Munro, D.A.
Crop damage by birds. Vancouver, 1958.

CROP DAMAGE BY BIRDS

Introduction

The Canadian Wildlife Service and other agencies administering game in Canada have for some years been plagued with the problems created by ducks damaging cereal crops. These problems are outstanding in the Prairie Provinces, although they occur to a limited extent elsewhere in Canada and in the United States. Damage by ducks is a serious matter. Not only does it result in a substantial loss of revenue by grain farmers, but also, as a result of those losses, many farmers are becoming more and more antagonistic toward the program being developed for the conservation of ducks.

Following a season of heavy damage in 1951, the Department of Northern Affairs and National Resources in 1953 altered pertinent sections of the Migratory Bird Regulations to give more freedom to farmers to destroy ducks damaging their crops. There is no doubt that those administrative changes were received with some satisfaction by the farmers and that, because they were thus less impelled to complain, the problem has seemed of less consequence since that time. Moreover, due only to the vagaries of weather, since 1951 there has not been a season when such widespread severe damage took place and that fact also has contributed to the illusion that the problem is no longer with us.

The Nature of Crop Damage

Various species of migratory birds may cause damage to cereal crops in various areas but the most important losses are caused by mallards, and this account will thus refer almost exclusively to damage by mallards in the Prairie Provinces. This is done for simplicity's sake and should not be construed as dismissal of problems involving other birds and other crops.

Crop damage by birds is not a new problem but it has been aggravated by extension of agricultural activity and modifications in agricultural techniques. The practice of swathing grain rather than stooking it has literally set a banquet table for ducks.

Crop damage occurs in August and September when grain is in the swath and when the duck population is at its annual peak. Damage results from ducks eating the heads of grain

exposed on the top of the swath, and from their tramping on the swath and shelling out grain from heads below the surface of the swath. If rains at the time the grain is in swath delay completion of harvesting, damage is intensified. Flocks of several thousands may form the habit of feeding in a single field and may continue to do so long enough to make it impossible to recover 50 per cent or more of the crop. There are certain areas in the Prairie Provinces where much damage may be expected to occur each year, but some damage may occur almost anywhere in the grain growing region each year.

The pattern of duck damage presently noted in the Prairie Provinces indicates that large bodies of water act as holding areas for ducks damaging crops. Thus it is pertinent to suggest here that the construction of the South Saskatchewan Dam is quite likely to create conditions which may result in an increase in duck damage. Such has been the experience under similar circumstances in some of the western States.

The Extent of Crop Damage

We do not know the value of the average annual loss of grain resulting from duck damage, but a number of estimates of damage on localized areas give a rough idea of the values involved. These are given below:

Location	Area	Year	Est. Damage	Source of Est.
Vulcan, Alta.	360 sq. mi.	1951	$432,000	Farmer
The Pas, Man.	23.4 sq. mi.	1949	$20-30,000	"
Kindersley, Sask.	324 sq. mi.	1951	$290,000	Sask. Game Branch based on farmer interviews

A rough estimate for the value of damage in 1955 in the whole of Saskatchewan was derived by J.B. Gollop, Canadian Wildlife Service, from data submitted by farmers to the Department of Agriculture. These data have their limitations in that they are not obtained by means of an objective statistically designed sampling method, but the method used is the same as that by which estimates of damage by rust, sawflies and other pests are made and it is thus possible to compare the various loss factors. In 1955, 51 per cent of 1,772 farmers responding

to the questionnaire claimed damage, and damage was reported in 90 per cent of the municipal districts of the Province. Extrapolating the sample data, one can calculate the value of the farmers' loss on account of duck damage to be $10,576,000. Loss due to insect damage was about $60,000,000. The value of the harvested crop in that year was $418,000,000.

Data on average and total losses are interesting and instructive but they do not tell the whole story. The occurrence of duck damage is not evenly distributed and thus individual farmers often suffer losses much in excess of their normal margin of profit. Such events are of outstanding importance to individuals and contribute significantly to the development of public attitudes.

The Significance of Crop Damage

The direct economic effects of crop damage by ducks have been mentioned. It seems that the average annual loss is of the order of 2 to 3 per cent of the value of the harvested crop. The proportionate extent of the loss in terms of the profit margin will, of course, be substantially higher. There can be no doubt that this is a serious matter economically.

The status of ducks is different from that of other agents responsible for crop damage. Hail and wind are acknowledged acts of God and their occurrence in damaging proportions causes sorrow but not bitterness. Rust, cutworms, wireworms and sawflies are acknowledged pests and substantial efforts are being made to learn how to control them and actually to reduce their impact on the farming economy. Ducks, however, have a positive value, although largely to other people, and they may be destroyed only by permit or during the legal hunting season. Here is the root of an important conflict and the source of much bitterness. It must be remembered, too, that the welfare of ducks is to some extent dependent on the farmer: he can drain the marshes which are their habitat; he can reduce their numbers by illegal means; and he can press for extension of legal means of reducing their population. Thus the farmers' goodwill is of outstanding importance to the future of ducks on the prairie, and it behooves the agencies responsible for wildlife conservation to seek all practical means of reducing the conflict between ducks and grain farming.

Possibilities for Solution

Action to solve or ease the problem can be categorized as follows:

1) Limit numbers of ducks

For a number of reasons this practice can be carried only so far. The general intent of the Migratory Birds Treaty is clearly to protect migratory birds, although provision is made for hunting, and for killing them when they damage agricultural interests. Sportsmen and nature lovers are opposed to drastic reduction in numbers of birds. Even if it were practical to reduce the numbers of birds, all damage would not thereby be eliminated, although the chances of its occurrence should be reduced. During recent years, regulations governing duck hunting in the Prairie Provinces have, in fact, been most liberal. Had they not been the duck population might possibly, but not certainly, have become even greater.

2) Keep ducks away from grain

A variety of techniques are of this type. They are the use of frightening devices such as scarecrows, pyrotechnics, explorers etc; shooting to scare and to kill under the permit system referred to in the introduction to this memorandum; and herding ducks by aeroplane. All the frightening procedures have one common drawback, viz., their use merely results in the birds going to feed on some other field.

However, the difficulties caused by dispersion of birds can be reduced by the provision of what may be called "banishment areas", i.e., areas where the birds are encouraged to go and are protected. If food in the form of a standing crop (a "lure crop") or dumped grain (the provision of which may be called "lure feeding") is available, those difficulties can be substantially reduced. While we have no generally applicable figures on the cost of effective lure feeding, an example from Manitoba may be of interest. In 1957, the Manitoba government provided 31,000 bushels of grain, reputedly at a cost of $30,000, to feed ducks in the Portage Plains area. The farmers themselves transported the grain, and a biologist from the Delta Waterfowl Research Station organized and supervised the program. In addition, the hunting season on ducks was opened on September 6 on cultivated lands only and not within 100 yards of any water area. The Manitoba program was considered to have reduced crop losses (although nobody knows

how much), and it was well received by the farmers. Procedures of this type in various modified forms certainly have a potential use in some areas. They should be given additional trials and data on costs and effectiveness obtained so that an objective evaluation can be worked out.

Difficulty connected with any of these control practices is that all require considerable manpower at harvest time when labour is practically unavailable.

3) Make grain unavailable to ducks

One of the more important factors contributing to occurrence of duck damage is the practice of swathing grain. Swathing might be largely eliminated if earlier ripening varieties of grain were developed and used, or if the use of chemical ripening agents in the form of spray were to become practical. Elimination of swathing would almost certainly reduce the importance of duck damage to insignificance. Perhaps either or both of those advances may some day be realized but we cannot count on it.

The development of a repellent spray to be used on swaths is a theoretical possibility.

4) Make ducks of positive value to farmers

It has been pointed out that ducks have a positive economic value but not to the farmers who, willingly and unwillingly, provide much of the habitat within which they are produced. The problem becomes a double-barrelled one at this juncture because here we come up against the question of habitat maintenance. Wetlands in agricultural regions are vital for the survival of waterfowl, but they are also being reduced in number and area by drainage. To maintain duck numbers it is necessary to maintain wetlands. How can that be done, when the owners of wetlands derive no benefit from ducks and, indeed, suffer from their presence?

The answer would seem to lie in providing some recompense to landowners for the maintenance of wetlands and support of waterfowl. This could take one or a combination of various forms such as a direct subsidy for the production and support of waterfowl, a tax easement based on wetland areas, a comprehensive scheme to insure all agriculturists against crop loss by waterfowl (there is such an insurance scheme in operation in Saskatchewan but it has too limited a base), or provision for the landowner to obtain a direct monetary reward from hunting. Should some arrangement involving compensation be deemed desirable it would be necessary to con-

sider the source of the funds and the arrangements which would be made to take into account the interlocking interests of Canada and the United States.

Sources of Additional Information

A number of publications, as well as unpublished reports, contain accounts of crop damage by waterfowl on the Canadian prairies. The habits of grain feeding ducks and qualitative descriptions of damage done by them are quite well recorded but there is a lack of information on the quantitative aspects of damage for major regions.

One of the most comprehensive accounts of crop damage is

Bossenmaier, Eugene F. and William H. Marshall, Field-Feeding by Waterfowl in Southeastern Manitoba, 1958. Wildlife Monographs No. I.

This paper refers to the situation in the Whitewater Lake area of Manitoba but it contains much information which reflects conditions elsewhere.

A number of other papers include discussion of the crop damage problem in general terms. Some of these are:

Colls, D.G. The conflict between waterfowl and agriculture, 1951. Trans. 16. N. Am. Wildl. Conf.: 89-93

Mair, W.W. Ducks and grain, 1953. Trans. 18. N. Am. Wildl. Conf.

Munro, D.A. & J.B. Gollop. Canada's place in flyway management, 1955. Trans. 20. N. Am. Wildl. Conf.: 118-125

Paynter, E.L. Crop insurance against waterfowl depredations, 1955. Trans. 20. N. Am. Wildl. Conf.: 151-157

Some unpublished reports which contain details of local studies of crop damage are:

Benson, A.W. Results of attempts to control duck damage in the Marenyo area of western Saskatchewan, August - September, 1952. Report to the Saskatchewan Game Branch.

Colls, D.G. Depredation control studies, Manitoba, 1952. Report to the Canadian Wildlife Service.

Gollop, J.B. Report on investigation of damage to cereal crops by ducks in the Prairie Provinces, 1949. Report to the Canadian Wildlife Service.

Gollop, J.B. Report on investigation of damage to cereal crops by ducks, 1950. Report to the Canadian Wildlife Service.

Gollop, J.B. Report on investigation of damage to cereal crops by ducks, 1951. Report to the Canadian Wildlife Service.

Munro, D.A. Control of crop damage by ducks at Mossbank, Saskatchewan, August-September, 1952.

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D.A. Munro,
Canadian Wildlife Service,
July 22, 1958.

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