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Wallace B. Rendell

Bridget J. Stutchbury

Raleigh J. Robertson

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# A Manual Trap for Capturing Hole-Nesting Birds

Wallace B. Rendell  
Department of Biology  
Queen's University  
Kingston, Ontario K7L 3N6, Canada

Bridget J. Stutchbury  
Department of Biology  
Yale University  
New Haven, Connecticut 06511, USA

Raleigh J. Robertson  
Department of Biology  
Queen's University  
Kingston, Ontario K7L 3N6, Canada

Hole-nesting birds can be difficult to capture at natural nest sites because cavities are inaccessible due to the height of a cavity or burrow above the ground or because of tree decay. For this reason, we created a manually operated, portable trap (similar to Jackson 1977) that was successfully used to capture Tree Swallows (*Tachycineta bicolor*), and subsequently Bank Swallows (*Riparia riparia*), as they emerged from their cavities.

Briefly, the "basket trap" (Fig. 1) consists of a wire skeleton with netting attached. One face of the frame remains open to allow a bird to enter the trap.

The basket trap is attached to the end of a lightweight, extendable pole (e.g., mist net pole) and is raised to enclose the entrance of a cavity containing a bird. A bird leaving the cavity dives into the trap and becomes tangled in the mist net.

Figure 1: The Basket Trap : (A) front side showing entrance and (B) side view of the trap at a cavity. Abbreviations are: (A) front hoop, fh; back hoop, bh; entrance, e; fishing line, fl; pole, p; (B) strut, st; bag, b; mount, mt; and nest cavity, nc.

Figure 1A

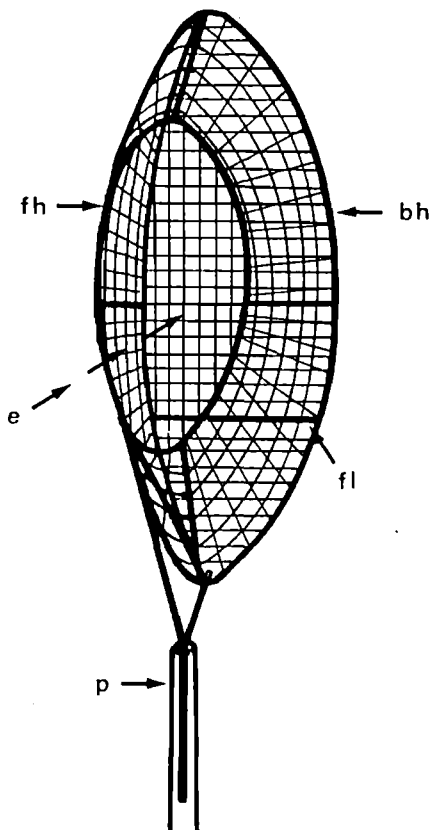
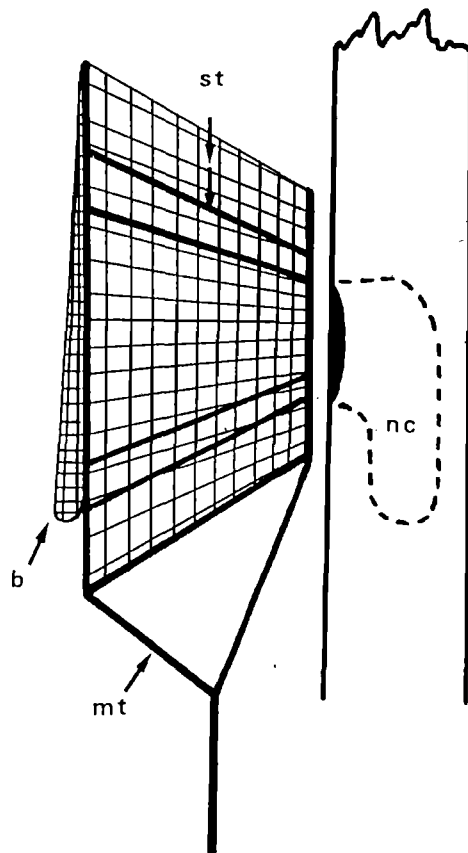


Figure 1B



## Construction of the Trap

The frame of the basket trap is made from two wire hoops (9-12 gauge) of different sizes ("fh" and "bh", Fig. 1A). The diameters of the hoops are 40 and 70 cm, although the size of the trap could likely be scaled down with little change in effectiveness. The ends of four straight wire struts ("st", Fig. 1B, each 25 cm long) are soldered to both hoops, separating them by 20 cm. The struts are equally spaced around the hoops, connecting them to form a basket-like frame. A P-shaped loop of wire is attached to the frame which serves as the mount ("mt", Fig. 1B) to attach to the pole.

After the frame is prepared, a large, circular piece of mist net (1-1/2" mesh) is stitched to the frame with a needle and braided nylon fishing line, such that the face of the smaller hoop is open but the sides and back of the basket are covered. The netting is stitched along all parts of the frame including the struts. Between the struts, and on the lower third of the large hoop, the net is stitched tightly, while the remaining upper two-thirds of netting on the large hoop are left loose. A piece of nylon fishing line ("fl", Fig. 1A) tied tightly across the frame separates the loose upper portion of the net from the lower, tighter portion, forming a pouch across the back of the trap that is similar to a standard mist net. To save time, the net could be taped to the frame rather than stitched.

## Tree Swallows

Tree Swallows were captured during a study conducted at two beaver ponds near the Queen's University Biological Station, Chaffey's Lock, Ontario (Rendell 1987). At each site, hundreds of dead snags, prone to falling because of decay, were standing in 1.0 to 1.5 m of water. Cavities occupied by Tree Swallows were located 1 to 9 m above the water surface. Previously, we used mist nets and temporary erection of nest boxes with traps (Stutchbury and Robertson 1986) to capture birds in natural sites for banding, but these methods were not very successful.

Operation of the trap is simple. Considering a typical capture attempt, a bander positioned below a cavity would shape the frame of the trap to the trunk circumference (this prevents birds from escaping between the frame and the tree). The trap would be raised to enclose the entrance of the cavity containing a bird. Occasionally, the snag trunk was hit to cause the bird to leave the cavity. As soon as a bird entered the net, the trap was lowered and the bird was removed. When lowering the trap, it is useful to hold the open face up, allowing the weight of the bird to keep it tangled in the net. Only one bird escaped from the trap while it was being lowered. This was a result of not repairing holes that developed in the net.

Successful operation of the basket trap also requires knowledge of a species' behavior at the nest site. We had the greatest success capturing individuals during the nestling

stage when both adults were busy feeding young. However, adults were captured at all stages of the nesting cycle. Catching birds before incubation is not recommended due to the higher chance of abandonment (Burt and Tuttle 1983).

A total of 25 birds (19 different individuals + 6 recaptures) were caught using the basket trap at cavities that ranged from 1 to 7.5 m above the water surface. Included in this total was one bird captured from a Purple Martin (*Progne subis*) house. The sample included six captures of males and 19 captures of females. Birds were sexed according to the presence of cloacal protuberance, brood patch, behavioral observations, wing chord and plumage (Stutchbury and Robertson 1987). The recaptures included two birds which were first caught using the basket trap and four which were first caught in nest boxes. One male captured with the basket trap in 1986 was caught again at the same cavity in 1987. Both members of pairs were captured separately at six cavities.

Males appeared to be more wary of the bander than females, particularly after a female mate was captured. If the male of a pair was captured first, there was little problem with catching the female. Females always entered the nest site despite the presence of a bander. No birds of either sex were known to abandon a breeding attempt after capture.

## Bank Swallows

Bank Swallows were studied May-July 1987 in Dickinson Co., Iowa, near the Iowa Lakeside Laboratory (Stutchbury 1988). Bank Swallows nested in sand pits in colonies of 20-50 pairs. Nesting burrows were closely packed along the faces of sand pits. Two colonies where birds were captured with the basket trap were only 1-2 m above the ground, so the trap was not mounted on an extendable pole.

Birds were caught by propping the basket trap against the bank face so that it covered the entrance to a single burrow. The net was left in place while the bander watched from a distance. Several nets could be left in place at different burrows at the same time. Most birds exited within five to ten minutes, but some birds did not leave their burrow while the trap was in place. Although mist nets placed in front of the bank face were used to capture large numbers of Bank Swallows, the basket trap was used in field experiments to catch birds from a particular burrow without undue disturbance to the rest of the colony.

Bank Swallows were caught with the basket trap throughout the nesting season (but consider Burt and Tuttle 1983). A total of 26 different individuals were captured, with one bird caught three separate times and two birds caught two times each. The sample consisted of five males, 10 females, and 11 birds of unknown sex (birds sexed by presence of brood patch or cloacal protuberance). There were no known cases of

abandonment after capture during the incubation or nestling period. In five cases, both the male and female of a pair were captured in the net simultaneously, although this occurred early in the season when males were mate guarding (Beecher and Beecher 1979).

### Discussion

We were very successful in capturing both Tree Swallows and Bank Swallows at their nest sites with the basket trap, and we feel this method could be useful for capturing other cavity and burrow-nesting species when nest sites are inaccessible. The basket trap is particularly useful when the capture of specific individuals is necessary.

Jackson (1977) created a similar trap for cavity-roosting birds. Jackson's trap is different from our basket trap because it has a spring-loaded frame that supports the trap as it "hugs" the trunk, so the bander does not need to hold the trap while waiting for the birds to leave. Jackson's trap, however, appears to be more complicated to construct and operate than the basket trap. There may be difficulties with adjusting the frame of this device to trunks <50 cm in circumference, and also in retrieving the trap once a bird is caught. Furthermore, Jackson et al. (1979) states that this trap allowed approximately 40% of captured birds to escape before the trap was lowered to the ground.

Jackson et al. (1979) described a manually operated cavity trap that is a two-chambered, wire box. Similar to our trap, it is raised on an extendable pole to enclose a cavity entrance. Once a bird enters the lower chamber, it is supposed to climb into the upper chamber from where it cannot exit. This trap has successfully eliminated opportunities of escape for birds, but Jackson et al. (1979) admit that problems exist with positioning the trap at an entrance and with getting birds to enter the upper chamber.

Although it is manually operated, our basket trap is simple for one person to use, flexible, portable, and lightweight. When properly constructed, maintained, and operated, the likelihood of escape by captured individuals is low. It is also easy to construct and requires few materials.

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