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NEST MONITORING USING A MICRO-VIDEO CAMERA

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Abstract.—A system is described that utilizes a battery operated micro-video camera mounted on an extendible pole for monitoring high nests. The video image is transmitted to a hand-held monitor at ground level and provides accurate information about the contents of high nests.

MONITOREO DE NIDOS UTILIZANDO UNA MICROGRABADORA DE VIDEO

Sinopsis.—Se describe un método que utiliza una micrograbadora de video portátil, montada en una vara, para monitorear nidos construidos a alturas considerables. La imagen transmitida a un monitor portátil permite obtener información detallada sobre el contenido del nido.

Studies involving breeding birds often require periodic nest monitoring. For non-cavity or cupped nests, researchers have commonly used pole-mounted mirrors to examine the contents of overhead nests (e.g., Best and Stauffer 1980, Conner et al. 1986, Nichols et al. 1984, Patonde and White 1992). With this method a mirror attached to the end of a pole is raised to a position above the nest where the image reflected in the mirror reveals the nest's contents. Mirrors often are difficult to use, however. As the distance to the mirror increases, the reflected image becomes more difficult to discern; for higher nests this becomes an obvious problem. To counter this problem a larger mirror could be used. Larger mirrors add undesirable weight and make the pole less stable and difficult to maneuver. Dense vegetative cover associated with some nests can make access by larger mirrors impractical. Another problem is that birds may attack the image in the mirror. In light of these problems we used micro-video cameras to monitor nests in our studies of birds nesting in bottomland hardwood forests. These small, lightweight, rugged units have proven efficient for monitoring nests inaccessible to pole-mounted mirrors.

We use a system composed of a micro-video camera attached to a fiberglass pole extendible to 13.6 m (Crain Enterprises model # MR-STD-13.6). The video image is conducted to a portable hand-held monitor at ground level. Both the camera and the monitor are powered by a small rechargeable 7.2 V battery (typically found in hobby shops). We mount the camera to a 20 cm length of 1.25-cm (diameter) flexible copper tubing that is attached to the end of the pole with hose clamps. The tubing is attached so that approximately half of its length extends beyond the end of the pole. The camera is mounted onto the end of the copper tubing with two large rubber bands. The flexible tubing allows the camera to be turned easily in any direction.

We use a SuperCircuits model PC-3 camera. This model is 7 cm (H) × 4.6 cm (W) × 2.3 cm (D) and weighs 37.5 g. It comes with a minimum focal length of 15.25 cm but may be adjusted to shorter lengths. It has a horizontal resolution of 240 lines and is operable under light conditions between 2 and 100,000 lux. It is a black and white camera, but more expensive color models are available. The monitor we use is an LCD Citizen M329 Mark II, with a screen size of 57.1 × 42.6 mm (94608 pixels). It is 80 mm (H) × 91 mm (W) × 27.1 mm (D) and weighs approximately 130 g. Both monitor and camera are wired with plug-in connections that allow easy hook up to the battery source. We use a Tandy 7.2 V, 1200 mAh rechargeable Ni-Cad battery pack (Tandy cat. no 23-230A). It is compact, 13 cm (L) × 5 cm (W) × 2 cm (D), light weight, 315 g, and easily carried in the field. This battery provides over 1 h of use. A slightly larger 8.6 V battery will power the system for approximately 3.5 h.

The camera at the top of the extendible pole is connected to the monitor and battery with flexible wire. We recommend multistranded wire that can withstand the bending and unbending associated with operation of the unit. We coiled the wire between two pegs, which were mounted on the bottom section of the pole. The total cost for the system was approximately $760 (US) with the pole being the most expensive item at $320. The camera we use cost $210, the monitor cost $195 and the battery cost $14. The remainder of the system cost was for miscellaneous wiring.

For field use one observer raises the camera into position above the nest while a second observer uncoils the wire going to the camera and views the monitor. When the contents of the nest are observed this process is simply reversed. We successfully used this system to monitor nests up to 13 m high in bottomland hardwood forests in Louisiana. We found the resolution was sufficient to allow us to easily determine the difference between cowbird and host eggs and to determine feather growth, which we use in estimating age of nestlings. The response of the birds to the camera was minimal, and sometimes a bird had to be flushed from the nest for us to see the contents. With mirrors, the birds often flushed earlier or even attacked the mirrors. The weight of the camera was much less than the weight of the mirrors we have used, and we doubt we could have controlled the pole at the higher nests using mirrors. The system we describe because of its small size, ease of use, good resolution, and the option of videotaping the nest contents for further study and documentation is effective in monitoring the contents of bird nests.

Systems employing similar micro-video equipment could be used as productive tools for field biologists in other ways. There are many brands and models of cameras and associated equipment to choose from with varying degrees of light sensitivity (some with infrared capabilities), resolution, and price. The large array of available products should allow researchers to adapt this type of equipment to their specific needs.

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