A Simple, Inexpensive, and Mass-producible Research Blind

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ABSTRACT

We describe a research blind that is low-cost, easy to build, mass-producible, and easily modified. The blind is built from low-cost or free materials, and is easy to setup, maintain, and store. The basic design consists of lightweight wood-framed painted cardboard panels that can be carried into and assembled quickly in the field. The design can be sized easily or modified to fit a particular research need. Viewing ports can be added at any time, and openings are closed easily or permanently repaired. This design proved to be durable when subjected to harsh field conditions, including wet and windy weather. This design is ideal in situations, such as research stations, where a number of blinds are needed for long-term studies.

INTRODUCTION

Blinds have been used for hunting and observing wildlife for centuries. Ornithologists, in particular, have used blinds fashioned from all types of materials, including cardboard, plastic sheeting, sheet metal, cloth, alone or on frames built from pipe, PVC, and wood. Most blinds we have seen were developed for a specific study, or only for short-term use. Here we describe an effective, inexpensive blind that is easy to build and has many improvements over existing designs because it is constructed from readily available, free or low-cost materials, and is easy to transport, set up, maintain, and store.

We built ten blinds and used them over two field seasons in a study of Tree Swallow *(Tachycineta bicolor)* parental care behavior. We developed this blind because we could not find commercially available units that fit our needs, plus the cost of purchasing 10 blinds was prohibitive. Our blind was designed to meet our specific requirements, yet the design could be adapted easily to accommodate many research and photography needs. It would be excellent in situations, such as at field stations, where a number of blinds are needed for a variety of long-term research projects.

Design The easily modifiable design was developed from several descriptions of quick and easy blinds made from large packing boxes (Allen 1930, Peterson 1941, Rue 1984). The basic design consisted of four panels (183 cm h x 81 cm w; 72 in x 32 in) constructed from a lightweight wood frame (Figure 1A) covered with painted cardboard, and a roof of similar construction (Figure 2A and B). All of the wood pieces, with the exception of the ridge board, were made of 2.5 x 2.5 cm (1 in x 1 in) stock of differing lengths. This facilitated using production-line techniques to make multiple blinds with interchangeable parts. We purchased rough-sawn white cedar boards (2.5 cm thick; 1 in) purchased from a local mill which we ripped to width. The frame for the sides consists of 183 cm (72 in) stiles and 76 cm (30 in) cross rails held together at each joint with two 6.5 cm (2.5 in) decking screws driven into pre-drilled holes (Figure 1A inset). All of the cardboard used was obtained free-of-charge from grocery and furniture stores and lumber yards; proprietors cooperated by saving the material for us.

We painted the cardboard to make it more weather resistant. Paint was obtained from a hardware store at a fraction of the original cost by purchasing miscolored or returned paint which was recolored

free of charge once we explained our research plans. The cardboard was attached to the frame with 1.3 cm (0.5 in) staples, and the edges were covered with a strip of wood (4.4 cm x 0.6 cm; 1.75 in x 0.25 in) that was screwed to the frame through the cardboard using 3.2 cm (1.25 in) drywall screws. The edge of the cardboard between the frame and the covering strip was sealed using inexpensive latex caulk (see Figure 1B) to reduce the impact of rain. One of the four frames was used as an entrance door by attaching the bottom middle rail higher on the panel and leaving the cardboard below it unattached on three sides. The full width of the cardboard served as a hinge.

The roof base was 91.5 cm x 96.5 cm (36 in x 38 in) with two cross braces (Figure 2B). To the base we attached a 96.5 cm (38 in) ridge board (2 x 6 cm in cross section; 0.75 in x 2.25 in) and attached three roof joists on each side which were connected at their ends by a fascia piece (Figure 2A). Connections were made using 6.5 cm (2.5 in) decking screws in predrilled holes. For the roof, we used durable, water resistant, heavy waxed cardboard obtained from chicken packing boxes. The gable ends could be covered with cardboard as well, but we used a dark colored fiberglass screen which provided better ventilation.

Openings for observing or photography can be cut anywhere in the panels using a sharp pocket knife or a razor knife. We also cut approximately 50 x 20 cm (20 in x 8 in) flaps near the bottom of the panels for ventilation. If openings were only cut on three sides, bending the cardboard back into place allowed adequate closure when not in use. A more permanent solution is to glue a patch over the slits from the inside. We also attached removable wood shelves directly to the panel stiles for holding equipment. This size blind readily accommodates a standing person, or will hold a stool or lawn chair.

Fig. 1. Basic side panel construction plans including wood frame (1A) held together, with decking screws (shown in inset), and covered with painted cardboard attached to frame (1B). English equivalents for metric measures are given in the text.

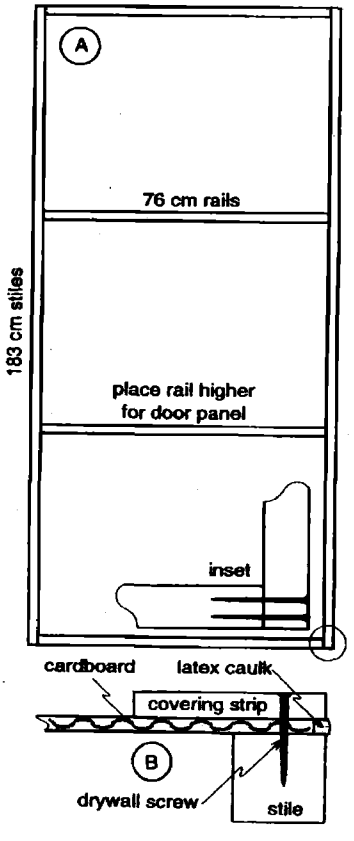


Fig. 2. Roof panel construction plans (2A), including base frame (2B). Roof was constructed using same techniques as side panels. English equivalents for metric measures are given in the text.

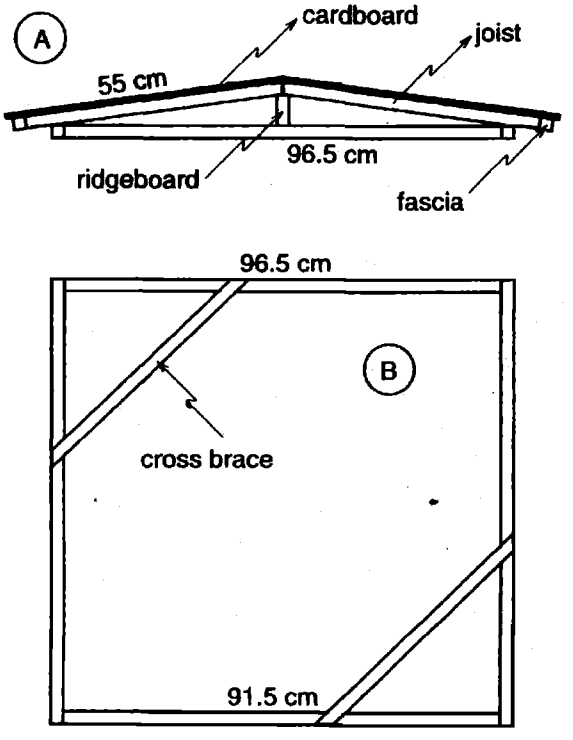
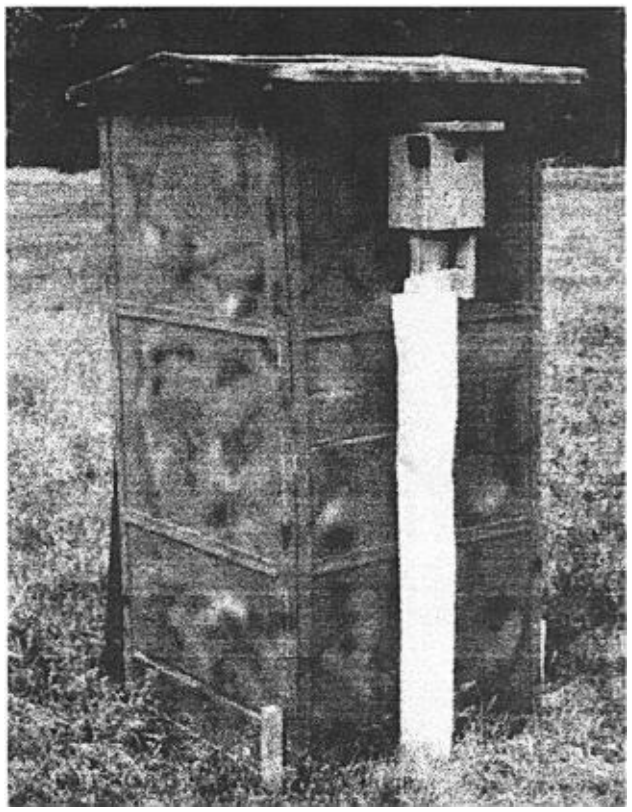


Fig. 3. Assembled blind shown in the field attached to Tree Swallow nestbox. Nestbox post is wrapped with high-density polyethylene to discourage climbing predators.



DISCUSSION

We developed this blind because our study required the blind be attached to the Tree Swallow nestbox situated atop a wooden post. The commercial blind we originally used was difficult to attach and required an additional sleeve between the blind opening and the nestbox. Our design allowed the blind to be snugged up against the nestbox and post (Figure 3).

To deploy blinds in the field, the four side panels were screwed together at two or three points along their intersection, using 6.5 cm (2.5 in) decking screws and a cordless drill. A manual screwdriver could be used; the cordless tool allowed more rapid and easier assembly.The roof was attached by screwing through the top rail of the side panels into the roof base cross pieces where they intersected. We secured the blind to the ground by driving two 4.5 cm x 4.5 cm x 60 cm (2 in x 2 in x 24 in) wooden stakes into the ground adjacent to opposing bottom corners of the blind and screwing through the stake into the side panel stiles (Fig. 3).

We began deployment on the day after the young in the focal nest hatched. We used the recommended staged deployment technique (Hosking and Gooders 1974, Kinne 1979, Rue 1984) to allow ample time for the adults to become accustomed to the blind. The blind was first placed approximately 10 m from the desired nestbox. After approximately 24 hr it was moved to within 3 m, and on the third day the blind was attached to the nestbox. Initial set up took less than 10 minutes, and we simply carried the blind to the spot where it was first deployed. Final attachment to the nestbox took approximately 20 minutes, mainly because prior to final attachment to the nestbox we had to modify the nestbox so it would open from both the front and back (now inside of the blind). If the nestboxes were already modified, final deployment would have taken less than five minutes. Adult Tree Swallows readily accepted the blinds, sometimes returning to feed young within several minutes of attachment to the nestbox.

During 1991, we used five blinds deployed for a total of 74 days (14.8 days/blind, range 13-17 days). During 1992, we used 10 blinds deployed for a total of 215 days (21.5 days/blind range 14-27 days). Five of the blinds used in 1992 were the same as those used in 1991, so the total use for these five blinds averaged about 35 days. The blinds were subjected to a variety of weather conditions including severe summer thunder storms and continuous wet weather for more than 24 hours. During 1991, 9.2 cm of rain fell during the period that the blinds were in the field; and in one 24-hr period, over 5.8 cm was received. During 1992, 9.9 cm of rain was received, and one 24 hr period received nearly 5 cm. The blinds were located in open fields and experienced winds in excess of 32 km/hr, recorded on a hand-held Dwyer wind meter. We experienced no problems due to adverse weather conditions. As a further test of durability, one blind already used during both 1991 and 1992 was deployed in 1993 for over four months (34.9 cm of rain). Although the cardboard panels in most blinds absorbed water during rain events and began to buckle after repeated wetting, they did not separate from the frames, and no structural problems were encountered.

The cost in 1997 dollars to build one blind is approximately $30.00. Substantial savings can be

realized if lumber is purchased from a local mill and if paint and caulk are purchased on sale. In some areas, recycled paint and salvage lumber may be an option. The time factor to build a blind will vary depending upon the experience of the builder and the facilities and tools available. We had a fully equipped shop and experienced personnel, and the blinds each took approximately four to five hours to complete. At a minimum, a power saw and drill are required, and a cordless drill for rapid field deployment is almost essential. Basic painting equipment is also needed. A table or radial arm saw will help ripping boards to width for stock material and an assembly table made from saw horses and a sheet of plywood was useful.

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