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# Construction of Portable Net Poles and Transport Containers

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Since mist nets were first introduced to North America in the late 1940s (Austin 1947), several types of portable net poles have been used (Bubb 1960, Peterson 1960, Bleitz 1964, Ludwig 1968, Howell 1969, Castrale and Karr 1981, Jackson and Schardien 1982, Trichka and Varza 1982, Keyes and Grue 1982). The most common pole now used for this purpose is a 10-ft length of electrical conduit of ½- or ¾-in diameter. Transporting this length is difficult without a truck or station wagon, however, and most small aircraft are too small to accommodate objects much over 6 ft. in length.

I devised simple methods to modify 10-ft portable net poles and construct containers in which the poles can be transported or shipped by commercial means. These procedures were developed specifically for a research project on the Kirtland's Warbler (*Dendroica kirtlandii*) in the Bahama Archipelago, West Indies, where mist nets had to be moved from place to place on an island and from island to island. Others may also find these procedures useful for their banding operations and research projects.

The tools and materials needed to construct the net poles and the transport containers are listed in the table. Electrical conduit is available at most hardware and at all electrical supply stores. Four-inch polyvinylchloride (PVC) pipe and 4-in PVC fittings are commonly used for sewage systems and are available at most plumbing supply companies. The 4-in PVC pipe and ⅝-in diameter steel round stock (rod) are available in 20-ft lengths, but many companies will cut and sell shorter sections. Hardwood dowels are much less satisfactory than steel or aluminum rods because they often break when the net is stretched tight and they also swell when wet so that they must be broken to take the poles apart. Schedule 40 PVC pipe is recommended because it is thick walled and less subject to cracking or breaking.

The mist net poles were constructed by placing the conduit in a bench-mounted vise and cutting it into 57- and 63-in lengths. The cut ends were smoothed on the outside with a flat metal file and on the inside with a rat-

tailed metal file. The cut ends were beveled just enough to remove sharp jagged edges. The ⅝-in steel or aluminum rod was cut into 12-in pieces and the midpoint of each 12-in section marked with a pencil. Each section of rod was beveled slightly at both ends to remove the sharp edges and to make it easier to insert into the conduit. One of the 12-in rods was then tapped halfway into an end of the shorter piece of conduit with a hammer. Using the steel punch and hammer, four indentations were made in the wall of the conduit where the 6-in section of rod had been inserted. Two indentations were made in line at 1 and 4 inches from the end of the conduit and the same done on the opposite side. These 4 indentations in the thin-walled conduit prevent the rod from moving. These indentations (in lieu of nuts and bolts or screws) permit the loops of the mist net trammels to be moved unimpeded up or down the poles and eliminate entanglement of the net on sharp edges or projections. To assemble the mated pieces of conduit for the full 10-ft length of pole, simply slide the longer section over the exposed 6-in rod until the two sections of conduit meet.

The transport or shipping container is made from a section of 4-in PVC pipe cut with a hacksaw to 61 in. Slightly bevel the cut inside and outside lips with a wood file to remove the rough edge. Cut a 4-in circle of 2-in foam rubber with a knife (or scissors) and insert flush into one end of the 4-in pipe. Glue the 4-in slip-joint cap over the same end of the pipe with PVC cement. At the opposite end of the pipe, glue the 4-in coupling in place with PVC cement (schedule 40 PVC pipe requires a coupling to connect the clean-out fitting). Then, remove the threaded cap of the clean-out fitting and glue the fitting to the coupling with PVC cement. When gluing the fitting to the coupling, make sure that no PVC cement gets on the threads. If it does, immediately wipe the threads clean before the cement reacts with the PVC, otherwise it will damage the threads and the screw cap may not seat properly. Cut a second 4-in circular piece of 2-in foam rubber to insert into the clean-out fitting after the container is loaded. The container constructed is now complete and ready for use, since the PVC cement sets in several minutes.

Each transport container holds 10 sectioned poles (20 pieces—enough for 5 nets using 2 10-ft poles per net), weighs about 48 lb fully loaded if steel rods are used (43 lb with aluminum rods), and has an overall length (with threaded cap in place in the clean-out fitting) of 67½ in and a maximum diameter (where fittings are attached) of 5¼ in. The container will hold 12 sectioned poles, but with that number it is difficult to get them in and out of the tube. The two foam pieces fill the excess space at the ends of the container and help reduce movement and noise when poles are transported. This container is compact, easy to handle, and easy to load and unload. It keeps the poles together, affords protection to the poles, and eliminates any exposed sharp metal edges.

## Acknowledgments

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## Tools and materials for construction of portable net poles and transport containers.<sup>1</sup>

### Tools Needed

Hammer	12-in wood file
4½-in steel punch	8-in rat-tailed file
Knife or scissors	6-in flat metal file
Measuring tape,	10-in hacksaw
6 ft or longer	Graphite pencil

## Materials

### Portable Poles

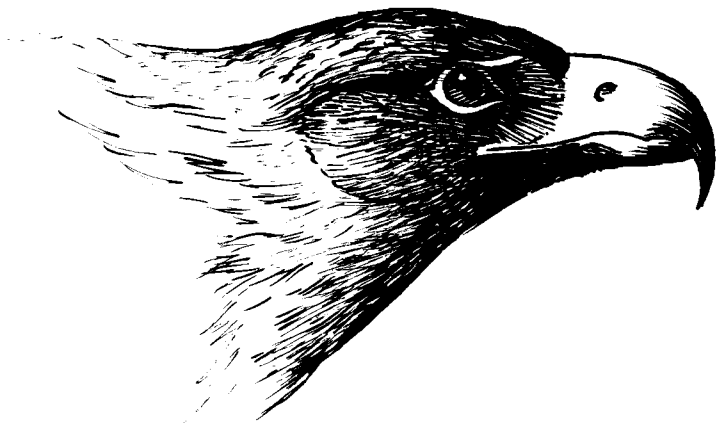
- 10-ft ½-in (diameter) galvanized thin-walled electrical conduit<sup>2</sup>
- ⅝-in (diameter) smooth hot-rolled steel round stock or ⅝-in (diameter) aluminum rod

### Transport Containers

- 4-in (diameter) schedule 40 polyvinylchloride (PVC) pipe
- 4-in PVC coupling
- 4-in PVC slip-joint cap
- 4-in PVC clean-out fitting with threaded cap
- Heavy duty clear PVC cement
- 2-in (thick) foam rubber

<sup>1</sup>English units of measure are given because all tools and materials used were of that system.

<sup>2</sup>The inside diameter of what in the construction trade is called ½-in thin-walled conduit is actually ⅝ in.



The E. Alexander Bergstrom Memorial Research Fund of the Northeastern Bird-Banding Association, Inc., promotes research on birds. Small grants, usually not exceeding \$200, are available to cover expenses (but not salaries or overhead charges to institutions). Details and application forms may be obtained from Dr. Valerie M. Freer, Chairman, NEBBA Research Committee, Science Department, Sullivan County Community College, Loch Sheldrake, NY 12759. Deadline for applications is 15 February 1986.