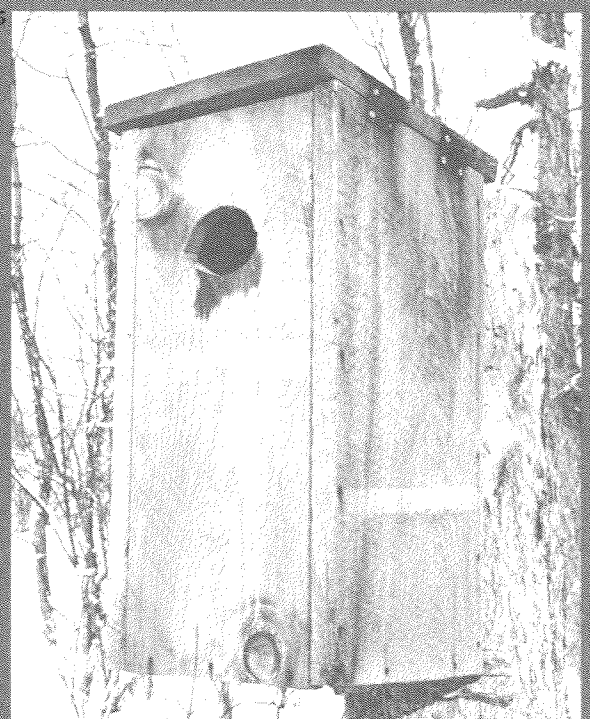
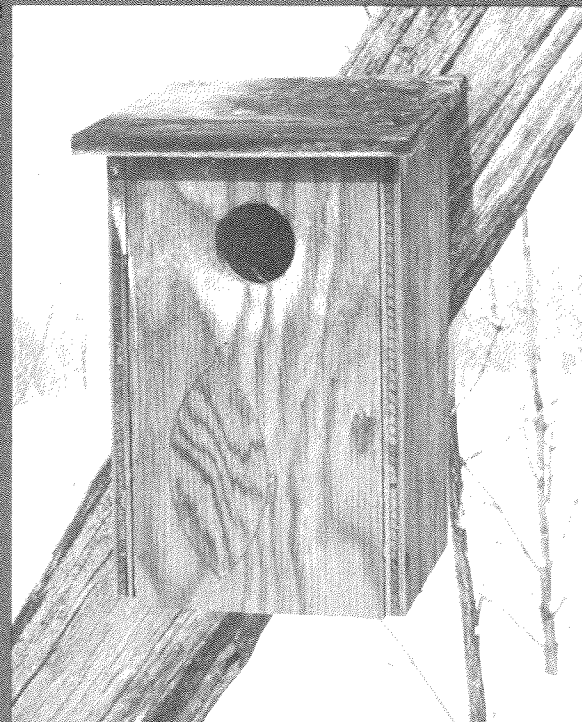
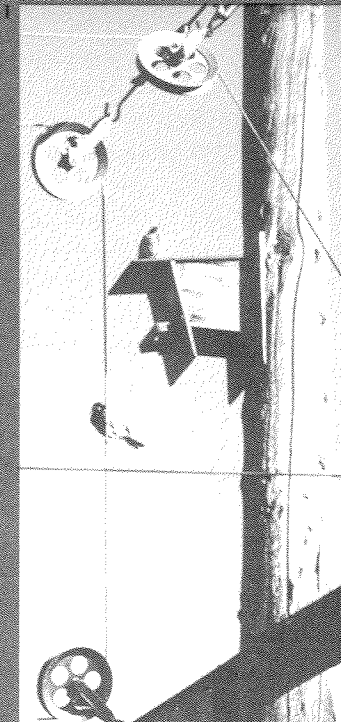


Nest boxes for birds



- 1 Clothesline poles make good sites for nest boxes. (Photo: Valerie Kirkwood)
- 2 Nest box suitable for Tree Swallows or Bluebirds. (Photo: D. Gow)
- 3 This is a four-sided nest box with a peaked roof. (Photo: Parks Canada)
- 4 Purple Martin nest box. (Photo: D. Gow)
- 5 Wood Duck nest box. Notice the hinged roof. (Photo: D. Gow)

Throughout the years man has tried to attract birds to his lawn and garden to photograph or study them or simply to enjoy their colour, movements and song. Building and setting out nest boxes is an effective way of achieving this end. At the same time cavity-nesting birds are given "artificial" nest sites to replace natural cavities which are rapidly decreasing in numbers.

In Canada about two dozen species of birds, ranging in size from wrens to ducks, nest in cavities. Normally, woodpeckers and chickadees excavate these cavities in the softened wood fibres of decayed trees or stumps. Each year these birds make new holes, leaving the old ones for other cavity-nesting birds. Fewer and fewer natural nest sites, however, are now available to the birds because these weakened or dying trees are ideal sources for firewood or are considered a hazard and are removed. Cavities that do remain are often occupied by starlings or sparrows, species which nest early in the spring. As a result, the population levels of many of the native cavity-nesting birds have declined in recent years. But we can help reverse this trend by providing nest boxes to offset the shortage in natural nest sites. For example, bluebirds and wood ducks which were rarely seen in some areas where they were once common, returned when nest boxes were provided (Reader's Digest, September 1973).

This pamphlet is a guide for building nest boxes. Although elaborate designs for boxes are available, the plans described here have been kept simple. Builders, including children, should be able to construct these boxes without difficulty in a very short time. Expense is kept to a minimum by using waste ends of lumber. Whatever the design or material, the boxes should be strong and weatherproof and fastened securely.

Single compartment nest boxes are the easiest to build and the most frequently used by birds. Build the box with an easily removed roof to allow for annual cleaning and for occasional *careful* observations on nesting progress if photography or record keeping are parts of the project. Thoroughly clean the box and discard used nesting material after the birds have left the box in the fall. This eliminates parasites which collect in the nests while the birds are there. Do not attempt to help the birds by putting nest material into the box in the spring. Most birds prefer a clean empty box; they are well adapted by natural instinct to prepare and line their nests. For birds of the woodpecker, owl and duck families, a layer of wood chips or shavings about one inch deep may be placed in the bottom of the box. Do not use sawdust.

Protect your boxes from predators. Do not attach a platform or perch on the outside of the box near the entrance. This creates a convenient perch for enemies raiding the nest and a temptation for young birds to venture out of the box before they can fly. Protect boxes which are

placed on poles by a guard, e.g. an inverted cone or a two-foot strip of metal wrapped around the pole. A plastic milk bottle or chlorine bleach bottle, with the bottom cut out and nailed to the pole at the neck, would serve the same purpose. This will prevent cats, squirrels or raccoons from reaching the entrance and taking eggs or young from the nest box. Squirrels will sometimes use nest boxes as a home for their own families. Place boxes for birds on poles well away from trees and shrubs to stop squirrels from jumping to the roof of the box. To prevent raccoons from raiding nest boxes for ducks, make the entrance hole oval in shape and erect the pole in water at the edge of a pond, lake or river. These precautions are in addition to the cone or sleeve on the pole itself. Starlings and sparrows, early nesters, often take over boxes intended for other species. Covering the entrances until desired species are ready to nest or placing extra boxes in your garden will usually take care of this problem.

Make sure your box will be a comfortable dry home. Drill a few small holes on the sides near the top of the box, just below the roof overhang. These will provide needed ventilation, particularly on hot summer days, as well as allow light to filter in, making the dark cavity a little more inviting. Also, drill a few holes in the floor of the house, near the walls, to allow for drainage.

Although the basic design for nest boxes is standard, the size and location of the box will vary depending on which species of birds you wish to attract. Table 1 gives the dimensions of nest boxes for common species of birds. These measurements are based on the length of the bird. It is most important to make the entrance hole the correct size for each bird. Otherwise, although you may wish to attract wrens, you will most likely be watching a pair of house sparrows nest in your box if you make the entrance hole 1.5 inches in diameter instead of 1 inch. A box is most likely to be used if placed on a pole. A general rule is to place the box as many feet above the ground as the depth of the box in inches. If tall trees are available, hang the box against the trunk or from a branch by means of a hook screwed into the roof of the box. It's a good idea to put a guard around the tree trunk to prevent unwanted visitors from reaching the box. Or place your boxes on clothesline poles (above the flapping clothes), or on the side of buildings, a few feet below the roof. Try to find a location which is in the sun at least part of the day and turn the entrance away from the usual direction of wind and rain.

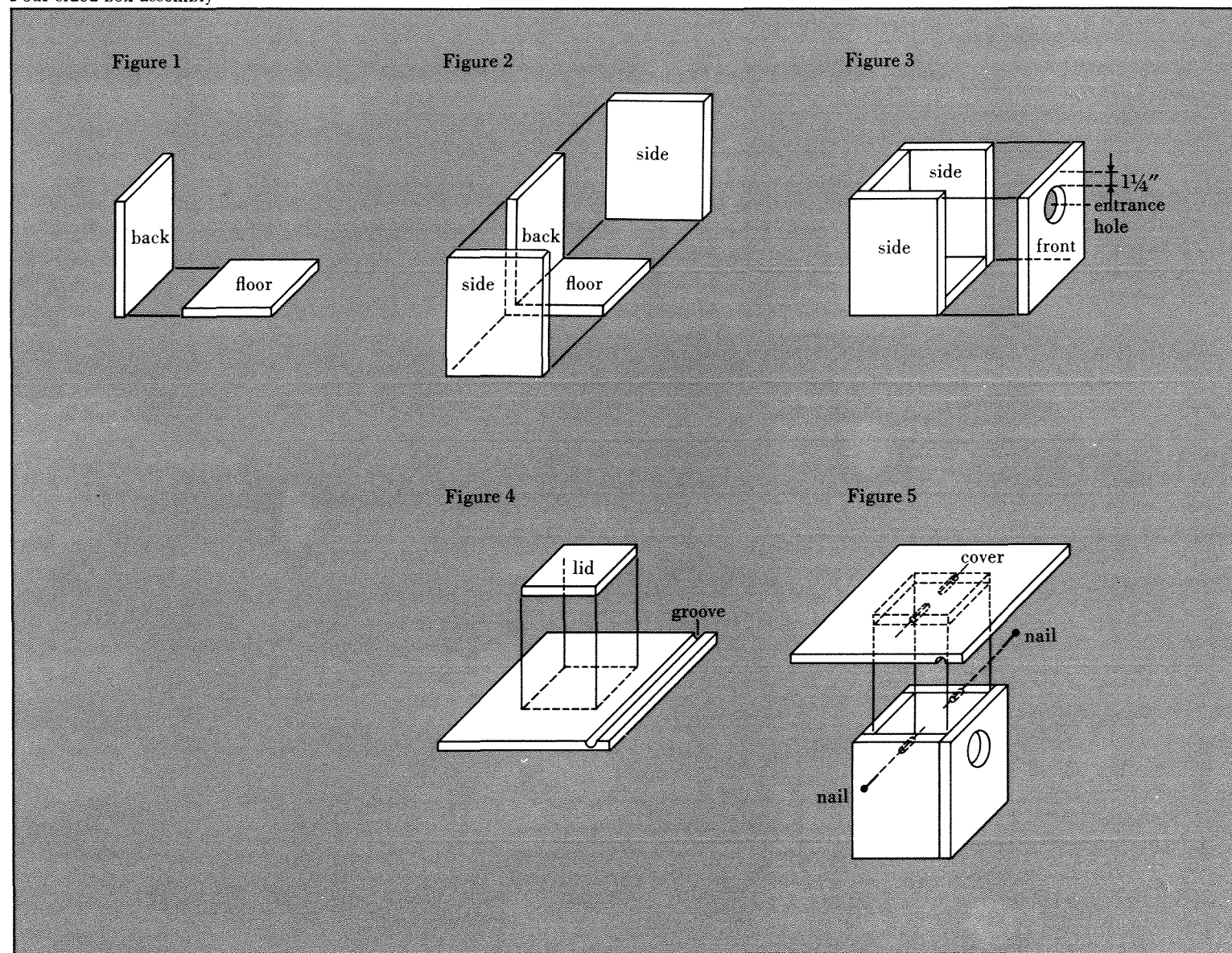
For *wrens*, build two or more boxes for each pair. One box will be used for nesting, the other will be filled with twigs and grasses. A pair will defend a territory of about one acre, driving away other wrens and occasionally trying to force out other species. As they will be busy filling the

Table 1
Dimensions for boxes for various species of birds with information on nesting

Species	Entrance hole diameter		Inside floor area		Height of wall panels		Min. height above ground		On pole or tree near shrubs	On pole or tree in open areas	Average territory no. of pairs per acre	No. of eggs in a clutch	Incubation period in days	Age when young leave the nest in days
	inches	cm*	inches	cm*	inches	cm*	feet	m*						
House Wren	1	2.5	2½ x 2½	6.3 x 6.3	6	15	6	1.8	•		1	6-8	13	12-18
Chickadee	1¼	3.1	3¼ x 3¼	8.1 x 8.1	8	20	6	1.8	•		1-2	6-8	12	16
Nuthatch												5-9	12	18
Downy Woodpecker												4-5	12	24
Bluebird	1½	3.8	4 x 4	10 x 10	10	25	7	2.1		•	1	4-5	12	15-18
Tree Swallow											8	4-6	14	16-20
English Sparrow											4	4-6	12	12-14
Red-headed Woodpecker	1¾	4.4	4½ x 4½	11.3 x 11.3	12½	31.3	10	3		•	2	4-7	14	25-28
Hairy Woodpecker	2	5.0	5 x 5	12.5 x 12.5	12½	31.3	10	3		•	1	3-6	14	24-26
Crested Flycatcher											1	4-8	15	13-15
Starling											4	4-6	12-14	16-18
Common Flicker	2½	6.3	6 x 6	15 x 15	15	37.5	10	3		•	2	6-8	14-16	25-28
Bufflehead											1	6-11	29	1-2
Screech Owl	3	7.5	7½ x 7½	18.8 x 18.8	17	42.5	15	4.5		•	1	4-5	26	24-26
American Kestrel												4-5	28	24-26
Wood Duck	3 x 4	7.5 x 10	10 x 10	2.5 x 2.5	20	50	8	2.4	•	•		10-15	29	1-2
Hooded Merganser	oval	oval									2	10-12	31	1-2
Common Goldeneye												10-12	31	1-2
Purple Martin	2	5	5 x 5	12.5 x 12.5	6	15	8	2.4		•	50	4-5	12-12	15-18

*Metric equivalents are straight conversions. You will, however, have to use the foot-inch measurements when buying wood from retailers until such time as they convert (possibly 1978).

Diagram I
Four-sided box assembly



extra boxes with nesting materials, the wrens are less likely to interfere with other birds nesting nearby, such as tree swallows.

Tree swallows are gregarious and will nest in boxes placed as close together as 10 feet. These boxes must be in open areas. These birds prefer boxes within sight of open water.

Chickadees prefer their nest boxes set close to shrubs or bushes. Unlike the tree swallows, each pair will defend an acre of territory against intrusion from other chickadees. They move so quickly and quietly during the nesting season that you often do not realize these birds are occupying your nest box.

With *bluebirds*, *robins* and other species which may attempt a second nesting, you must make a special effort to avoid an excessive number of parasites in the boxes. Parasites are common in most young birds, increasing rapidly in number as the season progresses. Young birds grow rapidly and leave the nest usually before parasites become a major problem. If, however weather and food conditions allow the adult pair to start a second clutch and if this clutch is started in the same box, already heavily invested with parasites, the young seldom survive. Give the female an opportunity to lay her second clutch in a clean nest by providing a second box. Attach the second box to a pole about 20 feet away from the first box. Do not set out this box until about nine days after the first young have hatched. This will minimize the chance of other birds using the box before the female is ready to lay, about one or two days before her first brood leaves the nest.

Common Flickers can be attracted to a nest box very easily provided the box is placed above any immediately surrounding foliage. Be sure to cover the bottom of the box with wood chips so the birds may shape a cavity for the eggs. Otherwise, the flickers are likely to peck away at and damage the box itself in order to make their own supply of chips. In western Canada, where both *Buffleheads* and flickers are found, there is some competition for the nest-cavities as both species use boxes of the same size.

Cavity-nesting ducks, the *Wood Duck*, *golden-eye*, *merganser* and *Bufflehead*, prefer a nest box near or standing in water. The young leave the nest within 48 hours, although they still cannot fly. The box must have a roughened area on the inside of the front panel so the ducklings can work themselves up from the rather deep floor of the nest box to the entrance. Horizontal sawcuts or a piece of wire screen attached to the inside wall between the floor and the entrance are essential. Once at the entrance, the young birds will tumble to the ground and immediately make their way to the pond or river.

Purple martins nest in colonies. Once established, they return year after year to the same nest boxes. They will use large, multiple-unit structures set in open areas which allow the adult

birds to swoop onto the nest sites. Be sure to keep the entrances covered until martins are spotted in the spring. Otherwise, sparrows or starlings will take over the multi-compartment structures; they are the only other species likely to do so. Once the nesting season begins, martins will probably be quite successful at keeping off invaders.

Materials

Use any wood which resists weathering for building nest boxes. Softwoods, particularly pines, are easy to work with, won't seriously split when nails are driven in and are very weather resistant. Avoid hardwoods, poplar and basswood as they have a poor resistance to weather. Normally one-inch lumber stock will do. A natural log effect can be achieved by using bits and pieces of wood with bark still intact. These mill-slabs can be found in most sawmills, lumber yards and firewood lots. Slabs are usually cheaper than rough or dressed lumber, which can also be used. Boxes made of dressed lumber must be stained with waterproof varnish if they are to last for many seasons. If you wish to paint your boxes, avoid bright colours; use natural and subdued browns and greens. Two-inch coated nails are recommended. Your box will last longer if sections are glued together with bond fast glue as well as nailed.

Four-sided box

Using the measurements given in Table 1, cut two identical squares of board for the floor and part of the lid. Cut a piece for the back panel the same width as the floor and the height given in the table. Cut two pieces for the sides. The width should measure the width of the floor plus the thickness of the back panel; the height is the same as that of the back panel given in the table. Cut the front panel as wide as the floor plus the thickness of the two side panels and the same height as the back and sides.

Thus, if all your dressed lumber is $\frac{3}{4}$ " thick and you wish to build a house for chickadees, you must cut your floor and lid $3\frac{1}{4}$ " wide and $3\frac{1}{4}$ " long. Your back panel will be $3\frac{1}{4}$ " wide and 8" high. The two side panels are 4" wide (the width of the floor, $3\frac{1}{4}$ ", plus the thickness of the back panel, $\frac{3}{4}$ ") and 8" high. The front panel is $4\frac{3}{4}$ " wide ($3\frac{1}{4}$ ", plus the thickness of the two side panels combined, $1\frac{1}{2}$ ") and 8" high.

You are now ready to assemble your nest box (see Diagram I). To avoid splitting the wood, it is advisable to drill all holes before nailing. Nail the back panel to one edge of the floor (Figure 1). Nail the sides to both the floor and the back panel, keeping the front edges of the sides flush with the front edge of the floor (Figure 2). Drill the entrance hole in the front panel to the size recommended in Table 1. Leave about $1\frac{1}{4}$ " between the top edge of the front panel and the top of the entrance hole. If the box is intended for ducks, nail a piece of wire screen

or cut horizontal marks on the inside of the front panel between the floor and the bottom of the entrance hole. Nail the front panel to the floor and both sides (Figure 3).

Cut a board slightly larger than the outside dimensions of the box. Make one groove along the underside, just in from one edge of the board. Nail the lid in the centre of this piece. These two pieces form the cover of the box (Figure 4) and the grooved section will form the overhang on the entrance side. This will prevent water dripping off the roof and into the box through the entrance hole. To secure this cover to the box in a way that it can be easily removed, drill a hole through the top centre of each side panel into the lower or lid part of the cover. Push a nail or peg into each hole to hold the cover in place (Figure 5). To remove the cover, remove the nails. Fasten the box to the pole, side of building or wherever it is to be located by a screw through the back or use square brackets.

Multi-compartment unit

To attract colonial birds such as Purple Martins to your garden, you should provide them with a multi-compartment nest. These large boxes, resembling high-rise apartment buildings, are more complicated and more expensive to build than the single unit houses. The extra effort and expense, however, would certainly be worthwhile if setting out such a box gives you the opportunity to study these birds as they glide about your garden, catching insects on the wing.

The basic principle of the martin box described here is to build separate units or floors, each made up of four compartments, and to mount one floor over the other. Each unit is fastened to the one below with screws, and the roof is attached to the top in the same manner. This will allow you to dismantle the entire structure, floor by floor, to clean out the boxes at the end of the season. It also permits the addition of other storeys as needed.

You can change the size of your structure by varying the number of floors used. Thus, a one-storey box would have nest sites for four pairs of martins; a five-storey unit could be used by as many as 20 pairs. Of course, the more floors you add, the heavier and more unwieldy becomes the structure and the costlier it is to build. A two- to three-storey unit should be adequate for a start.

Set out your martin house in an open area. This will allow the birds to swoop down to the entrances which are located on opposite sides of the structure. Mount the box at the top of a pole 20' or more in length for best results. Because they are out in open areas, exposed to lots of sun, martin boxes should be painted white to reflect heat.

Use $\frac{3}{4}$ " lumber for both the inner partitions and outer walls of the structure, but $\frac{1}{2}$ " outdoor plywood for the roof/floor sections.

Diagram II shows the basic components with appropriate measurements for a three-storey house. You may wish to make a more ornate structure with a slant roof, or perhaps design a unit with six or more compartments on each floor. Whatever, the basic building instructions will be the same.

For the three-storey unit, cut four pieces of plywood to dimensions given for section A. For the walls and partitions, you must cut six pieces of lumber to each of the dimensions given for B, C and E and three pieces of lumber to the dimensions given for D. Be sure to drill small holes near the upper edges of the outside walls, B and C. This will allow air to circulate through each compartment but high above the floor level, so the young will not be in a draught.

Build one floor of your structure at a time as shown in Diagram III. Begin by assembling the outside walls. Nail together two entrance wall sections C, and two side wall sections B, as per Figure 1. Next, assemble the inner partitions by nailing in a staggered position, one section E on either side of section D, (Figure 2). Insert these inner partitions between the outside walls (Figure 3) and then nail the whole unit to a floor section. You have now completed one floor of your multi-unit box. When you have assembled all three floors, mount one over the other, screwing each into place as shown in Figure 4 and top off the structure with the roof, which is also screwed on.

Finally, cut and nail two braces (F) to the bottom of your structure (Figure 5). These braces will be used to fasten the box to the pole.

Maintenance

Occasional and careful inspection of the boxes during the nesting season will add to your enjoyment of your project and enable you to control conditions in the nest. Do not inspect the box during the first five days of incubation, when the parent birds are attending the eggs. The adults seem quite susceptible to disturbances during this period and may readily abandon the nest. After this period, inspect the nest no more than once a day. Carry out the inspection as quickly as possible, preferably when the adults are away feeding. If any young have died in the nest, it is best to remove them as they will attract insects which may also attack the live young.

Records

For maximum enjoyment of your project, keep records of arrival and nesting and departure dates. This will allow you to compare records from year to year as well as provide useful information for the national Nest Record Card Program if recorded on the appropriate cards. These cards can be obtained by writing to the addresses provided for your particular area. The information from these cards is used by biol-

Diagram II

Multi-compartment unit house sections

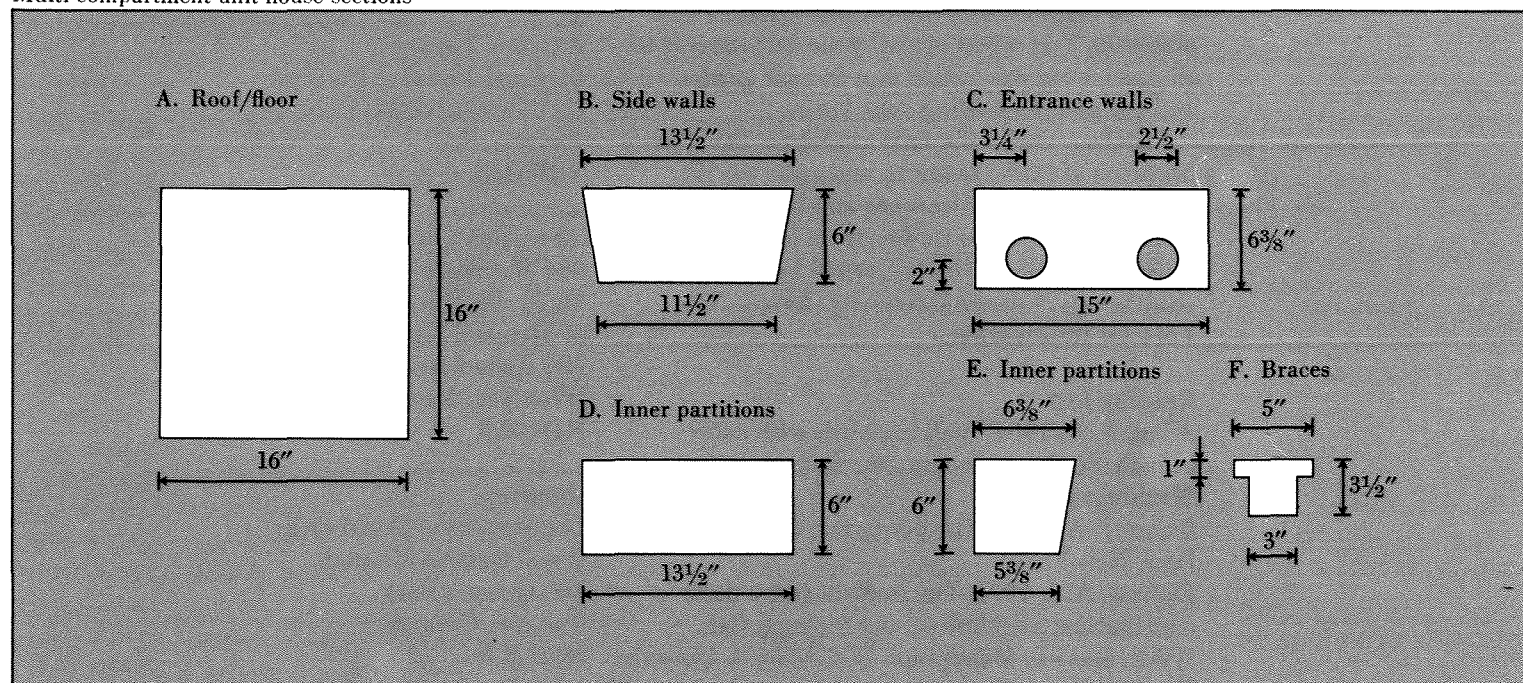
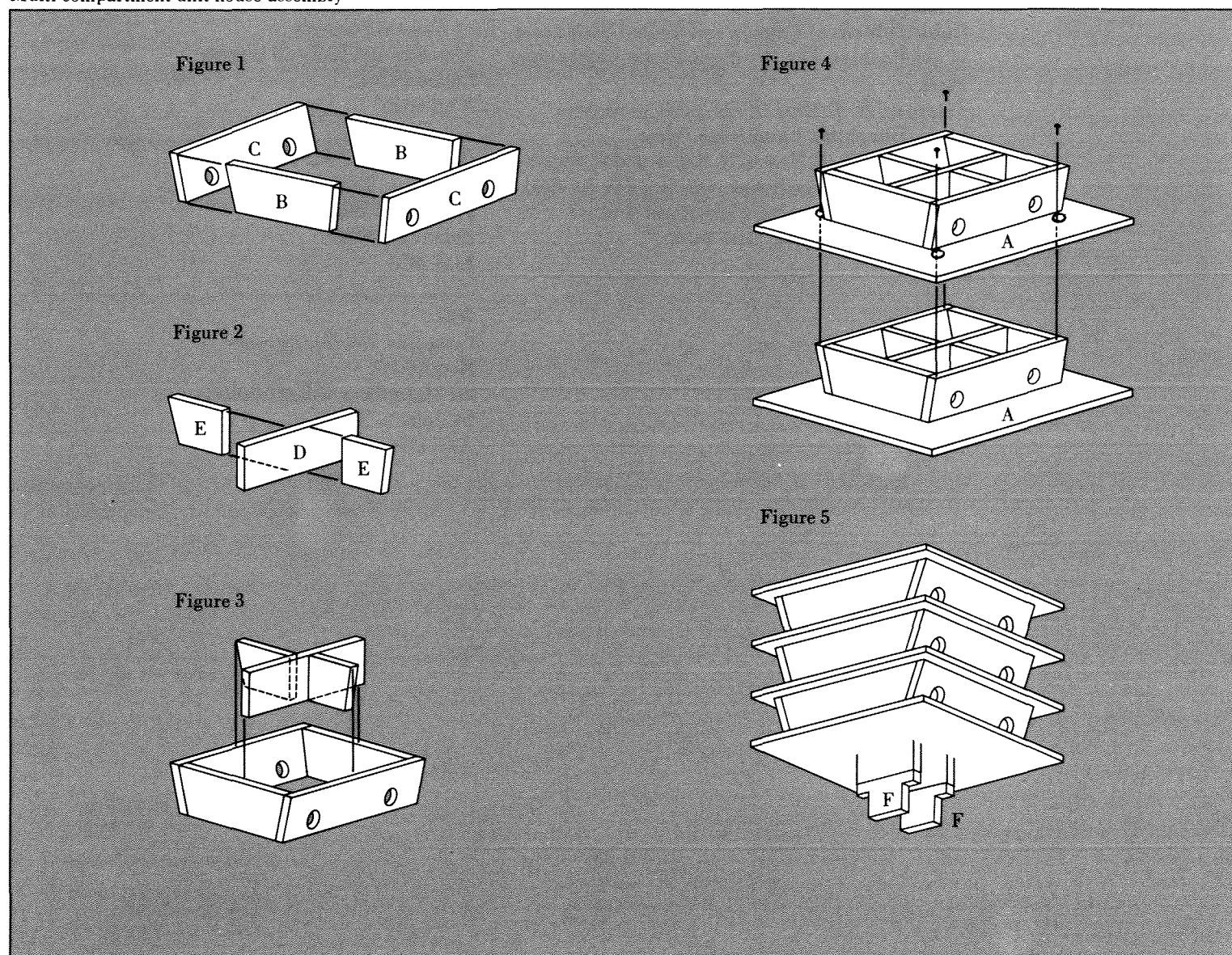


Diagram III

Multi-compartment unit house assembly



ogists and students to study population trends for birds in relation to environmental changes and pollution. You might extend your nest records to all species of birds which nest in your garden and not just those using your boxes.

Purchase one of the field guides for the identification of birds. Learn to recognize the different species by appearance and by song. Study their habits. A home-study course in ornithology is also available. Write to Cornell Laboratory of Ornithology, Cornell University, Ithica, New York for information.

Reading List

Allen, A. A. 1961. Stalking birds with color camera. National Geographic Society, Washington, D.C.

Baker, J. A. 1976. The peregrine. Harper and Row, New York.

Erskine, A. J. 1971. The Buffleheads — their distribution, populations and biology. Can. Wildl. Service. Monograph Series No. 4. Queen's Printer, Ottawa.

Ivor, R. 1968. I live with birds. Ryerson Press, Toronto.

Peterson, R. T. 1947. Field guide to birds. Guide to birds of Canada and United States east of the Rockies. The Riverside Press, Cambridge, Mass.

Peterson, R. T. 1961. Field guide to western birds. Houghton, Cambridge, Mass.

Robbins, C. S., B. Bruun, H. S. Zim and A. Singer. 1966. Birds of North America. A guide for field identification covering Canada and United States. Golden Press, New York.

Addresses for obtaining nest record cards

B.C. and Yukon:

Bird and Mammal Division
B.C. Provincial Museum
Victoria, B.C.
V8W 1A1

Alta., Sask., Man. and Mackenzie Dist.:

Manitoba Museum
of Man and Nature
190 Rupert Ave.
Winnipeg, Man.
R3B 0N2

Ontario:

Department of Ornithology
Royal Ontario Museum
100 Queen's Park
Toronto, Ontario
M5S 2C6

Quebec:

Ornithology Section
National Museum
of Natural Sciences
Metcalfe and McLeod Streets
Ottawa, Ont.
K1A 0M8

N.B., N.S. and P.E.I.:

Canadian Wildlife Service
P.O. Box 1590
Sackville, N.B.
E0A 3C0

Nfld.:

Canadian Wildlife Service
Room 611
Sir Humphrey Gilbert Building
St. John's, Nfld.
A1C 1G4



Fisheries and Environment Pêches et Environnement
Canada Canada

Issued under the authority
of the Minister of Fisheries
and the Environment
© Dept. of Supply and Services,
Ottawa, 1977
Catalogue No. CW66-48/1976
ISBN No. 0-662-00405-1
Design: Gottschalk + Ash Ltd.