests and meadows normally nest on the top of large, broken off trees and in the unused nests of herons, hawks, eagles and other large birds.

Next in line is the “Tiger of the Air,” also known as “The Cat Owl,” the formidable Great Horned Owl, *Bubo virginianus* (GHOW). When it comes to consuming prey, there is no other bird that can come remotely close to the Great Horned Owl. They consume anything that is handy — from beetles to shrews to mice to voles to barn cats and skunks — they are without a doubt a perfect example of a true “opportunistic raptor.” They will also eat other owls if they are available.

The nesting platform illustrated on page 26 will work for Great Gray and Great Horned Owls. It may be placed on the side of any tree or structure at between 30 to 50 feet above the surface.

BURROWING OWL ARTIFICIAL NESTING BURROW

(After Troy Wellicome, Ray Longmuir, & Dave Scobie)

Place a small amount of dry cow manure around the entrance hole. The owls do that to mask the scent of the nestlings.

3 feet +

Insert

3 feet

Place a large, HEAVY, rock or concrete slab on top

INSTALL
NESTING BOXES
ONLY
DURING
NON-BREEDING
SEASON

16"
12"
Nesting box (Side view)

16"
Nesting box (Top view)

Fill top bucket with soil, fold handle down.

Two 5-gallon plastic buckets. Cut bottom out of lower one and fit it into the upper one. Attach lower bucket to box as shown.

MATERIALS & INSTRUCTIONS

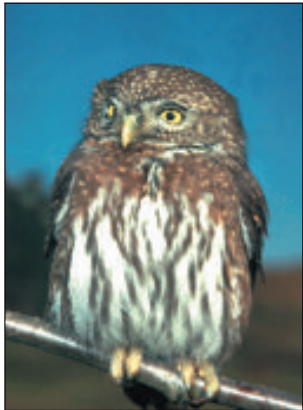
Make nesting box, cover, and tunnel ring from 5/8" exterior (*not "treated"*) plywood. Assemble with screws. **DO NOT USE WOOD PRESERVATIVE, PAINT, OR STAIN.** Make entrance tunnel from 6" x 8 feet weeping tile. Use two 5-gallon plastic buckets for nesting box access, one with bottom cut out and fitted to top of nesting box. Bury box and entrance tunnel as shown, at least 3-feet below the surface. Tunnel must be at a *slight* angle. Pack soil tight around box and tunnel. Place *small* amount of fine sand mixed with dry cow manure on the bottom of tunnel. Place enough soil around the tunnel entrance to keep water from flooding in.

Be sure top bucket is 2" to 3" *below* surface. Place a rock to mark bucket location. Place fine soil in the bottom of the nesting box and small amounts of dry cow or horse manure in the tunnel and around the sides of the interior of nesting box. Try to save vegetation (destroy invasive weeds!) and replant on the surface. Water when finished.

NORTHERN PYGMY OWL

The Northern Pygmy Owl will nest in just about any old abandoned woodpecker cavity, whether it be in a rotting stump (as some old Pileated Woodpecker nests are found), or a flicker cavity high up in a Ponderosa Pine, or Douglas Fir. A nesting box with an 8-inch square floor, 10-inches high at the front, with a 1-3/4 to 2-inch entrance hole will work. The hole is best placed so as to be 8-inches from the floor of the box. It is suggested that at least 2-inches of pine shavings be placed in the bottom of the box.

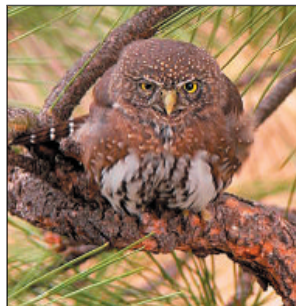
The boxes should be placed along an active stream within an area with moderate open spacing, from 4-feet to 10-feet above the ground. If there are openings that will allow sunlight to hit the box, place it on the NORTH side of the tree or stump.



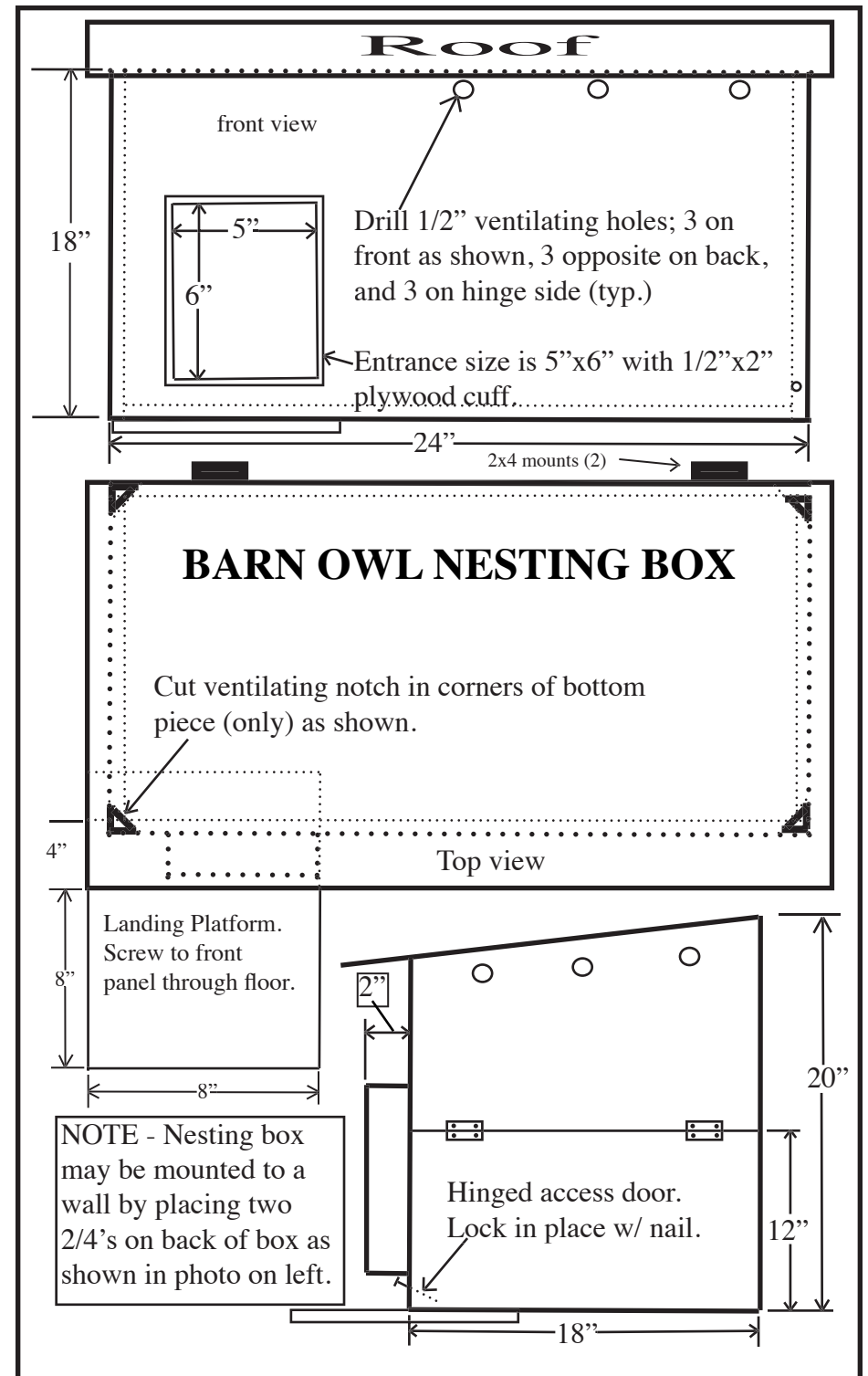
Northern Pygmy Owl
Front view



Northern Pygmy Owl
Back view



Northern Pygmy Owl
Photo-Kris Kistovich





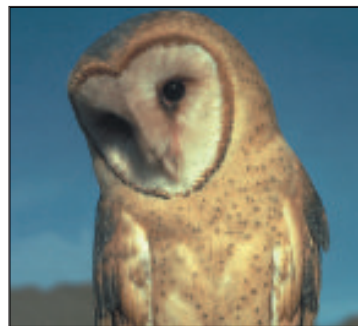
MATERIALS AND MOUNTING INSTRUCTIONS FOR BARN OWL A NESTING BOX

Make from 12" > exterior plywood. DO NOT USE PARTICLE BOARD as glue may cause illness to birds. DO NOT PAINT OR STAIN inside for similar reasons. Assemble nesting box with galvanized #6 screws or sheetrock screws. Place 1/2" pine shavings, or dry straw in the bottom of the box. Mount

nesting box with entrance hole facing north or east.



Author with finished Barn Owl nesting box. Note the two 2x4s mounted to the back of the box. These are for mounting the box to a flat surface, but can also be used as braces when placed in a tree.



Cut corners as shown on bottom

Drill four 3/8" vents - 2 pr side

Bottom

Roof

Side

Front swings out to open
Note two hinge nails & front locking nail

Front

TYPICAL NORTHERN PYGMY OWL NESTING BOX

CUT LIST
(Typical)

Bottom	8"x8"
A - Mounting piece (L)	15"
B - Back	8"x11"
C - Front	8"x 10"
D - Roof	12"
E - Roof	12"
F - Mounting Piece (W)	3"
H - Entrance Hole	1-3/4"

Northern Pygmy Owl
Photo-Kris Kistovich

FLAMMULATED OWL

“Flams,” (or FLOW as listed in the Bird Banding Manual) are largely insect-eaters, (especially large moths and flightless locusts). Placing of the box near water and habitat that generates moths and locusts will usually bring a Flam to the nesting box. It is best to place the box at least 15-feet above the surface, on the north side of a tree, about 10-feet in from the edge of a meadow. A decadent lodgepole forest with water and meadows is excellent habitat.

FIELD NOTES FROM PETE STACY - FLAMMULATED OWL RESEARCHER

“We started off using the smaller boxes and then moved to the larger sizes. At the end of the study we were using the two largest sizes exclusively, (10 x 20 or 8 x 14) since they were successful in attracting the owls and they had the potential of being used by other cavity nesting species as well. At our site, almost all of the secondary cavity nesters except the parids and wrens used old woodpecker nest holes in either oaks or ponderosa pine. The larger boxes created “cavities” that were most similar to that type of hole.”

“The primary excavator in the oaks at our site was the Acorn Woodpecker, which had become locally extinct in the area before our study. Due to natural attrition and wood cutting, suitable nest cavities were becoming rare at the site, and the owls readily used the boxes. What seemed to be most important was height (at our site, around 15’ since this is where the AW’s typically made their holes), orientation (south seemed best), and location relative to the foliage (typically on a clear section of the main trunk, with a some foliage from branches 4-5 feet away from the trunk, but a clear flight path to the entrance)”.

HERE’S LOOKIN’
AT YA’, BABY!

