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AMERICAN CROWS

Ron J. Johnson
University of Nebraska-Lincoln, ronj@clemson.edu

Ron J. Johnson
Extension Wildlife Specialist
Department of Forestry, Fisheries
and Wildlife
University of Nebraska
Lincoln, Nebraska 68583-0819

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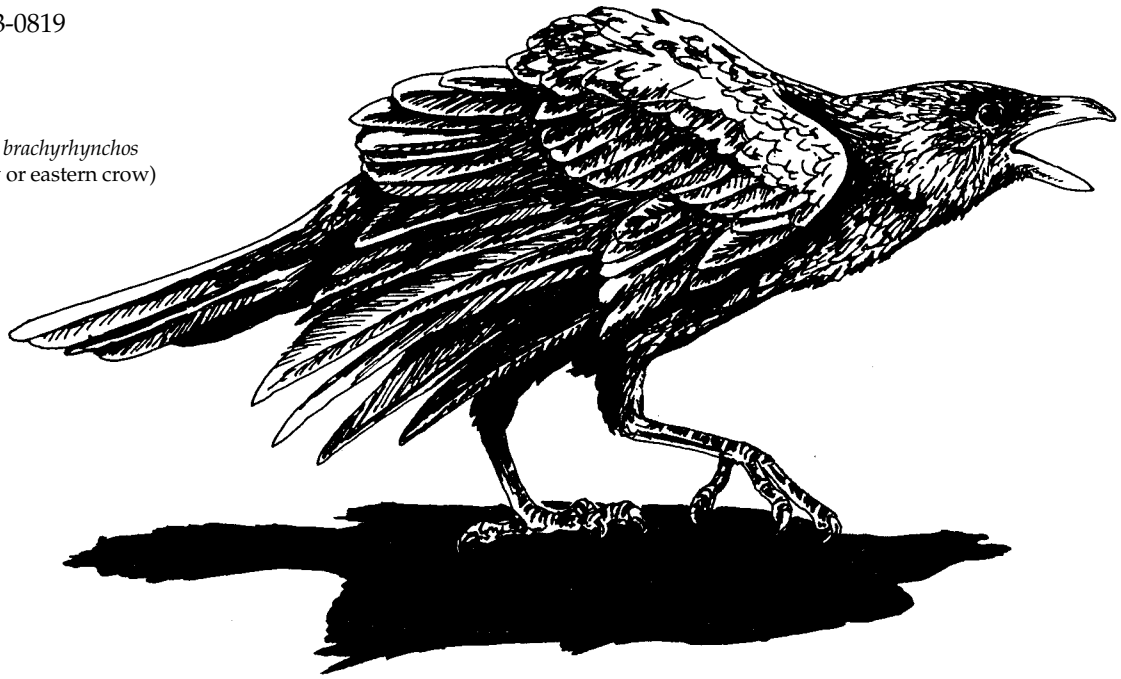


Fig. 1. American crow, *Corvus brachyrhynchos* (also called the common crow or eastern crow)

Damage Prevention and Control Methods

Exclusion

Netting to exclude crows from high-value crops or small areas.

Protect ripening corn in gardens by covering each ear with a paper cup or sack after the silk has turned brown.

Widely-spaced lines or wires placed around sites needing protection may have some efficacy in repelling crows, but further study is needed.

Cultural Methods

Alternate or decoy foods; example: scatter whole corn, preferably softened by water, through a field to protect newly planted corn seedlings.

Frightening

Use with roosts, crops, and some other situations. Frightening devices include recorded distress or alarm calls, pyrotechnics, various sound-producing devices, chemical frightening agents (Avitrol®), lights, bright objects, high-pressure water spray, and, where appropriate, shotguns.

Repellents

None are registered.

Toxicants

None are registered

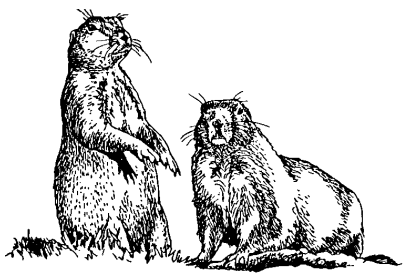
Trapping

Check laws before trapping. Australian crow decoy traps may be useful near a high-value crop or other areas where a resident population is causing damage. Proper care of traps and decoy birds is necessary.

Capture single crows uninjured in size No. 0 or No. 1 steel traps that have the jaws wrapped with cloth or rubber.

Shooting and Hunting

Helpful as a dispersal or frightening technique but generally not effective in reducing overall crow numbers. Crows may be hunted during open seasons. Check with your state wildlife agency for local restrictions.



PREVENTION AND CONTROL OF WILDLIFE DAMAGE — 1994

Cooperative Extension Division
Institute of Agriculture and Natural Resources
University of Nebraska - Lincoln

United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control

Great Plains Agricultural Council
Wildlife Committee

E-33

Identification

The American crow (Fig. 1) is one of America's best-known birds. Males and females are outwardly alike. Their large size (17 to 21 inches [43 to 53 cm] long), completely coal-black plumage, and familiar "caw caw" sound make them easy to identify. They are fairly common in areas near people, and tales of their wit and intelligence have been noted in many stories.

Three other crows occur in the continental United States, the fish crow (*Corvus ossifragus*), the northwestern crow (*Corvus caurinus*), and the Mexican crow (*Corvus imparatus*). Fish crows are primarily inhabitants of the eastern and southeastern coastal United States, but their range extends into the eastern edges of Oklahoma and Texas. Fish crows are somewhat smaller than American crows, but in the field they appear much alike. They can be distinguished, however, by their calls — the fish crow call is a short, nasal "ca," "car," or "ca-ha." Northwestern crows, as their name implies, occur in the northwest along the coastal strip from Washington to Alaska. They are most often seen foraging along beaches. Northwestern crows are smaller than American crows, but in Washington state these two species may hybridize. Mexican crows occur in south Texas (Brownsville area) primarily during fall and winter and are fairly small for crows. Their voice is a low froglike "gurr" or "croak" or, in some areas, a higher-pitched "creow."

Ravens are similar to crows in appearance. Two species occur in the continental United States, the common or northern raven (*Corvus corax*) and Chihuahuan or white-necked raven (*Corvus cryptoleucus*). The common raven is found from the foothills of the Rockies westward, northward to Alaska and eastward across Canada and some northern U.S. states, and locally in the Appalachian mountains. Common ravens can be distinguished from crows by their larger size, call, wedge-shaped tail, and flight pattern that commonly includes soaring or gliding. In contrast, crows have a frequent steady wing-beat with little or no gliding.

Chihuahuan ravens occur in the Southwest, including portions of western Kansas, Colorado, Oklahoma, Texas, New Mexico, and Arizona and rarely in south-central Nebraska. This raven, which is smaller than the common raven and somewhat larger than the American crow, can be distinguished from the crow by its call, slightly wedge-shaped tail, and flight pattern that includes gliding. The white neck feathers, which account for its other name, are seldom visible in the field.

Range

American crows are widely distributed over much of North America. They breed from Newfoundland and Manitoba southward to Florida and Texas, and throughout the West, except in the drier southwestern portions. During fall, crows in the northern parts of their range migrate southward and generally winter south of the Canada-US border.

Habitat

American crows do best in a mixture of open fields where food can be found and woodlots where there are trees for nesting and roosting. They commonly use woodlots, wooded areas along streams and rivers, farmlands, orchards, parks, and suburban areas. Winter roosting concentrations of crows occur in areas that have favorable roost sites and abundant food.

Food Habits

Crows are omnivorous, eating almost anything, and they readily adapt food habits to changing seasons and available food supply. They belong to a select group of birds that appear equally adept at live hunting, pirating, and scavenging. Studies show that crows consume over 600 different food items.

About one-third of the crow's annual diet consists of animal matter, including grasshoppers, beetles, beetle larvae (white grubs, wireworms), caterpillars, spiders, millipedes, dead fish, frogs, salamanders, snakes, eggs and young of birds, and carrion such as traffic-killed animals. The remainder of the crow's diet consists of vegetable or plant matter. Corn is the principal food item in this category, much of it obtained from fields after harvest. Crows also consume acorns, various wild and cultivated fruits, watermelon, wheat, sorghum, peanuts, pecans, garbage, and miscellaneous other items.

General Biology, Reproduction, and Behavior

Crows are among the most intelligent of birds. Experiments indicate that American crows can count to three or four, are good at solving puzzles, have good memories, employ a diverse and behaviorally complex range of vocalizations, and quickly learn to associate various noises and symbols with food. One report describes an American crow that dropped palm nuts (*Washingtonia* sp.) onto a residential street, then waited for passing automobiles to crack them. Crows are keen and wary birds. Consider the number of crows that scavenge along highways; how many have you seen hit by autos? Crows can mimic sounds made by other birds and animals and have been taught to mimic the human voice. The myth that splitting the tongue allows a crow to talk better, however, is not true and is needlessly cruel.

Crows often post a sentinel while feeding. Although studies indicate that the sentinel may be part of a family group, unrelated crows and other birds in the area likely benefit from the sentinel's presence.

Crows begin nesting in early spring (February to May, with southern nests starting earlier than northern ones) and build a nest of twigs, sticks, and coarse stems. Crow pairs appear to remain together throughout the year, at least in nonmigratory populations, and pairs or pair bonds are likely

maintained even within large winter migratory flocks. The nest, which is lined with shredded bark, feathers, grass, cloth, and string, is usually built 18 to 60 feet (5 to 18 m) above ground in oaks, pines, cottonwoods, or other trees. Where there are few trees, crows may nest on the ground or on the crossbars of telephone poles. The average clutch is 4 to 6 eggs that hatch in about 18 days. Young fledge in about 30 days. Usually there is 1 brood per year, but in some southern areas there may be 2 broods. Both sexes help build the nest and feed the young, and occasionally offspring that are 1 or more years old (nest associates) help with nesting activities. The female incubates the eggs and is fed during incubation by the male and nest associates. The young leave the nest at about 5 weeks of age and forage with their parents throughout the summer. Later in the year, the family may join other groups that in turn may join still larger groups. The larger groups often migrate in late fall or winter.

Few crows in the wild live more than 4 to 6 years, but some have lived to 14 years in the wild and over 20 years in captivity. Recently, a bird bander reported a crow that had lived an incredible 29 years in the wild. Adult crows have few predators, although larger hawks and owls and occasionally canids take some. Brood losses result from a variety of factors including predation by raccoons (*Procyon lotor*), great-horned owls (*Bubo virginianus*), and other predators; starvation; and adverse weather.

One important and spectacular aspect of crow behavior is their congregation into huge flocks in fall and winter. Large flocks are the result of many small flocks gradually assembling as the season progresses, with the largest concentration occurring in late winter. The Fort Cobb area in Oklahoma, a communal roost site, holds several million crows each winter. In Nebraska, Wisconsin, and possibly other states, crows appear to be roosting more commonly in towns near people, resulting in mixed opinions on how to deal with them. These flocks roost together at night and disperse over large areas to feed during the day. Crows may commonly fly 6 to 12 miles (10 to 20 km) outward from a roost each day to feed.

Recent radio-telemetry studies indicate that roosting crows may have two distinct daily movement patterns. Some fly each day to a stable territory, called a diurnal activity center, which is maintained by four or five birds throughout the winter and apparently then used as a nesting site in spring. Although these stable groups of crows may stop at superabundant food sources such as landfills, individuals within the groups typically fly different routes and make different stops. Other crows appear to be unattached and without specific daily activity centers or stable groups. Although they use the same roosts as the activity-center crows, these unattached birds, possibly migrants, are not faithful to any specific location or territory and more regularly feed at sites such as landfills.

Ongoing changes in land-use patterns may result in associated impacts on crow populations and behavior. Historically, crow populations have benefited from agricultural development because of grains available as a food supply and because trees became established in prairie areas where agriculture and settlement suppressed natural fires. The combination of food and tree availability favored crows, and in some areas with abundant food and available roost sites, large winter roosting concentrations became established. As the current trend toward sustainable agricultural systems continues, which may include a variety of crops and rotations with nongrain crops, food availability and associated patterns of crow roosts may change.

The growing number of crows that nest and roost in urban areas also raises questions. Are urban habitats now selected because of adaptive changes in crow behavior, or are changes in rural settings making urban sites comparably more suitable? One study described two neighboring but distinct crow nesting populations — one that was urban and somewhat habituated to people and another that was rural and relatively wary of people. Will crows that are hatched in urban areas be habituated to people to such an extent that they will be more difficult than their rural counterparts to disperse from problem sites? Understanding such factors may lead to better options for managing crows in ways compatible with the needs of people.

Damage and Damage Identification

Complaints associated with crow damage to agriculture were more common in the 1940s than they are today. Although surveys indicate that overall crow numbers have not changed appreciably, the populations appear to be more scattered during much of the year. This change has resulted apparently from the crows' response to changing land-use patterns. Farming has become more prevalent in some areas, generally with larger fields. Woodland areas are generally smaller, and trees and other resources in urban sites provide crow habitat. Overall, the amount and degree of damage is highly variable from place to place and year to year. Several variables enter into the complex picture of crow damage, including season, local weather, time of harvest, amount of crop production, and availability and distribution of wild mast, insects, and other foods.

Although crows cause a variety of damage problems, many of these are more commonly associated with other animal species. Crows may damage seedling corn plants by pulling the sprouts and consuming the kernels. Similar damage may also be caused by other birds (pheasants, starlings, blackbirds) and rodents (mice, ground squirrels). Crows at times damage ripening corn during the milk and dough stages of development. Such damage, however, is more commonly caused by blackbirds; for further information, see **Blackbirds**. Crows consume peanuts when they are windrowed in fields to dry, but other birds, especially grackles, cause the greatest portion of this damage. Crows may also damage

other crops, including ripening grain sorghum, commercial sunflowers, pecans, various fruits, and watermelons. In rare situations, crows may attack very young calves, pigs, goats, and lambs, particularly during or shortly after birth. This problem, which is more often associated with magpies or ravens, is most likely to happen where livestock births occur in unprotected open fields near large concentrations of crows.

Another complaint about crows is that they consume the eggs and sometimes the young of waterfowl, pheasants, and other birds during the nesting season. Overall, such crow depredation probably has little effect on the numbers of these birds. However, it can be a problem of concern locally, particularly where breeding waterfowl are concentrated and where there is too little habitat cover to conceal nests. For example, nests are more easily found by crows, as well as by other predators, when located in a narrow fence row or at the edge of a prairie pothole that has little surrounding cover.

Large fall and winter crow roosts cause serious problems in some areas, particularly when located in towns or other sites near people. Such roosts are objectionable because of the odor of the bird droppings, health concerns, noise, and damage to trees in the roost. In addition, crows flying out from roosts each day to feed may cause agricultural or other damage problems. On the other hand, the diet of crows may be beneficial to agriculture, depending on the time of year and surrounding land use (see sections on crow food habits and economics).

Finally, in some situations, large crow flocks may become a factor in spreading disease. At times, they feed in and around farm buildings, where they have been implicated in the spread of transmissible gastroenteritis (TGE) among swine facilities. At other times, large crow flocks near wetland areas may increase the potential for spread of waterfowl diseases such as avian cholera. The scavenging habits of crows and the apparent longer incubation time of the disease in crows are factors that increase the potential for crows to spread this devastating disease. Also, crow and other bird (blackbird, starling) roosts that have been in place for several years may harbor the fungus (*Histoplasma capsulatum*) that causes histoplasmosis, a disease that can infect people who breathe in spores when a roost is disturbed.

Legal Status

Crows are protected by the Migratory Bird Treaty Act, a federal act resulting from a formal treaty signed by the United States, Canada, and Mexico. However, under this act, crows may be controlled without a federal permit when found "committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner to constitute a health hazard or other nuisance."

States may require permits to control crows and may regulate the method of take. Federal guidelines permit states to establish hunting seasons for crows. During these seasons, crows may be hunted according to the regulations established in each state. Regulations or interpretation of depredation rules may vary among states, and state or local laws may prohibit certain control techniques such as shooting or trapping. Check with local wildlife officials if there is any doubt regarding legality of control methods.

Damage Prevention and Control Methods

Exclusion

Exclusion generally is not practical for most crow problems, but might be useful in some situations. For example, nylon or plastic netting might be useful in excluding crows from high-value crops or small areas. Protect ripening corn in small gardens from crow or other bird damage by placing a paper cup or sack over each ear after the silk has turned brown. The dried brown silk indicates that the ear has been pollinated by the corn tassels, a necessary step in corn grain development.

Lines. Another excluding or repelling technique used historically to protect fields from crows is stretching cord or fine wire at intervals across the field at heights about 6 to 8 feet (1.8 to 2.4 m) above the ground. Sometimes aluminum or cloth strips or aluminum pie pans were tied to the wires. More recently, the concept of stretching widely spaced lines or wires over or around sites needing protection from certain birds has received increased attention. Crows were included in two studies at sanitary landfills, but results were somewhat conflicting. One report from South Carolina indicated that a 20 x 20-foot (6 x 6-m) wire grid repelled crows, but another from New York indicated that parallel wires stretched 10 x 10 feet (3 x 3 m) apart and 80 x 80 feet (24 x 24 m) above the ground did not repel them.

The reason this technique has worked for certain birds is not completely clear, but the wires appear to represent an obstacle that is difficult for a flying bird to see, especially when rapid escape may be necessary. Various species respond differently to lines, and generally adult birds are more repelled by lines than juveniles. Other factors such as season and/or biological activity of the birds, type of lines or wires, spacing, and height need further research and development to better understand the potential usefulness of lines in bird management.

Cultural Methods

Agricultural Crops. Some reports indicate that providing an alternate or decoy food source will reduce crop damage caused by crows. An example would be scattering a grain such as whole corn, preferably softened by water, through a field where crows are damaging newly planted corn seedlings. Although this technique has been reported to be helpful in some situations, it has not been well tested.

Tree Roosts. Thinning branches from specific roost trees or thinning trees from dense groves reduces the availability of perch sites and opens the trees to weather effects. Such vegetation management has effectively

dispersed starling/blackbird roosts, and the same biological concepts indicate probable effectiveness in dispersing crow roosts. When roosts occur in a small number of landscape trees near homes or along streets, they usually are in fairly dense trees where thinning the branches will reduce the trees' attractiveness as roosts. Roosts in tree groves or woodlots usually occur in dense stands of young trees. Thinning about one-third of the trees improves the tree stand, especially if marked by a professional forester. Such thinning successfully dispersed blackbird/starling roosts from research woodlots in Ohio and Kentucky, and from at least two problem roost sites in Nebraska. In dense cedar thickets, bulldozing strips through the roost site to remove one-third of the habitat has also been successful in dispersing birds, but soil disturbance with this method may be hazardous if soils harbor fungal spores of the human respiratory disease histoplasmosis. For further information on roost dispersal, see **Bird Dispersal Techniques**.

Frightening

Frightening is effective in dispersing crows from roosts, some crops, and other troublesome sites. In a recent study in California, crows were successfully dispersed from urban crow roosts using tape-recorded "squalling" calls (given by a crow struggling to escape from a predator) and a portable tape player commonly used by hunters to attract animals. Such dispersal allows crows to be moved from problem sites to sites where they are less likely to interfere with people.

In addition to recorded distress or alarm calls, frightening devices include gas-operated exploders, battery-operated alarms, pyrotechnics, (shell-crackers, bird bombs), chemical frightening agents (see Avitrol® below), lights (for roosting sites at night), bright objects, clapper devices, and various other noisemakers. Beating on tin sheets or barrels with clubs can help in scaring birds. Spraying birds as they land, with water from a hose or from sprinklers mounted in the roost trees, has helped in some situations. Hanging mylar tape in roost trees may be helpful in urban areas. A combination of several scare techniques used together works better than a single technique used alone. Vary the location, intensity, and types of scare devices to improve their effectiveness. Supplement frightening techniques with shotguns, where permitted, to improve their effectiveness in dispersing crows. Ultrasonic (high frequency, above 20 kHz) sounds are not effective in frightening crows and most other birds because, like humans, they do not hear these sounds. For a more detailed discussion of frightening techniques, see **Bird Dispersal Techniques**.

Animated "crow-killing" owl models can frighten crows from gardens and small fields. These are made from a plastic owl model with a crow model attached in such a way that the crow appears to be in the owl's talons. Movement is supplied by mounting the model on a weather vane and by adding wind- or battery-powered wings to the crow.

Clapper devices (Tomko Timer-Clapper) have been reported by the Nebraska Game and Parks Commission as successful in dispersing crows from waterfowl concentration areas where crow roosting was destroying a multiple-row shelterbelt and where there was concern that crows were aggravating the spread of avian cholera. A clapper device intermittently "claps," producing a sound much like a twig snapping or like two boards clapping together. The device can be placed up in trees or at other sites close to crow perches, making it perhaps more significant to crows as a frightening device. Clappers have also been used to frighten and disperse other birds (starlings, grackles, swallows) and to repel deer at night. Like many other frightening techniques, clappers appear to be most effective with wary populations. Populations that have habituated to people or disturbance to such an extent that they have lost their wariness, may not respond.

Avitrol®. Avitrol® (active ingredient: 4-aminopyridine) is a Restricted Use Pesticide and chemical frightening agent, available in a whole-corn bait formulation (Double Strength Whole Corn) for use in dispersing crows. It is only for sale to certified applicators or persons under their direct supervision and only for those uses covered by the applicator's certification.

Avitrol® baits contain a small number of treated grains mixed with many others that are untreated. Birds that eat the treated portion of the bait behave erratically and/or give warning cries that frighten other birds from the area. Generally, birds that eat the treated particles die. Overall, because of the type of damage problems associated with crows, Avitrol® is unlikely to be used often. This product is included here, however, because situations may arise in which its use would be helpful. Before using this product for crow control, it is best to contact a qualified person trained in bird control work (someone from the Cooperative Extension or USDA-APHIS-Animal Damage Control, for example) for technical assistance. For additional information on Avitrol®, see **Blackbirds** and **European Starlings**.

Repellents

No repellents are registered for crow control. Recent studies show that conditioned aversion learning, a form of repellency, can reduce egg and possibly fruit and grain crop depredation by crows. Further work and registration of an appropriate agent for producing a conditioned aversion response are needed.

Toxicants

No toxicants are registered for crow control. Special Local Needs 24(c) registrations have been sought for DRC-1339 (3-chloro *p*-toluidine hydrochloride) by USDA-APHIS-ADC for limited, small-scale use.

Trapping

Trapping is often less attractive than other techniques because of the wide-ranging movements of crows, the time necessary to maintain and manage traps, and the number of crows that

can be captured compared to the total number in the area. Trapping and removing crows, however, can be a successful method of control at locations where a small resident population is causing damage or where other techniques cannot be used. Examples include trapping damage-causing crows near a high-value crop or in an area where nesting waterfowl are highly concentrated.

Two types of traps can be used to successfully capture crows. First, individual crows may be captured uninjured with No. 0 or No. 1 steel traps that have the jaws wrapped with cloth or rubber. These sets are most successful if placed at vantage points in areas habitually used by crows or if baited with a dummy nest containing a few eggs. Check such traps at least twice daily. Crows captured in this way might be used, if necessary, as initial decoys in the Australian crow trap described below, but the small number of captures is otherwise unlikely to affect a damage situation.

A second and more commonly used trap for crows is the Australian Crow Trap (Fig. 2), a type of decoy trap. These traps are most successful if used during the winter when food is scarce. Australian crow traps should be at least 8 to 10 feet (2.4 to 3 m) square and 5 to 6 feet (1.5 to 1.8 m) high. If desired, construct the sides and top in panels to facilitate transportation and storage. Place the trap where crows are likely to congregate. The most attractive bait is meat (such as slaughterhouse offal, small animal carcasses) or eggs. Whole kernel corn, milo heads, watermelon, and poultry feed may also work and may be preferred where carnivores such as feral dogs might be attracted to the trap. Place the bait under the ladder portion of the trap. Also provide water. After the first baiting, the trap should not be visited for 24 hours. Once the birds begin to enter the trap, it should be cared for daily. Replace the bait as soon as it loses its fresh appearance. Remove all crows captured except for about five to be left in the trap as decoys. Remove captured crows after sunset when they are calm (to facilitate handling).

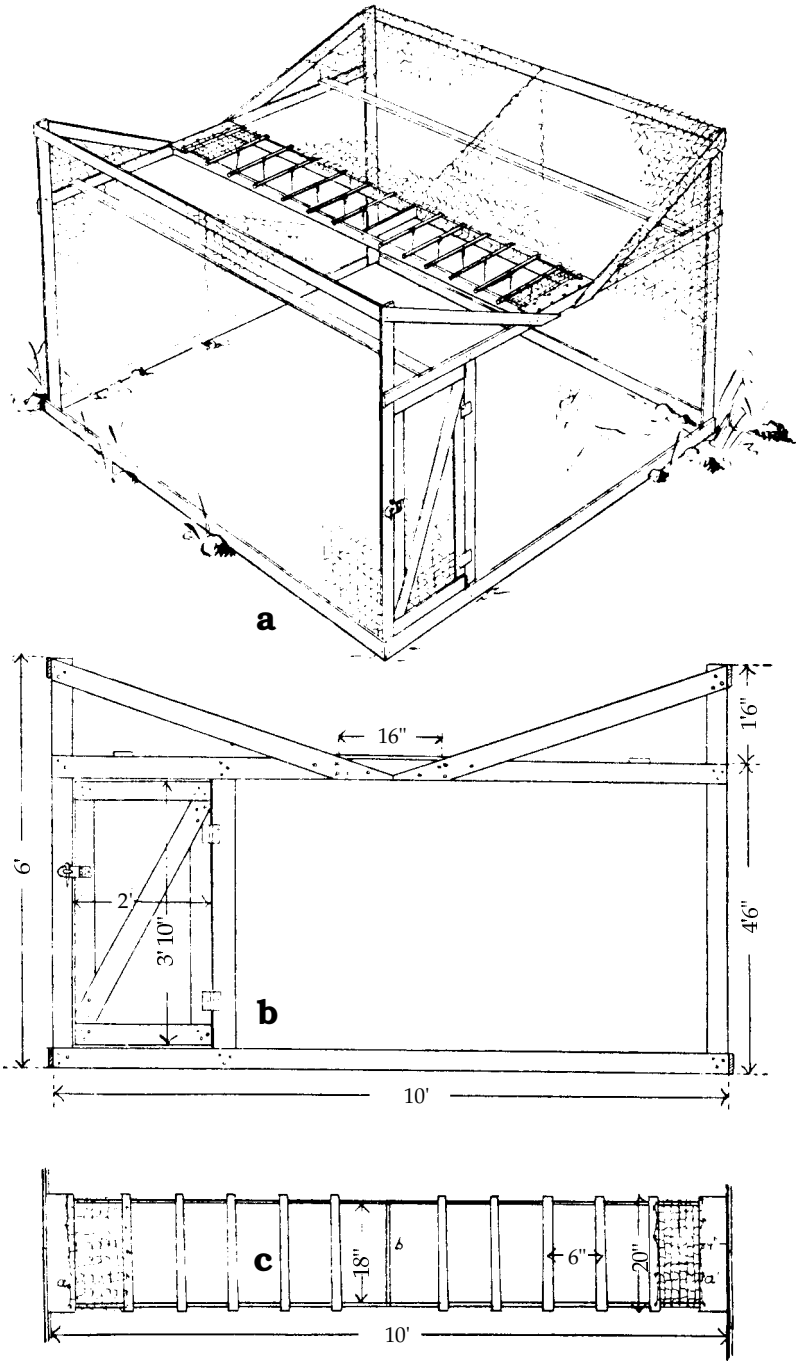


Fig. 2. Australian crow trap: (a) completed trap, (b) end view, and (c) plan of "ladder" opening.

Should any nontarget birds be captured, release them unharmed immediately. Euthanize captured crows humanely by carbon dioxide exposure or cervical dislocation. A well-maintained decoy trap can capture a number of crows each day, depending on its size and location, the time of year, and how well the trap is maintained.

A recent study in Israel of hooded crows (*Corvus corone*), which are about the same size as American crows, indicated that decoy crows were more important than bait to trap success. Using one hooded crow decoy bird, however, appeared to be as effective as using three to four, and fleshy baits did increase success in some cases. To prevent hooded crow escape, the ladder gap width of the American model was reduced from 18 to 12 inches (45 to 30 cm), and 1.5 x 0.8-inch (4 x 2-cm) square rungs were used instead of 3-inch (8-cm) diameter metal rods. The potential response of American crows to such trap modifications is unknown but merits study.

Shooting and Hunting

Shooting is more effective as a dispersal technique than as a way to reduce crow numbers. Crows are wary and thus difficult to shoot during daylight hours. They may be attracted to a concealed shooter, however, by using crow decoys or calls, or by placing an owl effigy in a conspicuous location. Generally, the number of crows killed by shooting is very small in relation to the numbers involved in pest situations. However, shooting can be a helpful technique to supplement and reinforce other dispersal techniques when the goal is to frighten and disperse crows rather than specifically to reduce numbers. For more details on dispersal, see **Bird Dispersal Techniques**.

Crow hunting during open season can be encouraged in areas where crows cause problems. The helpfulness of hunting as a control technique varies depending on crow movements, the season in which the damage occurs, and other factors. Another consideration is that crows tend to be more wary of people when they are hunted and thus more easily dispersed from roosting or other areas where their presence is a problem. Further study is needed to better understand the relationships between hunting and wariness, and whether a pattern exists that might be used to improve crow management programs.

Economics of Damage and Control

The economics of crow damage often center around a widespread controversy over whether crow feeding habits are harmful or beneficial. Some say that crows earn their keep by taking harmful insects and cleaning up carrion. Others say the damage done far outweighs any beneficial aspects. Despite some studies of the crow diet, little quantitative information is available on the overall economic impacts of crows. In addition, it appears likely that the economics of crows in relation to agriculture or people have changed from what they were 30 or more years ago when many crow studies were done.

At one time several state legislatures appropriated funds for bounties on crows and for bombing crow roosts, and suggested all-out efforts to eradicate the crow. Now, most state wildlife and agriculture departments report only a few scattered complaints of crow damage each year. At times, however, individual farms or crops do suffer severe damage, and concerns about large crow roosts in urban areas near people appear to be increasing. Individuals experiencing damage problems should weigh the costs of control against the amount of damage, then work with the proper authorities to develop a control program.

On the beneficial side, the crow diet includes large numbers of insects considered harmful to agriculture, as well as mice and carrion. In addition, their consumption of waste grain left in fields may help prevent undesirable volunteer corn in the following year's crop. The fact that crows also eat snakes may be considered a benefit by some people.

Overall, crow and other bird problems can be difficult or frustrating to resolve satisfactorily with the methods and understanding currently available. Persistence and use of a variety of techniques may be necessary to help prevent damage. In addition, further research is needed to develop damage control methods based on an understanding of bird problems in relation to agricultural and urban landscapes and other natural resource systems where damage occurs.

Acknowledgments

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Figure 1 by Emily Oseas Routman, University of Nebraska-Lincoln.

Figure 2 from E. R. Kalmbach (1939).

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Editors

Scott E. Hygnstrom
Robert M. Timm
Gary E. Larson