
Capturing the endangered Hawaiian Crow with mist nets

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Studies of endangered bird species frequently must rely upon intensive observation of only a few nesting pairs or specific individuals. To make maximum use of the information gained from such studies, it is desirable to capture and mark individuals for ease in field identification, as well as to determine sex or age.

Decoys, playback of vocalizations, and mist nets have been used to capture an array of passerine birds (Johnson 1965). Other methods used to capture crows (*Corvus* spp.) include cage traps baited with meat, grain, or other crows (Kalmbach and Aldous 1940, Rowley 1968) and rocket nets (Stiehl 1978; R. Windingstad, pers. comm.). This paper describes how fledglings, playback of vocalizations, and crow decoys were used to capture nesting adult Hawaiian Crows in mist nets.

Early Polynesians in Hawaii used thrown nets of light thread and wide mesh to capture crows and other birds (Brigham 1899). At that time, Hawaiian Crows (*Corvus tropicus*) were commonly found in large flocks and were quite tame (Cook 1784). The Hawaiian Crow is now endangered, however, with a population estimated between 60 and 70 (Marshall 1975) to as many as 100 to 150 (J. M. Scott, pers. comm.). Little is known of the ecology of this species.

During our field investigation of the breeding biology and feeding habits of the Hawaiian Crow, we could not use baited traps because crows avoided food on man-made feeding platforms (Sakai and Ralph 1980). Rocket nets were ruled out as potentially injurious to the birds, yet we needed to color-mark individuals at each nest site to distinguish sexes during nest observations and for use in future demographic studies.

During June and July, 1979 and 1980, we attempted to capture nesting pairs at 5 nest sites located on the McCandless Ranch, Puuwaawaa Ranch, and Honaunau Forest Reserve, on the island of Hawaii. These 3 areas comprise about two-thirds of the Hawaiian Crow's presently known range.

We usually set up a 12 m X 2.6 m, 50 mm mesh mist net in the shade about 20 m from an active nest site. To lure the crows into the net we used 3 techniques, either singly or in various combinations: playback of recorded crow vocalizations, rubber crow decoys, and placement of the net near perched fledglings.

Before the netting attempts, we recorded crow vocaliza-

tions during visits to the nests. During netting, one of us hid in vegetation near the net and played the tapes. Upon hearing this "intruder," the crows became agitated and flew back and forth through the netting area. To help direct this aggression, we sometimes placed decoys on low limbs within 2-5 m of the net.

Recently fledged young were often found on or near the ground, and were easily caught by hand and used to help trap adults. To help prevent their capture by predators, we moved the fledglings to perches 1-1.5 m off the ground, and 2-5 m from the net. The distress calls given by the fledglings when handled, or the food-begging calls given shortly after they were perched, often lured the adults into the net.

In 1979 our netting activities were conducted in the 3 weeks that made up the last half of the nestling period, or the first 2 weeks after fledging. In 1980, our netting activities were confined to the post-fledging period to conform to permit restrictions. When netting attempts were made during the nestling period, we restricted our activities to less than 90 min to ensure that the nestlings were fed frequently enough, and also to reduce disturbance. When fledglings were involved, we allowed more time (up to 150 min), since normal feeding continued throughout. As Tomich (1971:471) has observed, the Hawaiian Crow "... is outstandingly tolerant of humans ... they quickly accommodated to our presence. ..."

Results and discussion

At 2 of the 5 nests, we captured both members of the nesting pair. At the McCandless Ranch Center nest, we captured the adults separately during the late nestling period. The playback of crow calls appeared to elicit well-directed aggressiveness toward the decoys from both adults. At Puuwaawaa Ranch, we captured both birds with 30 min of net placement. Each adult was caught when it flew down to feed the young fledged on that same day. In one instance, after feeding the young, the male attacked a decoy then flew into the mist net.

We captured the only attentive adults, both females, at nests #1 and #3 at Honaunau Forest Reserve when they flew down in response to calls of the 3- to 4-day-old fledglings as we moved them to perches. The use of playbacks and decoys proved unsuccessful in capturing the males at these nests because they, although respon-

sive to the playbacks, stayed too high in the forest canopy for our nets. Later, the movement of the 10- to 15-day-old young away from the net thwarted further capture attempts. Twice when the net was up, we saw the male at nest #3 at Honaunau remain perched in the upper canopy with food intended for the young. He regurgitated this food to the female, which then flew down to feed the fledgling. During many other observations the male flew down to feed the young.

In 1979, our capture attempts at nest #1 at Honaunau Forest Reserve failed since the older fledgling perched too high (about 19 m). Both adults responded to the playback but remained in the upper canopy. In the same year at the McCandless Ranch South nest, 2 crows were temporarily restrained on our first netting attempt. The female was caught as she flew toward the perched juvenile to feed it, but escaped by tearing through the 36 mm mesh net. An accompanying 1-year-old escaped by bouncing off the too-taut net. On subsequent netting attempts, the fledgling's mobility prevented its effective use as a decoy.

Although no single method succeeded at all nest sites, we believe that the variation in success was related primarily to the age of the fledglings. The two variables that contributed to our failures, mobility of the fledglings and behavior of the male during the post-fledgling period, were certainly related to the age of the fledglings. The best time to net adult Hawaiian Crows seemed to be before, or within 1 or 2 days after, the time that the young have left the nest. Only one adult (we believe the female) was in consistent attendance to fledglings that were more than 3 days out of the nest. The other bird was frequently away, presumably foraging, and less responsive to our efforts. Additionally, after about 5 days of age, fledglings became quite mobile and were either located too high to be useful as netting lures or, if on a low branch, would not remain perched long enough to be caught. Netting during the early nestling stage could be harmful to the young because of interference with feeding and thermoregulation by the adults.

In making tape recordings for playbacks, we did not restrict ourselves to specific call types (e.g., distress, food begging by nestlings or females). Specific calls, rather than random presentations, might prove more effective in attracting the adults to the net.

We offer the following suggestions for using mist nets to capture Hawaiian Crows, and possibly other corvids, at active nest sites: (1) minimize the time involved in a netting attempt to ensure that the young are fed; (2) use as many different combinations of methods as necessary to rapidly accomplish a successful capture; (3) use mist nets of 50-mm (or larger) mesh, and ensure that the net has sufficient pockets.

Summary

Mist nets, decoys, and playback of vocalizations were used successfully to capture Hawaiian Crows. Variation in success was related primarily to age of fledglings. The best time to net adult crows was before or 1 or 2 days after the young birds leave the nest. Crows were captured as quickly as possible to ensure that the young were fed. Many questions about the Hawaiian Crow remain unanswered so that further research may be necessary. The techniques used in this study may be applicable to other species with similar habits.

Acknowledgements

We thank C. John Ralph and Stanley A. Temple for providing direction and opportunity to do this research, and David F. DeSante, C. John Ralph, Jon G. Giffin, J. Michael Scott, and Jared Verner, for reviewing this manuscript.

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