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ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: BIRD REACTIONS AND SCARING DEVICES

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1. PURPOSE. This advisory circular transmits, as Appendix 1, a report on bird species and their responses and reactions to scaring devices. This report is another tool for use by airport owners and operators in combating the hazard birds cause to aircraft on and adjacent to airports. In general, the report emphasizes that to effectively use bird scaring devices the birds have to be kept off balance by the use of a variation of devices.

2. GENERAL. The report, "Bird Reactions and Scaring Devices," was prepared by Dr. John A. Kadlec while employed as a Research Biologist with the Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior. Dr. Kadlec is presently Associate Professor, School of Natural Resources, University of Michigan, Ann Arbor, Michigan. His report was made available to the National Pest Control Association, Elizabeth, New Jersey, who released it under Technical Number 7-68. The Federal Aviation Administration requested from and received the whole-hearted permission of the National Pest Control Association to reproduce and distribute the report to the U.S. civil aviation industry.

3. HOW TO OBTAIN THIS PUBLICATION. Additional copies of this advisory circular, AC 150/5200-9, Bird Reactions and Scaring Devices, may be obtained from the Department of Transportation, Distribution Unit, TAD-484.3, Washington, D.C. 20590.

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APPENDIX 1. BIRD REACTIONS AND SCARING DEVICES

What determines the reactions of birds to scaring devices? To answer this question, we need to draw heavily on what is known about bird behavior. The problem has three aspects: (1) Which species is causing the problem, (2) Why is the species a problem, and (3) Why does the species respond as it does to the scare device?

Which species: Anyone who has attempted to approach birds in the woods or fields knows how wary and easily frightened they are. Why, then, is it often difficult to frighten away birds which are considered nuisances? In part, the answer lies with the habits of the problem birds. Often these are species such as pigeons, starlings, house sparrows, or even sea gulls, which have prospered (often increasing to undesirably high numbers) because they are able to live with man and profit from this association. To these species, man and his works are not adverse to life but, quite the contrary, are advantageous. In fact, with remarkably few exceptions, we can assume that any species of bird which causes man problems is able to tolerate and profit from him.

Are the abilities of birds to tolerate and even profit from man unique characteristics? Only insofar as they require a certain degree of adaptability. That is, the species must be plastic enough to change its habits. Perhaps an example will make this clear. The herring gull was, and in part still is, a bird of the seashore. Its food comes largely from scavenging along the inter-tidal zone of the seacoast and in shallow water. This habit of scavenging has permitted the herring gull (and some other gulls, too) to exploit man's wastes and increase in numbers to the point of becoming a nuisance.

An important characteristic of the herring gull--and of many other problem species--which enables it to take advantage of man, is its ability to live in close proximity to man. This ability is, of course, an aspect of behavior and any effort to deal with problem birds by any method other than by killing them is an effort to modify behavior. There are two broad categories of bird behavior, although they are not so distinct as they may seem at first glance: instinct and learning. The distinguishing characteristic of instinct is that it is inherited, although recent studies have shown that instincts are modified by learning. (In fact, there are two schools of thought quite at odds about the relative amounts of inheritance and learning involved in what is usually called instinctive behavior.)

I doubt if there is any species of bird which instinctively associates with man. To the contrary, most species are indifferent to man or avoid him. Nevertheless, a few of the over 700 species in North America appear to have inherited behavior patterns which permit them to exploit association with man.

Learning does play a part in some species' toleration of man, but to what degree is not known. Again, let's look at the herring gull as an example. Gulls living along the shore are at least moderately wary and very suspicious of human activity. Yet if you watch their activities at a garbage dump or pier where fish are processed, they seem not the least concerned about the activities of the dump-keepers or fishermen. Let a stranger appear, however, and they immediately become more wary. The gulls seem to have learned that certain men pose no threat to them, while others do. The reactions of pigeons and starlings are more difficult to interpret. Young of these species are hatched and reared in immediate proximity to man, so learning begins immediately after hatching and, thus, is indistinguishable from instinct.

Part of the difficulty in scaring nuisance birds may thus be attributed to characteristics of the birds themselves. We are faced with species with "built-in" tolerances of man and his activities.

Why is the species a problem: The reasons for the presence of problem birds determine whether or not they will be easily scared away. Whenever we attempt to scare a bird, it is faced with a conflict. Its response will depend on whether the tendency to flee the frightening sight or sound is stronger or weaker than the attraction which brought it there in the first place. We can anticipate--and indeed we find--that birds can be scared from certain places (such as their only food supply or where they have young) only with great difficulty, if at all. On the other hand, a naturally wary species, or perhaps one that is on migration and is only weakly attracted to a problem area, may be easily scared away.

The needs of birds often change with the season, as reflected in their use of feeding sites, for example. Adult birds feeding young are restricted in range, and so are forced to utilize food supplies close to their nests. In winter, birds may find few feeding areas available, and thus concentrate. On migration, birds choose good feeding areas, but are often restless and move on with little provocation. Many other special seasonal needs exist, and may influence the behavior pattern of the birds which we are attempting to scare. In fact, birds often change their habits daily in response to changes in weather.

We need, therefore, to know if the birds are attracted because of food, water, territory, shelter, or to satisfy some other need. Perhaps more important, we need to determine if there are other places nearby where this need can be satisfied. It may be useful to remember that the bird is "interested" mainly in staying alive. It will go wherever necessary to obtain the requisites of life, but with the least possible hazard.

Why does the species respond as it does: The success of attempts to frighten birds away from any given area depends on our understanding of their reactions to repellent stimuli. In the interests of self-preservation, all birds react automatically to unfamiliar sights and sounds. Thus, almost any loud noise or unusual object will initially produce an effect--at least an increase in wariness or readiness to flee. However, if birds continually reacted this way to all miscellaneous noises and objects, they would be constantly alarmed. This, of course, would interfere with other necessary activities. Feeding, for example, might be disrupted to the point of starvation. To counteract this, then, birds slowly learn to ignore noises and objects as they become familiar and prove harmless. In fact, students of bird behavior have found that small birds even cease to react to the presence of a hawk, normally a potentially dangerous predator, if continuously or frequently in the sight of one. In general, then, we can expect birds to gradually learn to ignore any normally frightening noise or object if exposed to it too often or for too long.

Recognizing that birds learn to ignore a scare device through repeated experience without any adverse effect, we must proceed in such a way that learning cannot take place. In principle, success can easily be accomplished by: (1) never using the same scare device often enough to permit learning; (2) making certain something unpleasant, such as shooting a member of the flock, occurs simultaneously with the scare device often enough to teach the birds that there is cause for real alarm; or (3) better still, doing both. In practice, success is more difficult to achieve, for automated devices are virtually precluded and considerable appreciation of the behavior of the birds is required to achieve proper timing of the scaring efforts.

In essence, all scare techniques are fakes--that is, they are attempts to fool birds into "believing" something bad is going to happen to them if they don't leave. The value of any technique can be increased if, occasionally, something disastrous does happen to a bird. Thus, the occasional shooting of a bird out of a flock reluctant to respond to a scare device can be an important part of preventing the birds from learning that we are employing fakes. In short, we must present the "real thing" often enough to have birds associate this with our fake.

At one time we believed that, if we could communicate with the birds in their own "language," we could develop a "message" to which they would always react. Much of bird behavior, including vocalization, is indeed a method of communication. Birds react to what other birds (usually members of the same species) are doing and "saying." As long ago as 1954, recordings of bird calls were tested as scaring techniques. Over the years the distress call has received the most attention, although not all species have such a call in their "vocabulary." As an example, although the herring gull distress call is specific and does indeed carry a "message" to the birds hearing it, the gulls still learn to ignore it. Recordings seem to be different from more conventional scaring devices, primarily in being a specific, rather than a generalized, stimulus. Thus, the immediate reactions of the birds are different, but the long term effects are similar.

Another way of taking advantage of the communication system of social (flocking) birds, is making use of the recent development of chemicals which produce very abnormal behavior in a few members of the flock. The sight of the antics of affected birds has a frightening effect on the rest of the flock. We do not know yet if this method is subject to the same shortcoming (it has others) as are more conventional scare devices.

Conclusion: The reaction of any given group of birds to scaring devices depends on the degree of natural wariness of the species, the strength of the "reason" for the birds being in the area, and whether we can "outsmart" them. "Outsmarting" the birds means, of course, using the proper methods and techniques in such a way as to produce the desired effect. This is the only part of the system over which we have control; however, by understanding the whole system, we should be able to develop the art of bird-scaring far beyond its present limits.