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TECHNIQUES FOR CAPTURING BIRDS INSIDE NATURAL CAVITIES

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Abstract.—Techniques developed over the course of a long-term study of Acorn Woodpeckers (*Melanerpes formicivorus*) for reaching and opening nest and roost holes and for capturing adults at natural cavities are described. Holes are reached using ladders or technical climbing gear. Cavities are opened by sawing removable "doors" that allow one to reach inside and can then be nailed back in place. Adults are captured by trapping them at nests or roost holes by means of a plastic bobber set so as to allow one to block the cavity entrance by pulling a string from the ground. These methods help make the capture and study of birds using natural cavities practical.

TÉCNICAS PARA CAPTURAR AVES DENTRO DE CAVIDADES NATURALES

Sinopsis.—Se describe el método desarrollado, a través de un largo estudio del carpintero *Melanerpes formicivorus,* para allegarse a una cavidad, abrirla y capturar adultos en éstas. Se llega a las cavidades utilizando escaleras o equipo para trepar postes y/o árboles. Luego las cavidades son abiertas serruchando "puertas" removibles que le permiten a uno llegar al nido y luego repararlo clavando la madera removida. Los adultos son atrapados cuando éstos se encuentran en la cavidad. Cuando el ave está adentro se cubre la entrada con un tapón plástico arreglado en tal forma que la acción se pueda llevar a cabo halando una fina cuerda desde el suelo. Este método ayuda a capturar y a estudiar aves que utilizan cavidades, de una forma práctica.

As a result of the difficulties associated with studying birds nesting in natural cavities, most research performed on cavity-nesting birds involves the use of artificial nest boxes. Such boxes differ from natural cavities in several ways including size, density, and vulnerability to predators and parasites (e.g., Nillson 1984). The use of boxes also restricts workers to secondary cavity nesters that use already existing holes, rather than primary cavity nesters that excavate holes themselves. Here we summarize techniques for reaching nests and roost holes, opening cavities and capturing adults. These techniques were developed in the course of our work on Acorn Woodpeckers (*Melanerpes formicivorus*) at Hastings Reservation, central coastal California. Our goal is not to provide complete details concerning safe climbing techniques; for these, workers should consult

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directly with qualified technical climbers. Rather, we hope that this information will help facilitate study of other species nesting in natural cavities.

REACHING NATURAL CAVITIES

Natural cavities, used for either nesting or roosting, suffer the initial problem of often being high up in trees. We use several methods to reach nests depending on the kind of tree, the height of the hole, and the condition of the limb in which they are located. Acorn Woodpecker nests at Hastings are generally in oaks (*Quercus* spp.) or sycamores (*Platanus*); both these taxa grow major limbs irregularly at odd angles rather than having a single main trunk that grows straight up, as in most pines (*Pinus* spp.). Thus, "tree grippers" or sectional tree climbing ladders, such as are available from forestry supply companies, cannot be used. We also do not recommend using climbing irons, as these damage trees and are difficult to use.

If the hole is either located in, near, or below a limb capable of sustaining a person, we generally reach it with the aid of basic rock-climbing gear (see also Seginak 1990). Initially, a thin line of twine is thrown over a suitable limb using a 0.2-kg circular lead fishing weight. The twine is then attached to a climbing rope, which is pulled up and over the limb, back to the ground, and secured. The rope is then climbed using Jumar ascenders. If the cavity is above the limb over which the rope hangs, additional distance along or up the limb to the hole is traversed while "clipped in" to pieces of tubular webbing that have first been tied in a loop and then wrapped around the tree with one end put through the other end. By putting a carabiner on the free end and attaching it to one's climbing harness, one can then move along a limb section or even hang from the limb with no danger of falling off the limb. Safety lines, when needed, can be attached to nearby limbs. Descent is accomplished by rapelling using a "figure 8," again available commercially.

Holes that are located in rotten limbs well above or away from a limb capable of sustaining weight must be reached using ladders. At Hastings, we typically use 6-m aluminum extension ladders for low nests and a 12-m aluminum extension ladder for higher nests. Nests that cannot sustain even the weight of an aluminum ladder can generally be reached using either a ladder suspended vertically using four guy lines (Rohwer 1988) or an extension ladder supported by a large step ladder. We have reached nests up to 15 m high in rotten limbs by leaning a 12-m extension ladder up against a 5-m step ladder and then lifting the former up along the latter until it reaches the nest and then tying the two ladders together with webbing. With the aid of one or two assistants to stand on the bottom of the step ladder and keep it from falling over, one can then climb up to the top of the extension ladder while exerting virtually no pressure against the tree itself. Obviously, this technique is not for the faint of heart.

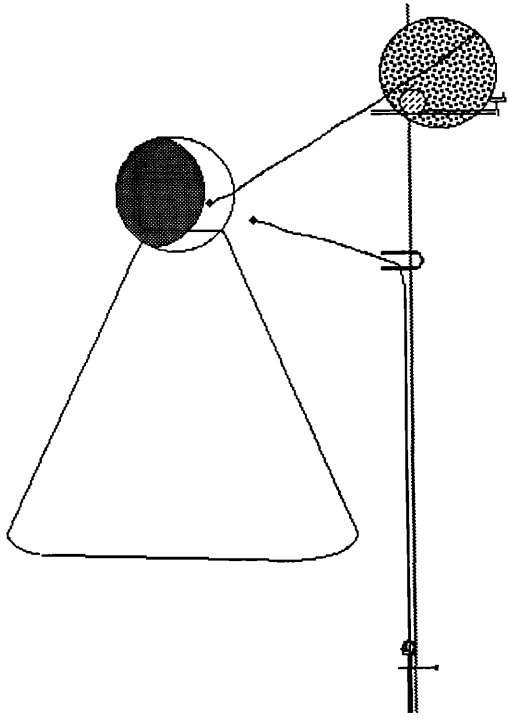

FIGURE 1. The finished ambusher showing triangular "door."

OPENING NESTS AND ROOST HOLES

We frequently check inside holes using a flexible light and a small dental mirror, but ultimately saw open holes below the actual nest cavity entrance (see also Erskine 1959). Although every situation is different, we offer some basic guidelines. First, if a nest is to be cut open, it is best to do it before or soon after the eggs hatch. It is desirable to gain some idea of the depth of the cavity before making the cut to ensure that the nest contents are not damaged in the process and that they can be reached after the door is made. Often a long stick or grass stem is adequate for this purpose.

To open a nest or roost hole, we generally cut a triangular door below the cavity entrance (Fig. 1) using a folding pruning saw for the main cuts and a keyhole saw, Swiss Army knife saw, or drill to turn the corners. The door can be held securely in place using nails. Cuts should be angled so that the door cannot fall inwards. If any large gaps remain after the door is replaced, they can be filled with glazing compound, which can be bought in gray so as be relatively inconspicuous. Deeper holes can be cut as shown in Figure 2. Opening holes in weak or rotten wood can be

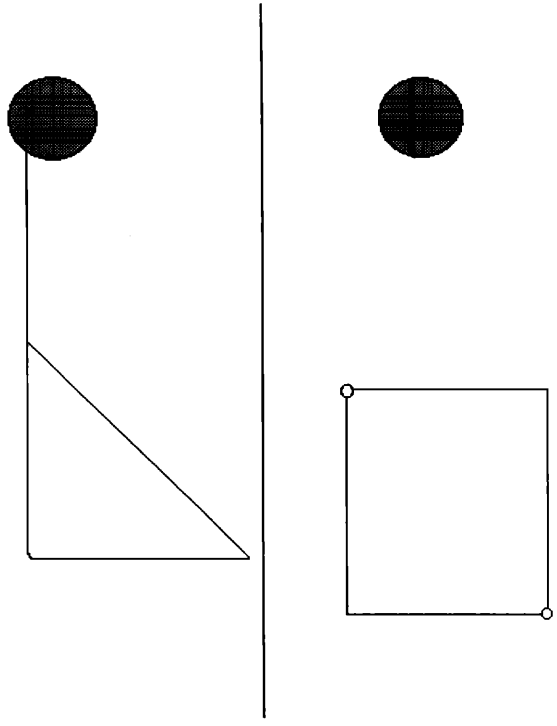

FIGURE 2. For deep cavities, it is necessary to place the door far below the cavity entrance. a) If a drill is not available, a long vertical cut can be made to lower the door. Such cuts heal very quickly. b) If a drill is available, a door can be constructed at any desired level in the cavity with minimal damage to the tree. A keyhole saw can be inserted into the drilled hole to start the major cut.

especially tricky, particularly because keeping thin or rotten doors from falling out is often difficult.

If done properly, nails can be removed later and the hole checked with little difficulty. In subsequent years, however, holes in living limbs can become grown over with new wood which may require some additional sawing. Well-made doors are hardly noticeable and such cavities are used by birds for both roosting and nesting in subsequent years.

CAPTURING ADULTS

Perhaps the most useful technique we have developed over the years to catch adults is the "ambush." For species that will readily flush from inside a hole, one needs only put a net of some sort over the hole after roosting has occurred and allow the bird(s) to flush into the bag. Nets or bags put at the end of extendable poles (Jackson and Parris 1991, Rendell et al. 1989) can be up to 10 m high and used to reach holes that cannot

even be climbed. If the species in question is one that tends to sit tight in such a situation, it is necessary first to saw a removable "door," as described above. As Acorn Woodpeckers are suspicious of any foreign objects within their holes, we have been unable to utilize methods such as that described by Cohen and Hayes (1984) which involve an entrance-blocking device within the cavity.

To set an ambush, first drive a nail through the wood at the edge of the entrance (Fig. 1). The nail should emerge about 2 cm from the outer edge of the cavity entrance. Once through, remove the nail. Through the resulting hole, thread a 1.5 m segment of monofilament fishing line (9 kg test works well). On the end that emerges from the cavity entrance, tie a plastic fishing bobber of a size that will block the hole; thus, the bobber should be only slightly larger than the hole it is intended to cover. Before attaching the bobber to the monofilament, wrap it in masking or duct tape and scribble on it with a permanent marker to simulate the natural surface of the tree. Tie the monofilament to the pole of the bobber that lacks the protruding button. This last step is important. If the bobber is attached by the button end, there is no "give" when the string is pulled and there is a risk of breakage. To the opposite end of the monofilament, tie twine to reach the ground. Drive two medium-sized nails into the tree to one side of and slightly above the hole on the same side as the monofilament is emerging. The bobber is set onto these nails (Fig. 1). Before descending, make sure that the bobber falls freely when the string is pulled.

As birds often approach the hole from directly underneath, the "down" end of the monofilament should be aimed away from the hole via a U-shaped nail (Fig. 1). Not only will the monofilament be less visible, but it will also be less likely to become tangled in a bird's foot as it approaches the hole. As holes are not always in vertical limbs, we often pin the string to the trunk about a meter below the hole to keep the monofilament and string flush with the trunk (Fig. 1). By having it pinned, it is also less likely that a minor disturbance (e.g., wind) could spring the ambusher. The string should, however, be pinned only lightly, so that it does not interfere with the springing of the trap. The ambusher cannot be left for extensive periods of time as eventually the bobber is likely to fall or blow off the nails and flap in front of the hole, thereby scaring birds away. If set discreetly, however, birds are unlikely to notice it and will either roost or continue to feed nestlings. Once set, the string can then be pulled quickly and firmly so as to block the hole with the bobber. One can then climb up and remove birds directly from the cavity.

If the ambush is to catch roosting birds, one can spring the trap either at night shortly after birds have roosted or in the morning before they depart. Although evening ambushes are often more convenient, predawn ambushes are less risky because they avoid the possibility of flushing birds out of the cavity and forcing them to roost outside for the entire night if something goes wrong with the ambush. Either way, we have found with Acorn Woodpeckers that silence is important; birds can be extremely

wary and will often flush, even into the night, once undue disturbance is noted.

Ambushes set to catch birds feeding nestlings must be planned carefully so as to minimize the possibility of disturbing birds at a stage when they may abandon the nest. For Acorn Woodpeckers, there is a window of time from approximately 12–20 d old that is optimal for catching adults; nestlings of this age have begun to thermoregulate fairly well (Weathers et al. 1990) and thus are not overly vulnerable to exposure, but have not yet begun to beg from the nest entrance. Thus, adults must enter the cavity completely when feeding and can be captured as described above.

CONCLUSIONS

Using these techniques and their predecessors, we have successfully opened well over 100 nest holes over the years and captured hundreds of adults. We have yet to find a nest hole that we were unable to reach and have never sustained any injuries in our climbs. Unfortunately, there is no guarantee that nests will be as readily accessible in other habitats. Furthermore, we caution that climbing trees, especially in the dark, can be dangerous. Anyone contemplating these methods should therefore take care to obtain proper equipment, keep it in good condition, and receive appropriate training in technical climbing procedures.

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