

My results show that color bands were not a critical cue to White-crowned Sparrows for recognition of individual birds. If birds had been using color bands as cues, interactions would have occurred between individuals in the opposite manner of previous interactions. Since the numbers of interactions below the diagonal (R's) in the dominance matrix did not increase, I conclude that the birds were using a different method of individual recognition than the color bands.

Burley (Science 211:721-722, 1981) found that Zebra Finches (*Poephila guttata*) selected mates based on band color. Zebra Finches naturally have orange legs, and the preferred band colors were red and orange. It is not surprising that species with colorful legs would respond to colored leg bands. The legs of White-crowned Sparrows are not brightly colored, and there is no a priori reason to assume they would respond to changes in color on their legs.

Guhl and Ortman (Condor 55:287-298, 1953) found that disguised features of the head and neck were more effective in producing a loss of recognition between domestic chickens (*Gallus gallus*) than were those of areas of the trunk. In other studies (unpubl. data), I found that White-throated Sparrows made initial mistakes in individual recognition after head markings were altered using colored pens. In light of the present study, it is likely that individual recognition in White-crowned Sparrows is based on characteristics located elsewhere on the body, posturing of the body, or vocal attributes.—DORIS J. WATT, Department of Zoology, University of Oklahoma, Norman, Oklahoma 73019. Received 20 May 1981; accepted 13 Oct. 1981.

An Easily Assembled Tree-top Blind.—Ethological studies of canopy nesting birds are often difficult to conduct because of the need to build blinds at tree-top height. A blind must accommodate the needs of the observer and the sensitivity of the birds. Blinds should be of simple construction because the builder must deal with limited maneuverability, fatigue, and safety problems. Generally the more elaborate and intrusive a blind is, the greater the disturbance to the birds. Blinds described in the literature are for use on the ground (Robins, Bird-Banding 43:218-219, 1972; LeCroy, Bird-Banding 46:166-168, 1975) or on top of a tower (Herrick, Auk 49:306-323, 1932; Pettingill, Ornithology in Laboratory and Field, 4th ed., Burgess Publ. Co., Minneapolis, Minn., 1970). Tree-top blinds of which I am aware are generally suitable only for short photography sessions, or are heavy complicated structures that must be laboriously constructed over a long period of time. I present here a design for an inexpensive blind that can be rapidly and easily assembled by one person.

I have used 2 tree-top blinds in a study of the breeding biology of Bald Eagles (*Haliaeetus leucocephalus*) in northern Saskatchewan. The blinds were 25 and 26 m above ground in white spruces (*Picea glauca*). They were usually occupied for 10 h at a time, and easily supported at least 82 kg even during strong winds (about 35 km/h) without noticeable stress to the materials or the trees. The trees used were approximately 20 cm in diameter at blind level. I cannot recommend a safe minimum size of tree-top suitable for all species, but I suspect that diameters less than 20 cm could prove dangerous. To date my blinds have remained in place for 2 summers and 1 winter and show no signs of deterioration.

Materials and preparation.—The key component is a section of galvanized steel tower of the type commonly used to support television antennas. It is sold in 3 m sections which may be cut into thirds with a hacksaw to produce supports for 3 blinds. One-third of a section consists of 3 tubes encircled at 2 points about 46 cm apart by flat metal braces. At one end of one of these I made 2 orthogonal saw-cuts along each of the tubes (see insert Fig. 1). These cuts allowed the tube-ends to be bent backwards (during assembly) forming an effective flange which secured the platform. Three pieces of 6 mm rope, 4 m long, were used to tie the tower section to the tree.

A piece of 10 mm thick plywood, 1.2 m × 1.2 m was used for the platform. As this by itself was not strong enough to bear the weight of an observer, and since thicker material was too heavy to haul up a tree, support was largely provided by two 1.3 m

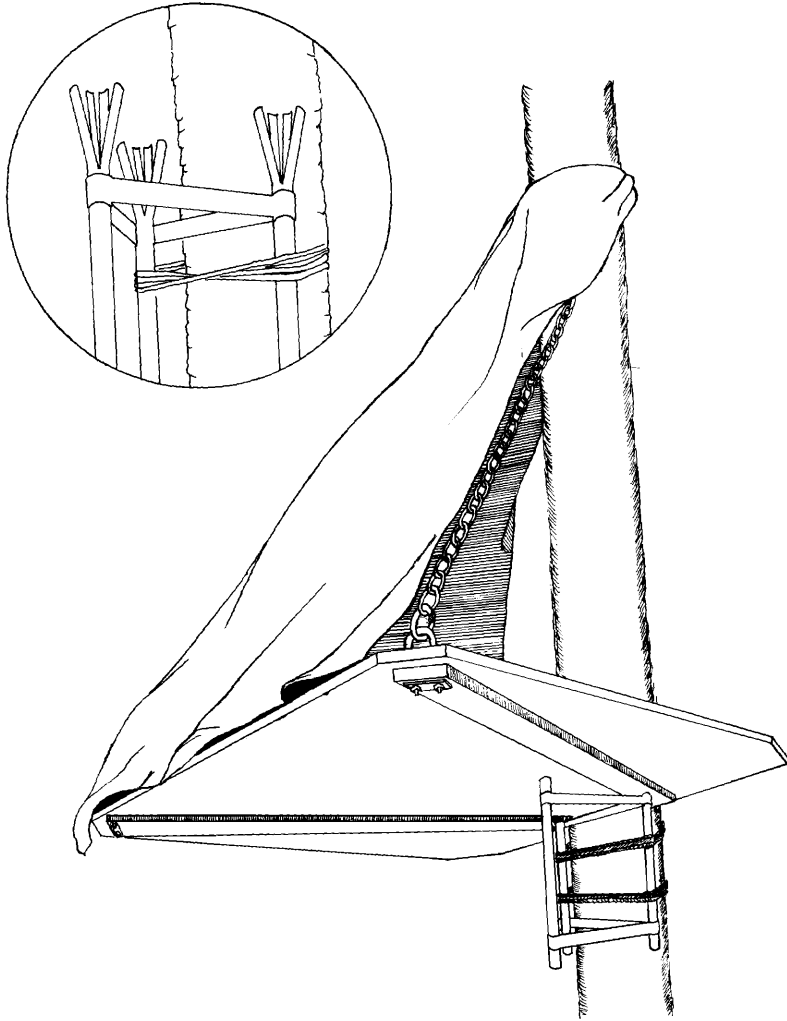


FIGURE 1. Assembled blind with the canvas loosely draped around. The inset is of the top of the tower section on which the platform rests, with flanges separated for illustration.

lengths of "2 by 4" (about 4×9 cm) lumber (Fig. 1). A few nails were sufficient to hold these pieces together. Using the tower as a template, I drilled 3 holes approximately 5 cm in diameter through the platform, 1 passing through each of the 2 by 4 supports and the third through the plywood alone. At each of the corners farthest from the tree, I drilled 2 holes a few cm from the edge through both the plywood and lumber, into which I inserted 6-cm-wide U-bolts.

To suspend the platform I used two 3.5 m lengths of 5 mm coil chain. I chose chain

because there is no danger of a knot slipping, or fibers fraying, decaying, or being chewed by mammals.

About 3.6 m of 152 cm wide green canvas was sufficient material to drape over the chains. Some trimming and patching was necessary to form the canvas into the triangular shape of the blind. A drawstring was sewn into the cloth at the top of the blind.

Construction.—Before construction began I prepared the blind tree for an easy and rapid ascent by driving 25 cm spikes into the tree at 50 cm intervals upward in a zig-zag fashion to the first limb that would support my weight. This did little damage to the trees.

A blind should be installed in stages to minimize trauma to the nesting birds. At each step a contingency plan for removing the most recent addition should be considered in case the subjects react adversely to the presence of the new material. I built my blinds in 5 work periods over 8 days. Each period consisted of only 5 to 15 min of construction time. After each session I withdrew from the area of the nest to a distance at which my presence would not disturb the birds; I remained there until convinced that the blind was accepted. My activities were ordered as follows. (1) On the first climb I carried the tower section, some rope, and a small saw. After pruning a few branches at the site where the blind was to be built, I loosely tied the tower to the tree trunk. (2) I secured the tower section to the tree with rope, and drove a 15 cm spike through one of the flat metal braces into the tree (the latter may not be necessary). While standing on the tower I wrapped 1 end of each of the 2 lengths of chain around the trunk about 2.5 m above the tower. This end was secured by joining the terminal and 1 other link (against the trunk) by means of a 6 mm screw-tight connecting link. The loose end was left to hang until needed later. A single length of chain, the middle of which would wrap around the tree, could have been used, but I found 2 easier to manipulate. (3) I hauled the platform up the tree with a rope tied through both U-bolts. It was then lowered onto the tower such that each tube passed through one of the 3 holes of the platform. I partially bent back 1 or 2 of the flanges to temporarily prevent the wood from dislodging (yet allowing for easy removal). I then attached the free ends of the chains to the U-bolts with 6 mm screw-tight connecting links. (4) I permanently anchored the platform by hammering flat all of the flanges. I fitted the canvas by first tying the drawstring tightly around the tree at the point where the chains wrap around, then draping the material over the links and stapling the edges to the wood. (5) I further secured the canvas, and increased the area inside the blind by propping a stick near the top to hold out the canvas.

I have observed through 1-way windows and peep-holes but prefer the former. The windows I used were of thin plastic reflecting film (such as is used to decorate the windows of vans) affixed to plexiglass. A window was installed effectively by first covering the edges of the plexiglass with heavy cloth tape leaving a flap of tape extending all the way around. I cut a hole in the canvas and attached the tape of the window to the cloth with large safety pins. It was important to install the window after the canvas had been secured to the blind as it was difficult to predict where it should be placed.

The weight of the observer was borne safely by the tree along the length of the tower. Because of its triangular shape, the tower section provided a great deal of stability; there were no problems with twisting in the wind or sliding. Blinds of this design can potentially remain functional for years as little damage is done to the blind tree and most of the materials do not deteriorate. The basic structure could perhaps be modified to serve as a nesting platform to encourage species, particularly raptors, to nest in areas where nest-sites are limited.

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