TWO CAPTURE METHODS FOR BLACK-BILLED MAGPIES

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"It has long been recognized by those involved in pest control and research that the Black-billed Magpie is one of the most wary and difficult birds to capture alive"—Alsager et al. (1972).

A number of characteristics contribute to the difficulties involved in capturing Black-billed Magpies (*Pica pica*). They are extremely wary, tending to avoid unusual objects (e.g., wire traps or mist-net poles) that have been recently introduced into their environment. Some are particularly reluctant to walk into enclosed traps (Birkhead 1991, J. M. Marzluff pers. comm.). Magpies also tend to be opportunistic feeders, making it virtually impossible to predict flight paths for the placement of mist nets. Finally, they learn very quickly and will avoid any trap in which they have previously been caught or nearly caught. They may even avoid traps in which they have merely seen other birds captured.

Researchers have coped with these problems in several ways. Variations of funnel-entrance traps (e.g., Alsager et al. 1972) have been used with considerable success in some populations (Erpino 1968, Reese and Kadlec 1985) but with little or no success in others (Birkhead 1991, J. M. Marzluff pers. comm.). Buitron (1983) has used nooses hidden in grass and baited with suet to capture adult magpies, while Marzluff (pers. comm.) has used modified mammal leg-hold traps hidden under vegetation and baited with eggs. Unfortunately, individuals may learn to avoid any of these traps. To overcome this problem, one can use an arsenal of different traps, introducing new varieties as individuals learn to avoid those currently employed. Another common solution (e.g., Birkhead 1991) has been simply to abandon efforts to capture adults and rely on the banding of juveniles in the nest. Of course, this solution is practical only for those conducting relatively long-term studies of magpies dispersing only short distances.

We experienced the difficulties involved in capturing adult magpies while trying to color-band a small population near Reno, Nevada. We came to rely on two trapping methods, one a modified traditional trap (the noose carpet), the other a modified method of mist-netting. Based on the design of the balchatri trap (Berger and Mueller 1959) traditionally used for raptors, a noose carpet is a flat piece of wire mesh to which have been tied numerous monofilament nooses. Noose carpets have been used to capture raptors and galliforms (Bloom 1987, Bub 1991), but their design and use for corvids has not previously been described in detail in the literature. We also developed and refined a capture technique using mist nets that we call the "bait-and-chase" method. We were able to rely on these two methods exclusively because magpies were relatively slow to learn to avoid them. Both methods had the further advantages of allowing the capture of multiple birds simultaneously and the targeting of desired individuals; they should be useful for capturing other corvids and trap-shy species.

METHODS

Study Area

Our study area was located on the University of Nevada Agricultural Experiment Station just east of Reno, Nevada. The station lies along the Truckee River and includes a 1.5-km strip of riparian habitat. This strip varies in width from 5 to 100 m and is characterized by dense willow thickets (*Salix* spp.) interspersed with cottonwoods (*Populus trichocarpa*). The area is bordered by agricultural fields and farm buildings.

Noose Carpet

We constructed a noose carpet using a 1 × 0.75-m piece of heavy-duty 12.5-mm wire mesh. Before attaching nooses, we spray-painted the mesh a flat brown to make it less visible. Using 17-pound-test monofilament line, we made nooses approximately 7 cm in diameter and tied them to the mesh, spaced at 4-cm intervals. The nooses were tied with the knot described by Berger and Mueller (1959; cited by Bub 1991:197). The corners of the mesh were then staked to the ground in a conspicuous location on or near the territories of individuals that we wished to capture, and bait was placed in the center of the carpet. The best times of day for noosing were during the morning or late afternoon, when the birds were either leaving for or returning from foraging areas.

Bait and Chase with Mist-Nets

Locations for mist-netting were selected on the basis of proximity to the territories of target birds and conditions that tended to hide the net. Magpies were easily attracted to bait placed about 1 m from center of the net. However, we found that even if numerous magpies were flying to and from the bait, they were always quite aware of the net and avoided it successfully. We solved this problem by developing a "bait-and-chase" technique using two people, an observer and a chaser. The observer sits at least 100 m away from the net, the closest distance that does not deter birds from approaching the bait. The chaser hides completely in or behind vegetation located approximately 25 m from the net. The chaser watches only the observer and does not attempt to observe the birds or the net. If the chaser can see the birds, then they will usually see him. For this reason, "bait-and-chase" with one person as observer/chaser was an abject failure. The observer watches the bait and net through a spotting scope and waits until one or more target birds are at the net. When the birds begin to show decreased vigilance (e.g., sustained foraging with head down), the observer signals the chaser, who then charges toward the birds, usually flushing them into the net.

Baiting

After trying out various forms of bait, including cracked corn, dog food, bacon, fish, and eggs, we determined that Cheetos brand snack food worked best for our purposes. The bright orange color of this snack can attract the attention of magpies from a considerable distance (M. D. Reynolds pers. comm.). It is also of an appropriate size for caching, so individual magpies

often make repeated trips to the trap area. In addition to placing bait on the noose carpet or beside the mist-net, we also placed a small pile of bait 2–10 m away from the primary bait pile in as conspicuous a location as possible. This satellite pile allowed the birds to sample the bait without having to approach the trap directly, which they were always reluctant to do. Having sampled from the satellite pile, individuals were more likely to visit the main bait pile after the satellite pile had been exhausted. To aid the birds in making the connection between the two piles, we placed a trail of bait from the satellite pile to the main bait pile.

RESULTS AND DISCUSSION

Our initial attempts to capture magpies by simply baiting them to mist-nets were not very successful—we caught only one magpie during 9 hours of effort (0.1 birds/hr). Using the "bait-and-chase" technique, however, we were able to capture 9 magpies in 13 hours (0.7 birds/hr), and the noose carpet was even more successful, capturing 11 magpies in 10 hours (1.1 birds/hr). Sessions with any of these techniques usually lasted about an hour. Using simple baiting, we were successful during one out of seven sessions. With bait-and-chase, four of ten sessions were successful, and with the noose carpet, seven of ten sessions were successful. Unsuccessful sessions with either of the latter techniques could often be attributed to interference from other species, primarily European Starlings (*Sturnus vulgaris*) and Red-winged Blackbirds (*Agelaius phoenicius*). During some sessions, individuals of these species were captured, and the magpies proved quite capable of learning from their examples. More care was taken in later sessions to avoid locations where these species were common.

An advantage shared by both the bait-and-chase and noose-carpet methods is the ability to capture multiple magpies not only during a single capture session but even simultaneously. As individuals made more trips to the bait pile, they became less vigilant and lingered longer near the mist net. As these first visitors became more comfortable their presence often attracted others. We found that by exercising patience, we could regularly net two or three magpies with a single chase. During one 2-hour bait-and-chase session, we were able to capture five magpies, three of which were netted together with a single chase.

When a magpie became entangled in the noose carpet, its first reactions seemed to be of confusion and curiosity, rather than fear. Most individuals began struggling actively against the nooses only after 1 to 5 minutes. If we waited for a noosed bird to begin to struggle before going to the trap, then we would occasionally snare another bird during this interval. On two occasions we captured two birds simultaneously with the noose carpet, catching a total of three magpies during both of these one-hour sessions. As with the bait-and-chase technique, patience is the key to catching multiple birds with the noose carpet.

Both of the capture methods that we have developed are easy to use, and neither requires the construction of large or expensive traps. No birds were injured by either method, yet both yielded relatively high capture rates.

Furthermore, both methods allowed the capture of multiple birds at once and the targeting of desired individuals. Because magpies appeared to learn to avoid these traps relatively slowly, these methods could be used alone for small-scale trapping studies. If many individuals need to be captured over a number of years, these methods would be valuable additions to an arsenal, since a larger arsenal increases capture rates by increasing the amount of time between exposure to any given technique. The use of both the noose carpet and bait-and-chase mist-netting should facilitate additional studies of Black-billed Magpie demography and behavior and should be applicable to the capture of other corvids and perhaps of wary birds in general.

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