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TESTS OF A POTENTIAL METHOD FOR DECOYING STARLINGS TO BAIT STATIONS

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The successful establishment of the European Starling (*sturnus vulgaris*) in this country since its introduction at the turn of the century has created enumerable problems for agricultural as well as urban communities. Each year brings an increasing number of reports of Starlings causing agricultural crop losses, cattle feedlot depredations, and roosting site damages. In addition, ecological concern has arisen recently in California where it appears that the Starling is contributing to the demise of several endemic avian species, e.g., the Acorn Woodpecker (*Melanerpes formicivorus*) by displacing it from its nestholes during the breeding season (Troetschler, 1971).

Attempts to control Starling population increases and range expansions have met with limited success. Several counties in California are currently undertaking trapping programs using live Starling decoys to lure free birds into large “cotton trailer” traps. Although this method does alleviate local agriculture damage and results in the removal of thousands of Starlings from the population each year, the effect is minimal with respect to appreciable reduction in the overall population size. Furthermore, this “control” method is relatively expensive due to the costs of maintaining live Starling decoys during the year, and transporting them to various sites throughout the trapping area. During the trapping season (generally May through September in California) additional expenses result from maintenance of captured birds in the traps prior to their disposal, and removal of non-target species which occasionally become trapped. This regular removal and disposal process is time-consuming and therefore expensive.

The costs of existing Starling control programs prompted the design and test of an alternative method for removing significant numbers of Starlings from heavily damaged areas. The procedure involved the placement of taxidermically prepared adult Starling skins on and near bait stations, accompanied in some cases by broadcasts of recorded Starling vocalizations. Previous studies had indicated that bait stations unaccompanied by live Starling decoys were not acceptable to the birds. Although non-toxic baits were used during these tests to determine the attractability of the stations, ultimate substitution of chemically treated toxic baits was envisioned.

Methods and Materials

Adult Starlings were taxidermically prepared and mounted on wooden dowels in various positions resembling as nearly as possible live Starlings. Several of these decoys were placed on each bait station. Ten stations were

initially used, each consisting of a plywood platform (approximately 2' x 2') mounted on a six-foot post. Later, four additional stations, each with a platform approximately 2.5' x 4' mounted on four legs, were incorporated into the study. Heavy guage wire was attached above some of the stations to serve as perches for landing birds and from which to suspend decoys via monofilament fish line so as to facilitate wind-induced movement. The stations were portable, and therefore easily moved to different sites within the study areas as warrented by movements of local Starling populations. Oat groats, turkey pellets, raisins and fresh grapes were placed in various combinations on the stations. Pans of fresh water were also added in some cases. Stations were observed during daylight hours, ranging from one hour before sunrise to one hour after sunset, to determine the extent of Starling activity and visitation, as well as the activity of non-target avian species within the study area. As was expected, peak activity occurred between sunrise and midmorning and again in late afternoon with a general lull during midday and a gradual decrease during the evening.

Further tests were conducted employing play-back of tape-recorded Starling feeding vocalizations near bait stations. Two methods of recording Starling calls were used: 1) vocalizations of captive Starlings were recorded during early morning feeding periods; and 2) vocalizations of free-living Starlings during feeding in the study area. Speakers placed at various stations were activated remotely when Starlings were in the vicinity of a station. Recorded vocalizations were also played back near an empty cotton trailer trap which had previously been successful in capturing Starlings (normally live Starling decoys are placed in such traps as an attractant). Bait trays filled with fresh grapes were placed on top of the trap as an added incentive to incoming birds.

A final test consisted of tethering live juvenile Starlings to one of the stations baited with grapes and fresh water, so as to assess the attractability of the station to free-living Starlings. In this study, as in those previously conducted, attempts were made to place bait stations within areas of relatively high Starling activity, as determined by daily observations of feeding habits.

These studies were conducted from 1 July to 21 September, 1973 in two areas in San Joaquin County in the central valley of California. The first site was located in a cherry orchard five miles north of Stockton, California. Scattered orchards of black and English walnuts were nearby. Information collected by the San Joaquin County Department of Agriculture indicated that this area had been subjected to heavy Starling feeding activity. County-serviced traps within the cherry orchard were capturing several hundred Starlings each month both prior to and during bait station tests. The second test area was located within a vineyard of tokay and zinfandel grapes seven miles northwest of Lodi, California. A five-acre irrigated pasture, bordered by oak trees, coffeeberry bushes and blackberry bushes, and a 15-acre non-irrigated pasture, scattered with oak trees, were adjacent to the immediate study area. Extensive Starling activity was observed in and around this site.

In addition to an estimated 1000 resident Starlings, avian species and the estimated size of resident populations in the study plots and adjacent

areas included: Mockingbird (*Mimus polyglottos*, 125); Scrub Jay (*Aphelocoma coerulescens*, 75); Barn Swallow (*Hirundo rustica*, 200); Yellow-billed Magpie (*pica nuttain*, 75); House Sparrow (*passer domesticus*, 50); Western Meadowlark (*sturnella neglecta*, 50); House Finch (*carpodacus mexicanus*, 50); Brewers Blackbird (*Euphagus cyanocephalus*, 100); Red-shafted Flicker (*colaptes cafer*, 25); Acorn Woodpecker (*Melanerpes formicivorus*, 15); Domestic Pigeon (*columba livia*, 50); Mourning Dove (*zenaidura macroura*, 20); Common Crow (*Corvus brachyihynchos*, 50); Robin (Turdus *migratorius*, 75); Killdeer (*charadrius vociferus*, 50); Sharp-shinned Hawk (*Accipiter striatus*, 2); California Quail (*Lophortyx californicus*, 75); Western Kingbird (Tyrannus *verticalis*, 10).

Results

Despite the abundance of Starlings in the test areas, all attempts to entice them to bait stations incorporating the inanimate decoys proved unsuccessful. With the exception of a few Mockingbirds observed landing on the platforms, no other bird activity was evident or observed at the baiting stations. However, the addition of recordings of Starling feeding calls resultèd in a slight attraction of Starlings to stations incorporating the taxidermically prepared decoys, although actual landings on the platforms were not observed. Stations incorporating Starling feeding call recordings, in contrast to those without such sound, did not attract Mockingbirds.

The use of recorded Starling calls in conjunction with an empty trap also failed to attract Starlings. Normally, Starlings frequented the trap when live Starlings were inside. However, without live decoys, such visits were rare. Only a small number of the few Starlings observed approaching the trap ever landed, and *none* entered. An interesting pattern was noted regarding the local Mockingbirds. They normally avoided the trap when it contained live Starlings, but at the empty trap without recorded Starling calls, much Mockingbird activity was observed. In contrast, essentially no Mockingbirds approached the empty trap when the recorded Starling calls were broadcast.

The final test involved live juvenile Starlings tethered to bait stations. Under these conditions, free Starlings were observed flying to these bait stations directly from the vineyard or from nearby trees and telephone lines. These birds landed on the platform and accepted baits. Thus, it seems likely that the bait stations themselves were not causing the observed aversion by free-living Starlings.

Discussion

Despite the constant alteration of bait stations in terms of arrangements of decoys, types of baits offered, location of the stations within the study areas, and the addition of recorded Starling vocalizations, our attempts to attract free-living Starlings were unsuccessful. Several factors may have contributed to this failure.

The success of current trapping methods using live Starling decoys and the results of tethering live Starlings to bait stations, strongly suggest that some aspect of Starling behavior is important in the attraction of other Starlings. The immobile Starling mounts used in these studies

obviously lacked the behavioral cues necessary for attraction (see Ellis, 1966, for a description of Starling behavior and displays). It is also possible that the immobility of decoys used in these studyes may have been a deterrent to Starling attraction, evoking an avoidance reaction in approaching birds.

The lack of enticement by recorded Starling "feeding noises" emphasizes the probable importance of behavior in the attraction of other Starlings. Pearson and Skon (1967) reported that recorded feeding calls used as "additional bait" in Starling traps had only a slight positive effect on trapping success, a result confirmed in our studies. It would appear that the only beneficial effect of these vocalizations was to deter a non-target species (Mockingbirds) from frequenting the bait stations. Had Starlings been attracted under these circumstances, the deterrence of other species would assume importance, assuring that only Starlings would be taking toxic baits on the stations. It is possible, of course, that the acoustical quality of the recording system, coupled with such factors as age, sex, and "motivation" of the Starlings being recorded contributed to the failure of this method (see Brough, 1969).

Choice of baits used in conjunction with the stations cannot explain the failure of these studies. This was demonstrated by placing various combinations of the baits in bait trays attached to the top of a large trap containing live Starlings. Free Starlings landed on the trap and consumed bait before either flying away, or dropping into the trap. It would appear that the live Starling decoys were initially responsible for the attraction of free-living Starlings, and that the presence of bait on top of the trap was of relatively less importance.

The results of these tests conclusively demonstrate that free-living flocks of European Starlings were not "fooled" by the inanimate, taxidermically prepared decoys. However, the complexity of behavioral factors contributing to the success or failure of decoy effectiveness became exceedingly obvious. During the tests described here, 23 of the 45 inanimate decoys were removed from the bait stations by a Sharp-shinned Hawk (A*ccipiter striatus*). Obviously, Starlings are more discriminatory in recognition of intra-specific behavioral factors than is the Sharp-shinned Hawk from an inter-specific standpoint. Although this hawk did remove many of our inanimate decoys, many hours of observation strongly suggest that the occasional presence of this hawk did not overtly affect the outcome of these tests with respect to the avoidance of the bait stations by Starlings.

Despite the failure of these studies, we would hope that further attempts will be made to improve procedures involved with the control of Starlings via baiting stations. The expense involved in existing control programs necessitates that further research be conducted in this area.

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