Wildlife Conservation for 4-H Clubs
Michigan State University Cooperative Extension Service
4-H Club Bulletin
R.G.Hill, F.F. Tubbs, Charles Shick
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4-H CLUB BULLETIN 49

WILDLIFE CONSERVATION *for* 4-H CLUBS

By R. G. Hill, F. F. Tubbs, and Charles Shick

MICHIGAN STATE COLLEGE
COOPERATIVE EXTENSION SERVICE
EAST LANSING

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FOREWORD

Conservation is the wise use of our natural resources—land, forests, flowers, minerals, water, and wildlife.

A number of state and federal agencies have developed conservation programs which will bring the greatest amount of prosperity and happiness to the greatest number of people, not only for the present but for all future time.

To attain the goals of any conservation program, it is necessary that all Michigan citizens enlist their support to the work to be done.

Young people should have a definite part in this effort. That is why the 4-H Club Department of Michigan State College has made conservation a definite feature of their year-round program.

This bulletin has been prepared for your use. Use it wisely; put into practice the suggestions presented. If you will do that and do it well, you will be helping to conserve some of the natural resources of Michigan.

A. G. KETTUNEN,
STATE 4-H CLUB LEADER

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Wildlife Conservation for 4-H Clubs

By R. G. HILL[1], F. F. TUBBS[2], and CHARLES SHICK[3]

Like all 4-H Club work, this project offers a chance to learn by doing. By completing the requirements, as outlined in this bulletin, you can gain some knowledge of the factors which operate in producing wildlife. You can learn something of the importance of wildlife, and its dependence on the land. And you can help develop a healthy body and a keen mind—by contact with the out-of-doors, by observing animal life in its natural habitat, and by helping to rebuild wildlife as one of our natural resources.

1. Any boy or girl between the ages of 10 and 21 years by July 1, who is enrolled in a 4-H Club, may participate in the following activities.
2. Project credit can be obtained by completing any two activities in one year, with the exception of the song bird study. Project credit will be given for completing the song bird study project. Seasonal project years in conservation will correspond to the seasonal project years for other 4-H projects.
3. Your project work must be reported on the record blank which will be provided by your club leader.
4. Each member is required to display an exhibit at Achievement Day or at a fair designated by the club leader. This may consist of one or more of the following:
   a. Actual material made
   b. Miniatures illustrating finished work
   c. Pictures or photographs of project work
   d. Scrap book containing pictures, drawings or stories of the work done
   e. Record book
   f. Drawings illustrating work done
   g. Collections of material related to your work

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A 4-H Club may wish to carry on some Wildlife Conservation activity not described here. This may be done if consent is given by the county 4-H leader, and if individual or group requirements for activity credit are set up prior to starting the work.

Some 4-H clubs have completed the development of a small lake for ducks and other waterfowl. This may be done as a group project. However, special assistance will be necessary for this work. If you are interested your club leader will make such arrangements.

TO THE 4-H CLUB LEADER:

Record blanks for reporting activities or projects completed by members are available from the State 4-H Club Office, East Lansing.

There are many interesting places to which field trips may be taken to study wildlife conservation. The following are a few of them:

Rose Lake Wildlife Experiment Station, East Lansing
Swan Creek Wildlife Experiment Station, Allegan
W. K. Kellogg Bird Sanctuary, Hickory Corners.
Cusino Wildlife Experiment Station, Shingleton
Dead Stream Game Area (Houghton Lake) Roscommon

In order to receive assistance when visiting these places be sure to make arrangements with the men in charge at least two weeks before the trip is taken. Write to the director of the station at the address given. At least one field trip should be taken each year.

Many individuals located throughout the state are able to give your club considerable assistance. Prominent among this group are the district game supervisors. These men are well trained in wildlife conservation and will give you such help as their time allows. Every county in the state is within the jurisdiction of a district game supervisor. Ask your county 4-H leader or conservation officer—or write to the authors of this bulletin—for the name and address of the game area manager in your district. In addition, the extension specialist in farm game management, Michigan State College, East Lansing, will be glad to assist. Arrangement for his services should be made through your county agricultural agent.

Requirements listed in the activities are the minimum requirements. Club members should be encouraged to do more than just enough to complete their activities.

Regular meetings of the club should be held. Motion pictures and colored 2-inch slides on conservation work may be obtained

through county extension offices from the Audio-Visual Center, M. S. C. and directly from the Education Division, Michigan Department of Conservation, Lansing, Michigan. Make reservations for films and slides well in advance of the date on which they will be used. Your county conservation officer will be glad to discuss conservation laws at one of your meetings.

A portion of the school program, assembly or home room hour may be devoted to discussing some phase of wildlife conservation. A "pot-luck" game supper during the hunting season will attract parents as well as members. Homemade posters depicting some phase of conservation can be made for the schoolroom wall.

It is suggested that boys and girls carrying conservation projects or activities become members of a regular 4-H Conservation Club. In this way social and related benefits, important objectives of 4-H Club work, may be obtained. In addition, since all conservation projects and activities are related, such an organization will aid to emphasize the relationship. Members of the club may then take any conservation project or activity they wish. Following is a list of conservation projects available to 4-H members *in addition to the projects and activities included in this bulletin.*

OTHER CONSERVATION PROJECTS

Fur Trapping and Management—This project gives the young trapper an opportunity to learn the better methods of trapping, and the handling of pelts. In addition, activities are included which, if completed, will better acquaint the member with fur animals on his farm. This is a year-around project. It should be started by December 1. In the second-year's work, one activity is required in which some improvement in homes for fur animals must be completed. In addition, complete trapping records must be kept.

For additional details request 4-H Club Bulletin No. 55, "Fur Trapping and Management for 4-H Clubs".

Deer Yard Study—This is a group project, in which club members visit winter deer yards with an experienced guide. One of the Conservation Department's district game supervisors would be useful on such trips. The winter food eaten by deer is observed and samples collected. The quantity of winter food available in the yard is checked. And a map is made of the yard showing its condition as a suitable winter home for deer.

This project may be completed during the winter. For further information, see 4-H Club Bulletin 40, "Michigan Deer Herd".

Survey of Michigan Inland Lakes—The objective of this project is to present to members a plan whereby they can obtain interesting information about a lake near their community.

This plan includes:

1. Making a map of the lake,
2. Determining the depth of the lake,
3. Studying the soil and the plant and insect life in the lake,
4. Determining the kind of fish found in the lake,
5. Taking a creel census, and
6. Studying the history of the lake.

This is a group project which may be completed during the winter.

Wildflower Project—The activities included in this project have the following objectives:

1. To learn the names of some of the common wild flowers of Michigan,
2. To study the conditions causing a decline in numbers and varieties of wild flowers,
3. To become better acquainted with wild flowers through the study of their habits,
4. To learn to conserve and preserve the natural wild flowers of our state.

This is a one-year project. Complete details are found in 4-H Club Bulletin 46, "Wildflower Project Outline For 4-H Clubs".

Forest Fire Study—The project is divided into two years' work. The first year's activities are designed to inform each member of the organization, the function, and responsibility of the state's fire-fighting forces. Forest-fire towers are visted, and the methods of observing and reporting fires are studied. An appreciation of the forest-fire problem is another objective.

During the second year, each member must demonstrate the proper way to build and extinguish a camp fire, make a forest-fire spot map, and actually take part in forest-fire control if possible. These projects are described in 4-H Club Bulletins 31 and 31A "Forest Fire Study".

Forestry Projects—Several years' credit in 4-H club work may be earned by completing the following projects, plus other required activities. Only one project should be carried at a time.

PROJECT 1. Plant trees at home for Christmas trees, windbreaks, or erosion control. Or help plant trees in the school forest.

PROJECT 2. Collect forest tree seeds; sow them in a prepared seedbed to grow forest trees for planting at home or in the school forest. Or make a study of the flowering and leafing of forest trees.

PROJECT 3. Make certain instruments used for scaling logs and estimating timber. Learn to use them by actually scaling logs and estimating timber.

ADVANCED PROJECTS. Older members may earn fourth, fifth, and sixth year work in forestry by completing advanced projects in woodland management satisfactorily. The projects are to be outlined by the club agent and extension forester.

For complete information on forestry projects see the 4-H Club bulletins on forestry.

Soil Conservation—Many Soil Conservation 4-H projects are available. These will help boys and girls gain a better understanding of why it is necessary to practice good land use, and to learn about the many soil and water conservation practices that can be applied.

Young club members will find the many soil conservation activities described in Club Bulletin 56 interesting. Many can even be used for demonstrations. Older members will learn a great deal about land from the farm-mapping projects outlined in Club Bulletin 33. Actual soil conservation practices can be applied to the land by older club members. These practices are presented in Club Bulletin 41.

A 4-H Soil Conservation Club member will find several years of interesting project work available to him.

MEETING SUGGESTIONS

The following is a list of meeting suggestions for 4-H Clubs. This list deals chiefly with wildlife topics. Suggestions for other conservation programs may be obtained from the various 4-H club conservation bulletins. The club leader should obtain the following bulletin for his use: "Teaching Conservation of Wildlife Through 4-H Clubs," Extension Service, U. S. Department of Agriculture, Washington, C. D. It is wise to encourage club members to give suggestions for meeting programs. A program committee will prove useful.

January

1. Why is wildlife important to the people of Michigan?
2. Discussion on winter feeding of wildlife.
   a. Seed and berries. Each member may bring a collection of seeds and berries found on the farm which are available as wildlife food. These may be identified and labeled as abundant, common, or scarce.
   b. Feeding stations. What species of wildlife are using feeding stations set up by members? Is standing corn being used by any wildlife?
3. What are the species of wildlife common to the community doing this month? A list of the wild animal life should be made and filed with the secretary, to be referred to each month for discussion. This topic may be discussed once each month.
4. Roll call. Each member answer by naming a fruit or seed used by wildlife as winter food.
5. Short report by each member on the progress of his project or activity. This should be done at each meeting.

February

1. Pictures of wild animals and their tracks may be used in an identification contest.
2. Roll call. Each member read a recent news item concerning some wild animal.
3. Have weather conditions this winter been favorable to wildlife? What about temperature and amount of snow?
4. This is a good month to show conservation movies. Write to the Education Division, Michigan Department of Conservation, Lansing, Michigan, concerning the borrowing of films.
5. Discuss ways by which you can improve your farm for wildlife.

March

1. In what type of cover did each of the game animals found in the community spend the winter? Is this cover abundant, common, or scarce? Is food available nearby?
2. Bird house construction should be discussed during the February or March meeting.
3. Roll call. Each member respond by imitating the common sound used by some kind of wildlife.
4. Two-inch colored slides on "Game Animals on Michigan Farms" may be borrowed through county extension offices, or from the Audio-Visual Center, Michigan State College.
5. Name the birds which winter in your community but migrate north in the spring.

April

1. Discussion. What is a predator? Should an effort be made to eradicate all predators? Write the name of each predator on the board; list both its good and bad qualities. Is some control of most species of wildlife necessary under certain conditions?
2. How may soil conservation practices be favorable to wildlife production?
3. Roll call. Each member give a short description of the life of some animal. The animal to be described should be assigned in the meeting notice

or at previous meeting. After each member responds, other members of the club should be allowed to add to the member's description.

May

1. This is the season when most wild animals are producing young. Which animals bring forth young alive? Which ones lay eggs? Where are the nests located? Discuss each animal separately.
2. Nesting hazards. Discuss effect of burning in farm operations on pheasant, quail, and rabbit nests.
3. Is burning generally a good or poor farm practice? *Debate:* Resolved that burning as a farm practice should be encouraged.
4. Does Michigan have laws regulating burning? (What are they?) Some member of the club should write to the Field Administration, Michigan Department of Conservation, Lansing, Michigan, for this information.
5. Roll call. Each member name a mammal, bird, or fish not found in Michigan but found in some other part of the United States.

June

1. What farming practices aid in producing wildlife (see M. S. C. Extension Bulletin 218)?
2. List all the uses of water. How important is water to wildlife? Discuss ways by which water may be conserved.
3. Contest. Determine how many birds, game animals, fish and fur animals each member can spell from the letters in *"Conservation."*
4. Roll call. Each member describe some family of wildlife observed during the last two months. How many young were there? What were they doing? How many times did you see them?

July

1. Have members report on number of broods of pheasants or quail they have seen on the farm.
2. Some members will be taking vacations or trips to lakes during the month. Have them tell about the wild animal life they observed.
3. Why are some pheasants still nesting in July?
4. Contest. Have each member bring to the meeting a written description of some form of wildlife. Number each description. Read them to the club and give prizes for members recognizing most descriptions. A prize might also be offered for the best description.
5. Roll call. Each member brings a book or bulletin which he has collected on conservation. During roll call he reads name of bulletin and describes its content.

August

1. Meeting may be held at a park or lake where birds, muskrats and other animals can be observed.
2. Discuss house cat and dog as predators on wildlife. Is it possible to control the number of stray cats and dogs? Are there laws concerning dogs interfering with wild animal life?
3. Visit a member's farm and observe the conditions present which are favorable to wildlife. Is there plenty of food and cover available for summer or for winter? Is it all in one place or distributed around the farm?

4. Each 4-H club member should receive some information concerning public agencies working on conservation. Some of these agencies are: The Michigan Department of Conservation, Soil Conservation Service, U. S. Forest Service, Cooperative Extension Service, M. S. C., and U. S. Fish and Wildlife Service. Information about the work of these agencies should be obtained and discussed at one of the meetings.
5. Sponsor a conservation quiz program. Choose sides and appoint a score keeper. Each member should bring five questions with the correct answers for the quiz. Losers to pay forfeit.

September

1. Trespass laws may be discussed this month. Copies of farm trespass laws may be obtained from the Michigan Conservation Department, Lansing, Michigan.
2. Controlled Hunting organizations (Williamston Plan may be explained).
3. How much wildlife is killed on the highway? Members may keep a record of what they see over a certain period and report at a meeting.
4. Vacation reports on wildlife seen or other experiences may be continued this month.
5. Wildlife picture contest. There may be two parts—one for pictures taken by club members, another for pictures collected from magazines.

October

1. Have county conservation officer discuss game laws at your meeting.
2. Why do we have conservation laws? Every club must discuss this. Copies of game laws should be obtained from your local hunting license dealer.
3. Demonstration on proper handling of guns. Conservation officer or other qualified sportsman may assist with this demonstration (See "4-H Gun Safety Project" Bulletin.)
4. A pot-luck game supper may be held this month.
5. Birds start to migrate south this month. One program may be spent discussing bird migration. Maps of North and South America are helpful in showing routes of birds. Consult reference on bird migration.

November

1. How does the amount of cover available for wildlife differ between summer and winter? Has good winter cover been destroyed by fall burning?
2. Hunting experiences may be told.
3. A survey of game from members' farms during hunting season could be made by club members.
4. Have a taxidermist give a demonstration.
5. Values of wildlife to us and to our fellow citizens should be discussed at one meeting.
6. Roll call. Have each member tell where various species of wildlife can spend the winter on his farm. Perhaps there are no suitable places for some species.

December

1. What things can be done in a woodlot which will aid wildlife?
2. Santa Claus is supposed to use reindeer to pull his sleigh. Have someone report on those animals. Where do they live? What do they eat?

3. This month, feeding stations should be started. Describe different kinds of food to be used and location of stations.
4. Trapping experiences may be related here. What fur animals are trapped in the community? In the state? How important is trapping in Michigan?
5. What are the common fur trapping laws?
6. Check newspaper ads or mail order catalogs for names under which furs are sold. From what animals did the furs come?

WHAT WILDLIFE CROPS ARE BEST SUITED FOR YOUR PROJECT?

Different kinds of soils vary in their ability to grow certain agricultural crops. In a like manner, soils vary in their ability to produce the different kinds of food and cover which determine the crop of wildlife. Most species of animals respond favorably to fertile soils—provided, of course, those soils produce the kind and variety of food and cover necessary for the animals' existence. Because soils, climate and land use influence the distribution and abundance of wildlife crops, the first task is to determine the kinds of animals a certain locality can produce most efficiently. Then you can proceed to make management plans for those species.

To do that, it is necessary to consider: (1) Whether the lands are agricultural or wild land types, (2) the agricultural cropping program, (3) proportion of the land that is uncultivated, (4) climate, and (5) individual requirements of the animals.

Michigan may be divided into two general habitat types for game production: (1) The farm land area in the southern half of the lower peninsula; and (2) the northern wild land area which constitutes the rest of the state. Within each type there is considerable overlapping, especially where southern agricultural lands merge with northern wild lands (Fig. 1).

Southern Agricultural Lands—Originally, the entire state was forest covered, with only few scattered openings. As time progressed, this great expanse of timber was cut for lumber or fuel and the land cleared for agriculture. What has happened on the land since this original clearing took place directly influences the present distribution and abundance of wild animals.

The southern half of the lower peninsula—the present farm land game area—was developed for agricultural use. The extent of this development varied from one section to another, but at present from 50 to 95 percent is crop or pasture land.

Fig. 1.

This agricultural development altered food and cover conditions on virtually all of the land, changing it from a wild land environment to an agricultural environment. Likewise, some of the wild land species—such as grouse, grey squirrel, snowshoe hare and others—were forced to abandon the agricultural belt. Slowly the newly created habitat was occupied by the quail, cottontail, opossum, fox squirrel, and raccoon. Later the pheasant was introduced and soon became established.

Pheasants, cottontail rabbits, fox squirrels, quail, raccoons, and opossums are farm game species. All thrive on the agricultural areas of southern Michigan. A large portion of their food comes from the

residue grains and weeds common to cultivated fields. Too, the climate of successful agricultural lands is milder than that of northern lands. This makes it possible for seed-eating animals to feed on grains or weed seeds throughout the winter.

All agricultural lands are not equally capable of producing the various game animals. If the land is fertile and not too cleanly farmed, the pheasant may be the only game species that will succeed in numbers. As the amount of cover increases on equally fertile soil, good populations of rabbits, squirrels and raccoon may be found in addition to the pheasant.

Most rough or poorer farm lands have more woods and brushy cover than do the level, fertile soils. Here the rabbit, squirrel, or raccoon are likely to be the principal game animals, the pheasant ranking far behind. Presence or absence of a water supply may influence the number and variety of wild animals found on an area.

Poor agricultural soils, lacking cover, are generally of little value for wildlife production.

Northern Wild Lands—The northern half of the Lower Peninsula and the entire Upper Peninsula should in general be classed as wild lands (see Fig. 1). Some good farms are scattered throughout this area. A large part of this territory is not suited to agricultural use, however. This is because of either the quality of soil, the short, uncertain growing season, or distance from markets. In some agricultural communities the bulk of the land is cleared for crop production or pasture.

Even when farm land predominates in the northern zone, it is not capable of growing the farm game species such as pheasants, cottontail rabbits, opossum, or quail. The deep snow, sustained low temperatures, or the absence of certain agricultural crops are responsible. (Fig. 2.)

Wild land provides the homes for deer, bear, snowshoe hares, squirrels, and members of the grouse family. These animals can live on the native vegetation with no help whatever from agricultural waste. Their food consists of fruits, seeds, buds, browse, (tender twigs of trees and shrubs) and insects common to northern areas. Deep snows or extreme cold cause little hardship, if ample food is available. The range required per individual animal is usually large, so detailed management plans—such as adapted to the farmland areas—usually prove too costly for use on northern areas.

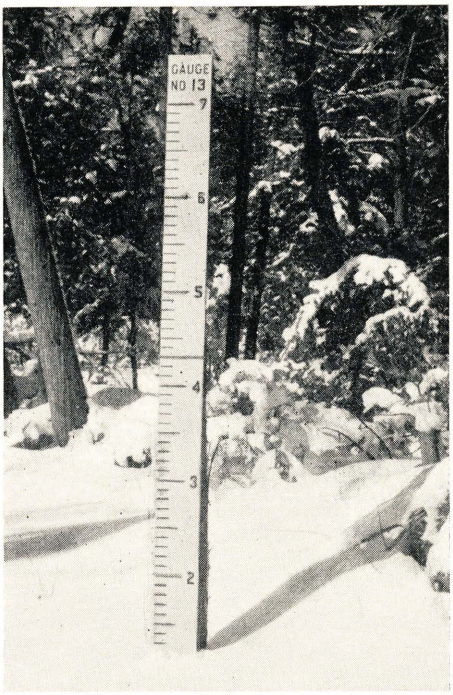

Fig. 2. Deep snows which persist over a long period of time are a limiting factor in farm game production.

Game species responding to management on or near northern agricultural lands include the prairie chicken, sharp-tailed grouse, and fox and grey squirrels. These species often use food patches and feeding stations. The prairie chicken and sharp-tailed grouse have "dancing" hills which should be protected. Fox and grey squirrels will make use of nesting boxes, if den trees are absent. Not all northern areas will have prairie chickens or "sharp-tails," but if found locally these interesting birds should be considered in the management project.

The amount of land involved in the management of deer is so large that ordinary management measures are useless (see deer yard study project).

SUPPLYING WINTER FOOD FOR WILDLIFE

Some Michigan farms are without sufficient crop wastes to support a good population of wildlife. This deficiency may be caused by

extra-clean farming methods, crop failures, or lack of soil productivity. Even though there is an abundance of cover and natural wild foods, wild creatures may suffer at times. This is especially so during late winter when those supplies become exhausted or are made inaccessible by deep snow or ice.

In summer there is an abundance of food everywhere. Also, the foliage of growing crops is dense, thereby affording wild animals good protection from their enemies. However, this condition changes when the farmer starts to harvest his crops, and prepare his fields for spring planting. Each crop removed and each acre plowed restrict the available range. By the time hunting season has arrived, the corn has been shocked or put in a silo, the beans pulled, wheat sown, and the fall plowing program is under way. Hay fields have been pastured more or less heavily, leaving very little cover except weed patches, fencerows and permanent cover along swales and woodlots.

Frosts make further restrictions, thinning out protective cover by removing most of the leaves. The first snowstorm further limits this range by covering stubble and meadows. By the time winter is well under way, the feeding and shelter covers are limited to only a small fraction of the area available during the summer months. The food supply is also gradually being diminished by the feeding animals. Each successive day finds conditions more adverse, and this trend continues until new growth starts in spring.

ACTIVITY—PLANT OR LEAVE GRAIN PATCHES AS WILDLIFE FOOD

Minimum Requirements

1. At least one-half acre in a properly placed food patch or in food patches must be provided if the member wishes to receive credit for this activity.
2. The activity report should include a description of what animals used the food patch, and approximately how many of each species of animals. Also your observation on how the grain stood up during the winter, how long the food lasted, and any other happening of interest.

Food Patches—The food patch offers one way of insuring wildlife an adequate amount of food. A few rows of corn left uncut or a few shocks of corn or sheaves of grain left along brushy fencerows,

marshes, ungrazed woodlots, strips of standing rye or sweet clover, or a "kettle hole" will suffice. If the wildlife population is large, an increased area may be devoted to food patches.

Many kinds of grains may be used in food-patch plantings. But since the food patch is to provide game with food during the most adverse weather conditions, such grains as wheat, oats, barley, or buckwheat are not very effective. They have weak stalks and are incapable of holding the head of grain above the snow throughout the winter. Usefulness of those plants is limited to the fall and early winter months, or to the spring after the snow has melted.

Experience indicates that corn is by far the most important food-patch plant for farm-game species. An early-maturing variety of yellow dent corn should be planted, and cultivated sufficiently to insure a good crop of ears. Late cultivation may be omitted, allowing weeds to form a dense ground cover. Otherwise corn should be planted and cared for the same as the regular crop grown for grain production.

Ground cover makes it possible for animals to feed with the seclusion and protection they desire. It is also recommended that sudan grass or millet be sown broadcast and cultivated in. Sudan grass or millet should be planted sometime before July 10. This makes a dense tangle of cover, and the seeds of the plants increase the amounts and variety of food available during the fall and winter. It is possible to grow such a combination on a farm that has very little or no cover and, thus, keep many kinds of wildlife throughout the winter.

The corp crop grown as a food patch may be shocked or left standing (Fig. 3). In case the corn is shocked, it will be necessary to visit the area regularly as the winter progresses to open and expose a new supply of ears. If it is planned to handle the food patch in the most efficient manner, corn should be left uncut. The natural placement of ears on the stalks at varying heights always insures the animals a meal, regardless of the depth of the snow.

Rye makes an excellent tangle for cover. Although not very palatable, it supplies considerable food during the winter. In many sections of Michigan where the soil is sandy—or on heavier agricultural soils which have been depleted of their fertility—rye is used instead of wheat in the rotation. Rye will make a fair-to-good growth on most agricultural soils. The stems are rigid and will usually stand nearly erect throughout the winter. Rye and vetch, or rye alone, should furnish an abundance of cover, supplying considerable food at the time of year when more palatable foods aren't available.

A well-prepared and properly fertilized seedbed is necessary if satisfactory food patches are to be grown. A soil poorly drained or unusually low in fertility cannot be expected to produce a good grain crop.

Fig. 3. One of the best feeding stations if located near some cover.

ACTIVITY—CONSTRUCT AND MAINTAIN WINTER FEEDING STATIONS

Minimum Requirements

1. At least three feeding stations must be constructed and maintained by each member who wishes to receive 4-H Club credit.
2. The stations should be started by December 1 and operated until March 15. Write to the Game Division, Michigan Conservation Department, for a free leaflet called "Feeding and Sheltering Michigan's Wildlife".
3. A record should be kept of the quantity of grain used in the station, as well as what animals made use of the feed. Indicate which species of animals used the station most and which one least.

The feeding station is not so efficient as the food patch, but it makes a suitable substitute. While the food patch is considered the most economical and efficient method of feeding wildlife during adverse times, it has other disadvantages. The person who elects to use this system loses some of the direct contact with the animals the operator of the feeding station enjoys. Many persons would much rather undergo the inconvenience of attending a feeding station regularly so as to enjoy the company of the wild animals.

A good feeding-station program, like any other well-organized procedure, has certain qualifications which should be met. If the program is to be effective, approximately six conditions should be considered when starting. While there is some overlapping, each station operator should consider these points:

1. The feeding station for game birds and animals should be located in the vicinity of good winter cover. This winter cover may be found at the edge of a woodlot, swale, marsh or brushy fencerow; or near patches of wheat, sweet clover, or rye. A location with a southern or southeastern exposure, or perhaps an opening in a patch of brush, is best.
2. The feeding station should not be located where it will be affected by the drifting of snows or prevailing winds. Nor should the birds be forced to wander out into the open to reach or use the station.
3. Feeding stations for songbirds can be placed so the birds can be readily observed for enjoyment from a window. Suet, bread crumbs, table scraps, grit, millet, cracked corn, weed seeds, and wild berries can be made available to the visiting songbirds.
4. The station must be established early in the season. Birds and animals will then learn its location and include it in their regular daily feeding range.
5. Stations should be started by December 1 in the Lower Peninsula; by November 15 in the Upper Peninsula.
6. The station for game birds and animals must be visited regularly. Provisions must be made for an adequate supply of grain and grit.
7. Several small stations scattered around the farm are preferred to a single large one.

It is not essential that the feeding station be of elaborate construction. Some of the most effective types are very simple. However, considerable pleasure can be obtained by building a feeding rack or one of the more complicated types of stations.

A few corn shocks placed near winter cover constitute probably one of the best and simplest types of feeding station. Rabbits, squirrels, bobwhites, pheasants, and possibly raccoons will make use of it. Any of those animals is capable of tearing the husks from the ears and eating the grain from the cob. Of course, the food furnished by the outside ears will soon be exhausted. It will then be necessary to open up the shocks to expose new ears.

Many other feeding stations may be made. A few of the more important ones are described and illustrated. Shelters are preferred by many persons. If a shelter is built, it is well to remember this—unless it is properly built, the animals may be "cornered" by dogs, cats or weasels. Should necessity arise, game should be able to escape in virtually any direction.

The frame work of the shelter can be constructed of poles and covered with burlap, boughs, cornstalks, or sheaves of grain (Fig. 4).

Cornstalks are often used for the covering, with the ears arranged so they hang down on the underside of the shelter.

Fig. 4. A good combination of feeding station and shelter.

A wire basket, made from hardware cloth and placed on the side of a tree rather close to the ground, is an effective way of feeding wildlife. (Fig. 5.) This basket may be filled with scratch feed, wheat, barley, or shelled corn. A station of this type has this advantage—the food is so completely enclosed the squirrels find it difficult to hide any amount of the grain.

The following is an easy and successful way of constructing a feeding station where plenty of brush or saplings is available. The only equipment needed is a hand axe, a few spikes, and a sack of ear corn. A sapling or a stout brush, an inch or two in diameter, is cut and left partially untrimmed so that the branches will hold the trunk partly out of the snow. Spikes are driven through the trunk at intervals of about a foot. The ears are pushed lengthwise onto the spikes.

This is an excellent type of station, is especially useful in emergency feeding. A slight modification is to cut off small twigs a quarter of an inch in diameter. The end of each sharpened twig is pushed

Fig. 5. A good feeding station. (Corn and scratch grain.)

Fig. 6. An example of a good feeding station. Normal snowfall will not cover up this one.

lengthwise into the pith of an ear of corn. When making a station of this type, it is well to arrange the ears at different heights above the ground. Cut the twigs at different heights before the ears are fastened to them. (Fig. 6.)

An excellent feeding station may be made along a wire fence where it passes through brushy cover. The only equipment necessary is a few feet of binder twine and some ear corn. The twine is tied to the ear of corn, then fastened to the fence so that the ear is held just above the snow. These ears should be arranged at different heights.

The prairie chicken and sharp-tailed grouse respond well to feeding stations, providing the stations are started early and the right grains are offered. "Chickens" reared on wild land areas distantly removed from agricultural crops often must learn to eat certain grains. Therefore, it is often necessary to experiment with several grains before the right one will be found. Again in this instance ear corn is best,

if the "chicken" will eat it, because it can be easily made available even though severe snow storms occur.

While prairie chickens and "sharp-tails" range over a rather wide area, they usually visit given localities regularly for feeding. The feeding site may be located by observation and the feeding station site selected. Dancing, or booming grounds, should always be inspected for signs of use, regardless of the season. Many successful feeding stations have been located on the dancing grounds.

Figure 7 illustrates a successful type of feeding station for the two species of chickens. This station is made by improvising a rack from materials at hand. Four strong stakes about 5 feet long are driven into the ground to form the upright supports. Poles may be wired or nailed to the tops of the supports, forming a square framework onto which the top is constructed. Evergreen boughs, brush, or poles are suitable for the top.

The grain should be placed on top of as well as under the shelter. When attempting to concentrate the birds around the station, it may

Fig. 7. Building a feeding station for prairie chicken and sharp-tail grouse.

be necessary to distribute grain rather widely in the vicinity of the station.

The number of feeding stations established will depend upon the size of the area, the number of suitable sites, and the number of animals to be serviced. Convenience should be considered when establishing the stations. Stations located nearby will require a minimum of effort to replenish the food supply.

You must remember the purpose of the feeding station or food patch is to provide the animals with an adequate food supply during the most adverse times they will experience in any season. Accordingly, all stations should be established so they can be easily attended if an emergency developes. As a rule, no great harm is done if for a day or so at a time no food is available at the stations—especially in mild weather or when the snow has melted from large areas, leaving plenty of bare ground. Because the purpose of winter feeding is to give the wild animals a dependable supply of food, all stations should be tended faithfully until the possibility of a food shortage is past.

ACTIVITY—MAKE PLANTINGS TO PROVIDE COVER FOR WILDLIFE

Requirements

1. Directions for making plantings are contained in 4-H Club Bulletin 19, "4-H Forestry Club Work".
2. Club members living in counties south of highway M-20 should write for and read "A Break for Farmers and Wildlife". The leaflet can be obtained without cost from the Game Division, Michigan Conservation Department. Also obtain the project bulletin, "Wildlife Management Program" from the 4-H Club office, M. S. C., East Lansing.
3. At least 500 trees and shrubs or a combination of trees and shrubs shall be planted by each member.
4. This activity may be done either in the fall or spring—preferably spring.
5. When activity is completed, obtain a record blank from your club leader for reporting your work. The report should tell how many trees or shrubs and what species were planted, where the planting was made, and your plans to protect and encourage the planting.

Cover is anything that provides a favorable retreat for wildlife, offers shelter and protection against weather and other animals, or can be used for nesting purposes. It may be a hollow tree for a raccoon or fox squirrel; a brush heap, a woodchuck hole, or thick swale for the cottontail; a pond for the muskrat; a fallen log for weasels or mink; a cedar swamp for deer; or a brushy fence row for the skunk. However, this activity will center around the increase of permanent cover—through plantings of shrubs, trees and vines—in the agricultural areas of the state.

Game animals such as deer, prairie chicken and grouse, found in northern Michigan, require such extensive areas that the small amount of cover which could be provided by an individual would have very little value.

Two fundamental requirements for all forms of wildlife are *food* and *cover*. Often the two go together. Shelter plants often provide food, and food-bearing plants may also provide suitable cover. It will be useless to expect much wild animal life, including song birds, on our farms unless cover and food requirements are met.

Each species of animal has its own habitat requirements. Satisfactory cover for one animal may not be suitable for another. For example, the ring-necked pheasant is most abundant in the intensively clean farm areas having fertile soils; the cottontail rabbit prefers areas having an abundance of swales, marshes, brush, and uncultivated land.

Each wild animal requires several types of cover. A place is necessary where the plants are dense and extend to the ground. This is used as a protection against other animals and shelter against the weather. If it is located near a grain or hayfield it may be used as an emergency hiding place against attacks by preying animals or man. There should also be some cover that is rather thin or sparse near the ground. The wildlife can then enjoy a "play area"—an area where some shade and protection are provided, yet the vegetation is thin enough to permit free movement.

Pheasants, rabbits, grouse, and prairie chicken, as well as many other birds and small animals, nest on the ground—especially near or in permanent protective cover. This nesting cover may be that of a grassy roadside, a fence row, hay field, edge of a marsh, swale or woodlot, or a variety of similar situations. Old stubble fields with their tangle of weeds make excellent nesting cover for cottontails and pheasants. It is advantageous in some respects to have small areas of each type of cover located together near the food supply and in

different parts of the farm, rather than one large area located on one side of the farm.

If you watch diligently you will notice that wildlife makes the most use of cover which is close to food. Cover without food, or food without cover, is nearly worthless.

We know that good agricultural land will not be deliberately left for wildlife cover, and that wildlife activities directly harmful to good agriculture will not be undertaken. Yet, there are a number of processes in line with good agriculture which can be beneficial to wild animal life. An unpastured woodlot not only will provide suitable environment for a great many forms of wildlife and produce more timber for a longer period of time; it will also hold greater quantities of water, so that erosion or flooding will be less devastating. A few den trees left in a woodlot may mean the difference between some or no raccoons. The presence of several nut or mast-producing trees in a woodlot will provide necessary food for a good fox squirrel population.

It is good agricultural practice, and likewise beneficial to many species of wildlife, not to allow farm animals on permanent pasture in the spring until it has had a chance to make good growth. Or to avoid pasturing fields so closely during the summer that plants will be permanently injured or erosion started.

Fig. 8. Clumps of evergreens have made this hillside safe from erosion and attractive to songbirds, game and fur animals.

Fig. 9. Black Locust planted in this gully is stopping serious erosion. Additional natural vegetation has started to grow.

Evergreens or shrubs planted along a fence row can afford an excellent windbreak, and provide permanent or emergency cover for wildlife, especially cottontail rabbits. Cover along a fence row may be used as a "street" which wild animals follow in going from permanent cover to their food supply. Preventing unnecessary burning of fence rows, swales, swamps or roadsides may save homes or nests of wildlife. On many farms there are gullies, sand blowouts, eroded hillsides and roadsides where plants would save the soil, definitely add to the appearance of the landscape, and attract many forms of wildlife. The same is true of many unused fence corners and land adjoining woods, along a creek, or surrounding a pond. Do you have any such places on your farm?

On page 31 you will find a chart showing trees and shrubs which may be planted on eroded or unused areas, fence rows, roadsides, or along the edge of the woodlot. Similar plantings may be made along stream banks or on edges of lakes. The presence of flowering and fruit-producing shrubs around a farm definitely adds to the liveability of the area. Many of these plants provide not only cover but also fruit or seeds which can be used as winter food—not only for wild-

life but for man as well. Do not plant them in solid blocks of the same kind, but distribute them so that they are mixed with other plants.

Trees or shrubs used for planting need not always be purchased. Some may be growing naturally on your farm which can be transplanted to the desired location. Better results are usually obtained if the planting contains groups of evergreen trees as well as hardwoods and shrubs. From the wildlife standpoint, group planting is preferred to solid planting. Such groups may contain from 20 to 50 trees or shrubs planted 6 feet apart. When shrubs are planted in gullies for erosion control it may be necessary to plant them closer together than 6 feet in order to hold the soil.

It must be remembered that a planting will be of little use for wildlife if grazing by farm animals is not prevented. Usually if an area

Fig. 10. Honeysuckle and coralberry has made this old gully pleasing to the eye and home to numerous forms of wildlife.

Fig. 11. Conifer tree plantings provide good rabbit cover as well as a tree crop and erosion control.

is protected from grazing, cutting, and burning a natural growth of trees and shrubs will result. Rural school children may desire to attract bird life around their school as well as beautify the grounds through plantings.

Several animals—such as the pheasant and the cotton tail rabbit—often use standing crops for summer cover, retreating to permanent cover during the winter. If no permanent cover is available these animals may not survive the low temperatures.

Additional information on wildlife cover may be obtained from Farmers' Bulletin 2035 "Making Land Produce Useful Wildlife". This may be obtained from the Soil Conservation Service, United States Department of Agriculture, Washington, D. C. Another publication which deals with this subject and which may prove useful is Michigan Extension Bulletin 218 "Producing Wildlife by Good Farm Land Use". This may be obtained from the Cooperative Extension Service of Michigan State College, East Lansing.

TREES AND SHRUBS FOR WILDLIFE PLANTINGS IN SOUTHERN MICHIGAN

SOIL PREFERENCE	TREES	SHRUBS	
Clay and Clay Loam	Ash, White Basswood Butternut Cedar, White Cherry, Black Hickory Locust, Black Maple, Soft Maple, Sugar Pine, White Plum, Wild Spruce, White Walnut, Black	Bittersweet Coralberry Crab, Wild Dogwood, Gray or Panicled *Dogwood, Red Osier Dogwood, Silky Elderberry, Black Berried Haw, Black Honeysuckle Indigo, False Nannyberry †Multiflora Rose	Nightshade Ninebark Raspberry Snowberry
Sandy Loam	Butternut Cherry, Black Hickory Locust, Black Maple, Soft Plum, Wild Oak Pine, Red ‡Pine, Scotch Pine, White Spruce, White Walnut	Bittersweet Blackberry Coralberry Crab, Wild Dogwood, Gray or Panicled Elderberry Grape, Wild Hawthorne Hazelnut Honeysuckle Indigo, False Juniper, Dwarf †Multiflora Rose	Raspberry Serviceberry Snowberry Sumac
Sand	Locust, Black Locust, Honey Maple, Soft Oak Pea, Siberian Pine, Jack Pine, Red ‡Pine, Scotch Pine, White	Blackberry Bittersweet Coralberry Grape, Wild Hazelnut Hawthorne Honeysuckle Indigo, False Juniper, Dwarf	Serviceberry Snowberry Sumac
Sand Blows	Locust, Honey Pea, Siberian Pine, Jack Pine, Red ‡Pine, Scotch	Blackberry Coralberry	

*Prefers low, wet soils.
†Recommended for areas south of Bay City and Muskegon.
‡Not native.

Compiled by
L. A. Davenport
R. G. Hill

ACTIVITY—CONSTRUCT NESTING BOXES FOR FOX SQUIRRELS, RACCOONS, OR WOOD DUCKS

Minimum Requirements

1. To be considered as a 4-H club activity, at least four artificial nesting boxes must be constructed and placed in trees by each member.
2. Report whether the nesting boxes were built for fox squirrels, raccoons, or wood ducks.
3. Indicate as best you can the animals using the boxes.

Fig. 12. A natural den tree for raccoon or fox squirrel. All such trees have been removed from many woodlots.

4. This activity may be carried on during the fall or winter. However, report should not be made until October 1 so as to enable member to observe use of boxes.
5. Give a complete report of the number of natural dens available in your woods for fox squirrels or raccoons. Indicate the kind of trees in which dens are located and tell whether the trees are old, medium age, or young. Also report the number of acres of woodland included in your survey of dens.

One activity, in which 4-H club members may take part, that will add to the comfort of fox squirrels is the placing of nesting boxes in trees. By observing how the boxes are used, some information concerning the lives of these animals can also be obtained.

Dens or cavities in trees are necessary for raccoons, fox squirrels, and wood ducks. Unfortunately for those animals, trees with dens are usually the first ones removed from a woodlot. The decline of raccoons in some areas can be traced directly to den tree removal.

Fox squirrels normally produce their young in small hollow dens in trees. Or, if dens are not plentiful, they use large leaf nests which they build on tree branches. Two to four young are born in these nests during late winter and early spring. It is a common occurrence for a second litter to be born during early fall. Fox squirrels seem to prefer the artificial nesting boxes to their natural nesting sites for rearing young and as retreats during winter. One nesting box for each one acre of woodlot is sufficient. If these nests are erected before February 1 they will probably be used that season for rearing young.

Nesting boxes should be securely placed, at least 25 feet from the ground, in the larger trees in the woodlot or along fence rows. It is suggested that they be placed in such a way so as to be protected by limbs from stones or shooting from below. Nesting boxes should not be placed in trees already having cavities suitable for nesting.

Nothing need be put in the boxes; the squirrels will pack them full of leaves to suit their own needs. It is not necessary to clean these nests. You will probably find that red squirrels, flying squirrels, woodmice, screech owls, bees, and even tree frogs will use the boxes.

The pictures (Figs. 13 and 14) will give you suggestions for the construction of these artificial nests. An ordinary nail keg with the top closed is excellent. The entrance should be 3½ inches in diameter and located near the top of the box close to the trunk of the tree. If

Fig. 13. Artificial den for fox squirrel. Similar dens may be erected for wood duck and raccoon.

scrap lumber is used for this construction the dimensions should be approximately one foot square, and two feet deep.

Raccoons also use dens in which to produce their young. An average of four raccoon are born during April or May. Such dens are also valuable to this animal as a hiding and loafing place during other periods of the year.

Wood ducks, unlike most other waterfowl, make their nests in tree dens, hollow stumps or logs. The abundance of such places along lakes or rivers may determine whether those birds rear young in that community.

If 4-H members live near lakes or along rivers inhabited by wood ducks or raccoons, similar nesting boxes may be used for these animals.

However, for wood ducks the entrance should be about 4½ inches in diameter, and for raccoons a 5½-inch entrance is desirable. The box will also be more attractive to the raccoon if it is 3 feet deep instead of 2 feet as recommended for fox squirrels and wood ducks. Natural raccoon dens are usually deep.

Before building and placing nest boxes you should carefully check your woods for the number and location of natural dens. This will aid you to determine whether there is a shortage of dens and need for artificial nesting boxes. A natural den for every acre of woodlot is sufficient for fox squirrels. One den for each 10 acres of woodland seems adequate for raccoons.

Fig. 14. Artificial den for fox squirrel.

ACTIVITY—CONSTRUCT ARTIFICIAL DENS FOR COTTONTAIL RABBITS

Minimum Requirements

1. At least five brush piles or five ground dens, or a combination of brush piles and dens, must be constructed in suitable locations by each member to be credited as a 4-H club activity.
2. Records must be kept of the dates the brush piles or dens were made, and the first date you observed their being used. Also report whether animals other than cottontails used the coverts.
3. This activity may be completed during any season of the year.
4. This activity report should not be made until after brush piles or dens have been in use one winter. Spring achievement day is a good date to complete your report.

In many localities pasturing, cutting, burning and clearing have greatly reduced the thick brushy tangles necessary for the protection of cottontail rabbits. Intensively farmed areas may have very little brushy areas suitable for this animal. The decline in the number of woodchucks has further worked to the disadvantage of the cottontail, since the burrows of woodchucks make good retreats for rabbits. As a result, many areas with some cover have very few rabbits.

It is possible to provide artificial escape areas. One of the most common methods is to construct brush piles from branches removed during wood cutting, thinning or clearing. The brush should be piled over a log or stump to prevent crushing by hunters or snow. Large branches should be placed on the bottom; lighter, finer branches on top. To be usable for a long time, the completed brush pile should be at least 10 to 12 feet across and about 6 feet high. (Fig. 15.)

CROSS SECTION OF A BRUSH PILE.

Fig. 15.

It is necessary that these piles be placed in those parts of the farm where at least a few cottontails can naturally be found. Such locations as the outside portions of an unpastured woodlot, marsh or swale, along fence rows or windbreaks may be satisfactory.

Another type of artificial protective cover for cottontail rabbits is the ground den. The artificial ground den will be most effective where natural ground burrows are absent. They can be made from scrap lumber found around the farm. The accompanying drawings (Fig. 16) will serve as a guide. The open end of the den should be placed in some ground vegetation where cottontails naturally will be found. It is also important that the den be placed in some location where it will not be flooded after rains. If tile is used as entrances to nest boxes it should be at least 5 inches in diameter.

Boys and girls need not fear that other animals will trap and kill many cottontails in these one-way ground dens. Research work at the Swan Creek Wildlife Experiment Station, near Allegan, has shown that if the burrow is of reasonable size, the cottontail will be able to rush past the intruder without being caught.

ACTIVITY—PHOTOGRAPH WILD ANIMAL LIFE AND THEIR HOMES

Minimum Requirements

1. At least 10 different pictures of wild animal life or their homes or a combination of animals and homes are necessary for this activity.
2. All pictures must be at least 2¼ x 3¼ inches in size and mounted on a cardboard or in an album book. All pictures should be of the same size.
3. A short paragraph must be written beneath each picture, describing the animal or animal home shown.
4. A story of your work should include the kind of camera or cameras used, types of film on which pictures were taken, and a description of your experiences while engaged in this activity. The story should also include the name of the reference or references used in connection with this activity.
5. Pictures of domesticated animals or animals in a zoo will not be accepted.
6. This activity may be done during any period of the year, and report made as soon as requirements are completed.

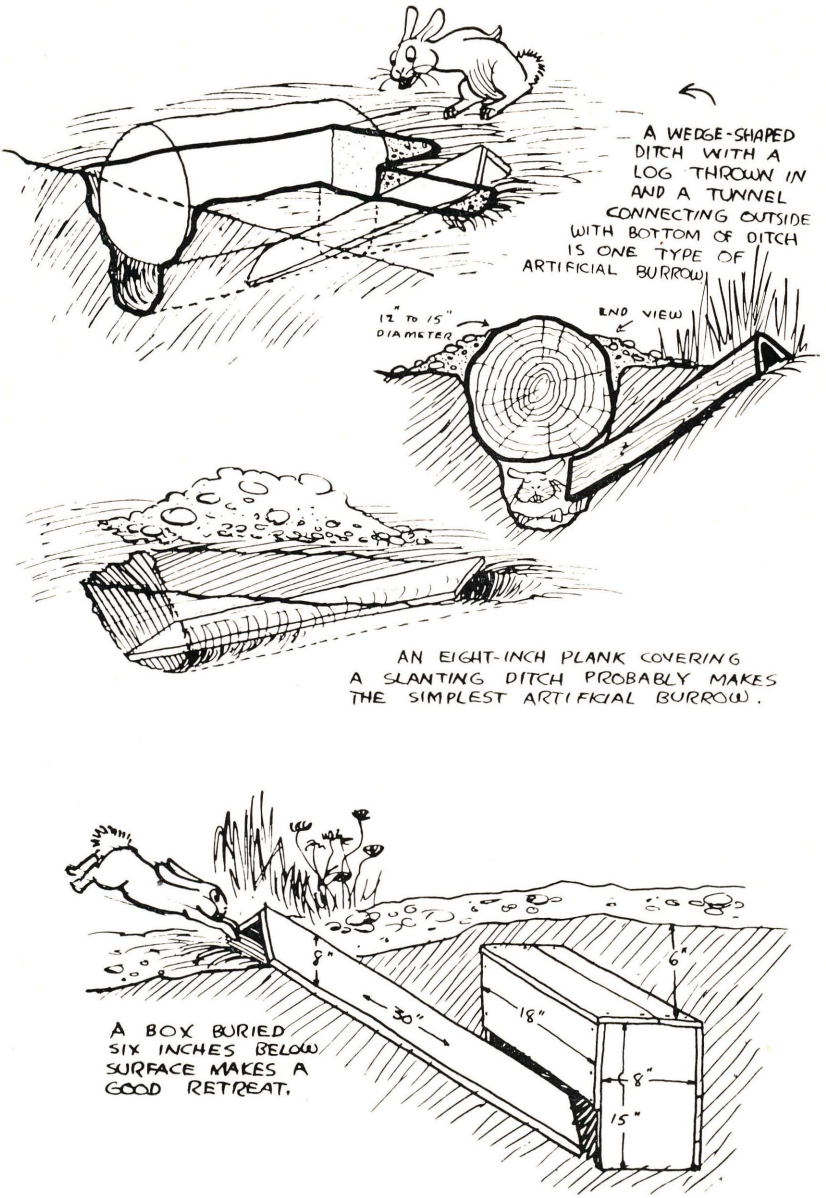

Fig. 16. Artificial ground dens for cottontail rabbits.

Fig. 17. A valued trophy.

Nearly every boy and girl owns some kind of a camera. To be able to take good pictures is a source of considerable enjoyment and satisfaction. It is much more difficult to take pictures of wildlife than those of scenery, other people, or stationary objects. Animal life such as birds, deer, or fur animals must first be located. Then, what is even more difficult, one must get near enough so that a "close-up" may be taken with proper lighting.

It is more difficult to take good pictures of wildlife than to hunt the same animals. A person who has taken an excellent picture of an animal in the wild has a more valued trophy (Fig. 17) than if he had shot and preserved the animal. Photographing wildlife is a greater test of skill than is hunting. Considerable technique is necessary to make good use of the camera. It is not always necessary to have expensive equipment to take good pictures (Fig. 18). However, one should be able to make the best use of the camera equipment that is available.

This activity is made available to 4-H club boys and girls as a means of improving their photographic technique and inducing them to learn more about wild animal life by locating and photographing the species in their homes. It is not necessary that you develop your own pictures.

Because there are several good publications available on taking pictures, the technique will not be discussed here. However, the boy or girl taking this activity must make use of at least one good reference on photography.

Recommended Reference:

"Photography in Camp" and "Picture Taking in Camp," Eastman Kodak Co., Rochester, N. Y.

THE HARVEST

Intelligent harvesting of wildlife is one of our most important game problems. Animals usually produce enough offspring so that some

Fig. 18. Expensive cameras are not necessary to get pictures of wildlife around the farm.

may be removed without endangering the future supply. Because the number of animals on an area is limited by food and cover, the quantity of wildlife produced in excess of this carrying capacity is a surplus and will disappear. This surplus may be removed by hunting, and in that way some food and enjoyment may be obtained from those surplus animals.

To determine the number of animals that constitute a surplus and may be annually removed requires the work of a technical game expert. Game laws have been established not to deprive people of sport, but to limit the harvest so that an adequate breeding or seed stock may be left for the following year. In some places, more hunting should be encouraged to keep the population of certain species low enough to reduce damage by these animals to agricultural crops. Careful observations over several years may be necessary to determine whether the limited numbers of wildlife on any farm is due to hunters or to other factors.

By means of "The Horton Trespass Law" and controlled hunting under the "Williamston Plan," landowners have the tools by which hunter trespass difficulty may be controlled. Your club leader will inform you concerning these controls.

ACTIVITY—ORGANIZE A CONTROLLED HUNTING AREA IN YOUR COMMUNITY

Minimum Requirements

1. The controlled hunting cooperative shall comprise at least 640 acres.
2. Parents may be members of the organization. However, all officers and committees shall be composed of 4-H Club members. It is suggested that the leader of the 4-H Club be a member of the controlled hunting cooperative.
3. The club shall make up and distribute record sheets to all members of the cooperative so a record of the number of hunters and of game killed on the area will be obtained.
4. A complete club report on the activities of the cooperative, and on the records obtained shall be made at the end of the hunting season. List the name of each member and the part he played in this activity.

This activity may be carried on by a group of club members living in the same community. This plan of cooperative wildlife management may be set up in areas ranging from 640 to approximately 5,000 acres. One section or 640 acres of farm land where every farmer is a member of the organization is the smallest unit acceptable. Through the use of such a cooperative the number of hunters and the amount of hunting can be controlled. The club members may also obtain a record of the animals removed from the area by hunting.

The area included is posted with one kind of boundary sign. (Fig. 19.) Hunting is allowed, but the guest must first obtain a permit card from a landowner and leave his car in that yard. The number of hunters using the area is limited, because only a certain number of permits (generally three) are available from each farm. The guest hunter is usually allowed to hunt over a section of land or the entire club area. But he must return to the farm yard to leave his permit, show his game, and get his car. (All posters and permit cards may

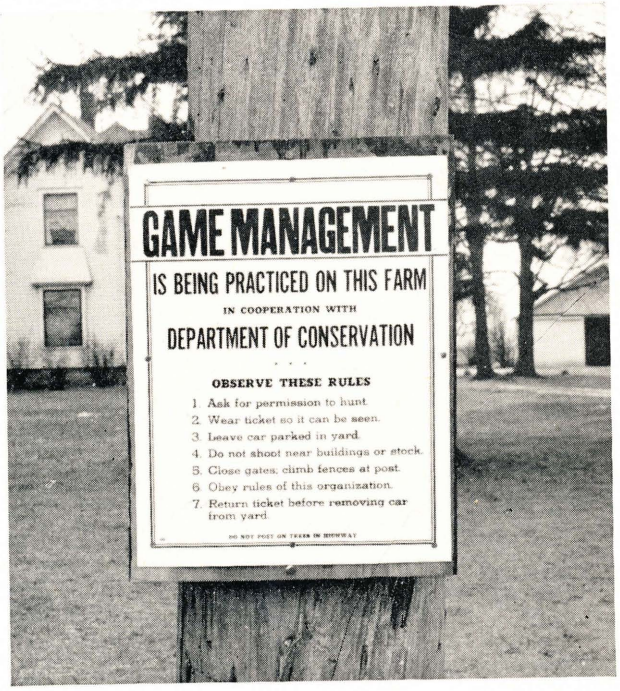

Fig. 19. Harvest control is a part of wildlife management. This gate sign is placed near the entrance to each farm yard.

be obtained free from the State Conservation Department. Applications for this material must be sent to the Department before September 10.)

Because the organization of a controlled hunting area involves a number of details it is suggested that the club members have a meeting and invite someone familiar with game management organizations to explain details. Your county 4-H leader will make such arrangements. This meeting should be held *not later than September 10* in order that all details will have been completed before hunting season.

BIRD STUDY PROJECT FOR 4-H CLUBS[4]

Michigan has among its wildlife resources an abundant and colorful population of birds. Some of these, the game birds, have received much attention because of their value for sport and food. However, there are other birds not so well known that also deserve study.

The bird study project may be started in late fall, or at the beginning of winter, spring, or summer. The intention is to show some ways in which non-game birds are important, and how to learn something of their lives and habits.

Altogether, about 310 species of birds have been found in Michigan. Of these, the passenger pigeon is now extinct, the Eskimo curlew is probably extinct, and the trumpeter swan and wild turkey are gone from the state. By omitting those four and some 30 other species rarely observed in Michigan, one has a list of about 275 birds to be expected in the state as a whole. For any one locality, a list of 200 is a possibility. And it should not be difficult to find 100 species almost anywhere.

Importance of Non-game Birds—The greatest value of songbirds and other non-game birds is the pleasure people derive from watching and hearing them. Brilliant colors and blended patterns make some birds beautiful; others are extremely interesting because of their ways of getting food, building homes, and rearing young, or escaping winter's bad weather. For many people birds are a chief hobby and recreation.

Birds are important in several other ways, however. Many species feed on insects, helping to control harmful bugs, flies, moths, beetles, ants, and other pests. Larger birds, especially hawks and owls, feed

[4]This project was prepared by Donald Douglass, Game Division, Michigan Department of Conservation.

on mice, rats, ground squirrels, and similar nuisances. They also serve as natural "health officers" to do away with sick or crippled birds and mammals. A few of the hawks and one or two owls may sometimes be troublesome in the chickenyard, but for the most part they are useful and interesting species.

Getting Acquainted with Birds—There are two principal methods of getting acquainted with birds. Either attract them to the home grounds or schoolyard, or go into the fields and woods to look for them.

Attracting Birds—The chief needs of birds are food, water, and shelter from enemies and weather. In the nesting season they require also suitable locations and materials from which to make nests. Providing those necessities will often attract birds to our yards or schoolgrounds. Many helpful ideas will be found in Conservation Bulletin No. 1, "Attracting Birds," for ten cents from the Government Printing Office, Washington 25, D. C.

This pamphlet discusses why people like to attract birds, and warns of possible complications that may arise from attracting too many birds to one locality. Such possibilities should be considered.

It is well to remember that, in general, things that make a home site or a schoolyard attractive to people also prove attractive to birds. Good landscaping practices are usually good wildlife practices, just as good use of land is usually good for wildlife as well as agriculture. Ordinarily, the following methods will prove valuable for attracting birds.

Providing Food—A feeding station started in late fall will attract birds while they are still moving about freely. Once started, a station must be kept going throughout the winter; otherwise a heavy snowstorm or ice sheet may kill the birds that have become dependent upon it. A board nailed to a window ledge or on top of a post or stump will serve as a feeding station. Or, more elaborate shelters can be set up. The food-tray should be placed where it is protected from wind and snow, and in good view from a window.

A variety of food is recommended: mixed grains such as scratch feed, sunflower seeds, cracked nuts and acorns, breadcrumbs, raisins, bits of apple, etc. For some birds, suet hung in mesh bags from branches or tied to a tree trunk is a special attraction. It is well to experiment with different foods. You may notice that the shape of a bird's bill influences its choice of foods. Write to the Michigan Con-

Fig. 20. Bird students examine a nest without disturbing it.

servation Department, Game Division, Lansing, for the free leaflet, "Feeding and Sheltering Michigan's Wildlife."

Providing Water—Where water is scarce, a bird bath may be the best means of bringing birds to the yard. A bird bath may be a pan set on the ground, or a large garden pool of cement with gradually sloping sides that provides shallows safe for the birds to stand in. Better protection from cats is given by a bowl raised on a post or pedestal. Dripping or running water may be preferable to a quiet bath.

Providing Shelter from Enemies and Weather—The best shelter for birds is an abundance of grass and weeds, low-growing shrubs, and trees. Suitable plant growth can be encouraged by planting shrubby evergreens, by pruning shrubs already growing, and by leaving grass and weeds undisturbed. Planting should include fruit and nut-producing species. Suggestions for planning a development of this sort will be found in the discussion of the planting activity, page 31. Also, in several of the publications listed in the back part of this bulletin under the heading of "recommended references."

Sometimes cats, dogs, and other enemies of birds are so numerous that artificial protection against them may be necessary, especially in nesting season. If a cat-proof fence is not possible, nest trees, feeding shelters, or bird-baths can be provided with metal cat-guards. (See the type shown in Conservation Bulletin No. 1, "Attracting Birds".)

Providing Nest-boxes and Materials—A majority of birds prefer to nest in bushes or shrubs, or among the branches and twigs of trees. Some, however, nest frequently in hollow trees or stumps; often these will make use of artificial hollows or nest-boxes. Considerable originality can be shown in using orange-crates and other inexpensive materials for constructing new styles of bird-houses. There is much practical information in "Homes for Birds," Conservation Bulletin No. 14, which can be obtained from the Government Printing Office, Washington 25, D. C., for ten cents.

Seeing Birds Afield—Because many birds prefer the woods and open country away from town, to see them it is necessary to go where they are. Properly conducted bird hikes are good sport (Fig. 20), but several facts should be remembered in planning them. Time of year is important for the beginner. Fall is difficult for identification because of the bewildering number of migrants, most of them in dull winter plumage.

The few species that remain all winter are comparatively easy to learn because they are less nervous and retiring than many of the summer birds. By learning the winter birds and "keeping up" with the migrants as they return in spring, the bird student gradually becomes familiar with a number of species.

A leader familiar with birds is a decided help in learning to know birds, but many club members have done well alone. Opera glasses, or, preferably, a prism binocular will aid in observing birds. Without a field glass one must be more patient, waiting for birds to come close enough to be seen.

When a bird has been noted on paper from careful observation in the field, it should be possible to find its name in a book. Colored pictures are especially helpful at first, but written descriptions should be used as well. A seasonal list of species likely to be seen in a locality is useful in narrowing possibilities. With practice one learns to recognize the family of a strange bird—whether it is a wren, a warbler, a sparrow, or a thrush—after which specific identification becomes easy.

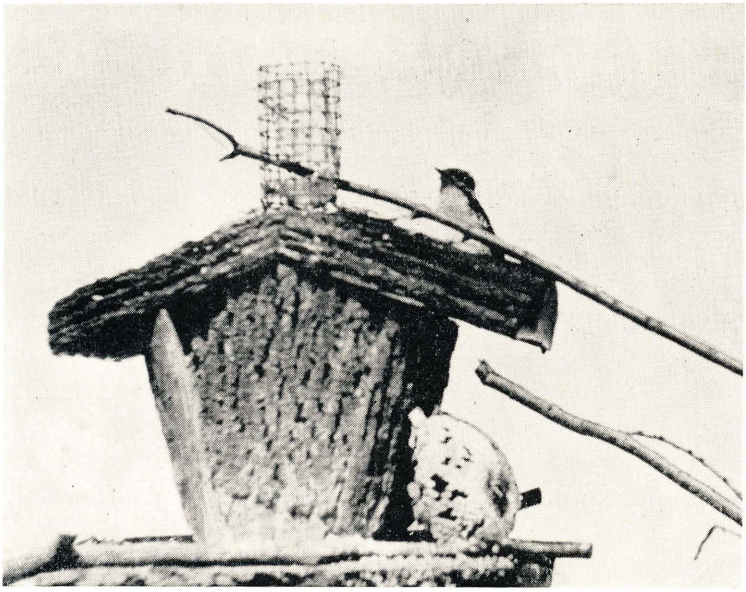

Fig. 21. A downy woodpecker comes to a feeding station for suet in a wire-mesh cup.

Things Not to Do—Forty or fifty years ago it was usual for boys interested in birds to collect eggs and shoot birds for their skins. Now it is illegal to kill most species of birds, or to possess their skins, eggs, or nests without special permits. A collection of photographs, however, is excellent.

The statement is frequently made that in order to encourage birds it is necessary to get rid of their enemies, but this is only partly true. Cats and dogs are at times a problem, but one that can usually be handled without resorting to a private trapping or shooting campaign that brings trouble with neighbors. Hawks and owls are highly interesting species not likely to destroy many birds. Likewise, snakes and small mammals that sometimes catch birds should not be hunted, as none is a really serious threat to bird life. These predators are all worth careful study.

ACTIVITY: FALL

1. Ask your county 4-H leader for the following government pamphlets:

"Attracting Birds," Conservation Bulletin No. 1, Government Printing Office, Washington 25, D. C. (ten cents)

"Homes for Birds," Conservation Bulletin No. 14, Government Printing Office, Washington 25, D. C. (ten cents)

"Some Common Birds Useful to the Farmer," Conservation Bulletin 18, Government Printing Office, Washington 25, D. C. (15 cents)

"The Migration of Birds," Circular No. 16, Government Printing Office, Washington 25, D. C. (35 cents)

2. Obtain some colored pictures of birds. The project leader may obtain two different sets of bird pictures free for each bird study member by writing to the Advertising Department, Church and Dwight Co., 70 Pine Street, New York, N. Y. The red, green, and blue books of Birds of America, which may be procured at "ten-cent" stores, are recommended. The files of the National Geographic Magazine contain excellent pictures and articles about nearly all North American birds.

3. If possible, visit a library regularly and form the habit of reading about birds. Remember, however, that many books discuss birds that are not likely to be seen in Michigan.

4. In late November or early December, set up a feeding station in your yard or on the school grounds, making use of suggestions in the pamphlet "Attracting Birds". A station should have at least one feeding-shelf, on a window ledge or on a post or tree. Besides the

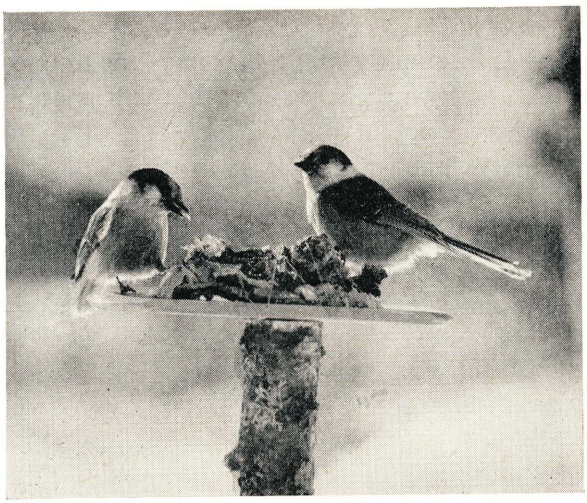

Fig. 22. Canada jays enjoy regular meals at a feeding tray.

feeding shelf the station should have at least two suet-containers (Fig. 21). Once you start putting out food, be sure to have plenty of food available at all times—especially when snow is on the ground, or when ice forms on trees. (Fig. 22.)

5. Make yourself a set of identification sheets, such as the sample record of the robin. (See page 50).

With a typewriter and carbon paper you can make 5 or 6 copies at a time. If your school has a mimeograph or hectograph machine, copies can be made for everyone in the bird project. Perhaps your county club leader can furnish you with copies. You will need at least 50 copies.

6. Fill out an identification sheet for each new bird seen. The important things to notice about a bird can be learned rather quickly, so the completed sheet should have all the information needed to identify the bird with the aid of pictures or descriptions. One can actually learn a great deal about birds without knowing their names, but one must have names in order to tell other people what he has seen.

Be careful not to imagine anything when you fill out an identification sheet. If there is any doubt, wait until you have seen the bird again and made sure. Making sketches of shapes and color patterns will help you learn faster, and if the sketches are at all good you can show them at Achievement Day.

7. Each member should identify at least *seven* kinds during this season of the year (fall).

8. Take a bird hike. Unless you can go with a leader who knows birds well, don't go in a group. In looking for birds, one pair of eyes is better than four pairs of eyes and four active tongues. One companion is all right, however, if he wishes to see birds, too.

There are many places to see birds. The best places, usually, are those where woods meet an open field or pasture. Ponds and lakes, creeks and rivers, also help. Two or three hours is usually long enough for a bird hike.

Fill out an identification sheet for each bird you see. In addition, keep a journal or diary of your experiences with birds. In it, tell where you went, with the date and some remarks about the weather. Put down the more interesting things you noticed.

Take bird hikes when you can, on Saturday mornings or after school. But remember to keep your eyes open on your way to and from school, or whenever you are outdoors, and you will see birds.

BIRD IDENTIFYING SHEET

(Underline the proper words; write in necessary words)

Name *Robin* Date *April 2, 1941*

1. Where seen: Woods, edge of woods, bushes, open field, fence row, roadside stream border, marsh, swamp, lake, garden, orchard, near buildings.

2. Compares in size with: Crow, Robin, English Sparrow.

3. Principal colors: Gray, slate, brown, chestnut, black, white, blue, red, yellow, orange, green, olive.

4. Flash colors: What color? *White spots*
5. Actions: Slow and quiet, active and nervous.

6. Shape—Body: Long and slender, short and stocky.
   Bill: Short and stout, long and slender, long and heavy, hooked, curved.
   Wings: Short and round, long and pointed.
   Tail: Forked, notched, square, rounded, pointed.

7. Alone or in flocks? *Several together*

8. Flight: Straight and swift.
   Darting about.
   Up and down, wave-like.
   Flapping steadily.
   Sailing or soaring, wings stiff.
   Flapping and gliding, alternately.

9. Other movements: Hop, walk, creep up trees, bob head and wag tail, twitch tail from side to side.

10. Describe song or call note *Liquid carol—"cheer-up, cheer-ee."*

11. Where does it sing? *In trees*

    Does it sing while flying? *No*

12. Colors and markings:

Breast	*Brownish-orange*	Tail	*Slaty black—white tips on outer feathers*
Back	*Gray*	Top of head	*Black*
Wings	*Slaty*	Eye-streak (if any)	*None*
Wing-bars (if any)	*None*	Eye-ring (if any)	*White (incomplete)*

9. Go over the following list of birds. Copy a list of those you are likely to see in the late fall and winter. In general, this list will include only birds that are residents or winter visitors in your part of the state. Such a list will be a help in making identifications, because you can eliminate those possibilities that are improbable because of the season.

A PARTIAL LIST OF THE BIRDS OF MICHIGAN[5]

Some birds are only migrants (M) in Michigan; that is, they nest farther north than Michigan and go south of Michigan in winter. We usually see them in spring and fall as they pass through. Others winter farther south but spend their summers with us; they are summer residents (SR). Some hardy northern-nesting birds that come down to Michigan in winter are called winter visitors (WV). A few species that do not migrate extensively are residents (R), and may be found at any time of year.

If a bird spends its winters south of Michigan, but nests in the Upper Peninsula, it is a summer resident in the north and a migrant in the Lower Peninsula. It would be marked SR-U.P. Some species may include both resident and migrant individuals, as for example, the Blue Jay. In the following list many species have been considered as of only one group, for the sake of simplicity, when actually they should be classed in two or three groups.

These abbreviations are used in the list:

U.P.—Upper Peninsula
L.P.—Lower Peninsula
N —Northern half of Lower Peninsula and the Upper Peninsula
S —Southern half of Lower Peninsula

M —Migrant
SR —Summer Resident
WV—Winter Visitor
R —Resident

Relatively common species are marked with an asterisk (*)

SR	—Common Loon	M	—Ruddy Turnstone
SR–L. P.	—Pied-billed Grebe	SR	—Woodcock
*SR	—Great Blue Heron	SR–N	—Wilson's Snipe
*SR–S	—Green Heron	SR–L. P.	—Upland Plover
SR–S	—Black-crowned Night Heron	*SR	—Spotted Sandpiper
*SR	—American Bittern	M	—Solitary Sandpiper
SR–L. P.	—Least Bittern	M	—Greater Yellow-legs
M	—Whistling Swan	*M	—Lesser Yellow-legs
M	—Canada Goose	*M	—Pectoral Sandpiper
M	—Snow Goose	M	—Least Sandpiper

[5]Adapted and abridged from Josselyn Van Tyne's Check list of the birds of Michigan /Occ. Papers U. of Michigan, Museum of Zool. No. 379, 1935.

M —Blue Goose
*SR —Mallard
*SR —Black Duck
M —Gadwall
M —Baldpate
M —Pintail
M —Green-winged Teal
SR —Blue-winged Teal
M —Shoveller
SR —Wood Duck
M —Redhead
M —Ring-necked Duck
M —Canvas-back
M —Greater Scaup Duck
*M —Lesser Scaup Duck
R —American Golden-eye
M —Bufflehead
WV —Old-squaw
M —White-winged Scoter
M —Ruddy Duck
SR —Hooded Merganser
M —American Merganser
M —Red-breasted Merganser
SR —Turkey Vulture
*M —Sharp-shinned Hawk
SR —Cooper's Hawk
*SR —Red-tailed Hawk
SR–S —Red-shouldered Hawk
SR–N —Broad-winged Hawk
WV —American Rough-legged Hawk
R —Bald Eagle
*SR —Marsh Hawk
SR —Osprey
SR —Sparrow Hawk
R–N —Spruce Grouse
*R —Ruffed Grouse
R —Prairie Chicken
*R–U P. —Sharp-tailed Grouse
*R–L. P. —Bob-white
*R–L. P. —Ring-necked Pheasant
SR–S —King Rail
SR —Virginia Rail
SR —Sora Rail
SR–S —Florida Gallinule
*SR —Coot
SR —Piping Plover
M —Semipalmated Plover
*SR —Killdeer
M —Red-backed Sandpiper
M —Semipalmated Sandpiper
M —Sanderling
*R —Herring Gull
SR —Ring-billed Gull
M —Bonaparte's Gull
SR —Common Tern
M —Caspian Tern
*SR–S —Black Tern
*SR–L. P.—Mourning Dove
*SR —Yellow-billed Cuckoo
*SR —Black-billed Cuckoo
R–S —Barn Owl
*R–S —Screech Owl
R —Great Horned Owl
R–L. P. —Barred Owl
R–L. P. —Long-eared Owl
M —Short-eared Owl
*SR —Whip-poor-will
*SR —Nighthawk
*SR —Chimney Swift
SR —Ruby-throated Hummingbird
*SR —Belted Kingfisher
*SR —Flicker
R–U. P. —Pileated Woodpecker
SR —Red-headed Woodpecker
SR–N —Yellow-bellied Sapsucker
*R —Hairy Woodpecker
*R —Downy Woodpecker
*SR —Eastern Kingbird
*SR–S —Crested Flycatcher
*SR–L. P.—Eastern Phoebe
SR–S —Acadian Flycatcher
SR —Alder Flycatcher
*SR —Least Flycatcher
*SR —Wood Pewee
*SR —Horned Lark
*SR —Tree Swallow
*SR —Bank Swallow
*SR–L. P.—Rough-winged Swallow
*SR —Barn Swallow
*SR —Purple Martin
R–U. P. —Canada Jay
*R —Blue Jay
R–U. P. —Raven
*SR —Crow
*R —Black-capped Chickadee
R–U. P. —Hudsonian Chickadee

M —Black-bellied Plover
*R —White-breasted Nuthatch
SR–N —Red-breasted Nuthatch
SR–N —Brown Creeper
*SR —House Wren
SR–N —Winter Wren
SR–L. P.—Long-billed Marsh Wren
SR —Short-billed Marsh Wren
*SR —Catbird
*SR —Brown Thrasher
*SR —Robin
*SR–L. P.—Wood Thrush
*SR–N —Hermit Thrush
SR–N —Olive-backed Thrush
M —Gray-cheeked Thrush
SR —Veery
*SR —Bluebird
SR–S —Blue-gray Gnatcatcher
SR–U. P.—Golden-crowned Kinglet
*M —Ruby-crowned Kinglet
M —American Pipit
WV —Bohemian Waxwing
SR —Cedar Waxwing
WV —Northern Shrike
*SR —Migrant Shrike
*SR —Starling
SR —Yellow-throated Vireo
M —Blue-headed Vireo
*SR —Red-eyed Vireo
M —Philadelphia Vireo
SR —Warbling Vireo
*SR–N —Black and White Warbler
SR–S —Prothonotary Warbler
SR–S —Golden-winged Warbler
SR–S —Blue-winged Warbler
M —Tennessee Warbler
M —Orange-crowned Warbler
SR–N —Nashville Warbler
M —Parula Warbler
*SR —Yellow Warbler
SR–N —Magnolia Warbler
M —Cape May Warbler
SR–N —Black-throated Blue Warbler
*SR–N —Myrtle Warbler
*SR–N —Black-throated Green Warbler
M —Blackburnian Warbler
SR —Chestnut-sided Warbler
M —Bay-breasted Warbler
*R–S —Tufted Titmouse
M —Black-poll Warbler
*M —Palm Warbler
*SR —Oven-bird
M —Northern Water-Thrush
SR–S —Louisiana Water-Thrush
M —Mourning Warbler
*SR —Yellow-throat
M —Wilson's Warbler
M —Canada Warbler
*SR —Redstart
*R —English Sparrow
*SR–S —Bobolink
*SR —Eastern Meadowlark
*SR —Red-wing
*SR–L. P.—Baltimore Oriole
M —Rusty Blackbird
*SR —Bronzed Grackle
*SR —Cowbird
*SR–L. P.—Scarlet Tanager
*SR–L. P.—Cardinal
SR —Rose-breasted Grosbeak
*SR–L. P.—Indigo Bunting
WV —Evening Grosbeak
*SR–N —Purple Finch
WV —Pine Grosbeak
WV–N —Redpoll
*SR —Goldfinch
WV —Red Crossbill
*SR–L. P.—Red-eyed Towhee
*SR–N —Savannah Sparrow
SR–S —Grasshopper Sparrow
SR–S —Henslow's Sparrow
*SR —Vesper Sparrow
SR–S —Lark Sparrow
*WV–S, SR–N —Slate-colored Junco
*WV–S —Tree Sparrow
*SR —Chipping Sparrow
SR–N —Clay-colored Sparrow
*SR–S —Field Sparrow
*M —White-crowned Sparrow
*M —White-throated Sparrow
M Fox Sparrow
M Lincoln's Sparrow
*SR —Swamp Sparrow
*SR —Song Sparrow
WV–N —Lapland Longspur
*WV —Snow Bunting

ACTIVITY: WINTER

1. Keep your feeding-station free of snow and ice, and well supplied with a variety of foods. Continue your daily observations and records at the feeding-station. Try to determine what foods are preferred by the different kinds of birds. If possible, make recognizable photographs of three different species of birds at your feeding-station. It may be necessary to fasten the camera in position, focused on the feeding-tray, with a thread running from the shutter to a window from which you can keep watch.

It would be well to get the birds accustomed to a dummy camera before actually trying to make pictures. Remember also not to place the camera so near the shelf that birds on the shelf will be out of focus. A portrait attachment is useful in making close-up pictures of this kind. If you get good pictures, you may have enlargements made for showing at Achievement Day. A good enlargement can be improved by careful mounting on cardboard.

2. Take at least *three* bird hikes of 2 hours or longer. Keep identification sheets for new birds. Continue your journal and chart of birds seen. Winter is the best season to begin getting acquainted with birds, as there are fewer species to learn and they are apt to be more friendly or inquisitive than warm-weather birds.

Fig. 23. Purple martins prefer an apartment house set on a pole in the open.

3. Make a wren house and a bird house for some other species such as bluebird, chickadee, or flicker. In planning and building these bird houses follow the suggestions and specifications given in "Home for Birds." If you have a definite place in mind for putting up the house, you will be able to plan what type is most suitable to build. Your leader will check on the size of the nest-chamber and entrance-hole, on the placing of the entrance, provisions for ventilation and drainage of a nest-box, and workmanship.

4. Make a bird bath or additional bird houses (Fig. 23), or a winter roosting shelter as described in "Homes for Birds." If you make a roosting shelter, put it up immediately.

5. Plan for the spring and summer improvement of your home grounds or schoolyard for birds. Use the suggestions in "Attracting Birds" and in other publications you may have. Consider the following possibilities, among others:

a. Leaving cover,
b. Planting shrubs for cover or fruit,
c. Planting evergreens,
d. Erecting bird house,
e. Maintaining a bird bath,
f. Erecting cat-guards,
g. Erecting cat-proof fence,
h. Providing nest materials,
i. Fencing woods against pasturing.

6. You should have an identification sheet for at least 15 birds which you found during fall and winter.

ACTIVITY: SPRING

1. Continue the journal and chart of birds seen.

2. Begin carrying out your plan for improvement of home or school grounds. When it is done, write a brief report of the work, illustrating with sketches or photographs. "Before" and "After" pictures will be interesting.

3. Discontinue your feeding station activities in April, unless a late storm makes conditions difficult for birds.

4. Learn at least 25 new birds. Fill out an identification sheet and look up and write out the answers to these questions for each bird:

a. Where does it spend the winter?
b. Does it nest in Michigan or farther north?

5. If possible, visit a bird-banding station. Before you go, read the account of banding studies in "The Migration of Birds." Ask the bird-bander to tell you about some of his interesting experiences in trapping and handling birds.

6. Go on a bird hike once a week, if possible. Let the trips include a variety of different places, so that you can see which kinds of cover and habitat certain birds prefer. Make a special effort to visit rivers or lakes or other spots where water is found.

7. If possible, take at least one of your hikes between May 10 and May 20, with someone well acquainted with birds, to see migration at its height.

8. Look for bird nests, but be careful not to disturb a nest or birds on the nest. Keep a record of the building of a nest, and try to answer the questions listed in report blanks.

ACTIVITY: SUMMER

1. Continue the journal of field trips.

2. Find and study a nest of another bird, answering the same questions as for the first nest you studied.

3. Select five acres of the best bird area you know. Try to find all the nests on it.

Make a diagram sketch map to show the location of the different nests. On this map show fences, roads or lanes, buildings, etc., and different types of habitat or situations—such as alfalfa fields, grazed oak and hickory woods, marshes, creeks, gravel-pits, and the like. The area does not need to be accurately surveyed and measured off. Satisfactory measurements can be made by "stepping off" the distances.

Answer the questions in your activity report. The map should be included in this report.

4. Keep in mind possibilities for nest photography, and photographs of birds at a bird bath. Always be careful, however, that you do not cut or break protecting twigs and branches that screen a nest. You may tie them back in order to get a picture, but be sure that you do not leave eggs or nestling birds exposed to passing enemies and to the direct sun. It is best not to touch the eggs or nest at all, particularly in the early incubating period, as the parents are likely to desert. Later, when it is about time for the eggs to hatch, the parents are not so easily frightened away.

FIRE—A DESTROYER OF WILDLIFE

Fire, whether it be in a swale, roadside, fence row, prairie, or forest, is a destructive agency with which all species of wildlife have to contend. Fire not only destroys the nests, eggs, and young of birds, but often the mothers as well. Fire also is destructive to many fur-bearing animals—more especially, if it happens to be a brush or forest fire. However, destructive fire may be to birds and animals themselves, it is perhaps of greater destructiveness to their homes and habitats. Once the cover and vegetation are destroyed, long periods of time must lapse before the territory burned over can rehabilitate itself, and be of further use as rearing and living quarters for birds and animals.

Fire may have its uses in agriculture and even in wildlife management. But remember that while a little of it, if controlled, may be useful, uncontrolled it can cause considerable destruction. If burning is believed to be necessary, it should be done at those periods of the year when there is least likelihood of causing much damage. The late fall is such a time, or very early in the spring, preferably as soon as the snow has disappeared. By all means get it over before the birds start nesting, or before young rabbits are born. Burning as a tool in wildlife management should be done only by the technical supervisor who must know what to burn, how to burn, and when to burn.

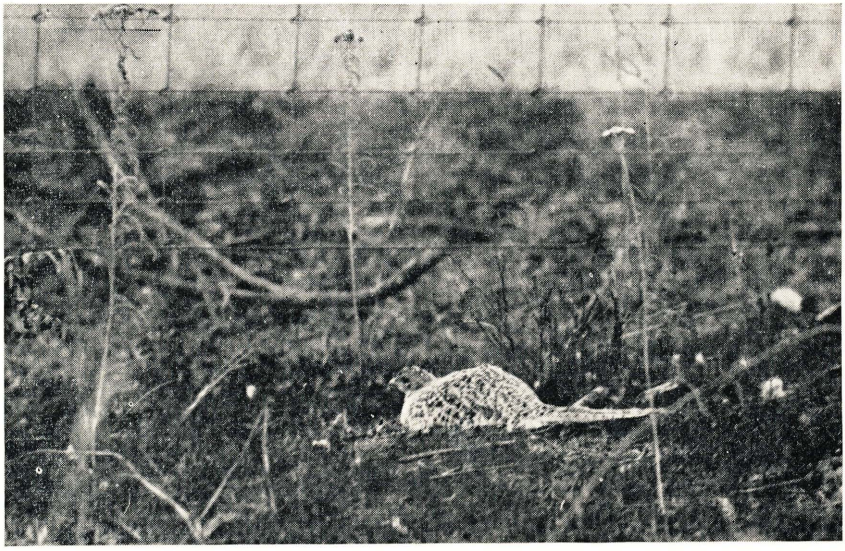

Fig. 24. A late spring fire has destroyed the protection for this nest. There is little chance for a successful hatch.

SHOULD ALL PREDATORS BE KILLED?

Too much emphasis is often placed on the part played by predators or "vermin" in destroying wildlife. There is no denying that in nature some animals feed upon other animals, but there is no proof that predators may be responsible for widespread destruction of a wildlife species. Predators eat a variety of foods. Generally they will take the food easiest to obtain, and there may be a shift from one food to another during a single year. Usually if food and cover conditions are satisfactory, losses from predators are small. Animals reproduce enough offspring to provide for normal losses without endangering the future supply.

Other factors such as excess hunting, disease, weather conditions, food, cover and accidents are equally important in regulating wildlife population over a large area. Predatory animals may also be very beneficial not only to wildlife by removing weak and diseased individuals, thereby keeping the species strong and healthy, but also to the landowner by destroying insects and other small animals that do damage to farm crops. Some of these animals may likewise provide income from their fur.

The boy and girl should be sure that the animals they destroy as predators are actually doing enough harm to over-balance their good qualities. Often stray dogs or homeless cats may be responsible for considerable damage to numbers of wildlife, and the club member may do well to prevent these animals from becoming too numerous.

Managing wildlife may actually mean reducing the population of some species. Almost any animal may interfere with man's interests under certain conditions, and control may be necessary. The robin is a favorite of many people—but it may cause considerable concern to cherry growers while the fruit is ripening. The pheasant is a desired game bird, but a tomato or melon grower may wish to keep the population very low on his farm. How can you classify wildlife as being good or bad?

Hawks and owls are perhaps the most misunderstood group of birds in our state. Frequently they are condemned as being responsible for large losses to wildlife and to poultry; many farmers consider those birds as "vermin" that should be killed upon sight. Every hawk is not a "chicken" hawk, and every owl does not live on songbirds and game animals.

There are at least a dozen different kinds of hawks in Michigan. Only three species may be considered harmful. Those are the goshawk, sharp-shinned hawk, and Cooper's hawk. The great-horned owl is the only owl that may be harmful. All others have definite value to the landowner, because of their habits of feeding upon large numbers

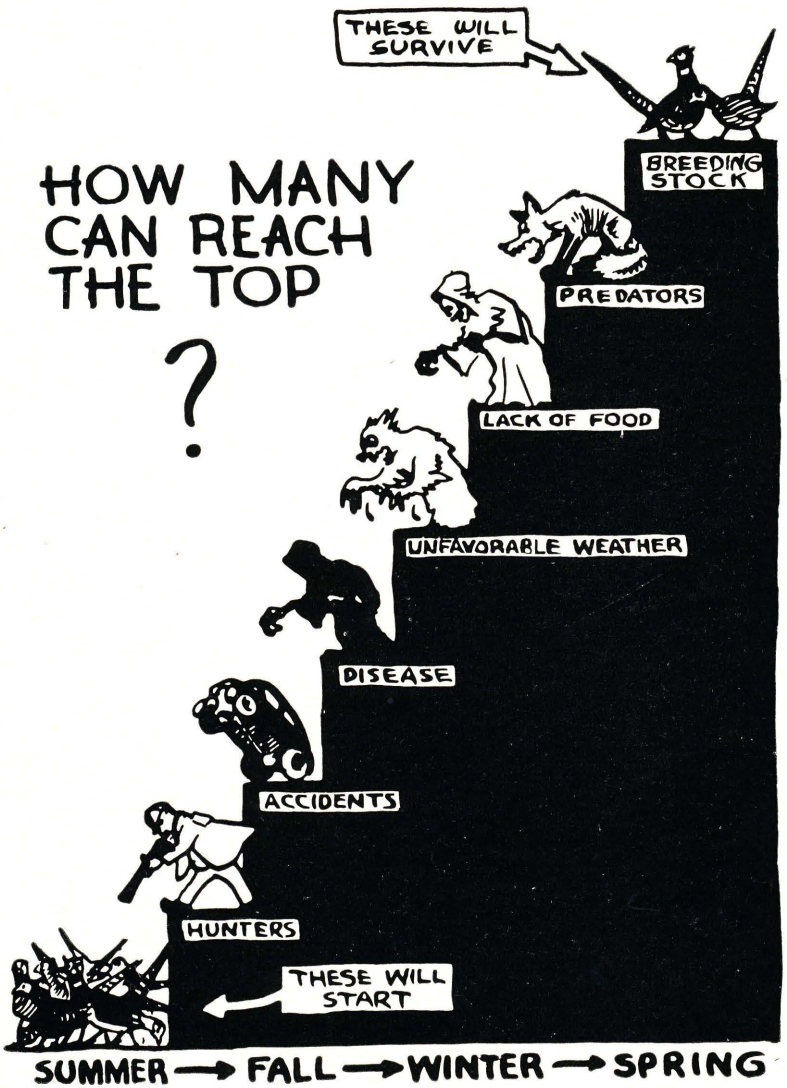

Fig. 25. Each crop of wildlife must pass through a succession of hazards. Many animals start the year but only a few are able to survive.

of mice, rats, and insects. Remember how often you have seen hawks and owls soaring or flying low over a field or along the edge of a swamp or woods looking for just such food? Can you distinguish these beneficial hawks and owls from the harmful ones?

No doubt at times when food and cover are scarce, and animals are forced to travel a considerable distance for food, some loss due to hawks and owls occurs. Naturally the sick and crippled birds and animals will be caught first, and their loss may actually benefit the species. Occasionally a hawk may habitually come to a chicken yard to catch chickens. The destruction of that particular hawk may be justified, but it is no cause for the destruction of all hawks upon sight.

Local control of a predator may at times be justified. The same can be said concerning skunks, foxes and other fur-bearers. If there is an ample supply of their normal food, very little harm to other species will result. Why not determine what is the natural food of these animals. These fur animals likewise have definite value from the standpoint of their pelts and many a farm boy receives considerable sport and income from hunting and trapping them.

Before you shoot, be sure your intended target is not a friend.

RECOMMENDED REFERENCES

The following bulletins can be obtained by writing to the addresses shown. Although not all publications are necessary for the wildlife conservation project, a few would be of some value to 4-H members.

"The Farmer and Wildlife," Wildlife Management Institute, 709 Wire Bldg., Washington 5, D. C. (single copies free)

"Waterfowl Management on Small Areas," Wildlife Management Institute, 709 Wire Bldg., Washington 5, D. C. (single copies free)

"Upland Game Management," Wildlife Management Institute, 709 Wire Bldg., Washington 5, D. C. (single copies free)

"Enjoying Birds in Michigan," Michigan Audubon Society, % Harold Wing, 7165 Bunker Hill Rd., Jackson, Michigan. ($1.00)

"Making Land Produce Useful Wildlife," Farmers Bulletin 2035, Soil Conservation Service, U. S. D. A., Washington, D. C. (free)

"Attracting Birds," Conservation Bulletin No. 1, Government Printing Office, Washington 25, D. C. (10¢)

"The Migration of Birds," Circular 16, Government Printing Office, Washington 25, D. C. (35¢)

"Homes for Birds," Conservation Bulletin No. 14, Government Printing Office, Washington 25, D. C. (10¢)

"Some Common Birds Useful to the Farmer," Conservation Bulletin No. 18, Government Printing Office, Washington 25, D. C. (15¢)

"A Cooperative Hunting Plan for Michigan Farmers," Michigan Conservation Department, Lansing 13, Michigan. (free)

"Wildlife Sketches," (Leaflets), Game Division, Michigan Conservation Department, Lansing 13, Michigan. (free)

"Feeding and Sheltering Michigan's Wildlife," Cooperative Extension Service, Michigan State College, East Lansing, Michigan. (free)

"How to Plant Forest Trees," F 32, Michigan State College, East Lansing, Michigan. (free)

"Snakes of Michigan," Extension Bulletin 315, Michigan State College, East Lansing, Michigan. (free)

"Producing Wildlife Through Good Farm Land Use," Extension Bulletin 218, Michigan State College, East Lansing, Michigan. (free)

"4-H Gun Safety Project," 4-H Club Office, Michigan State College, East Lansing, Michigan. (free)

*"Wildlife Management Program for Michigan 4-H Clubs," 4-H Club Office, Michigan State College, East Lansing, Michigan. (free)

"Fur Trapping and Management for 4-H Clubs," 4-H Club Office, Michigan State College, East Lansng, Michigan. (free)

"Photography in Camp," Eastman Kodak Co., Rochester, New York. (free)

"Picture Taking in Camp," Eastman Kodak Co., Rochester, New York. (25¢)

"Useful Birds of America," Church and Dwight Co., Inc., 70 Pine Street, New York 25, New York. (free)

"Bird Houses, Baths and Feeding Shelters," Cranbrook Institute of Science, Bloomfield Hills, Michigan. (20¢)

"The Flight of Birds," Cranbrook Institute of Science, Bloomfield Hills, Michigan. ($2.50)

"Wildlife Sketches," (Booklet) Education Division, Michigan Conservation Department, Lansing 13, Michigan. (25¢)

*(Note: This mimeographed bulletin is suitable only for counties south of Bay City and Muskegon.)

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4-H CLUB MOTTO—"To Make the Best Better"

4-H CLUB  *EMBLEM*

4-H CLUB COLORS—Green and White

4-H CLUB PLEDGE

I pledge

My head to clearer thinking,

My heart to greater loyalty,

My hands to larger service and

My health to better living

For

My Club

My Community and

My Country.

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