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SCARECROWS AND PREDATOR MODELS FOR FRIGHTENING BIRDS FROM SPECIFIC AREAS[1]

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ABSTRACT: Scarecrows and raptor models are fairly common traditional methods of attempting to frighten unwanted birds. Their effectiveness depends on the conditions under which they are used and the unwanted bird species involved. Best results are obtained from those that are most lifelike and have motion. When coupled with loud startling sounds or recorded distress calls their effectiveness is generally enhanced. Habituation by at least some birds is inevitable so the duration of effectiveness diminishes with time. It is essential to know what works best in a given situation so those methods can be employed to achieve maximum efficiency. An understanding of the limitations of these devices will temper expectations to a realistic level.

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INTRODUCTION

Predator models used to frighten birds include scarecrows (human effigies) and raptor models, especially hawks and owls. Model snakes and cat silhouettes are also commonly sold to gardeners. Scarecrows have a long history of use against pest birds (Frings and Frings 1967, Achiron 1988). Often, however, the traditional motionless scarecrows provide only short-term protection or are ineffective. Some birds may even utilize them as perches (DeHaven 1971), or associate them with favorable conditions (Inglis 1980). Hawk and owl models in some circumstances may be more effective than scarecrows, but birds can rapidly habituate to their presence (Conover 1982). For best results, scarecrow and raptor models should appear lifelike, be highly visible, and be moved frequently at the site to help alleviate habituation (Neff n.d., Vaudry 1979). Dangling streamers or reflectors from scarecrows and using brightly colored loose clothing may help increase their effectiveness because they move in the wind and birds react more readily to colored and moving objects (Vaudry 1979). Snake and cat models are rarely of any value.

This paper does not include a discussion of eye balloons, hawk-shaped kites, or helium balloon-supported hawk kites, which are flown above the area to be protected. Eye balloons and aerial visual stimuli devices are a subject unto themselves, and the pros and cons of these frightening devices differ in several ways from the more traditional scarecrows and predator models.

In most situations, traditional scarecrows and models of perched raptors do not closely enough resemble a situation that is alarming or threatening to birds (Inglis 1980). Reinforcement with shooting or supplementing models with other sound-producing, bird-scaring techniques is, however, highly recommended to increase their effectiveness. Field studies have indicated that mechanically incorporating movement or sound stimuli into the models may greatly enhance their effectiveness. Howard et al. (1985) suggested designing models that display action or produce sound, which is somehow triggered by the pest birds when they first enter an area, before they have a chance to land and feed. Such action or sound should be discontinued when the birds leave. This would result in the birds habituating much less rapidly. There is at least one such triggering device (Animal Detection Systems, Adams Dominion, Inc., 1212 Weible Rd., Crestwood, Kentucky 40014) that does turn on frightening equipment when the birds approach, activated by the particular sounds or calls the birds produce (Price and Adams 1990). The merits of this device have not been fully explored.

SCARECROWS (HUMAN EFFIGIES)

The use of traditional scarecrows to deter grain-eating and fish-eating birds has provided variable success. Simple scarecrows made of black plastic bags attached to wooden stakes are used to deter waterfowl from grain fields in North Dakota and South Dakota (Knittle and Porter 1988). This has also been tried in California to keep birds from contaminated waters. The key to their success is to place them out before waterfowl begin arriving in newly swathed fields. DeHaven (1971), however, considers scarecrows to be of little value in deterring blackbirds from rice fields unless they are used with other devices, such as propane exploders. Lagler (1939) stated that scarecrows placed along pond walls provided good protection at a fish hatchery in Utah, but they were not effective at a hatchery in West Virginia. A scarecrow mounted on a float was 80% effective in deterring birds from circular ponds, but kingfishers were not repelled (Lagler 1939). One of 14 fish-rearing facilities surveyed by Parkhurst et al. (1987) reported successful bird control with scarecrows, whereas 13 facilities rated them of limited or no success.

Boag and Lewin (1980) evaluated the effectiveness of a floating human effigy for deterring waterfowl from natural and artificial (contaminated) ponds in Alberta, Canada. The effigy was a commercial manikin clothed in bright orange coveralls and a knee-length bright yellow plastic overcoat, and it was mounted on a floating platform. In 1975 a single effigy was placed in the center of a small pond, and waterfowl were counted on the pond and on two untreated ponds to

[1] To simplify information, trade names have been used. No endorsement of named products or equipment is intended, nor is criticism implied of similar products not mentioned.

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determine their effectiveness. As a follow-up study in 1976, 27 manikins were placed on a contaminated 375-acre pond. In this study effectiveness was evaluated by comparing the number of dead birds located on the pond in 1976 versus the number found in the previous year when no control was used.

The human effigy was more effective in deterring waterfowl than were a floating raptor model and a series of floating reflectors. The number of waterfowl on the small treated pond in 1975 was 75% less than on control ponds. Significantly fewer dead birds were found on the contaminated pond in 1976 than in 1975. Resident birds, however, gradually habituated to the model, but nonresidents did not. Boag and Lewin (1980) concluded that human effigies can be effective in deterring waterfowl from ponds, although not all birds will be excluded.

Craven and Lev (1985) assessed the use of scarecrows to repel double-crested cormorants (*Phalacrocorax auritus*) damaging commercial fisheries in Wisconsin. Scarecrows hung from net poles were effective for about 1 month, but cormorants then began to habituate to the models and returned to perch on the poles. A scarecrow placed in a boat provided protection for about 5 weeks.

A variety of scarecrow models has been tested against various birds in Europe. One promising model consists of a 3-dimensional human effigy whose head and outstretched arms move periodically (Inglis 1980). The movement presumably more realistically mimics an alarming situation than docs an unanimated model. A mobile scarecrow unit also has been developed in Scotland but details are lacking. This consists of an inflated human effigy placed on a 3-wheeled cart that is guided along cables in fields and orchards (Achiron 1988). Propane exploders and taped distress calls supplement the deterrence provided by the moving effigy.

A relatively new inflatable human effigy, "Scarey Man," is now being marketed. Working on a battery-powered compressor, every 5 minutes it rapidly inflates and emits a high-pitched wail and then deflates. It is apparently gaining in use among catfish farmers in the Mississippi Delta to frighten cormorants. However, we are not aware of any scientific studies of its efficacy on any species.

Pop-up scarecrow units that work in synchrony with propane exploders also have been developed and evaluated in agricultural fields. One version consists of a head and torso of a human effigy mounted on an exploder (Achiron 1988). When the exploder blasts, the effigy shoots 3 feet into the air and spirals back down with fringes fluttering from its outstretched arms. One such unit is operated by a solar-powered cell and is marketed locally in North Dakota for about $500 (1988 cost).

Another version of the pop-up scarecrow was developed and tested by the Denver Wildlife Research Center (Cummings et al. 1986). The effigy consists of the upper torso of an inflatable plastic scarecrow injected with polyurethane foam. It is mounted on a CO_2-operated pop-up device set so the scarecrow pops up 15 to 30 seconds prior to two explosions (at 10-minute intervals) from a propane exploder. The unit is mounted on a tripod, but the scarecrow is visible above the sunflower heads only when the scarecrow is in the upright position. Units were tested against blackbirds damaging five sunflower fields (4 to 48 acres) in North Dakota in 1981 and 1982. Each unit covered 8 to 10 acres in 1981 and 4 to 6 acres in 1982. Sunflower damage was assessed to determine their effectiveness. The units were effective for deterring blackbirds, but efficacy varied among the test fields. They were less effective in fields where birds had an established feeding pattern and in fields located near roosts. Cost per unit, excluding labor, was about $900, but the cost per acre was estimated at $14 based on the expected life (10 years) of each unit.

RAPTOR MODELS (HAWKS AND OWLS)

Boag and Lewin (1980) also attempted deterring waterfowl from small ponds by using a model falcon mounted on floats. The wooden model simulated a flying falcon with a 16-inch wingspan. It was attached to a 12-foot tall pole bolted to the platform and floated in the center of a small pond. Wind and waves caused the model to move back and forth in a small arc. The number of birds counted on the pond declined 69% after the model was installed, and they declined 47% compared with the decline in numbers on two untreated ponds. The falcon model, however, was not as effective as the human effigy model tested on other ponds.

The use of raptor perches and perching kestrel models on some of the perches was found ineffective in significantly repelling pest birds from vineyards (Howard et al. 1985). Craven and Lev (1985) found that stationary owl decoys were not effective for repelling double-crested cormorants that perched on nets and poles of commercial fishermen. Cormorants were observed perching next to the decoys within 2 days after their placement. Will (1985) also noted that stuffed owls placed on beams and overhead ledges in aircraft hangars had little or no effect in dispersing roosting birds. The authors have observed a number of situations in which plastic owls were used on buildings, power poles, etc., with no success.

Models of owls are often promoted in garden catalogs and used unsuccessfully in an attempt to repel pest birds. Like any new object placed in the environment, they may be avoided by other birds for a few hours or days. However, the pest species soon learns that the models are no threat and pay no attention to them. They often even perch on top of the model owls.

Conover and Perito (1981) evaluated the response of starlings (*Sturnus vulgaris*) to predator models holding conspecific prey. The model was a great horned owl (*Bubo virginianus*) used alone, accompanied by a taped distress call, or grasping a "captured" starling. Observations were conducted at open silage troughs on two dairy farms where starlings fed regularly. Starlings usually responded to the models by delaying their return to the feeding trough and by feeding at the end of the trough opposite the model. Starlings fled the area when distress calls were played. They were most wary of the owl model when it was holding a live tethered starling. They were also more wary of the model after the starling was removed than before it was attached. Tethering a dead sterling to the model was less effective than attaching a live starling.

Conover (1979) evaluated the response of birds to raptor models at five artificial feeding stations and a small (0.15-acre) blueberry plot. The models were museum mounts of a sharp-shinned hawk (*Accipiter striatus*) and a goshawk (*A. gentilis*). More than 10 bird species used the feeders, which consisted of wooden platforms 3 to 4 feet off the ground baited with corn and sunflower seeds. The models were evaluated for up to 7 days each. They initially deterred birds but most habituated to the models after only 5 to 8 hours.

Blue jays (*Cyanocitta cristata*) and starlings were deterred more than mockingbirds (*Mimus polyglottos*), mourning doves (*Zenaida macroura*), and house finches (*Carpodacus mexicanus*). Although the hawk models significantly reduced the number of feeding birds, they were not as effective as a hawk kite suspended from a helium-filled balloon. Conover (1979) believes that movement of models or their "captured" prey is critical for frightening birds.

At least one mechanical hawk model (HI-TAKA) has been marketed and is powered by battery. It can be suspended from poles where it continuously flaps its wings. A timer can be installed to control and vary the times of operation. Other raptor models available have outstretched wings and are generally suspended from poles or overhead wires.

Conover (1985) also evaluated a great horned owl model for protecting vegetable crops from crow (*Corvus brachyrhynchos*) depredations. Three versions of the model were tested in 33 x 66-foot tomato and cantaloupe plots. The first test used an unanimated plastic model. The second test used the same model, but it was grasping a crow model in its talons and was mounted on a weathervane so it moved in a wind or breeze. The crow model had wings that also moved in the wind. The third test was similar to the second except that the model crow's wings were moved by a battery-operated motor, thus they moved even in the absence of a wind or breeze. Damage to fruit was assessed during each treatment and compared to damage levels in an untreated plot. The unanimated owl model was ineffective. Both animated versions reduced damage by 81% when compared to the control plot, and they were equally effective under the conditions tested. Models were inexpensive and easily built. Costs of the owl decoy and crow model in 1981 were $6 and $4, respectively. Other materials cost $20 for the wind-operated version and $60 for constructing the motor-operated model.

SUMMARY

Scarecrow and raptor models for frightening birds have been evaluated with varying degrees of success, depending on the species of birds to be repelled, the situation, and overall bird management objectives. In general, best results are obtained from models of scarecrows or raptors that are most lifelike and have motion. Their effectiveness is usually enhanced when accompanied by loud startling sounds or recorded distress calls. Novelty in the kinds and types of models and changes in their locations and presentation seem important to their effectiveness by slowing bird habituation. Some individual birds of a local population will inevitably habituate to the best of scarecrows or models so the duration of effectiveness diminishes with time.

Models of snakes apparently are not perceived as a threat as birds show little fear of these. The same is true of other unrealistic models or those without a major biological significance to birds. Understanding how to get the most repellency from these devices is essential. Substantially more research is needed in this area.

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