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The Game

Management

Policy

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By

JAMES W. KIMBALL

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Minnesota's game animals and tomorrow's hunting.

The Game Management Policy

JAMES W. KIMBALL

The Wildlife Story

Fifty million acres is a lot of land and four million acres is a lot of water. This is the landscape that Minnesotans share with wild animals; with deer, ducks, geese, pheasants, grouse and cottontails. It is the scene of fine fall days afield for a half million hunters and is the wildlife habitat that fills these hunters' bags with 3.5 million pieces of game.

Much of our game bounty we owe to Nature, for Minnesota is a happy combination of lakes, forests and fertile farm lands. It is an ideal home for many kinds of wild animals. Some of our game, however, has been fostered by the activities of man-planned or otherwise. Farming and forest cutting has made much land available for game, even though civilization has destroyed some of our larger game animals. Hunting in the future, however, will have to depend more and more on planned habitat management for game and better understanding of the game animals themselves.

Game animals and public hunting will face many problems in the future. There will be more people, more hunters, more intensive land use and conversion of wildlife habitat to other uses. Game animals will need more help to take care of themselves.

With this in mind the present Game Management Policy has been prepared. It tells what is being done for game; who is doing it and, as far as we can see, what we should do tomorrow. The Policy is lengthy but this is necessary for there are many kinds of animals and many wildlife problems. It has been prepared by experienced game workers within the Department and with the advice of game experts at the University and the U. S. Fish and Wildlife Service. This Game Management Policy has been prepared for the guidance and information of all who are interested in our wildlife. The Department needs an informed, appreciative and cooperative public. Upon such depends the future of wildlife and public hunting.



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Game management can be defined as the art and science of producing sustained annual crops of wild animals for recreational and economic use. Wild game on both public and private lands, and waters, is the property of the State in its sovereign capacity and belongs to all the people of the State. Because of this public ownership, the Department of Conservation is charged with the management of game, and with planning for the perpetuation and wise use of wildlife resources by the public.

Wildlife has many values. There are the hunting recreational hours supplied to 350,000 small game hunters and 175,000 big game hunters. There is the value of game as a food delicacy, and value as trophies of the hunt. In recent years about 3.5 million game animals have been harvested annually by Minnesota hunters: about a million pheasants, a million waterfowl, and 1.5 million other game animals, including 50 to 70 thousand deer. It is estimated that hunting provides about 16 million outdoor recreational hours each year and that about 45 million dollars is spent to take the game crop. In addition, pelts of furbearing animals are sold by trappers and hunters for about a million dollars each year.

Game has other real, but less tangible, values. There is the enjoyment of seeing game. There are biological values both on the debit and credit side of Nature's ledger. On the credit side is destruction of insect pests by game birds and destruction of undesirable rodents by hawks, owls and foxes. Beaver because of their dams may aid in water conservation. On the debit side, deer if too abundant, may injure forests by overbrowsing, and do damage to farm crops and orchards. Wrongly-placed beaver dams may flood forest and crop land and damage trout streams. Mink, fox and other furbearers sometimes destroy poultry and game birds. Bears can be destructive to an apiary or flock of sheep, and be a nuisance in camp grounds or near towns. Foxes, skunks, and raccoon can endanger humans and livestock if they become rabid.

Because of its many values, game and the habitat in which it lives must be managed. Game must be provided a place in the out-of-doors but still kept in its proper place. For such management the value of a game management policy is obvious. Such a policy provides a basis for coordinated thinking, planning, and action in the many and varied activities necessary for game management. It allows the people of the State to know "why," "how" and "on what basis" game management is being done and "who" is responsible for it.

Such a policy can be a guide but cannot be either an inflexible set of rules or a detailed program of specified projects. It must be a flexible guide for action and be subject to interpretation, both because of rapidly changing natural conditions and because of gaps and uncertainties in our present knowledge.

II. HISTORICAL BACKGROUND

It is more than 200 years since the first white man saw the wilderness that has become Minnesota. In this area of 84,068 square miles there originally were three distinct vegetational zones, each with its own kinds of game and other wildlife. Caribou and moose were found in the coniferous forest of the north and northeast: deer inhabited the hardwood forest of southeastern and central Minnesota; bison, elk and antelope grazed on the tall-grass prairies of the south, the southwest, and in the Red River Valley. Bear and cougars ranged throughout. With these big game animals were associated many kinds of smaller mammals and upland birds. Waterfowl, it is reported. rose from the prairie lakes with a noise like thunder and passenger pigeons weighted down the branches of oak trees.

Of native mammals originally present, all still occur in the State except grizzly bear, caribou, antelope and bison. Several native mammals once exterminated, or nearly so, may again be found in the wild in Minnesota. They include the elk (descended from a herd imported from Wyoming); the fisher (which has again become fairly common in the northeast); the cougar (which has been several times in recent years), and the beaver, which is now abundant after having been nearly gone from the State at the turn of the century. The Canada lynx is quite rare and only a single pine marten has been reported in recent years.

There is no way of knowing how much game there was in Minnesota when the white man arrived. Some early explorers found game in abundance: others reported it to be scarce. Nor is there any exact count of the Indians who lived on game and other wild products supplemented by harvests from rudimentary agriculture. It seems likely, however, that the total number of Indians in Minnesota at the coming of the white man did not exceed 20 thousand and that the amount of game they could have taken by primitive hunting was considerably less than that taken by our present-day army of sportsmen. Not only is game more heavily hunted today, but there is probably more game to hunt. It is well known that mature and unbroken forests are unproductive of game. It is along the edges or boundaries between vegetative types that our present game is most abundant. Farming and forest cutting, and fires that followed lumbering created such edges.

Disturbance of the landscape by man has favored some game animals, such as the deer, pheasant, and ruffed grouse. But it has eliminated, or nearly eliminated animals like the bison, caribou and elk which preferred extensive stretches of similar vegetation. For a while development of grain farming in Minnesota greatly favored the prairie chicken, but this bird has now disappeared from much of the state because of the development of intensive agriculture. Intensive and diversified agriculture has favored the introduced ringneck pheasant, and this fine bird has supplied much of our upland game bird hunting during the past 25 years. Waterfowl populations declined from primitive abundance on our prairie

lakes to an all-time low in the drought years of the 1930's, but have risen again to fairly high levels. Breeding of waterfowl in the State is 'now threatened by drainage of wetlands, especially prairie potholes, to provide more land for farm crops. More than 50,000 such small water areas have already been drained.

It is apparent that the unplanned changes in past land use pattern in Minnesota have had both favorable and unfavorable effects on game animals depending upon the amount of food and cover made available. Today, planned development of the habitat so that game animals are favored is one of the principal objectives of game management. Such habitat management must usually fit into a pattern of multiple land use in which agricultural, forestry, and recreational values are all considered.

In Minnesota during the past century game management ideas and approaches have progressed through several stages. When it became apparent that our game resources were not inexhaustible. protective legislation was passed limiting seasons and bags. From these early laws developed our present game protection code that is a mainstay of game management. The protective phase of management later included legal arrangements for establishment of refuges, both state-owned and statutory, and encouragement for the taking of predatory animals by provision of funds for bounty payments.

About 50 years ago it was seen that protection alone was not adequate to

provide desired hunting. To protection was added propagation and stocking of non-native game birds. At first it was thought necessary to stock such birds annually just as farm crops are planted. Of the several species so introduced the pheasant and Hungarian partridge have been eminently successful; several others failed to produce hunting.

With the rise of modern game management about 25 years ago came careful study of game and its relationship to the land, and evaluation of the older approaches. Emphasis shifted from artificial rearing and stocking to management of food and cover so that game can take care of itself. Public hunting grounds have been established to provide opportunity for hunting and harvesting game. The present approach requires more specific knowledge of game animals and their habitat on which to base better management. Knowledge properly applied means more game produced but there is no easy road to such knowledge. It must be gained through experience and painstaking research in the field and laboratory.

III. BASIS OF MODERN GAME MANAGEMENT

Modern game management emphasizes the *relationship between game and its habitat;* that is, between the animal and the land on which it lives. Any habitat—field or forest—is continually changing. Sometimes there is plenty of food; at other times food is scarce. Sometimes cover is abundant; sometimes sparse. The number of wild animals that an area of land can adequately support—*carrying capacity* varies throughout the year and often is lowest in winter when food and cover are scarcest. Many things may limit the size of wild animal populations, and the specific *limiting factor(s)* that hold down the size of the population may differ from place to place and season to season. It may be food, winter cover, nesting cover, weather, predators, disease, over-hunting, agricultural practices, forest management practices, or a combination of any of these.

The important points are that habitat conditions change, and the number of wild animals in a population fluctuates throughout the year. In spring there may be only a few pheasants on a farm, but these breed and nest. By fall the population may be three times that present in spring. But if the winter carrying capacity is low the surplus birds will be too many for the land. They will die between fall and spring from natural causes leaving only a breeding population. Here is where the hunter plays his part, for it is these surplus birds that will die before spring ---the harvestable surplus---that he can take by hunting without affecting next year's game crop. For most game animals the safe harvestable surplus is in general about one-third of the fall population on the land.

Most game animals are short-lived. Pheasants do not commonly live more than two years and most live less than one year. Deer usually do not live more than four years and the majority taken by hunters are in their second year. Any game population is changing constantly as young animals replace the older animals that die. And to assure survival, more young must be produced each year than are needed to replace their parents. It is this replacement of old by young animals *population turn-over*—and the changes in the carrying capacity of the habitat that allow the build-up of game populations at regular intervals (usually each fall) to a point where the excess can be harvested by hunters.

Modern game management is essentially the business of: (1) promoting through protection, habitat development, and control of limiting factors, as large a crop of game as the habitat will safely support, and (2) arranging for a hunting harvest at a time when the harvestable surplus can best be taken. It recognizes that the maximum population turn-over and the greatest use of the land by game comes when the game population is of a moderate size; that is, when the animals are not too crowded for food and space. It recognizes that like farm crops, the game productivity of the land is tied to the fertility of the soil, and that excessive numbers of game animals such as deer can ruin their own range and thereby reduce their own numbers. It recognizes that wild animals are part of the out-of-doors in which they live and must take care of themselves. It recognizes that many small things in the environment may be limiting factors, and strives to identify and remove or minimize the effect of these limiting factors so that the harvestable surplus to the hunter can be greater.

There is great difference between

extensive and intensive game management. Intensive game management, such as that practiced on private shooting preserves where game is fed and housed and shot for a price, cannot be economically practiced on a state-wide basis. Extensive game management, the goal of the Department's efforts, recognizes that game is usually a secondary crop on lands which have other primary uses-such as farming or forestry-and that game must fit into the prevailing land-use patterns. Intensive management can be practiced by the Department only on parcels of land that have been acquired primarily for game, and even here the intensity of management cannot reach that of private shooting preserves. In extensive management hunting regulations are of great importance. Game can be overharvested or underharvested. Wisest use of game consists of allowing an adequate harvest of surplus animals and at the same time preserving the breeding stock.

IV. GENERAL GAME MANAGEMENT ACTIVITIES BY THE SECTION OF GAME

The Section of Game in the Division of Game and Fish currently consists of a central supervisory staff of a Supervisor, an Assistant Supervisor, a Project Leader for Lands, and a Project Leader for Habitat Development. This staff directs the work of four Regional Game Managers and is currently responsible for the over-all supervision of about 100 permanent employees.

Following are the more important general management activities carried

out by personnel of the Section of Game:

- 1. Land acquisition and development of these lands for wildlife.
- 2. Management of game refuges and public shooting grounds.
- 3. Aiding and advising the Director in the setting of hunting regulations.
- 4. Carrying out of routine game censuses and surveys.
- 5. Coordination of State game management activities with those of other governmental agencies operating within the State.
- 6. Habitat improvement for game on public lands, and with the permission of the land owner, on private lands.
- 7. Enforcement of game laws on game refuges where the Section has personnel stationed, and elsewhere in close cooperation with the Game Wardens.
- 8. Limited game farm operations for production of day-old pheasant chicks for sportsmen to raise, and for experimental research on game birds.
- 9. Acquisition of lands for public access to public waters. Acquisition of lands for wildlife management, public hunting grounds, and wetlands.
- 10. Informational and educational services to the public.
- 11. Suggestion of necessary and desirable game research projects.
- 12. Preparation, care and display of

wild animal exhibits at the State Fair.

13. Establishment, modification or abandonment of Statutory Refuges.

V. GAME MANAGEMENT BY REGIONAL GAME MANAGERS

- 1. The principal field representatives of the Section are four Regional Game Managers who are stationed at Bemidji (Northwest Region); Grand Rapids (Northeast Region); St. Paul (Southeast Region) and Slayton (Southwest Region). These Regional Game Managers are responsible to the Supervisor of the Section of Game and direct the activities of Area Game Managers, Refuge Supervisors and other game personnel in the region.
- 2. The responsibilities of the Regional Game Manager include:
 - a. Supervision of all game management activities in the region.
 - b. Acquisition of land and water for wildlife habitat, public hunting grounds, and lake and stream access.
 - c. Public education and information concerning game and game management in the region.
 - d. Maintenance and operation of field stations and equipment of the Section in the Region.
 - e. Review and evaluation of proposed public projects concerned with water or land

use which may affect game in the Region.

- f. Recommendation of any areas, such as waterfowl lakes and watersheds, on which special information and surveys are needed from the Section of Research and Planning.
- g. Recommendations for regulations affecting game.
- h. Initiation of game management projects and submission of them for consideration by the Director.
- i. General direction of such game census projects as shall be assigned.
- j. Field coordination of the game management program of the Division with programs of other Divisions and agencies.
- k. Establishment, modification or abandonment of statutory refuges.

VI. ORGANIZATION AND ACTIVITIES PERTAINING TO GAME IN THE SECTION OF RESEARCH AND PLANNING

- 1. Game Research Unit; Organization and Activities
 - a. The Game Research Unit consists of a central supervisory staff of a Unit Supervisor and four Research Biologists who direct research activities in the four principle areas: (1) big game, (2) small game, (3) furbearers

and predators, and (4) waterfowl. The central staff directs the work of field biologists stationed strategically *at two field stations (Carlos Avery and Madelia), and elsewhere in the State. Currently the Game Research Unit contains 20 game biologists.

- b. The Supervisor of the Game Research Unit will be responsible to the Supervisor of the Section of Research and Planning and this Supervisor responsible to the Director.
- c. Activities of the Game Research Unit will consist of scientific investigative work organized on a project basis and financed with aid of (Pittman-Robertson) Federal Aid Funds. The principal types of game research are:
 - (1) Continuing basic research on life histories, distribution, and habits of game animals, birds, furbearers, and predators to gain a firmer foundation for better management. Special emphasis is placed on gathering of information which will allow provision for game in a pattern of multiple land use.
 - (2) Evaluation of management methods now being used.
 - (3) Development and testing of new management methods, including those

for control of nuisance animals.

- (4) Development and testing of methods for inventory of game populations and harvests and the coordination of inventory work carried out by personnel of this and other Sections within the Division of Game and Fish.
- (5) Studies on nutrition, disease, and physiology of wildlife.
- (6) Development of selected game habitat as experimental management and/ or demonstration areas.
- (7) Informational services including preparation and publications of research findings as bulletins, scientific papers, reports, popular articles, news releases and use of this material for public talks.
- (8) Work with the University and other agencies on cooperative research projects.
- (9) Cooperative work with personnel of the Section of Warden Service on the enforcement of game and fish laws.
- (10) Cooperative work with personnel of the Section of Game on development of game management procedures.

(11) Review of game management projects, and advising on management projects and associated problems as requested by the Director.

2. Biological Survey and Inventories Unit; Game Activities

Activities include biological surveys of watersheds, wetlands, and water areas that have or may have use by waterfowl, furbearers and other wildlife. Information gathered provides a basis for management. This unit currently employs three game biologists on survey work plus temporary help in summer.

VII. POLICIES FOR SPECIFIC GAME MANAGEMENT ACTIVITIES

1. Habitat Development

Lands and waters of the State will be developed by protecting and modifying the habitat so that as large a crop of game can be produced and harvested as is compatible with other land uses. Habitat development includes:

a. Forest management for game, including tree planting, planned forest cutting, controlled burning, spraying with herbicides and utilization of some poorer forest lands primarily for game management. In forest management for game the Department will work in close cooperation with forestry agencies.

- b. Plantings of trees, shrubs, and herbaceous plants, where desirable for game food and cover, on public non-forested lands managed for game, and on private lands where permission of the property owner has been obtained.
- c. Water level manipulation for the benefit of game where the State has the necessary legal control of affected lands. Use of areas for fish spawning will be taken into consideration.
- d. Installation of rough fish control structures or chemical control of rough fish where desirable for improvement of game habitat in marshes and shallow lakes.
- e. Fencing and posting of stateowned wildlife areas.
- f. Supervision of controlled grazing of wildlife lands.
- g. Aid to the State Water Pollution Control Commission on control of pollution affecting wildlife.
- h. Construction or aid in the construction, of access roads to areas inaccessible for hunting (designated roadless areas excepted).
- i. Modification of state-controlled lands managed for game through farming practices. This will be done according to good conservation practices and share cropping will be used when practiceable.

- 2. Game propagation and planting It is recognized that game propagation and stocking is a useful game management tool in specific situations. Planting of artificially-reared game animals to supply put-and-take hunting is too costly to be practical on a statewide basis and will not be generally practiced. Sometimes a species not present can be advantageously introduced. In good range, however, the habitat is usually occupied to its carrying capacity and stocked animals are apt to die or replace animals of the same species already present.
- 3. Acquisition and leasing of land for game management and public hunting.

In acquiring or leasing land for game, consideration will be given to the effects of land management for game upon uses of adjacent land, and upon over-all multiple land use of the area. Public recreation, in addition to the hunting, will be allowed on such areas when it does not seriously conflict with game management.

Lands acquired or leased by the State for game management and public hunting grounds are essentially of three types:

a. Scattered parcels of land in the midst of lands having other primary uses; such areas as potholes, marshes, stream banks, and non-tillable corners and fragments of land. Development of such areas provides niches for game in the general land-use pattern.

- b. Large blocks of land, especially those not well suited for agriculture or forestry, that can be managed primarily for game and will provide space for public hunting. Such lands also allow preservation of native vegetation and non-game animals and show the original nature of the Minnesota landscape.
- c. Access areas to public waters, refuges and public hunting grounds.
- 4. Management of Refuges and Public Hunting Grounds

Refuges and public hunting grounds administered by the Section of Game will be managed as units in the over-all management plan for the local area and the State. As far as possible, size, placement and management of refuges will be such that they contribute to optimum harvest of game rather than serving as repositories for "locking up" game resources and preventing their utilization. Statutory Game Refuges (blocks of private land posted by the State at owners request) will be established only where game and hunting is directly benefited and those now established but not serving these purposes eliminated whenever possible.

5. Feeding of Game

Experience in Minnesota and

elsewhere has shown that artificial feeding of game is costly and, in the long run, often harmful to game populations. Populations of game animals raised to abnormally high levels by artificial feeding suffer when forced to depend upon resources of the natural range, and (in case of deer) by their unnatural abundance may injure or destroy the range. Artificial feeding of game by bringing food to the animals will, therefore, be discouraged, but food patches may be planted where food appears to be the limiting factor in production of game. Where possible, forest lands will be managed to produce natural food for game animals.

6. Exotic (non-native) wild animals

No exotic species of wild animal or bird will be introduced unless there is a demonstrated need for it and until experimental work shows that it is likely: (1) to benefit hunting; (2) to be suited to climate and conditions in the state; (3) not apt to injure the production of native game animals and, (4) not apt to destroy agricultural or forest crops.

In the past the pheasant and the Hungarian partridge have been introduced in Minnesota with excellent results, but introductions of several other game birds have failed. With the introduction of new species of animals, there is always the possibility that disease may also be introduced that will infect native animals. It is recognized also that introduced animals may thrive by replacing native animals.

7. Predator Control

Predatory mammals and birds often play a useful role in the economy of nature by helping to keep populations of prey animals healthy and in balance with the environment. It is also recognized that the activities of predatory animals sometimes are injurious to man because of destruction of poultry, live-stock and game. It is the opinion of the Department that control of predators should be directed at individual predators doing damage. Non-directed, "shotgun-pattern" control, such as results from bounty payments, is usually both a waste of public funds and ineffective. Bear and fox should be ranked as game animals and sport hunting for them encouraged. Individual predators known to be doing damage should be taken by directed predator control.

Development of intensively managed private shooting preserves, fish hatcheries and fishing areas may bait birds of prey such as hawks, owls and herons which ordinarily are beneficial or do little damage. Destruction of protected birds of prey under such circumstances by private individuals will be permitted only with written permission of the Director.

8. Use of Fire for Game Management

Some game animals such as deer. prairie grouse, and ruffed grouse attain their greatest abundance during the earlier stages in plant succession which follow fire. The use of fire for controlled burning of selected areas managed primarily for game is recognized by the Department as a potentially useful management tool. Use of fire for game management will be permitted only with the written permission of the Director, and in forested areas, burning will be done only in close cooperation with forestry agencies.

9. Cooperation

Every effort will be made to encourage private land owners to produce game for public hunting on their lands. It is recognized that most farm game is raised on private lands and only with the cooperation of the landowners can public hunting for them be provided. Therefore, aid and advice concerning game management will be supplied to landowners upon request.

Sportsmen and conservation organizations are encouraged to work with landowners for habitat improvement and multiple land use which includes a place for game. The Department will consult and cooperate with, as far as feasible, all governmental and non-governmental agencies and organizations concerned with land and water use for the development of plans benefiting game and hunting. The principal agencies with which cooperation will be sought are the State Division of Lands & Minerals, State Division of Waters, State Division of Forestry, U. S. Soil Conservation Service and Districts. U. S. Fish and Wildlife Service, U. S. Department of Agriculture, the U. S. Forest Service, the Corps of Engineers of the U. S. Army, the Minnesota Department of Health, the Minnesota Water Pollution Control Board. Minnesota Water Resources Board, the University of Minnesota, other educational institutions, and the Conservation agencies of other states and Canadian provinces.

VIII. POLICIES FOR MANAGEMENT OF GAME ANIMALS BIG GAME

1. White-tailed deer

The white-tailed deer is Minnesota's most important big game animal and is found in every county of the State. There is no shortage of summer range or summer food for deer, but in many places the winter range (especially yarding areas in the north) is overbrowsed and in poor condition. The main northern deer range is now less favorable for deer than it was 20 years ago because of regrowth of dense forests. In recent years the deer population (principally because of effective law enforcement) has increased in the southern agricultural area. This desirable increase has been accompanied by some deer damage to agricultural crops and orchards. The principal items of a management policy for white-tailed deer are:

- a. Hunting regulations should continue to allow taking of deer of both sexes and all ages.
- b. The length of the hunting season will be determined by abundance of deer in the several natural areas within the range, by topography which determines accessibility for hunting, and by condition of the habitat, especially of the winter range.

c. The Department will work in close cooperation with forest management agencies so that forest management, including timber cutting can be coordinated with deer management.

- d. The Department will work for the development and maintenance of forest roads in inaccessible parts of the deer range so that a better hunting harvest can be had.
- e. Hunting will be allowed in state refuge areas, and in State Parks & Federal Refuges in cooperation with the Division of State Park and the U. S. Fish & Wild Life Service under general or special regulations when nec-

essary to prevent injury to the habitat by deer.

- f. Experimental improvement of deer habitat, especially of wintering vards, by timber cutting, spraying, controlled burning and mechanical methods, such as buildozing, will be continued and evaluated in cooperation with other federal, state or private agencies. General application will be made of those habitat improvement methods that are found desirable and financially practical.
- 2. Moose

With regrowth of the northern forest, moose are becoming more abundant. This wilderness animal has been protected from hunting since 1922. With the increasing numbers of moose, its range and population will be watched and limited hunting recommended if the range is becoming overbrowsed or a harvestable surplus is found to exist.

3. *Elk*

Elk, once native in the prairies of southern and western Minnesota, were early exterminated and the present herd of about 40 in Lake of the Woods and adjacent counties are descendants of an imported herd once kept at Itasca State Park. There is no open season on elk. It appears at present that this animal has little future in Minnesota. Elk

range conflicts with agricultural interests, and elk do damage to hay stacks and oat fields. Validity of each case of agricultural damage will be checked carefully before a permit is given to kill an animal. Animals killed under such permits will be turned over to the local game warden.

4. Caribou

Caribou, once a common woodland animal in the northeast, is now extirpated or nearly so. An introduction of Canadian caribou into the Red Lake Area in 1935 failed. With the regrowth of the northeastern forest some caribou may enter the state from Canada. Such animals will be protected.

5. Mule Deer

In recent years mule or blacktailed deer have occasionally been noted in the western part of the State. They have been seen as far east as Morrison and Ramsey Counties. No distinction will be made between mule deer or white-tailed deer in hunting regulations or for purposes of deer management.

6: Bear

The black bear is an unprotected animal under present laws and a state bounty is authorized for it. It is the opinion of the Department that the bear has a legitimate position as a big game animal and should be managed as such. Predatory or nuisance bears should and will be controlled where they are doing damage.

UPLAND GAME BIRDS

7. Pheasant

In most years the pheasant ranks first in the hunting harvest of game birds. Usually about a million pheasants are taken each year by small-game hunters. Pheasants occur throughout the prairie and hardwood forest region but are most abundant in the farming counties of southern and southwestern Minnesota.

Hunting pressure on this species is heaviest during the opening weekend and light during the following week days, with a slight increase in hunting pressure on following weekends of the season. The pheasant thrives in farming country and responds well to habitat improvement. With the development of more intensive farming methods, winter cover for peasants is becoming scarcer.

Principal items in the management policy for pheasants are:

- a. Every attempt will be made to prevent destruction of nesting hens by hay mowing. Farmers and highway departments will be encouraged to use flushing bars on mowers and, if possible, to delay the first mowing.
- b. Winter cover will be provided where necessary by planting of permanent cover and ac-

quisitions of small parcels of undeveloped lands that can provide winter cover in open farming country.

- The Department will not feed c. wild pheasants artificially and will discourage others from such feeding except under unusual climatic or biological circumstances. It has been found that pheasants can survive successfully for а week or more without food in times of heavy snow and ice cover. Farmers and sportsmen will be encouraged to grow and leave standing natural foods. Such foods will be planted, where necessary, on state game management areas.
- d. The Department will foster and promote good farmersportsmen relationships on the agricultural lands that comprise much of the pheasant range.
- Hunting regulations will allow e. harvest of as great a number of pheasant cocks as is consistent with maintenance of the population. During the past eight years (1950-1957) the ratio of cocks to hens in the early spring has ranged from 1 to 2.2 to 1 to 3.5. It is known that a ratio of 1 cock to 8 or 10 hens is satisfactory for the breeding population. It is apparent, therefore, that more cock pheasants could be harvested than

are now taken. It is often not realized that a hen pheasant can lay a full clutch of fertile eggs after a single mating.

- f. Hunting seasons will be based on the size of the fall pheasant population in any year. It is recognized that the opinions of the farmer concerning hunting on his land by the public must be considered when setting the shooting seasons and hours.
- g. Pheasant stocking for putand-take hunting is both too expensive to be practical and unnecessary in the better pheasant range where natural reproduction supplies good hunting year after year. Dayold chicks will be provided sportsmen's organizations that have adequate rearing facilities, for subsequent release for public hunting.
- 8. Ruffed Grouse

The ruffed grouse is a forest game bird that exhibits cyclic fluctuations in abundance. It is our second-most sought after game bird. Hunting harvest in recent years has ranged from 330,000 birds in 1956 (low year in the population cycles) to 1,-400,000 in 1951 (a high year). In some years the kill of ruffed grouse has surpassed that of pheasants. It is the most important game bird of forest lands in northern Minnesota. Items in the management policy for ruffed grouse are:

- a. Ruffed grouse management will be coordinated with forest management through cooperation of the Department and the forestry agencies.
- b. Hunting seasons for ruffed grouse will be established each year even during the low part of the population cycle. It has been found from several detailed studies that hunting during the low period of the grouse cycle has little or no effect on subsequent population build-up, and that heavy hunting during the high period may even retard a population decline.
- c. Length of the ruffed grouse season and bag limit will be adjusted to the size of the population in any year.
 - d. Forest access roads will be developed in inaccessible areas to promote hunting of both ruffed grouse and deer. Where feasible such roads will be seeded to white clover for the benefit of grouse.
 - e. Special management consideration will be given the remnant ruffed grouse population in southeastern Minnesota.

9. Prairie Grouse

Sharptail and pinnated grouse (prairie chicken) have two centers of abundance in Minnesota: the northwestern counties; and the bog-lands and abandoned farmsteads of Aitkin, Mille Lacs, Carlton and Pine Counties. Sharptail grouse provide a considerable amount of hunting each year (52,000 birds taken in 1957), but hunting pressure on them is generally light. Pinnated grouse, much fewer in numbers than sharptails, have not been hunted in recent years. Populations, however, have been increasing and limited hunting may be possible in the future.

Principal items for the management of prairie grouse are:

- a. Parcels of land especially suited for prairie grouse as a primary wildlife use will be developed by such practices as controlled burning, spraying, and cutting, so that a grass and low shrub habitat suitable for the birds is maintained. This type of management will be principally on public lands and such work on public lands will be carried out by the Department only with the cooperation of other public agencies concerned.
- b. Forestry agencies will be encouraged to leave openings and unplanted abandoned farmsteads on forest lands for use by prairie grouse.
- c. The Department will purchase, lease and develop the more important dancing grounds, nesting grounds and wintering areas as far as is practicable. Emphasis will be placed on preserving lands in

those areas where pinnated grouse are now in danger of extinction.

- d. Food patches for prairie grouse will be planted where found necessary.
- e. Pheasants will not be stocked in good prairie grouse areas.
- f. Hunting seasons for sharptail grouse will be adjusted to population levels and with a view to encouraging this native grouse. Hunting of pinnated grouse will be permitted only when and if harvestable populations are developed.
- 10. Hungarian Partridge

Hungarian partridge, an introduced game bird, occurs throughout the pheasant range but is most abundant in the farming counties of southwestern Minnesota. In 1957, 23,000 Hungarian partridge were taken by hunters.

The following items constitute the management policy for Hungarian partridge:

- a. Hunting seasons for Hungarian partridge will ordinarily run concurrently with the pheasant hunting season.
- b. Research on better methods for determining size of Hungarian partridge populations will be carried out.
- c. Special hunting methods such as the use of trained dogs, drives, etc., will be investigated and encouraged so that

more of these hard-to-hunt birds can be taken when they are abundant.

11. Spruce Grouse

Spruce grouse are becoming more abundant in the northeast with the regrowth of coniferous forests. It is the opinion of the Department that this bird should be removed from the protected list so that a hunting season for it can be set when and if its abundance warrants.

12. Bobwhite Quail

Bobwhite quail are now scarce in Minnesota and are limited to scattered coveys in the southeastern counties. Ouail populations are low largely because of destruction of suitable habitat by intensive agriculture and because southern Minnesota is on the northern fringe of the natural bobwhite range. Farmers will be encouraged to provide some cover and space for quail on farms in the southeast and information will be gathered as to a possible means of building up the quail population. The limited and local sport of quail hunting may be retained. At present, hunting appears to have little effect on the abundance of quail.

13. Woodcock

Woodcock supply some sport mostly to a few hunters who specialize in shooting this bird. Since it is a migratory bird, setting of the hunting seasons is under general federal control. Additional information on breeding habits, migration pattern and distribution of woodcock in the state will be gathered to facilitate better management and hunting regulations.

14. Mourning Dove

The mourning dove is the number one game bird in the United States in terms of number of birds shot. More doves are harvested than all waterfowl combined. It is the only game bird that nests in all 48 states. Under present national hunting pressure. leg band recoveries run about 3 percent, or similar to the robin, indicating an underharvest of doves. The dove could supply much hunting recreation if placed on the game bird list in Minnesota and managed and harvested as a game bird.

SMALL GAME MAMMALS

15. Rabbits and Hare

Hunting of cottontail rabbits, jack rabbits and snowshoe hare will be encouraged. Much hunting recreation can be provided and rabbit damage to farm and forest crops alleviated. Seasons will be arranged so that rabbits can supply hunting after most other hunting seasons are closed.

16. Squirrels

Hunting of gray and fox squirrels, which are common in woodlots and forest remnants of southern Minnesota will be encouraged. Much fall hunting is, and can be provided by squirrels, and winter damage to hard maple by stripping of bark, thereby alleviated. It is the Department's opinion that, at least in some years, squirrel hunting seasons should open October 1 rather than on October 15 as now provided by law. Extending the season through December 30, as at present, appears to be satisfactory.

MIGRATORY WATERFOWL

17. Ducks, geese and other migratory waterfowl

Migratory waterfowl, as here considered, include geese, ducks, coots, snipe, rails and gallinules. Under the Migratory Bird Act the federal government (U. S. Fish and Wildlife Service) and the conservation agencies of the several states are responsible for management, research, law enforcement and setting of seasons and bag limits for migratory waterfowl. Minnesota is a member of the Mississippi Flyway Council which coordinates work of governmental agencies on waterfowl. Principal items in overall waterfowl policy are:

a. Cooperation and coordination of the Minnesota waterfowl program with programs of governmental agencies concerned with waterfowl elsewhere in the Mississippi Flyway. A successful waterfowl program cannot be limited by state boundaries.

b. Acquisition of selected wet-

lands and small-water areas to provide breeding and resting places for waterfowl and to provide public hunting. Such areas, where possible, will be acquired in a planned pattern.

- c. Maintenance and improvement of shallow lakes and wild rice stands so that waterfowl are benefited.
- d. Adjustment of hunting seasons within the over-all framework set by the U. S. Fish and Wildlife Service so that production of ducks on local water areas is not adversely affected and water areas receive greatest possible waterfowl breeding and nesting use.
- e. Management of transient waterfowl (those raised mostly in Canada) will include:
 - (1) Provision for a well distributed pattern of planned hunting areas for ducks.
 - (2) Adjustment of hunting regulations, as necessary, to relate the kill of different species to their abundance in the population and provide some protection to species in danger of being overhunted.
- f. Management of resident waterfowl (those breeding in the state) will include emphasis by both management and re-

search on encouragement of local breeding of resident species, especially blue-wing teal, mallard, ring-neck, golden-eye, redhead, canvasback, Canada goose, and wood duck. Attempts will be made to obtain utilization by waterfowl of waters not now being used to capacity through necessary protection, propagation, and research into landuse patterns.

- g. Propagation and stocking of waterfowl will be carried out on an experimental basis to determine the value of such stocking on waters now inadequately used by nesting waterfowl.
- h. The possibilities of using small wintering flocks of waterfowl as nuclei for local breeding populations will be investigated. Such wintering flocks which occur in a few small areas that remain icefree, should be provided special protection.
- i. Research will be continued into the relationships between waterfowl production, land use, soil and water fertility, and hunting pressure. Investigations will continue on homing tendency of waterfowl and life histories, especially of ducks of the forest areas such as baldpate, blackduck and goldeneye. The forest areas appears to have a con-

siderable potential for producing waterfowl.

j. The probable increased future hunting use of coots, gallinules, rails, and snipes is recognized and more information for management of these birds will be sought. Wasteful shooting of coots for target practice is deplored, and hunters will be encouraged to recognize the real value of the coot as a game bird and table delicacy.

FURBEARERS AND PREDATORS

Furbearers are more important to the economy of the State than is usually realized. Income to the State from sale of furs has been as much as 6 million dollars a year (1946) and in recent years has been about 1 million dollars. These animals are worthy of more attention, management, and study than they have received in the past.

18. Mink

The mink is the most valuable Minnesota furbearer, and in 1956 the 53,000 mink taken by trappers sold for \$742,000. Information will be gathered on mink to promote better management. Opening date of the trapping season should be late enough so that most of the mink available for trapping will have prime pelts. Trapping seasons will be adjusted to the size of the mink population. 19. Muskrat

The muskrat is our most abundant furbearer and in years when the population was high nearly 2 million have been taken by trappers. Muskrat trapping is an important source of income to farm boys and trappers in small towns. The principal items in the policy for management of muskrats are:

- a. Opening date of trapping seasons and length of the season will be adjusted to muskrat abundance.
- b. Trapping seasons will be set on the basis of muskrat populations in suitable areas and not curtailed because of decline in populations in areas where the habitat has been harmed or destroyed by drought or drainage.
- c. Further investigation will be carried on of epidemic muskrat diseases which often cause large losses in muskrat marshes. Thinning of rats by trapping as a deterent to spread of such disease will be considered.

20. Beaver

Beaver are abundant in many parts of northern Minnesota and have been lightly trapped in recent years because of the low price of pelts. Flooding of land by beaver dams can be beneficial or harmful depending on the individual circumstances. The following items constitute the beaver policy:

- a. Beaver will be allowed to thrive where their activities are beneficial to forest fire protection, wildlife or water conservation, but population size will be controlled where beaver dams are flooding agricultural or productive forest land, or endangering their own food supply.
- b. Beaver populations will be controlled in trout streams in those places where dams and impoundments are injuring the stream for trout and trout fishing. If control cannot be had by regular trapping seasons, the Department will remove problem beaver and dams where such removal is feasible.

21. Otter

Otter are not abundant but are widely distributed in Minnesota lakes and streams. Until information suggesting other management is found otter trapping will be permitted during all or portion of the beaver trapping season.

22. Fisher

Fisher are increasing in numbers in northern Minnesota as the coniferous forest grows back. It is the opinion of the Department that this animal should be removed from the protected list so that a trapping season can be authorized if and when the population warrants. At present at least 50 to 75 fisher are taken accidentally each year by trappers.

23. Marten

Pine marten are very rare in Minnesota and the only record in recent years is that of an animal taken in a trap near Burntside Lake, St. Louis County, in 1953. Marten should remain on the protected list.

24. Raccoon

Raccoon are common over much of the state although the current population (in 1958) is somewhat less than that of 1955. Take of raccoon by hunting and trapping has increased in recent years and there has been considerable loss from diseases, especially distemper and encephalitis. Principal items in the management policy for raccoon are:

- a. If the population warrants, the separate season for hunting and trapping of raccoon will be continued.
- b. No special laws or regulations for destroying racoon are favored. It is recognized raccoons sometimes prey on nests and eggs of waterfowl, and upland game birds, but most of their food is not in conflict with human interests.

25. Skunks

The large striped skunk and the less common spotted skunk (civet cat) are unprotected in Minnesota. These animals are quite susceptible to rabies, and largely because of low fur prices and fear of contracting rabies, they have been little trapped in recent years. In 1957, 20 to 25 cases of rabies in skunks were diagnosed each month by the Minnesota Livestock Sanitary Board and the University of Minnesota. The Department does not favor a bounty on skunks both because a bounty would probably be ineffective in reducing numbers of skunks and, because of increased danger of humans contracting rabies from handling more animals.

26. Wolves

A. Timber Wolf

The timber wolf population in Minnesota now consists of 500 to 700 animals mostly in the northeastern wilderness. Policy items concerning the timber wolf are:

- a. A wolf population should be allowed to exist in the wilderness area. In inaccessible wilderness areas timber wolves interfere little with man and his activities. They may actually benefit the deer herd and habitat, and are an integral part of the wilderness wildlife society.
- b. Outside the wilderness area individual nuisance wolves doing damage to humans and stock can best be handled under a directed predator control program.
- c. Payment of bounties for wolves is discouraged by the Department because:

(1) this "shot-gun" approach does not allow control of the individual predators doing damage;
(2) it is very expensive;
(3) it promotes fraudulent claims; and, (4) there is no evidence that populations of wilderness game animals have benefited.

B. Coyote or Brush Wolf

The coyote or brush wolf occurs throughout much of the state and some coyotes are at times damaging to stock and poultry. The Department favors directed predator control of animals known to be doing damage. Bounty payments on coyotes are not favored.

27. Foxes

Foxes are fairly common throughout the state. The red fox is more abundant than the gray fox, which is most common in the southeast. Policy items concerning fox are:

- a. The fox should be considered a game animal. There are already several fox hunting clubs in the state.
- b. The beneficial food habits of foxes are recognized. Such habits as eating undesirable rodents usually outweighs damage done by foxes to game and poultry.
- c. Individual foxes known to be doing damage to poultry and

game should be destroyed by directed predator control. The Department can see little benefit to game animals from the extensive payment of fox bounties over many years and there has been no decline in the number of foxes bountied.

28. Native Cats

Three native cats occur in Minnesota. The bobcat is fairly common in northern forest areas. The Canada lynx is rare in the same region. In recent years there have been a few apparently authentic reports (sight and track records) of mountain lion but no animals have been taken. It appears that the mountain lion has recently returned to the state after having been extirpated about 1870. Policy items are:

- a. The native cats are recognized as an integral part of Minnesota's wilderness and some should be allowed to exist there.
- b. These native cats at present are not endangering game populations (such as deer). The bobcat has been found to feed mostly on snowshoe hare and therefore may be of direct benefit to the deer range because hares may destroy winter deer food.
- c. Directed predator control of individual native cats known to be doing damage is favored. Payment of bounties on them is not favored.

BIRDS OF PREY

29. Hawks and Owls

The value of continued protection of those hawks and owls now protected by Minnesota laws is emphasized. It is desirable also to protect the three remaining of hawks (goshawk, species Cooper's hawk. and sharpshinned hawk), and the great horned owl. Under the present laws individual birds doing damage can be killed. Hunters often do not distinguish between kinds of hawks afield and frequently protected kinds are shot. The use of pole traps for taking birds of prey is discouraged and use of them permitted only with the written permission of the Director. Pole traps are unselective and birds of all kinds, protected and unprotected, are taken by them.

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Dated July 14, 1958



