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A NOVEL, SIMPLE, SAFE AND EFFECTIVE TRAP FOR BURROWING OWLS AND OTHER FOSSORIAL ANIMALS

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Abstract.—This paper describes the construction and use of a new Burrowing Owl (*Speotyto cunicularia*) trap. Advantages of this new trap include its effectiveness in even the most inaccessible burrows, its safety to the owl(s) contained within, its cryptiveness when in place (making it tamper proof, an important consideration when trapping owls in urban settings), the ease of removal of captured owls through a hinged access door, its ease of transport to study sites, its low cost, the ability to check its contents via a clear Plexiglas door, and the possibility of catching owls or other fossorial animals either as they exit or enter burrows. This new trap has been used for 2 yr in southern New Mexico with a success rate of 75%.

UN MÉTODO NOVEL, SIMPLE, SEGURO Y EFECTIVO PARA ATRAPAR A INDIVIDUOS DE *SPEOTYTO CUNICULARIA* Y OTROS ANIMALES QUE VIVEN EN MADRIGUERAS

Sinopsis.—En este trabajo se describe la construcción y uso de una nueva trampa para atrapar individuos de *Speotyto cunicularia*. Las ventajas de esta nueva trampa incluyen su efectividad, inclusive en las madrigueras o cuevas más inaccesibles, seguridad, hacia los buhos que caigan en estas, secretividad (críptica), facilidad para remover los animales capturados, facilidad de transporte a las áreas de estudio, bajo costo, facilidad para cotejar lo que hay dentro de esta (a través de una puerta de plástico transparente), y posibilidad de atrapar animales que viven en madrigueras cuando éstos entran o salen de las mismas. Este nuevo tipo de trampa ha sido utilizado por dos años en Nuevo México con un éxito de atrapamiento de 75%.

As Burrowing Owls (*Speotyto cunicularia*) are terrestrial and often visible by day and night at the entrances to their fossorial burrows, they are more conspicuous and accessible than most other owls (Coulombe 1971, Haug et al. 1993, Martin 1973, Thomsen 1971). They are wary, however, and studies that involve capturing and/or marking individuals have utilized many different trapping techniques with varying success rates (Brenckle 1936, Ferguson and Jorgensen 1981, Lockley and Russell 1953, Martin 1971, Plumpton and Lutz 1992, Winchell and Turman 1992). Noose carpets and noose rods (hardware cloth or wooden dowels with attached monofilament nooses) have been used with some success (DeSante et al. 1993, Plumpton and Lutz 1992, Winchell and Turman 1992). Bal-Chatri traps (mesh cages with monofilament nooses attached to the outside and baited with a live rodent) are used (DeSante et al. 1993; M. Desmond, pers. comm.) but often are unsuccessful as a result of Burrowing Owl hunting methods (Martin 1971). Owls that we have observed usually land beside the Bal-Chatri trap and walk around it rather than pounce on the nooses with sufficient force to entangle their legs

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and feet. Leghold traps modified with padded jaws have been used successfully in some cases (Butts 1976, Haug and Oliphant 1990), but may be the most dangerous because they could break the bird's leg (Martin 1971).

To date, the most successful Burrowing Owl trap has been a live trap of the type designed for catching mammals: single- and double-doored Sherman, Havahart or Tomahawk live traps (Ferguson and Jorgensen 1981, Martin 1971, Plumpton and Lutz 1992). Problems with solid-sided and mesh-sided live mammal traps include their high cost, the need to alter the burrow entrance to set the traps and the difficulty of removing captured owls safely through the door ends. We have successfully used a type of live trap consisting of a one-way door over a burrow entrance and a 31-cm cube-shaped cage of PVC framing and plastic mesh (Banuelos 1992) in many applications and particularly in our attempts to capture entire broods of young. The major problems we have encountered with the use of this cage and one-way door trap include the impossibility of setting it at some burrows due to obstructions, locations of burrows on cliff or arroyo faces, and the trap's conspicuousness while in place. In urban settings this trap is easily seen by humans passing by; people have occasionally disturbed our traps.

This paper describes the construction and use of a Burrowing Owl trap based on the same concept as live mammal traps (Sherman, Havahart or Tomahawk) but with some unique benefits. For the Burrowing Owls in southern New Mexico that nest in holes in arroyo banks (at heights of up to 10 m), we needed a new trap with the following characteristics: ease of setting without altering (and possibly causing a cave-in of) the burrow, ease of repeatedly checking without removing the trap and disturbing the burrow, quickness and ease of removal from the burrow entrance once owls are trapped, safe enclosure of the owls and ease of removal of owls from the trap.

TRAP CONSTRUCTION

Construction of the trap begins with a 61 cm piece of 10-cm diameter PVC pipe (piece can be longer or shorter depending on tunnel length). A door (length = 30 cm, width = 14 cm) is cut into the pipe about midway from the ends using an electric jigsaw (Fig. 1). At least 2 cm must be left at each end of the pipe (Fig. 1). Small hinges are attached to the door using small machine screws and nuts. The hinges must be attached with the nuts on the outside of the trap in order to avoid injury to the owls within. The other half of the hinge is attached to the pipe so that the cut-out portion neatly fits into the area from which it was excised. The door is locked on the side opposite the hinges with two Velcro fasteners, glued onto the pipe pieces (Fig. 1). To make a one-way door into the pipe, clear 1-mm-thick Plexiglas pieces (each 2 cm wide and 9–10 cm long) are attached with a hinge of duct tape or Velcro on the upper side of the pipe (side with the access door). If a trap with one entrance is desired, one end of the tube can be covered completely with a full circle

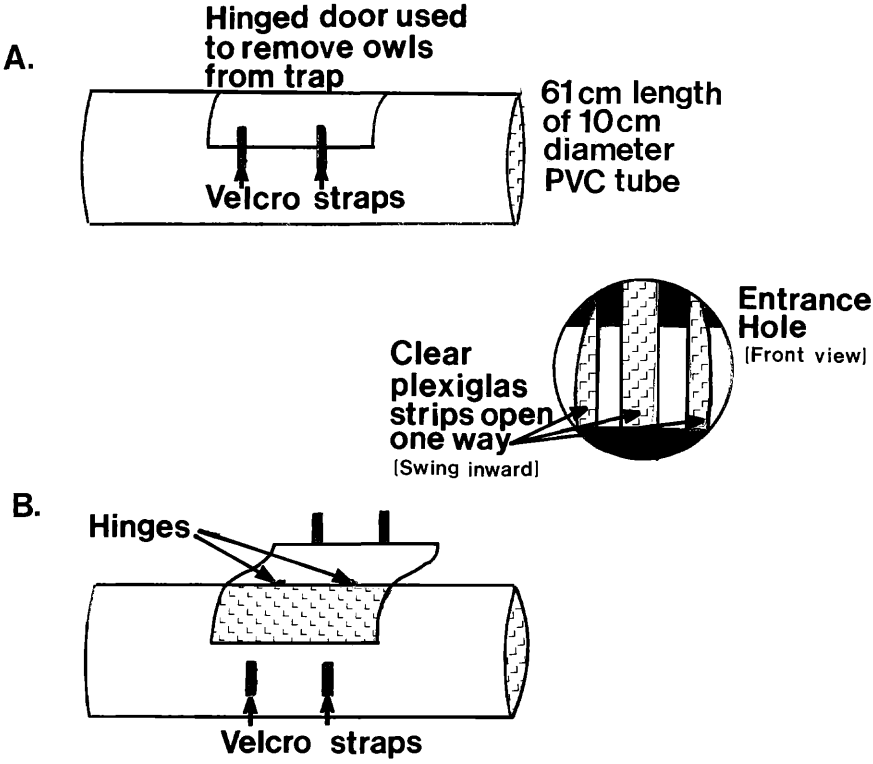

FIGURE 1. Diagram of novel Burrowing Owl trap. A. Trap with access door closed. B. Trap with access door open.

of Plexiglas attached to the PVC tube with duct tape. The Plexiglas on the one-way door is prevented from opening outward by a stop attached to the bottom of the entrance. The stop can be made from a small piece of PVC or foam, taped over securely with duct tape. The inside of the pipe can be left as is or covered with duct tape for traction. Traps with two entrances will have two one-way doors, each opening inward.

TRAP USE

To set the trap we insert it into the burrow entrance as far as possible. Some burrows have entrances too small for the trap; for these cases, we place the trap as far into the hole as possible and cover the visible portion of the trap with soil and rocks. If the burrow entrance is too large, the trap can be placed inside (again as far as possible) and any kind of materials (e.g., fine plastic mesh, cloth, rocks, branches) stuffed around the trap to insure that the owls are not able to get around it. Burrowing Owls will go around the trap if the opportunity exists, so it is essential to block all spaces between the trap and the entrance tunnel.

TABLE 1. The success rates of different types of Burrowing Owl traps used in this study.

Trap type	# owls caught	# traps set	% capture success
PVC tube trap	33	44	75
Cage and one-way door	196	259	76
Noose rods and noose carpets	0	5	0

Our traps are set just prior to dusk and left in place until 1 h after dark. Traps can be checked by looking through the clear Plexiglas door with a flashlight, thus eliminating the possibly-destructive process of removing the trap for checking. If the owl is inside the burrow prior to setting the trap, its capture is almost certain because most burrows have only one entrance. If there is a possibility that the burrow may have more than one entrance, we set the trap at the hole the owl used to enter the burrow and block the other(s) temporarily. Traps with a one-way door at each end can trap owls inside a burrow as they exit and outside as they enter (especially females entering the tunnel to feed young). This trap should be effective for capturing other fossorial animals as well (we have caught rabbits), with the same advantages.

TRAP SUCCESS

Capture success (i.e., number of owls caught versus number of traps set) was determined for three trap types used in this study (Table 1). PVC tube traps were as successful as cage and one-way door traps (Table 1) but their small size, inconspicuousness, ease of use and safety to the owls once caught justifies their use in most cases. Cage and one-way door traps are cumbersome and difficult to transport. Only two to three traps of this type could be transported in our medium-sized truck. Many PVC tube traps can be transported in a passenger car or on a commercial airliner as baggage. Noose rods and carpets (Winchell and Turman 1992) were used without success and quickly abandoned in favor of the above trap types. Owls ran into and out of burrows without getting tangled in nooses. Nooses also failed to stand upright even when heavier weight monofilament was used.

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