Our Hunting Heritage

An Adult Education Manual On Wildlife Ecology And Hunting Ethics

Produced By:

Minnesota Department of Natural Resources

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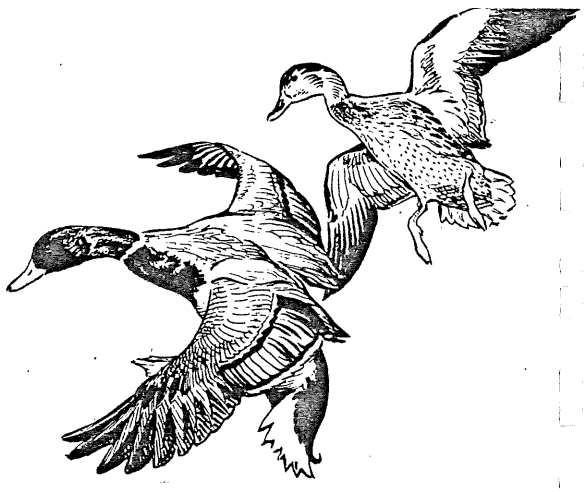


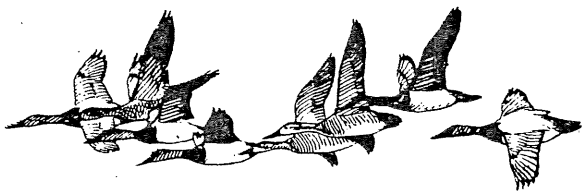
Introduction

I think I know you, but I can't recall where we met. It could have been over coffee in that duck blind that October morning when the mallards came from no-where. Or was it on a logging road that bright September afternoon when we shot more leaves than grouse. It could have been that frozen November day where all the trails came together at that deer rub. Where or when really make no difference, I guess. It's what we talked about I remember.

We talked about the one subject our wives say we always talk about, namely hunting. We talked of the meaning our hours afield have for us; of special days and places; of special game, special dogs, special friends.

We talked also of the lack of consideration, ability, knowledge and respect of some of our numbers who also call themselves hunters: of the damage these people cause to property, game and our hunt. We both felt the disappointment after a farmer refused to allow us to hunt his land. His reason: the misdeeds of some scatterbrains who only pose as hunters. We agree these people were hurting us in the eyes of the non-hunter, and providing ammunition for the anti-hunter.

As we parted, we mentioned how great it would be if everyone afield with a gun in season really deserved to be called a "hunter". Your last words were: "something has to be done." Hope this is a start.

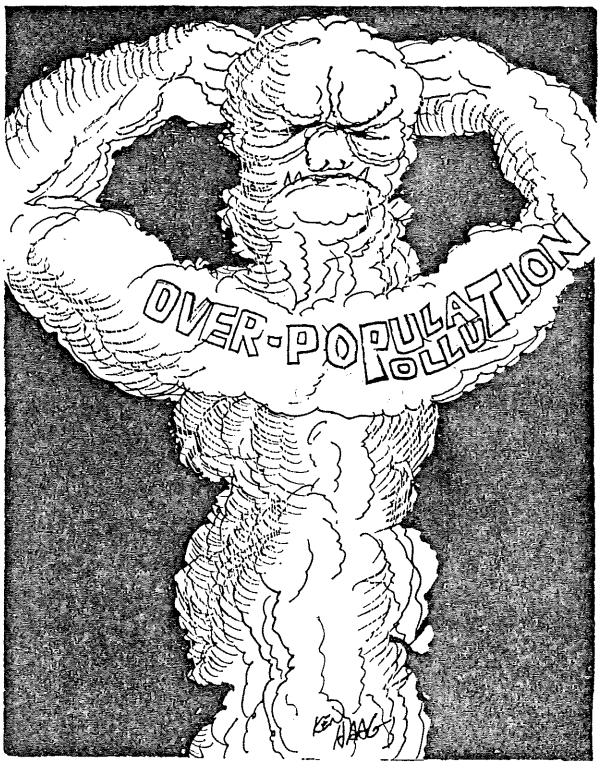


1

Philosophy and Purpose

We have reached a point in our hunting and shooting heritages where it is no longer sufficient nor justifiable for the only requirements of hunters, fishermen, trappers or shooters to be simply of adequate age and financial means to purchase licenses and equipment.

Sport hunters have to be more accountable than ever for their activities--not only to themselves, but to the non-hunting public, landowners, their hunting companions, and certainly to the wild birds and mammals they pursue. This, then, is the hunting ethic that must be instilled in every Minnesota hunter.



Admittedly, it is sometimes difficult for the hunter to exemplify a hunting ethic in his actions. Often, he is frustrated by: too many people stalking the same woods; too many lake cabins, countryside homes, highways and billboards; too many wetlands and other vital habitat areas that have been sacrificed in the name of "progress".

Unfortunately, there are too many of us who take out our frustrations on beer cans, signs, non-game species, public and private property.

Likewise, too many of us are ignorant of important game behavior, wildlife management principles, continuing habitat changes, game laws, hunter ethics, or the attempts of the Department of Natural Resources and U.S. Fish and Wildlife Service to promote "quality hunting", rather than "quantity hunting."

If hunting is to continue as an acceptable form of recreation, it must be orientated toward pursuing a hunter ethic, one based upon responsibility and respect.

How does one assimilate this hunting ethic? First, we must be willing to change--maybe some old habits, maybe a few preconceived notions and possibly our entire outlook on hunting. We must also be willing to learn--to try to understand such things as ecology, habitat, wildlife management and how game laws protect our wildlife resources.

To become true sportsmen, we will need not only knowledge (for unethical hunters can be learned intellectuals too), but skills such as waterfowl identification, marksmanship and firearms safety, map reading, etc.

But most importantly, in our actions afield, we must reflect both responsibility and respect.

If hunters can successfully progress toward these goals, we may indeed alter the tide of anti-hunting concern that grows stronger each day. The actions of ethical hunters can lead only to a spirit of cooperation with non-hunters in the acquisition and development of wildlife lands, so that both factions will attain the same goal--that of perpetuating our wildlife heritage.

Outdoorsmen everywhere must realize that the unwritten "laws" of good sportsmanship are broken by each and every one of us some of the time (usually through ignorance or frustration), and by some hunters almost all of the time. (These "laws" are similar to the "rules of the road," widely accepted driving standards that are commonly broken. For example: Have you ever followed another car too closely or failed to dim your headlights as another vehicle suddenly appeared over the crest of a hill?)

Few of us are so proficient or noble as to not need hunter education at some time, and many of us could use it both before and during each hunting season. It is only the degree to which we need updating and improvement that

differs. However, "formal hunter education" may not be as important as the regular interaction between hunting companions who constantly strive to help each other improve their hunting ethics.

2

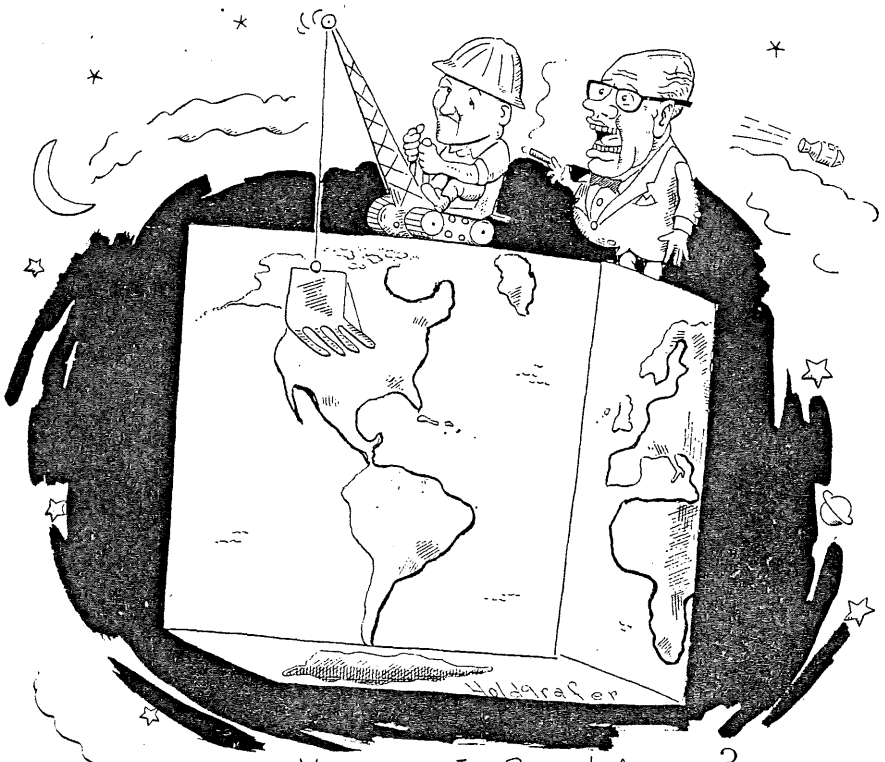
The Impact Of Man Habitat Alteration

....lest we forget, it is all inter-related and inter-dependent... man and all other living creatures, soil, waters and the air....

Development of the hunting ethic must be based in part upon sound knowledge of wildlife, the relationship of wildlife to habitat, and man's impact on habitat (both plants and animals).

How Has Man Changed The Natural Environment?

What was Minnesota like 200 years ago? How different is our state today as a result of man's influences and changes. Although the general areas of west-southwest prairie, northcentral and northeastern forests, and transition zones remain, their "characteristics" have been greatly altered by our activities. Historical accounts and records, tree-ring borings and studies of sediments in lake bottoms reveal many changes throughout the state.



There are seven principle man-caused factors that have greatly altered Minnesota and affected sweeping changes in wildlife populations:

1. Agriculture
2. Logging
3. Accidental Fires and Fire Control
4. Construction
5. Wetland Drainage
6. Commercial Shooting and Trapping
7. Pollution

What do all these factors have in common? A) They simplify natural ecosystems; B) They divert natural systems toward the direct support of man.

Understanding how mankind influences various ecosystems will help us to cultivate a hunting ethic. This booklet will focus upon man's alteration of the natural environment by examining the seven factors mentioned above. We will also stress the need for people to become stewards of the land.

What is stewardship? It is reverence and respect for soil, water, air and animals; it is a dedication to preserving and restoring wildlands; it is an attempt to manage the plant and animal populations we have so drastically disturbed.

Bobcat and
Downy Woodpecker

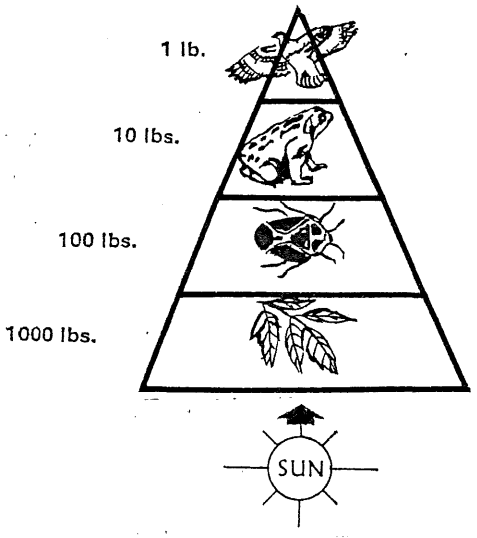
Bobcat & Downy Woodpecker

What Is An Ecosystem?

A natural ecosystem is an ever-changing, interacting association of living organisms and non-living substances. Within every ecosystem there is a continuing flow of energy. This energy flow occurs as organisms consume one another.

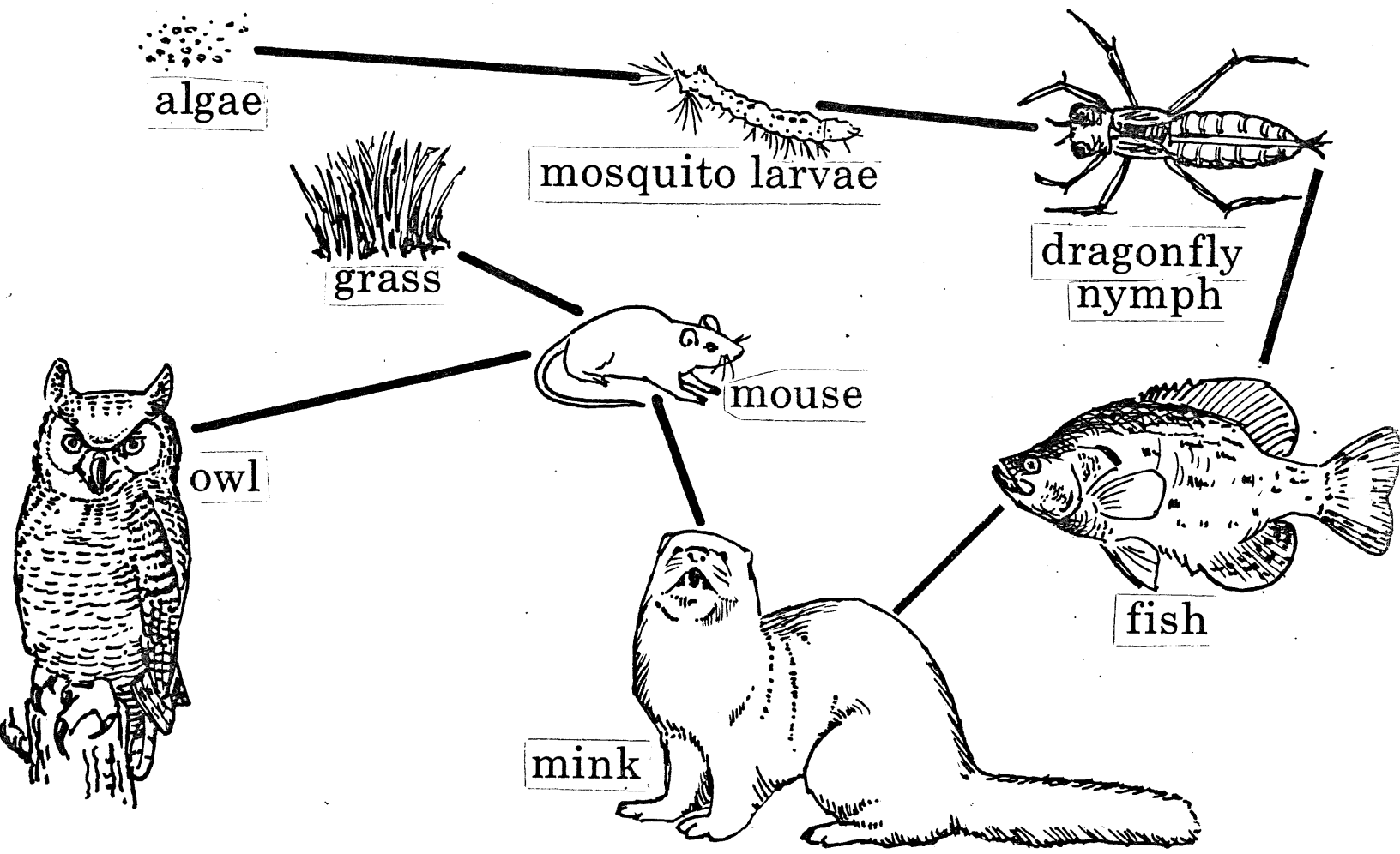
Energy transfer begins with solar energy entering plants and then passing from one level of a food chain to the next, though most energy is released as heat at each step in the food chain.

A Food Pyramid



Each animal will use a certain amount of the energy for its own growth and reproduction. Generally, only about one-tenth of the energy received by an animal is stored and made available to the next level. For this reason, animals at the top of a "food pyramid" are much less abundant than those at the bottom; each pound of a high level consumer is produced at the expense of hundreds or thousands of pounds of primary production.

Of course, nature consists of many complex food chains with the same plants and animals being part of several food chains simultaneously (since each species eats a variety of foods). Thus, a better term for this intricate and involved life system would be food web.

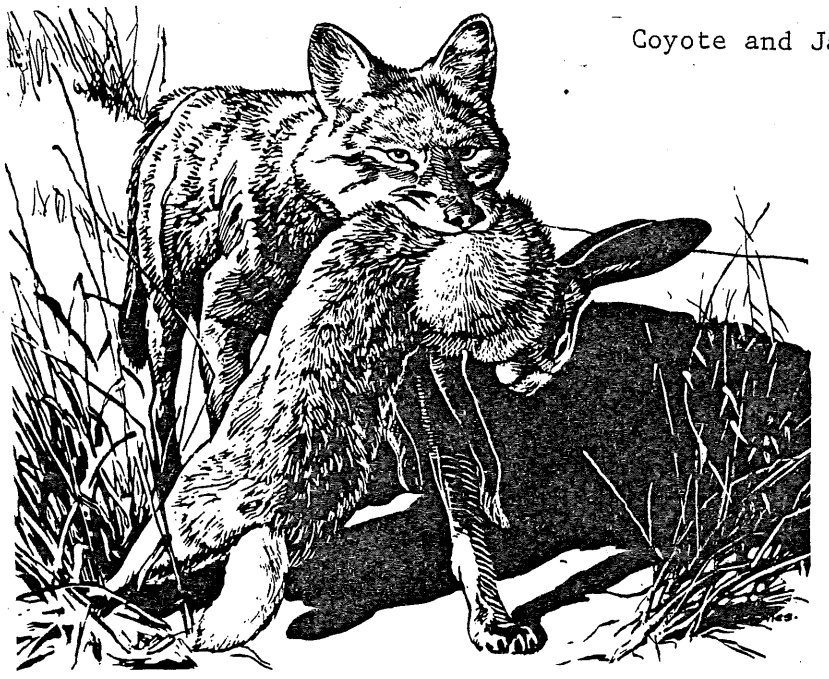


Greatly Simplified Food Chain

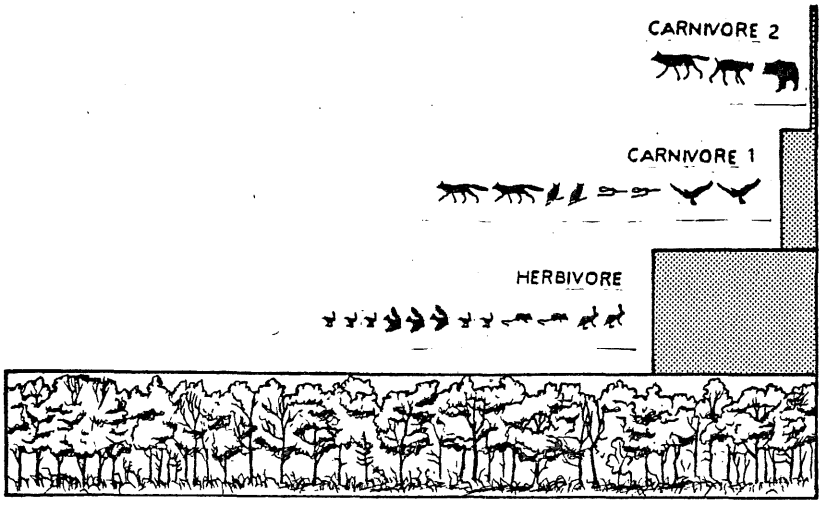
In the typical ecosystem, plants use soil nutrients, carbon dioxide, water and sunlight--and emit oxygen. Animals that eat plants, including rabbits, mice, deer and squirrels, are called herbivores. Carnivores, including timber wolves, fox, skunks, raccoons, etc. are meat eaters. Animals that eat both meat and plants, such as humans and bears, are omnivores. All animals take in oxygen and emit carbon dioxide.

Any natural ecosystem that is essentially undisturbed by man is very complex. Complexity gives stability to the ecosystem because natural calamities such as disease, floods or fire, which could severely affect several species, can not eliminate an entire level of the food chain.

For example, if disease causes a rabbit population to decline, coyotes and fox will feed more on rodents and other small animals. However, if a food web is simple, with only a few steps leading to the top step (such as if rabbits and mice were the only foods of fox), then fox would die off if both rabbit and mouse populations declined in the same year.

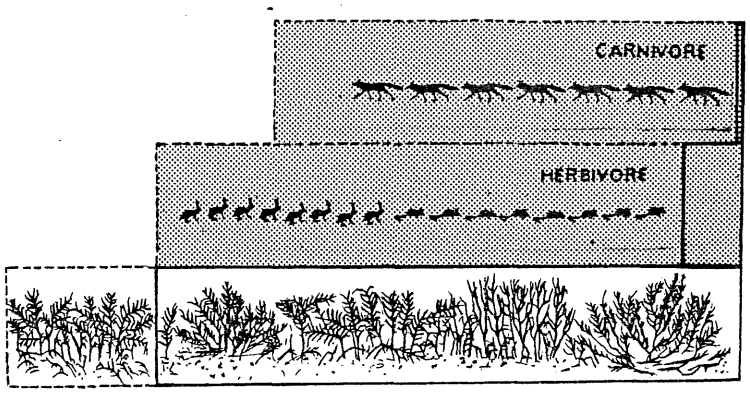


Coyote and Jackrabbit

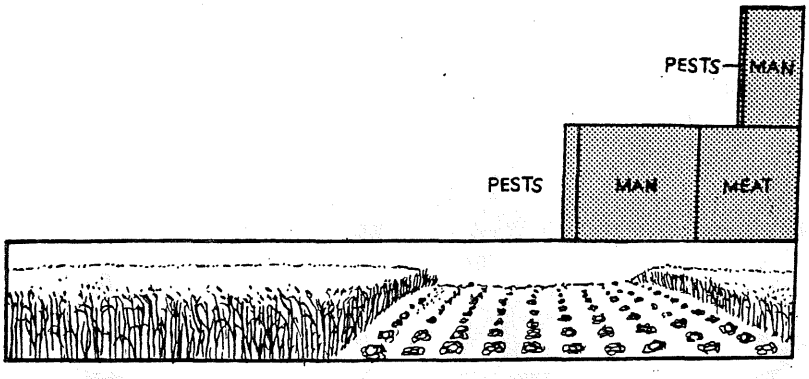


The "widths" of the rectangle represent 10% to 20% of the energy transfer with each width being 80% to 90% of the previous level.

INTACT NATURAL ECOSYSTEM is exemplified by a mature oak-hickory forest that supports several stages of consumers in the food chain, with from 10 to 20 percent of the energy in each level being passed along to the next level.



DEGRADED ECOSYSTEM. The annual production of the sparse grasses, herbs and shrubs fluctuates (shaded area). So do populations of herbivores and carnivores, which are characterized by large numbers of individuals but few different species.



AGRICULTURAL ECOSYSTEM is a special case, yielding a larger than normal harvest of net production for herbivores, including man and animals that provide meat for man. Large harvests result from inputs of energy in cultivation, pesticides and fertilizer.

Characteristics of a Natural, Complex Ecosystem

(Refer to Diagram on Page 10

There are many different species of plants.

There are many different species of animals.

There is a wide variety of age groups of plants and animals among all species, as well as short-lived and long-lived species.

There are a few species that are very abundant.

There are many common species and some not so common.

There is a wide variety of sizes of plants and animals from very large to very small.

As discussed earlier, the flow of energy as one living organism consumes another, determines the maximum number of organisms that can exist at any step in the food chain. Understanding this concept is important in understanding population dynamics.

By studying the diagram on the next page, it becomes easier to visualize that "population control" is at both ends of the scale, and not just "predators gobbling up prey" as many believe. For instance, populations of carnivores are partly controlled by the numbers of herbivores upon which they feed, and vice versa.

What implications does this have for understanding the fox-pheasant controversy in southern Minnesota, or the deer-timber wolf controversy in northern Minnesota?

Timber Wolves

Like most other primitive peoples, the tribes of North American Indians had little impact on ecosystems because Indian populations were not great, and they lacked the technology to permanently alter the environment.

However, when millions of industrially-oriented, white Europeans settled and increased in numbers in America, they began to change natural ecosystems to support themselves by:

- agricultural techniques that introduced fertilizers and toxic substances into the soils and waters to obtain greater crop yields;
- large-scale timber cutting to clear land for agriculture and provide lumber for building, and paper products;
- control of wildfires to protect lives and property;
- construction and technological advancements to make life healthier, safer, happier, easier, and more rewarding;
- wetland drainage to increase the available land for food and profit;
- commerical shooting and trapping to provide money for essentials and luxuries;
- water and air pollution which resulted from man's many and complex technological advances.

The most general effect of all these practices was the simplification of the many ecosystems. Here's how:

Fewer kinds of plants and animals (less species diversity): Instead of a variety of species, field after field becomes a single plant type; corn, soybeans, wheat, etc. In order to increase yields, special plant varieties are developed that can be bred (hybrids), planted, fertilized, cultivated and harvested. Each field of a single species becomes highly unstable, and susceptible to disease and weather extremes (floods, grasshopper plagues and droughts are not significant problems within natural ecosystems).

Forest tree stands are nearly all the same age (less age diversity): Fire control is causing much of Minnesota's northern forest to grow old and contain tree stands of nearly the same age, creating an unstable situation. In an extremely dry year, virtually all of northeastern Minnesota could become a large, unburned tinder box. However, if the forests contained different-aged tree stands (diversity), only certain stands would be most susceptible to fires, winds or disease.

Plants and animals that destroy man's crops are labeled "pests", "weeds", and "predators". Poisons and insecticides are used against numerous birds and insects while herbicides are sprayed on most agricultural fields to eliminate competing weeds.

> "The last word in ignorance is the man who says of an animal or plant, 'What good is it?' If the land mechanism as a whole is good, then every part is good, whether we understand it or not," Aldo Leopold, [19] Sand County Almanac.

Bounty programs were used to control "animal pests" that compete with man's livestock, agricultural products, and game animals. By killing off certain plants and animals, man modifies "steps" in many food webs. This upsets population levels of various other species in these webs because they depended on the eliminated animals for food or some other purpose. Some species may increase, while others decrease or die out.

White-tailed deer, raccoon and sharp-tailed grouse may increase as a result of certain agricultural practices. Small, short-lived creatures such as squirrels, rats, mice and pheasants are the remnant occupants of food webs in suburban areas. Deer populations have increased enormously in the

past 75 years because man has upset natural balances of predators, food supplies, and cover. Thus man inherits population control of certain species like deer, moose or elk that increase rapidly as natural predators are eliminated and food supplies increase.

Draining of wetland areas continues to simplify ecosystems because it eliminates habitat for dozens of wildlife species and plant communities.

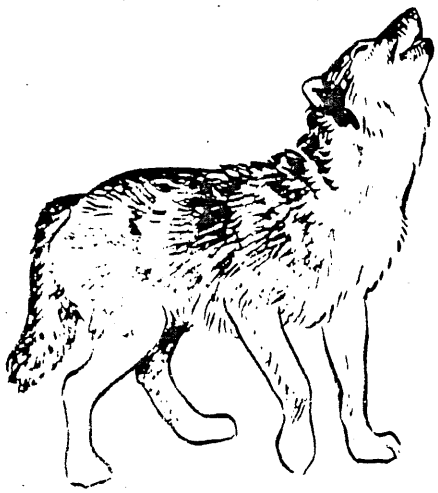
Construction of roadways, buildings, etc., simplifies ecosystems by eliminating or destroying certain habitats. Metropolitan areas contains only a few species of trees, shrubs and grasses. A classic example is the rise and fall of the American Elm, now endangered by Dutch Elm disease.

Toxic substances and human population expansion simplify ecosystems by eliminating certain species from the food web, or by eliminating wildlife habitat. Perhaps the most far-reaching impact on wildlife and man has resulted from the introduction of numerous chemicals into the air and water. Heavy metals such as lead and mercury, DDT, sulfur dioxide and many other pullutants, often have an irreversible impact on various wildlife species. Quite often toxic substances increase in concentration in animals higher up in the food chain. Predators such as ospreys and eagles seem to be affected by thinning of their egg shells or generally lower reproductive success. Industrial wastes released into rivers, oil spills and thermal pollution often destroy wildlife and its habitat.

In recent years we have seen the creation of state and federal efforts to identify dwindling species in an attempt to prevent their extinction. The grizzly bear is a classic example of this new "change in attitude" among the general public. Man has intruded into the grizzly bear's range, replacing the bear's food plants and animals with domestic livestock and crops. Some bears adapted by frequenting garbage dumps or by killing domestic livestock, both of which were frowned upon by man. As a result,

the grizzly was extirpated over much of its original range. Perhaps less than 1,000 of these animals now exist in the continental United States.

Similarly, Minnesota maintains the only significant population of timber wolves in the 48 contiguous states, estimated today at 800 to 1,200animals. This carnivore, similar to the grizzly, is at the top of the food chain and needs semi-primitive areas to survive. It will survive if its wilderness habitat in northern Minnesota is maintained.



"All conservation of wildness is self-defeating, for to cherish we must see and fondle, and when enough have seen and fondled, there is no wilderness left to cherish."

Aldo Leopold

Now, let's more closely examine the seven man-caused factors that have, in concert, altered Minnesota's natural environment and wildlife populations.

Agricultural Practices

The original Minnesota prairie (grassland) ecosystem was a stable complex of soil, plants and animals, where wind and water erosion were as scarce as people.

Aldo Leopold, in his classic "Sand County Almanac," describes the prairie this way:

> "The black prairie was built by plants, a hundred distinctive species of grasses, herbs and shrubs; by the prairie fungi, insects and bacteria; by the prairie mammals and birds, all interlocked into one humming community of co-operations and competitions through ten thousand years of dying, burning and growing, preying and fleeing, freezing and thawing."

When man joined nature as a co-manager of the Minnesota prairies, Leopold's "humming community" underwent some drastic changes. Exotic plants (thistles, corn and soybeans) and animals (starlings, house mice and sparrows) soon began to thrive on overgrazed pasture and intensively-farmed cropland. Presently, only remnants of original plants, potholes, buffalo, prairie chicken and many other prairie species remain as mute testimony to the massive destruction of the prairie ecosystem.

> "Our grandfathers killed off the prairie fauna (animals) and they drove the flora (plants) to the last refuge on railroad embankments and roadsides. To our engineers, the flora is merely weeds and brush." Aldo Leopold, Sand County Almanac

Fortunately, not everyone was willing to let the entire prairie ecosystem disappear unnoticed. Because of the hunter's early concern for wildlife habitat and his willingness to support habitat programs, a substantial acreage of the former prairie has been rescued or restored.

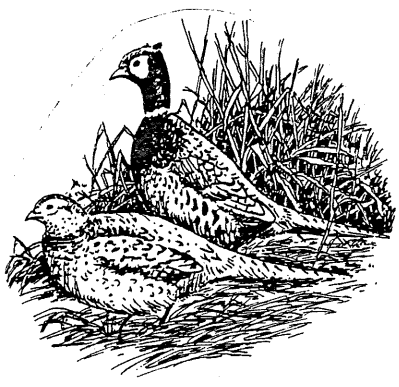
In western Minnesota, the Fish and Wildlife Service used duck stamp funds to purchase 106,000 acres of wetland wildlife habitat (Waterfowl Production Areas) and secured perpetual easements on another 130,000 acres.

The Department of Natural Resources established 825 wildlife management areas encompassing some 532,000 acres. Between 1951 and 1975 most of the $11 million used to acquire these wildlife areas was derived from $1 and $2 surcharges on small game hunting licenses.

Hunters also pay an 11 percent excise tax on sporting arms and ammunition to be used for habitat acquisition and development. In addition, sportsmen support private organizations that undertake habitat projects. Sportsmen have done much to perpetuate our wildlife heritage, but more needs to be done.

While interest and support from hunters and a few other individuals and groups was enough to save several hundred thousand acres of valuable grassland wildlife habitat, much stronger human demands for food production pulled the plow across most of Minnesota's prairie. This drastic change from nature-regulated to man-regulated prairies paved the way for animal and plant species having requirements associated with man's activities. One such species is the Chinese ring-necked pheasant.

Ring-necked Pheasants

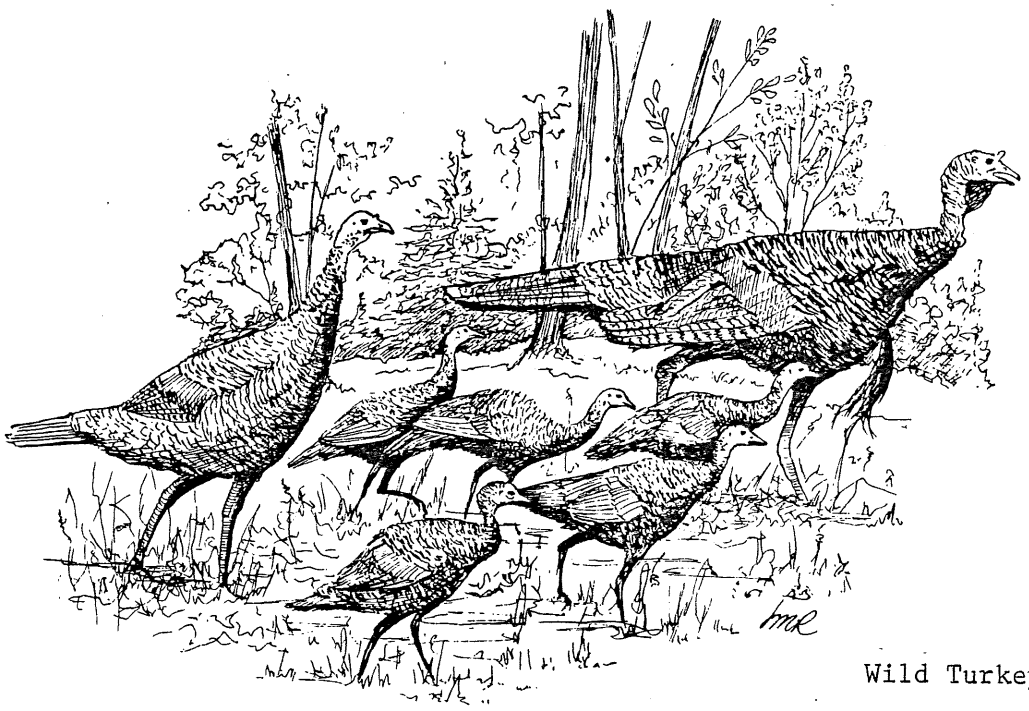


Introduced into Minnesota around 1900, this hardy game bird thrived on the combination of woody cover (shelterbelts), grassland, nesting cover and winter food created by early agriculture practices. However, by the 1960s, pheasant cover and the pheasant itself were going the way of the prairies, and for the same reason--intensified agriculture. Where there were once marshes, grasslands, farm groves, fence lines, meandering creeks, there are now drainage ditches, rowcrops and fall-plowed fields.

Reasons for Minnesota's resident duck decline are less subtle. When there was an abundance of marshes and grassland, there were ducks galore. In some Minnesota counties, up to 90 percent of the marshes have been drained.

The principle illustrated by the plight of pheasants and ducks is relatively easy to understand: No habitat -- no wildlife.

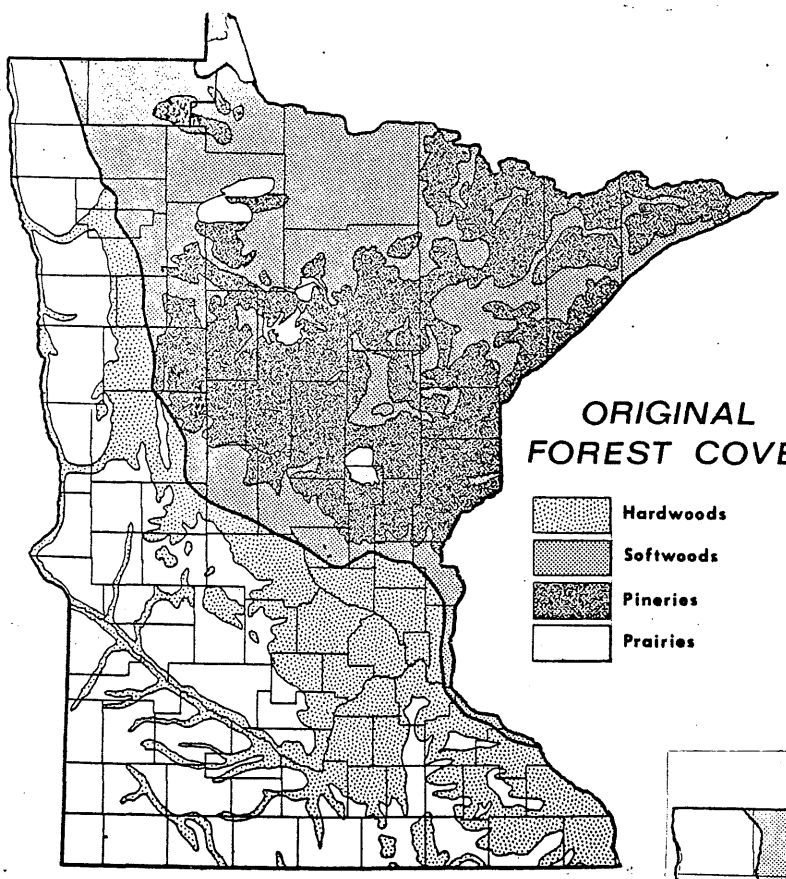
In summary, the same expanding human population that caused the elimination of prairie grasslands for food production is now doing the same thing to other types of wildlife habitat and subsequently, some species of wildlife.

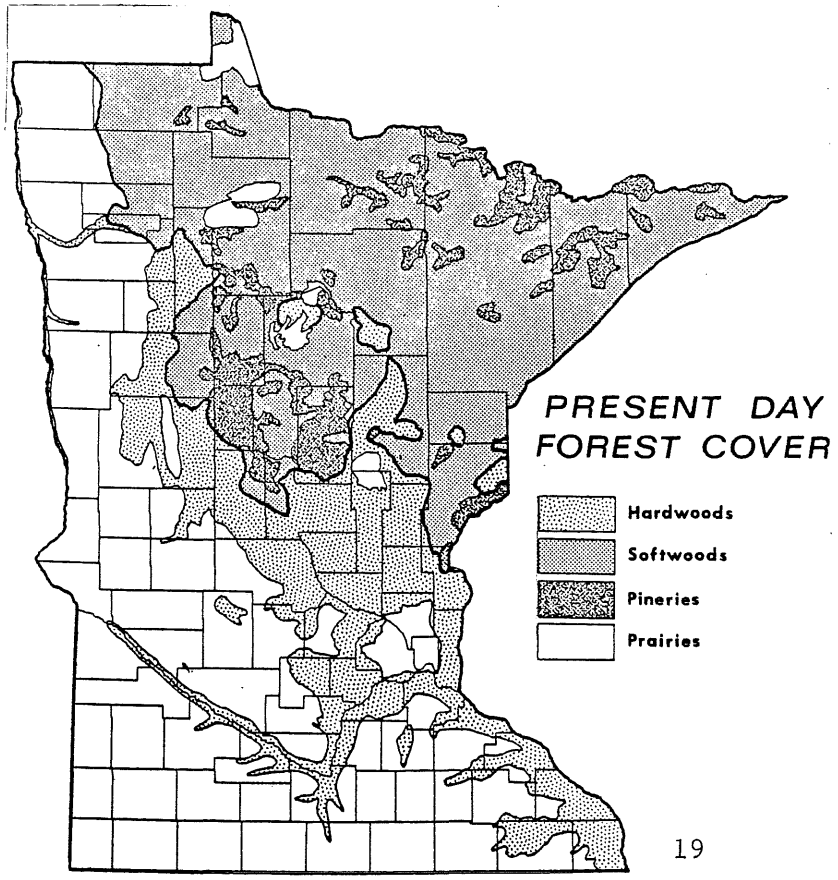


Wild Turkeys

Logging Practices

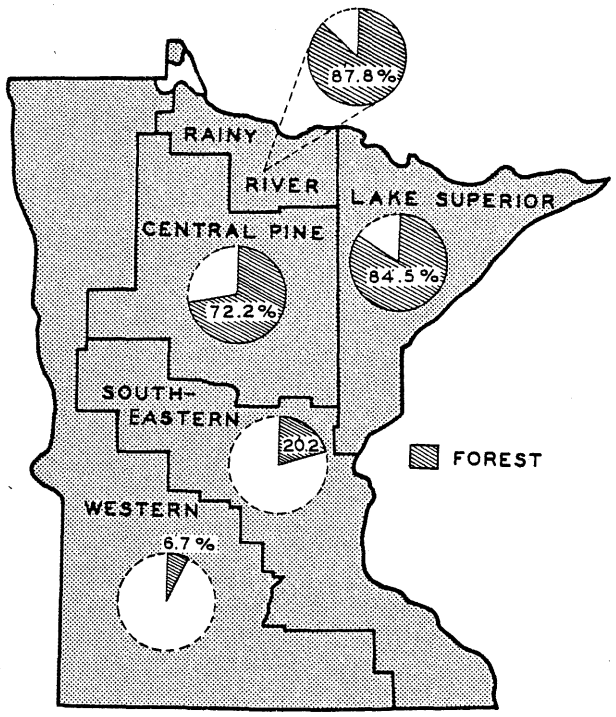
Beginning in the late 1800s and continuing into the 1930s, Minnesota experienced an era of logging that affected most of the state's north-northeast regions and transition areas. At that time, the forested area represented about two-thirds of the state's total area.





Today, three major forest types exist in Minnesota: aspen-birch, conifers (pines, spruce and fir), and non-aspen hardwoods.

The type of tree or plant species that grew back following logging was determined by the type of logging practice, the species of tree being harvested, soil type, seed availability, sunlight conditions, artificial planting, and other factors.



Percent of forested land by district, 1962.

Minnesota logging is no longer aimed at harvesting mature red and white pine for lumber as during the "logging years." Today, most logging is of hardwoods and softwoods utilized in the pulp and paper industries.

Again, referring to the maps on the previous page, it can be seen that

the mature pine stands (white and red), which blanketed northern Minnesota have been replaced by aspen-birch types (hardwoods) and balsam fir-spruce types (softwoods).

It should be noted that the maps are over-simplications of both the original and present-day forest areas. The original forest was a diverse mosiac of various forest types in addition to grasslands, brush areas and swamps (with varying ages of each). Rarely does any forest contain only one or two tree types, but rather is a complex mixture of trees, shrubs, forbs and grasses dominated by particular tree species after which it is named.

Briefly, we can think of all plant-animal systems as changing with time after major disturbances. These changes are called succession. For instance, after the advance of a glacier, a typical, natural plant succession might be:

Bare ground...grasslands...grass-shrubs...new growth trees... climax tree types.

By "climax" is meant a major type of vegetative community that continues to grow and replace itself. Depending on the soil type, soil nutrients, sunlight conditions, altitude, etc., numerous "climax" species are possible. For example, prairie grasses are "climax" species on the rich soils of south-western Minnesota prairies.

However, in areas where man has had little influence, natural disturbances such as fire, disease and winds set various patches of land back to earlier successional stages so that the larger area contains a diversity of "various age" stands as well as "different types" of forest stands. This complexity and diversity leads to ecological stability whether it be a forest, transition area, or prairie.

Most people who travel through northeastern Minnesota and gaze at the large expanses of swamps and forests, are apt to think of it all as being Virgin or untouched by man. Actually we have vastly changed these areas in our efforts to extract rich iron ores, build railroads and roadways, start or control fire, and log stands of Norway (red) and white pines.

White-tailed deer and ruffed grouse were probably rare in northeast forests prior to 1850, except where wildfires or wind destroyed large tracts of woods. Meanwhile, moose and particularly woodland caribou were well adapted to this early forest of mature hardwoods and conifers. A few elk could also be found in the northwestern and transition areas of the state.

Between 1870 and 1950, virtually all of the northcentral and northeastern Minnesota (except for a few locations in the Boundary Waters Canoe Area: BWCA) were changed from a diverse forest to a "new growth forest" highly dominated by aspen, birch, and shrubs associated with such plants as: Mountain maple, red osier dogwood, honeysuckle and blueberry.

Habitat once favorable to woodland caribou, moose, and spruce grouse, became more suitable to white-tailed deer, bear, ruffed grouse and sharp-tailed grouse. Deer populations in particular increased in this "new growth" between 1930 and 1960. At the same time, caribou and spruce grouse all but vanished from the state. Deer populations in the remainder of Minnesota also increased as agricultural crops provided more food and hunting seasons were implemented to control the harvest of deer.

Since the 1960s, forests in northeastern Minnesota have generally matured as a result of nearly complete fire control (which began in the 1920s), and the lack of extensive logging. Again, habitat changes have dictated changes in animal populations. Deer populations declined while

moose numbers increased to stable levels in the early 1970s. Spruce grouse populations have recovered as pine and spruce stands have grown and matured, while sharp-tails have declined as their preferred forest openings have grown in.

Accidental Fires and Fire Control

Two other major influences causing change across Minnesota were raging wildfires which occurred for several decades prior to the 1920s and extreme measures to control these devestating fires.

To Indians and early settlers of Minnesota fire was a common experience. Although it brought fear of death and disaster, it was natural and necessary to the stable and complex ecosystems of prairie and forest. As Minnesota's population and its activities grew during the 1800s and early 1900s, accidental fires became more and more frequent. Enormous numbers of lives, buildings, crops and timber were "lost" to fires, and so "fire" began to take on an aura of death, demise and destruction....as something not only unnatural, but inherently BAD, and even illegal!

Uncontrolled wildfires helped develop people's attitudes of extreme fearfulness of fires. In turn, these attitudes helped establish the extensive fire-control measures that exist today.

The development of fire control programs occurred throughout the state at all government levels. The thrust of early fire control was to eliminate nearly all fires, even natural ones in areas where fire was not only harmless to man, but beneficial and even necessary to some species of plants and animals.

However, the public's attitude towards the "evils of fire" began to change noticeably in the 1960s and 1970s. Many people now realize that fire in some areas is a normal and necessary part of natural ecosystems.

In some federally-owned areas where management objectives are to maintain wilderness, wildfires are being left alone to eventually burn out.

Where forests are managed for either lumber or paper products, fires are not compatible. Fire, of course, is not practical near human habitation or near farm crops. When the objectives are to provide wilderness areas such as in the BWCA, M. L. Heinselman, formerly with the North Central Forest Experiment Station, has stated, "the most significant potential effect of man on the character of the forest, may be the exclusion of fire itself."

The many benefits of small natural blazes are being realized as researchers study the effects of fires in recent years. Small, annual fires consume dead and diseased timber. These burns provide future "fire breaks" during dry seasons of potentially large fire danger. Some species of pine do not regenerate unless their cones are opened by the heat from fires. Fires create forest diversity of ages and species as new growth regenerates after the burn.

Many "after-fire studies" are now occurring in the Little Sioux area of the Superior National Forest which burned in May 1971. There, extremely high temperatures devastated large trees and some of man's habitation. However, studies reveal little harm to mammalian species or to the regrowth of trees and shrubs. There were no confirmed reports of any direct wildlife losses. In spite of the "hot burn", it was obvious that mammals both large and small found safety in the ground, under rocks or away from the fire, and later reappeared after the burn had cooled.

In addition to fire control, man's major impact on the aspen-type forests is logging, most of which is for the pulpwood and paper products industries. However, even if 700,000 acres are cut in the 1970s, as is estimated, this only represents 1/12 of the aspen available in Minnesota. Hence the majority

of aspen forests will continue to age. If aspen is allowed to age naturally, shade-tolerant species such as spruce and fir will probably take over by natural succession in the north, and hardwoods in northcentral Minnesota.

Thus, the aspen-type forest of Minnesota, and how man controls it through harvesting and fire prevention, plays an important part in determining the number of white-tailed deer, moose, grouse, woodcock, timber wolves, beaver and many other species.

Construction of residential areas, commercial and industrial sites and roadways

Each year large amounts of land are totally altered by the machines of our technological society. The only "natural-like" remains are Kentucky blue grass lawns, boulevards studded with elm trees, potholes on golf courses, and marshes filled in to provide the next shopping center or residential development. Each year in the U.S., more than one million acres of wildlife habitat is buried under buildings and pavements or inundated by reservoirs.

Thousands of birds and animals are killed directly by pollutants from these complexes or by autos and trucks (over 5,000 deer killed annually in Minnesota--over 100,000 nationally). These losses, however, are a mere drop in the bucket compared to the continuing loss of wildlands. Man's "developments" and, "improvements" kill forever those wild creatures that might have inhabited these areas...that is until the next glacier passes.

Drainage of Wetlands

Drainage of wetlands has been going on extensively in Minnesota for at least 100 years. In order to convert land to agricultural purposes, more and more land is drained annually. Subsides from local, state and national governments, as well as from private organizations, have provided financial support for drainage.

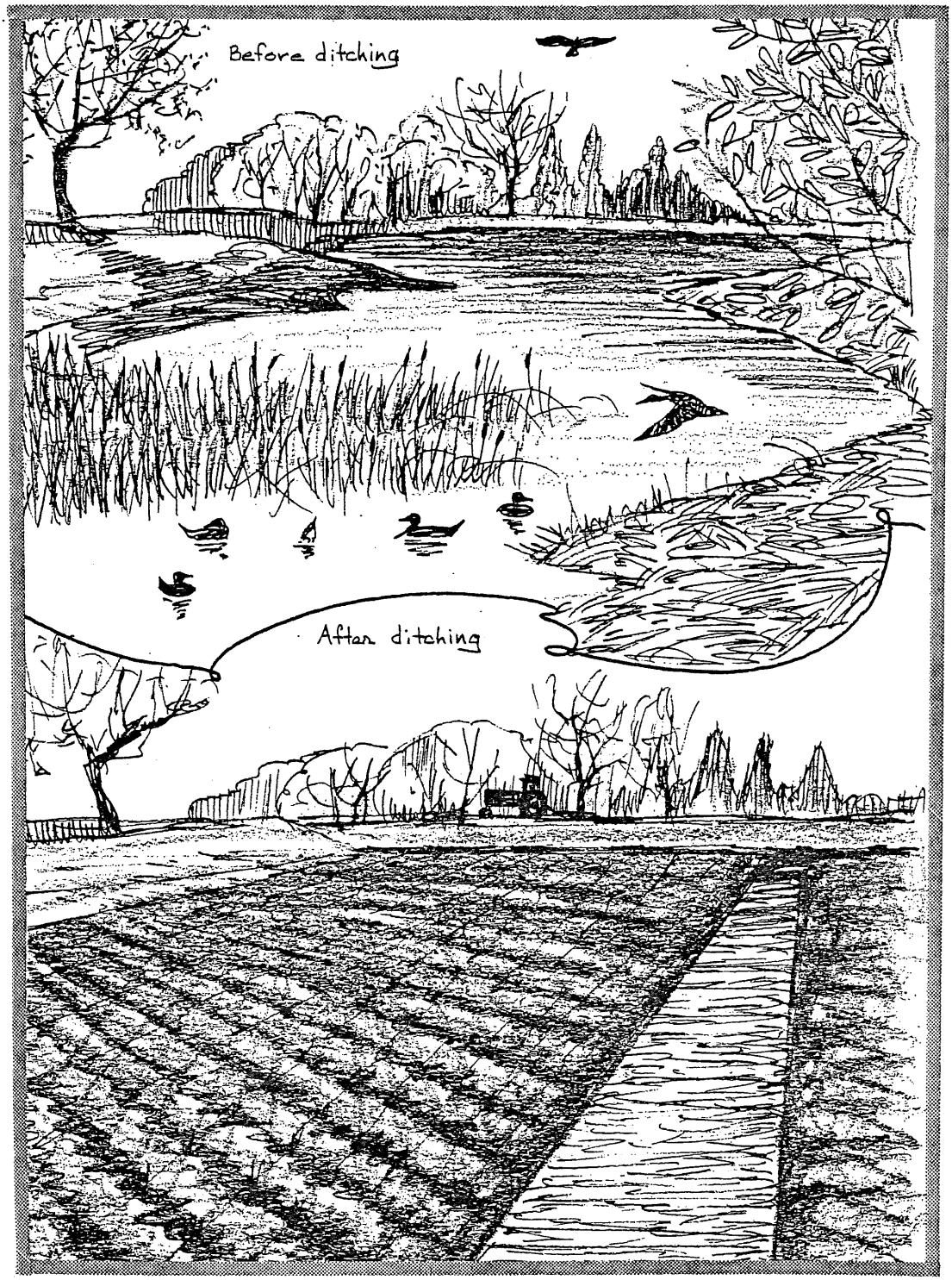
On the other hand, hunters and conservationists have sought to preserve marshlands by purchasing them. Ducks Unlimited secures private donations for maintaining and restoring leased wetland areas in Canada, and similarly the "Save Minnesota's Wetlands" program provides funds for buying and managing habitat in Minnesota. On a national level, millions of dollars have been allocated for purchase and improvement of waterfowl production areas through the Migratory Bird Hunting Stamp Act of 1934.

The Minnesota Waterfowl Association and other sportsman's clubs assist in creating and managing wetland areas. However, with a present world food crisis and expanding world populations, the pinch on wetlands for potential agricultural land will increase and Minnesota will add more to its 70,000 miles of drainage ditches. In addition, residents along Minnesota's rivers will almost annually greet the flooding waters from too many ditches that carry the rapid runoff of spring snow melt. Are record Minnesota floods in recent years (1965, 1969) just a coincidence?

Drainage has eliminated 3,257 of Minnesota's original 15,291 lakes. About 48,000 acres of prime wetlands in 19 west central Minnesota counties have been destroyed....14 percent of the total wetland acreage we had in 1964.

"The plover has only two real enemies:
the gully and the drainage ditch.
Perhaps we shall one day find that
these are our enemies too,"

Aldo Leopold.



Drainage codes, conceived many years ago almost entirely by drainage interests, have had a devastating effect on Minnesota's lakes and wildlife.

By 1968, 3,257 of Minnesota's original 15,291 lakes (10 acres or more in size) had been either partially or completely drained. In the 19 best waterfowl producing prairie counties (west central Minnesota) some 48,000 acres of prime marshland was destroyed between 1964-68. This represents 14 percent of the total wetland acreage which existed in 1964. This loss of wetlands reduced Minnesota's annual duck production by over 100,000 ducks!

In Cerro Gordo Township (Lac Qui Parle County), 1,668 acres of wetlands were lost in 1954; 627 acres were drained during 1962-67; and 390 acres were eliminated in 1972. The permanent annual loss of ducks in this one township is estimated at over 6,000.

A single Judicial Drainage Ditch in Yellow Medicine and Lac Qui Parle counties (constructed between 1967 and 1969) consisted of 149.1 miles of open ditch and 135 miles of tile. It drained 350 wetlands (4,730 acres). Estimated annual wildlife losses were 12,000 ducks, 9,000 muskrats, 8,000 pheasants and 300 mink.

Other wetland values include their roles as natural firebreaks and reducers of spring snow melt, run off and flooding.

Commercial Shooting and Trapping

Dating back to the commerical trapping days of the 1700s, and continuing into commercial waterfowl and buffalo shooting of the 1800s, man significantly altered natural populations of certain native animals. Commercial fur trapping was one of the first major industries in Minnesota. It started with the colorful French voyageurs in the northeast canoe country and continues today with the trapping of beaver, fox, muskrat, mink and other fur-bearers. Unregulated trapping and shooting brought many species to near extinction, but most recovered and many have since increased under regulated hunting and trapping.

One species that never did recover was the passenger pigeon. This bird was exterminated by wholesale trapping (netting) and other methods of greedy market gunners. Carloads of these magnificent birds were shipped to east coast markets. Meanwhile, land was being cleared for crops, thus destroying the pigeon's breeding habitat and major food supply: acorns and beech nuts.

American Bison

Commercial hunters killed millions of game birds and animals between 1840 and 1910. One market hunter admitted to killing more than 139,000 game birds and animals. Buffalo, passenger pigeons, waterfowl, deer, wild turkey, prairie chicken, ruffed grouse and many other species were destroyed by the wagonload. Professional gunners also kept lumbering crews and railroad construction "gangs" supplied with meat. Finally, even the Army got involved by slaughtering the dwindling bison herds in an attempt to control roving bands of Indians.

In 1877, a total of 7,490 deer saddles and carcasses and two tons of venison hams were shipped out of Minnesota. In 1880, 100,000 deer were commercially sold in Michigan. However, by 1900 there were only 500,000 deer left in all the United States of the millions that had once existed. The coast-to-coast distribution of elk dwindled from ten million to some 50,000 animals clinging to a few pockets of wilderness in seven western states.

By 1908, there were less than 25,000 pronghorn antelope in North America. Once they may have been more numerous than the buffalo; but with the bison gone, hungry Indians and plainsmen had turned their attention to the pronghorn.

"There is not a case known to me where sport hunting has seriously reduced or endangered populations of game animals. In this country, habitat destruction and environmental degradation are the main reasons some species have become endangered, not hunting," Dr. Starker Leopold.

Our present game species were once decimated because they were needed for food. Many other species were decimated because they were feared or they competed with man. By 1900, grizzlies and timber wolves were being eliminated in their last western strongholds. The federal government was attempting to exterminate coyotes, cougars, prairie dogs, and other "varmits." In one way or another, many major species have been subjected to domestic, commercial and political pressures.

Commercial exploitation of wildlife combined with the rapid change of the prairie to fenced grazing and agriculture catalyzed the beginning of the conservation era in the early 1900s. President Teddy Roosevelt, his chief forester, Gifford Pinchot and others led the fight to set aside land for refuges (51 in 1904 alone) and promoted the idea of harvesting only surplus game populations for sport. This marked the beginning of sport hunting and the end of market shooting.

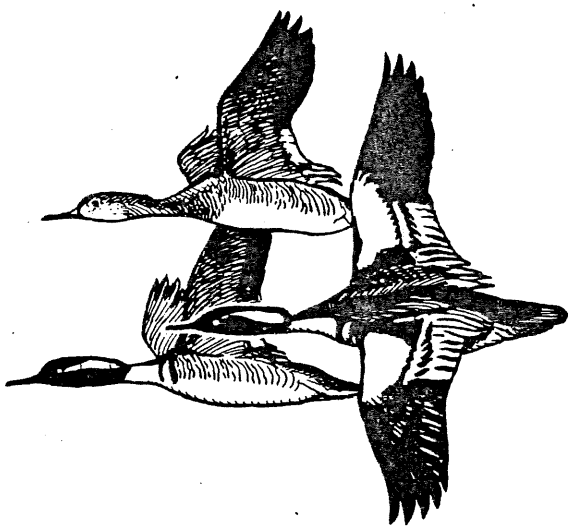
Prior to the conservation era it was very difficult to differentiate between hunting for sport, hunting for food, or hunting for saleable products such as meat or furs. During the 1800s, a good many animals were extirpated over parts of their range by overhunting and habitat loss. However, this type of hunting was for utilitarian purposes in a frontier society, not sport hunting as we know it today.

After the conservation era began early in this century, the states developed effective laws for wildlife protection. Conservation of wildlife was a new concept that required strict legislation to end market hunting. The Lacey Act of 1900, enacted to stop the transporting of illegal game across state lines, and the Migratory Bird Act of 1918, which placed all migratory birds under federal custody and regulation, were both landmarks in the new conservation movement. Illegal market hunting was on the retreat.

Over the years, enforcement became better, hunting seasons were strictly regulated and even closed some years, and more land was acquired for wildlife management area s and refuges. Numerous species such as white-tailed deer, mule deer, elk and antelope began to come back. In fact, the "conservation era" was so successful that it led to an "over-protection era."

In 1900, on the north rim of the Grand Canyon in Arizona, some 3,000 mule deer were residing on what was called the Kaibab Plateau. In 1906, Theodore Roosevelt established a one million acre sanctuary in the Kaibab. Government hunters killed 781 mountain lions, nearly 5,000 coyotes and extirpated the timber wolf, all within 25 years. During this period, deer populations rose to 100,000. The public demanded this "protectionism" and consequently, the deer over-browsed their ranges, became weak, diseased and stunted, and died by the tens of thousands. By 1930, there were only 30,000 left, and finally 15,000 a few years later.

An outgrowth of the problems of market hunting and later, the over-protection period, was the beginning of wildlife management in the late 1920s and early 1930s. Aldo Leopold, regarded as the father of wildlife management, led the move to "manage" wild lands and wild creatures, not just protect them. Here in the history of management, we have as good an answer as can be given to the ultra-protectionists and anti-hunters of today.

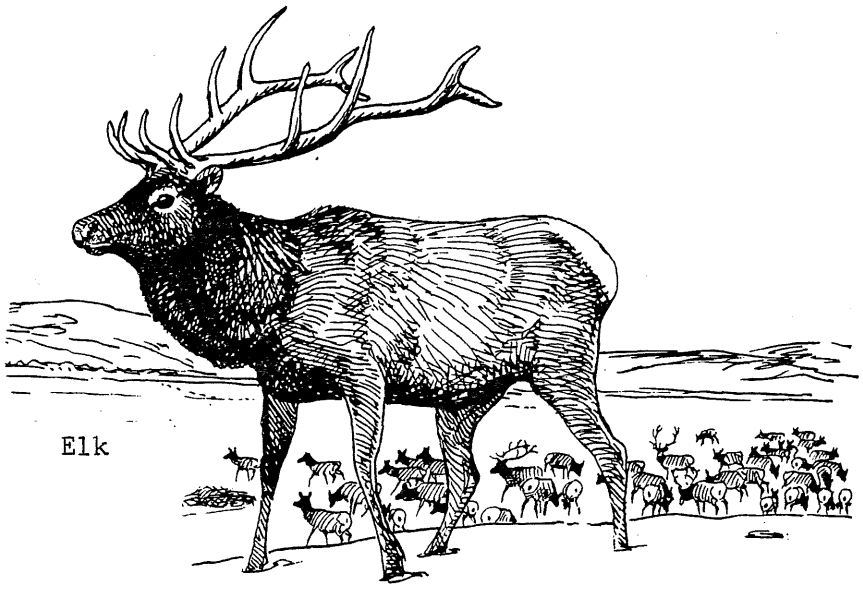


Hooded Mergansers

For wildlife management to be accepted and implemented at the state and federal levels, two requirements had to be met. The first was the development of wildlife management as a sound biological science. Through the combined efforts of the federal government, colleges and sporting arms and ammunition manufacturers, needed financial assistance was committed to collegiate research and graduate student training programs.

The second great need was the revenue to implement the new research findings. Hunting license fee money wasn't sufficient. Sportsmen and conservationists responded by supporting the Pittman-Robertson Federal Aid in Wildlife Restoration Act of 1937, which allocated a 10 percent (now 11 percent) excise tax on sporting goods and ammunition to be redistributed back to cooperating state conservation departments. To participate, states must pass legislation so they cannot divert their hunting license fees from financing their department programs. Over $400 million has been collected and redistributed to states thus far...a landmark for conservation.

The effects of widespread management brought about remarkable increases in elk, antelope, mule deer, white-tailed deer, and turkey populations. The Asian transplants of hungarian partridge and ring-necked pheasants are found in many states.



Elk

Wildlife Management Success Stories (estimated populations)*

Beaver: 1900: 0 in Miss. Valley States	1970: common
Antelope: 1925: 13,000-26,000	1970: 500,000
Bison: 1895: 800	1970: 7,000
Elk: 1907: 41,000	1970: 1,000,000
White-tailed deer: 1895: 350,000	1970: 12,000,000 (in 12 states)
Wild Turkey: 1930: common in a few states	1970: restored or established in 43 states
Egrets & Herons: 1910: several species near extinction due to market hunting for feathers and plumes for hats	1970: common in most states
Woodduck: 1915: near extinction	1970: one of most common breeding waterfowl in U.S.

*Reprinted from the pamphlet, Placing American Wildlife Management in Perspective, Wildlife Management Institute.

Water and Air Pollution

Our nation's rapid technological advances and improvements in our living standards have come at the expense of many wild creatures!

Pollutants may affect reproductive success of species, or alter their habitat so it is no longer suitable for their survival.

Energy consumption in the U.S. is directly related to our gross-national product. Unfortunately, it is also related directly to environmental degredation because of the many pollutants which result from the burning of fossil fuels (coal, oil, and oil products such as diesel oil, gasoline, jet fuel, petro-chemicals, and natural gas). Carbon dioxide, carbon monoxide, hydrocarbons, nitrogen oxides, sulphur oxides and particulate matter are released into the air by burning oil, gasoline, coal, etc.

It is horrifying to think of how man has abused the waters of the earth. Waste products from industry, agriculture and sewage disposal facilities have been dumped into rivers and streams throughout the country. It is ironical that one municipality will dump raw sewage into a river upstream from another municipality which may be drawing water from the same river for drinking purposes.

Aquatic-oriented wildlife have suffered greatly from man's pollutants. Large numbers of marine mammals and birds have been killed outright by toxic wastes and oil spills.

Pesticides and other by-products of our "technocracy" have had a less noticeable though more far-reaching impact on fish and wildlife. Insecticides (such as DDT) and heavy metals (such as mercury) become concentrated in animals higher up in food chains, thus reducing the nesting success of predatory birds, fishes and mammals.

Heated water discharges affect fish and wildlife, though opinions differ as to whether these "effects" are detrimental or beneficial to wildlife.

Electric power plants in several major cities in Minnesota, including Virginia and Rochester, discharge heated water at 15 to 85 degrees warmer than normal lake water temperatures. However, residents may not perceive this as "pollution" because the warmer water attracts and holds waterfowl over winter months. Rochester's Silver Lake provides a winter resting spot for more than 20,000 Giant Canada Geese.

Water bodies receive nutrients (nitrates, phosphates and carbon) from natural sources. However, excessive phosphate and nitrate fertilizing from poor septic systems, organic wastes from municipal areas, synthetic detergents and animal feedlots, cause rampant plant growth in waters. These nutrients appear to shift the balance from green algae (part of food webs) to blue-green algae (not part of food webs).

There are some 70,000 lakeshore cabins and homes in Minnesota. Inadequate sewage systems, combined with runoff of fertilizers from lakeshore lawns, have created serious blue-green algae problems in the more heavily-developed lakes. Runoff of raw sewage from cattle feedlots into streams--and eventually into lakes--has added more unwanted chemicals to lakes. Fortunately, Minnesota's new shoreland management program is eliminating many of these problems. Unfortunately, even with all of our technological advances, we cannot return these waters to their original pristine state.

One form of "pollution" that kills millions of waterfowl each year is lead poisoning. Lead shot is ingested by ducks and geese as they probe for food in the muddy bottoms of lakes and marshes.

An estimated 6,000 tons of lead pellets are discharged over waterfowl hunting areas in the U.S. every year. One to three million ducks, geese, and swans die from lead poisoning each year. Their loss will mean fewer ducks over hunters' blinds, fewer geese to stir the soul and fewer of breeders returning north to nesting grounds in spring.

Counts of lead shot from certain Minnesota lakes have commonly ranged as high as 64,000 to 250,000 per acre. Hopefully through the concerted and cooperative efforts of government agencies and shell manufacturers, this problem can be overcome. An interesting "first step" was taken at Tamarac National Wildlife Refuge northeast of Detroit Lakes where only steel shot is allowed.

3

Wildlife Ecology

In the second chapter, we learned how the type of habitat, changes in habitats and energy transfers in food chains determine which species exist and how many individuals of each species are likely to survive. These concepts were basic to understanding population dynamics.

Now let's discuss some of the biological principles that determine "how many wild birds and mammals" may exist in any particular habitat, and how man can munipulate these wildlife populations through the science of wildlife management.

Reproductive Capacity

Most small birds and mammals have a very high reproductive capacity. For example if a pheasant, quail or ruffed grouse hen were to lay 14 eggs in one clutch, and all were to survive, mate, and continue to lay 14 eggs per clutch, there would be 65,535 birds after five years.

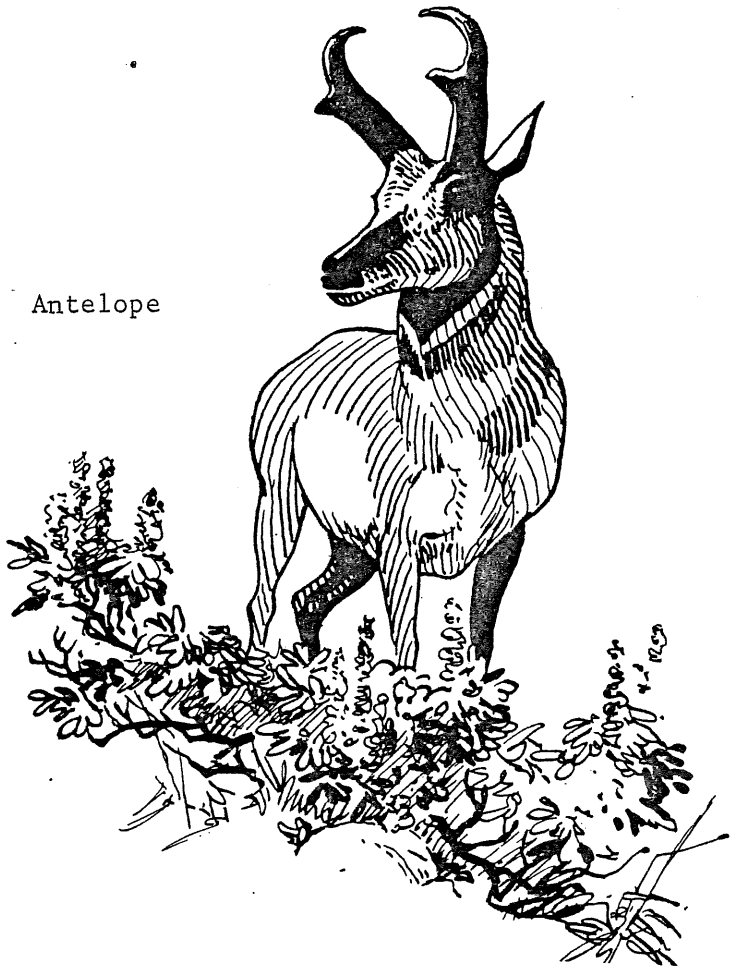
Of course, all of these birds will not survive. In fact, only three of every ten new chicks will survive the first year!

Where conditions are favorable, reproduction can be spectacular. Between 1914 and 1917, the South Dakota Department of Game, Fish and Parks trapped 7,000 wild pheasants from North Dakota and released them in South Dakota. By the 1930s, the state had an estimated 16 million pheasants!

Larger animals usually do not have as high a reproductive capacity as smaller animals. Deer, moose and bear may have only one to four offspring over a two-year period. Still, the capacity for population increase is high over a longer period of time because these animals live longer.

For example, few deer existed in Pennsylvania in 1905. However, after stocking, the herd grew to one million by 1930.

Pronghorn Antelope



Whitetailed Deer

The reproductive rate of white-tailed deer is illustrated also by the seven Minnesota deer transplanted to Finland in 1934. A total of 400 deer, out of an estimated herd of 6,500, were taken in that country's first deer hunting season in 1965.

Carrying Capacity

The maximum number of a given species that a particular area can support, during the least favorable times of the year, is its carrying capacity. Predators, disease, summer and winter food availability, cover, pollution, social intolerance, nesting conditions and weather--all play a part in determining carrying capacity.

The carrying capacity of any given area may vary from one year to the next as the various factors vary. Population levels of northern Minnesota's moose herd continued to increase during the 15 years prior to the mid-1960s when a stable population level of 8,000 animals was reached. Apparently, this total reflects the carrying capacity of the moose range.

Population Turnover

This concept refers to the annual turnover of wildlife populations. Among many small mammals and birds, only 20 to 50 percent survive one year. Predators, disease or weather take a large toll. Reproductive rate, strangely, increases for several species if annual mortality is higher than usual. Also quite remarkably, the population turnover remains the same for many species,

regardless of the causes of death. For example, if hunter-kill of a particular species increases, fewer may die from disease or severe weather.

Harvestable Surplus

Controlled hunting can remove the annual harvestable surplus of a particular wildlife population that would otherwise be removed by disease, weather or predators. Hunting regulations for migratory birds, upland small game and big game are designed to take the harvestable surplus while protecting enough breeding stock to allow each species to thrive.

It is beneficial for a wildlife population to have only enough animals entering the winter season that the existing habitat can support. Thus, the hunting season can be a highly successful management tool for maintaining both a species and its habitat.

Woodcock

Changing Habitat Changes Carrying Capacity

As discussed earlier, disappearing prairies, maturing forests, wetland drainage, intensive farming practices, etc.--all alter the amounts of food, winter and nesting cover, and water available for wildlife. Habitat can be altered so native species are eliminated while new (exotic) species flourish.

Techniques to restore habitat for native species are underway throughout Minnesota. Examples are wetland restoration, prescribed burning and logging of mature forests.

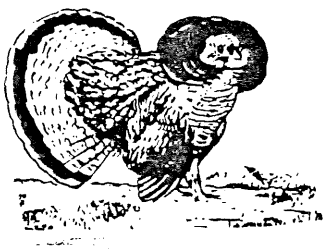
Cyclical Changes in Animal Populations

Populations of some small animals show almost predictable periodic fluctuations. In some areas, grouse cycles are obvious, varying roughly in nine to ten-year intervals (see table). In other locations, however, grouse populations are quite stable.

Northern Minnesota Ruffed Grouse Population Cycles*

1925.....low	1956.....low
1931.....high	1961.....high
1935.....low	1965.....low
1945.....low	1971.....high
1951.....high	1974.....low

*Data collected by Gordon Gullion, University of Minnesota, Wildlife Research Station, Cloquet, Minn.



Ruffed Grouse

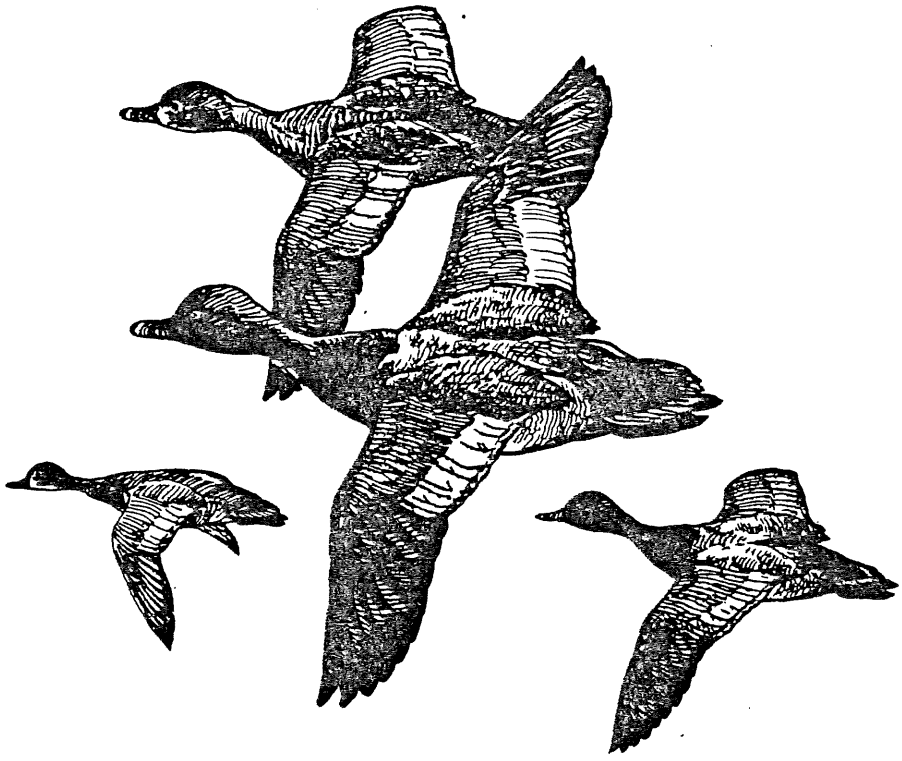
Hunter Impact - People Management

Although the number of Minnesota waterfowl hunters has not risen much since 1938, duck populations and habitat have declined so that each hunter has less area to hunt in, sees fewer ducks, and bags less per season (last column).

Year	# of small game licenses sold	# of season days	daily limit	kill (rounded)	# of duck stamps sold in Minnesota (hunter numbers)	ducks killed per stamp (estimated before 1934)
1919	76,000	107	15	1,800,000		(49.0)
1928	139,000	107	12	1,500,000		(22.0)
1930	184,000	107	12	2,200,000		(24.0)
1933	216,000	61	12.8	1,000,000		(9.8)
1935	216,000	30	10	500,000	44,000	11.3
1939	241,000	45	10	2,700,000	120,000	22.2
1942	271,000	70	10	2,200,000	111,000	19.8
1945	234,000	80	10	2,600,000	131,000	19.8
1946	322,000	45	7	2,300,000	175,000	13.1
1950	332,000	35	4	1,800,000	146,000	12.3
1955	343,000	70	4	1,300,000	132,000	9.8
1959	331,000	50	3	900,000	119,000	7.6
1962	361,000	25	2	400,000	78,000	5.1
1965	233,000	43	4	940,000	126,000	7.4
1967	272,000	40	4	1,400,000	159,000	8.8
1968	290,000	27	3	750,000	142,000	5.3
1970	280,000	45	4	1,500,000	174,000	8.6
1972	286,000	50	4	1,200,000	156,000	7.7
1973	275,000	40	4	900,000	122,000	7.4

Note: The "kill" column on the previous table indicates that duck populations as a whole (with normal, yearly ups and downs, and excluding certain species that are declining), were relatively stable between 1959-1973. Wood ducks and blue-winged teal have had some difficult years, though "woodies" have responded remarkably well to countless "artificial" nesting boxes provided by concerned conservationists throughout the U.S. and Canada. The number of breeding pairs of redheads and canvasbacks was also quite low, though these birds are also showing signs of recovery since 1955. The table reflects the fact that regulated hunting, combined with the wetlands purchased and improved with hunters dollars, have played a major part in perpetuating the waterfowl resource.

Since WW II, the number of small game licenses sold has declined by some 50,000. The number of waterfowl hunters has remained about the same, though fewer hunting areas are now available to sportsmen. As a result, more duck hunters are now crowded around Minnesota's marshlands. Each year, wildlife managers are increasingly pressed to "manage people" in order to provide quality waterfowl hunting.



Big game populations, particularly deer, have shown different trends than waterfowl numbers. White-tailed deer levels increased significantly from 1900 to the 1960s. Deer harvests exceeded 95,000 per year from 1960 to 1968. But then, deer populations began to decline as Minnesota's northern forests began to reach maturity, with less food and cover available to support large numbers of deer.

Year	No. of deer licenses sold	% Success	Deer Harvest
1919	34,000	40%	14,000
1926	45,000	47%	21,000
1930	63,000	44%	28,000
1932	53,000	69%	36,000
1936	71,000	56%	40,000
1940	69,000	66%	46,000
1942	102,000	61%	62,000
1945	115,000	43%	50,000
1951	181,000	50%	91,000
1955	164,000	48%	79,000
1960	233,000	42%	95,000
1965	290,000	44%	127,000
1967	307,000	35%	107,000
1969	256,000	27%	68,000
1970	188,000	26%	50,000
1973	294,000	23%	67,000
1974	310,000	21%	65,000

(Seasons closed in 1923, 1925, 1927, 1929, 1931, 1935, 1939, 1941, 1950, 1971)

The combined effects of increased hunter numbers, less land available for hunting, and declining or constant deer populations have all contributed to a drop in hunter success. Thus, the DNR has entered an era of "hunter management" to maintain quality hunting.

The squeeze for hunter space has either increased, or made more obvious, poor sportsmanship, trespassing, vandalizing, littering or other hunter-related problems. This, in turn, has fueled the fires of anti-hunters and ultra-protectionists.

In recent years, the Department of Natural Resources has promoted "quality" rather than "quantity" hunting. Hunting regulations have been consistent with this purpose.

To promote quality deer hunting while protecting the herd, hunters are given choices as to hunting dates (rather than all hunting on opening weekends as in the past). Spreading hunting pressure throughout the fall season has the added advantages of reducing the number of firearms mishaps and virtually eliminating some traffic problems, both on the highways and in the woods.

Following are some other innovations which are aimed at managing people in order to maintain wildlife populations:

1) opening of hunting seasons during the middle of the week;
2) the "zone system" with 2, 3, 4, 5, or 17-day choice of deer seasons in various zones, some of which are "bucks-only";
3) drawings for special moose hunting seasons in controlled zones;
4) the Thief Lake Wildlife Management Area Controlled Goose Hunt (drawings per chosen day, six shells per outing, and assigned blinds);
5) bucks-only deer hunting (both to build up the herd and promote quality, trophy hunting);
6) anterless deer quotas in bucks-only zones; and
7) 4:00 p.m. daily waterfowl closings.

Although most Minnesotans would agree that these new "hunter management" measures have been successful, will they be enough to meet the problems of the future--increased hunter numbers, fewer hunting lands, decreasing or constant game populations and growing anti-hunting attitudes? It seems that one positive answer to this disquieting question is hunter education--in fact, it may be the only answer in our country where the human population and its technological advances continue to increase.

Characteristics of Wildlife*

To understand the management problems and potentials of wildlife as a major recreational resource, it is essential that we take a sharp look at the "nature of the beast" with which we are concerned: What is wildlife? What makes it tick? What are the elements involved in its survival and welfare?

Many of the answers to these questions--a good working understanding of the basic characteristics of wildlife--are not as difficult to come by as one might at first suppose, because as hunters, we have spent many hours afield observing nature and already we may have some firsthand insight as to the habits and habitat of various wild creatures.

The animals which are included within our term "wildlife" are all of the vertebrates--those that possess a backbone similar to man's. Large and small, living on land and in water--the fishes, amphibians, reptiles, birds and mammals comprise the world of wildlife.

In many instances, wildlife and man share common characteristics. Cells of our bodies, growth processes, and even the method of genetic inheritance are similar to those found in many other animals. By studying the development of wildlife populations, we are learning a great deal about the basic forces controlling human population growth. Humans, in large concentrations suffer from epidemic diseases, starvation, and from problems created by waste disposal--just as wildlife does.

Wildness is not only important for survival in the natural world, but is a prime attribute determining sportiness in game fish, birds, and mammals.

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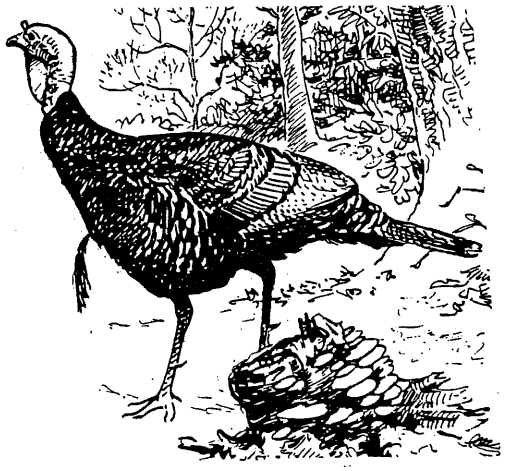
*The following pages are reprinted and/or adapted from: Course 200, Wildlife Resources and the Natural Environment, a correspondence course in agriculture at Pennsylvania State University. Course author is Dr. Oliver H. Hewitt, Professor of Wildlife Management, New York State College of Agriculture, Cornell University.



Wild Turkey

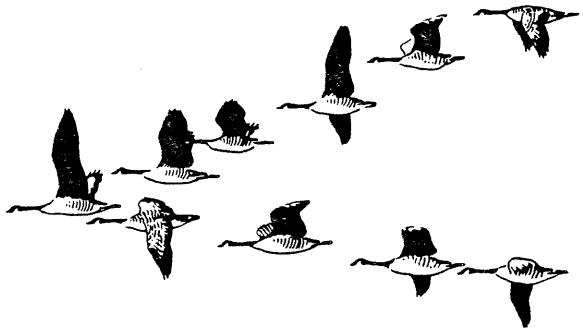
Wildness is an inherited condition by which animals are adapted to live successfully in a natural environment. The wild turkey is the epitomy of wildness. The inherited qualities that accompany wildness in the turkey include greater wariness, later nesting habit, a hiding reaction instead of a scattering reaction in disturbed broods, and larger brains, thyroid and adrenal glands than found in its domestic cousins.

Because of this wilderness factor, wildlife managers see little value in artificially rearing birds and mammals for stocking in areas where established wildlife opoulations already exist. (The lack of wildness in pen-raised pheasants is one factor that has made stocking of ring-necks in Minneso ta and other states largely unsuccessful.)

Most birds and mammals possess a regulatory mechanism that maintains a constant body heat, so that reproduction and growth may take place under adverse environmental conditions. However, this remarkable potential depends on adequate food and shelter.

Wildlife lives in an environment which it cannot change to suit its needs; its very existance depends on how well it adapts to its environment. Adaptations which have evolved include very sensitive receptor or sense organs. The amazing ability of birds to navigate during migration is an example of this acute sensitivity.

Canada Geese



Man has always admired the faculties in wildlife that are more acute than his own. To have the eyes of a hawk, the nose of a fox, the ears of a hare, and the speed of a deer--are familiar comparisons. Eyesight is usually comparatively good in the animal world, but the eyes of some birds are constructed to permit exceptionally sharp vision and even telescopic magnification. Owls and bats possess extremely sensitive hearing, enabling them to locate accurately the slightest sounds in total darkness. The bat is proficient in echo-location--it emits sounds of high frequency, and uses the reflection of these sounds to locate objects in its path. Radar and sonar devices operate on this principle.

Of critical importance are those characteristics of any wildlife species or wildlife population which assure its continued existance. Capacity to reproduce, longevity, population behavior, and social relationships are basic qualities of each species. Environmentally, each species must find adequate food, shelter, and living space to successfully occupy its place in the complicated scheme of nature.

A characteristic of special interest is the ability in many wildlife species to avoid over-population by various self-limiting factors. One type of mechanism is behavioral--for example, the intolerance of some individuals for others of their own kind during the breeding season. A behavior that can be observed in many birds and carnivorous mammals is when a breeding pair, or in some cases a male, establishes a territory which is strongly defended against other males of its species. This results in the effective spacing of the breeding population. Only those individuals strong enough to defend a territory are able to reproduce, so over-population and over-crowding are prevented and the fittest survive.

Woodchuck

The system has another advantage to the species: if a breeder is lost from the population by accident, predation, or other cause, its place is filled immediately by another individual so that reproduction of the species in that area is assured. This principle sometimes can be used in game management. Where the wild turkey is well established, some gobblers can be harvested in a spring season without reducing the reproductive capacity of the population. This is possible because one tom will normally breed several hens.

Another means of self-limitation is based on the physiological and psychological effects of stress. Stress increases in effectiveness as population density increases. To put it simply, when over-crowding occurs in some species--in muskrats, for example--chemical changes take place which result in fewer offspring.

Let us not forget that, as animals, our existance is governed by basic natural laws which we cannot change. As animals, we share many of the basic characteristics of wildlife.

Natural Communities Are Dynamic*

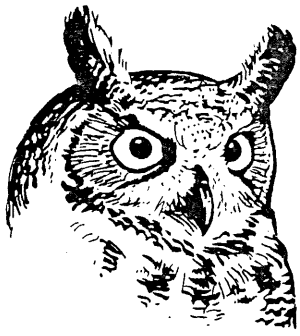
Communities of wildlife are sometimes regarded as a jumble of unrelated organisms. This is not true. There exists in these communities a high level of organization. Just because they vary with time, place, and man's influence does not mean that order is not present. However, complete balance can exist only temporarily.

Wildlife communities are always changing. But while the so-called balance of nature is a myth, under fairly uniform conditions a dynamic equilibrium may exist. Wildlife populations in a community are like a flotilla of boats, each trying to maintain a straight course through waters that have variable tides, currents, eddies, and surface winds. They can remain only as long as their positions in relation to each other are constantly changing.

Relations Between Species

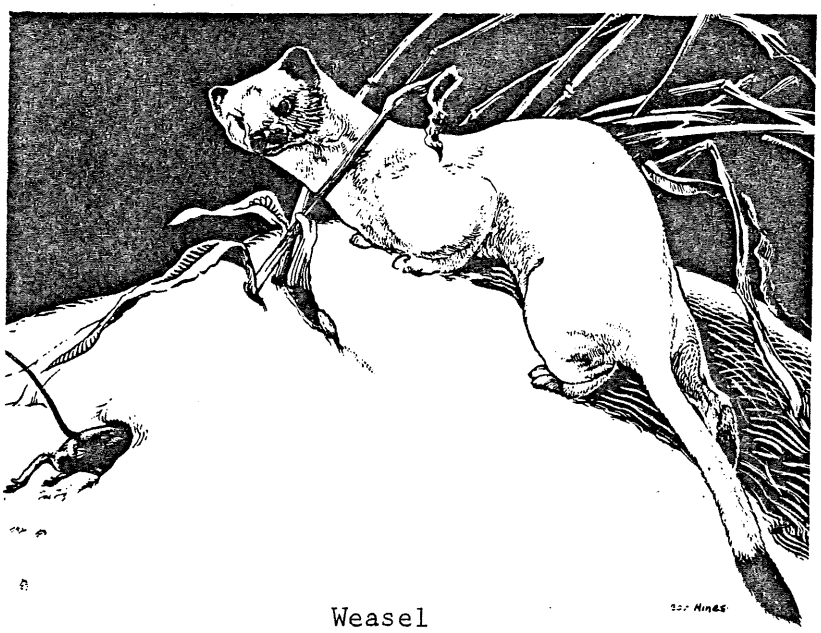
Many species of wildlife depend upon one another for their existance. Carnivores are dependent upon herbivores for food. When one animal preys upon another, it is called predation.

The subject of predation evokes considerably discussion and controversy. However, its value and importance to a wildlife community



Great Horned Owl

*Written for Pennsylvania State University, Course 200, by Maurice M. Alexander, chairman, Department of Forest Zoology, State University, College of Forestry, Syracuse University.



Weasel

should not be debated. Its control value is important. (As discussed earlier, the "control" is also opposite to what many people think: predator populations both control and are controlled in the food chain by the numbers of "preyed upon" species.)

Another relationship is competition. This is an important factor because it too exerts control on populations. It exists between species, and it occurs between individuals of a single species.

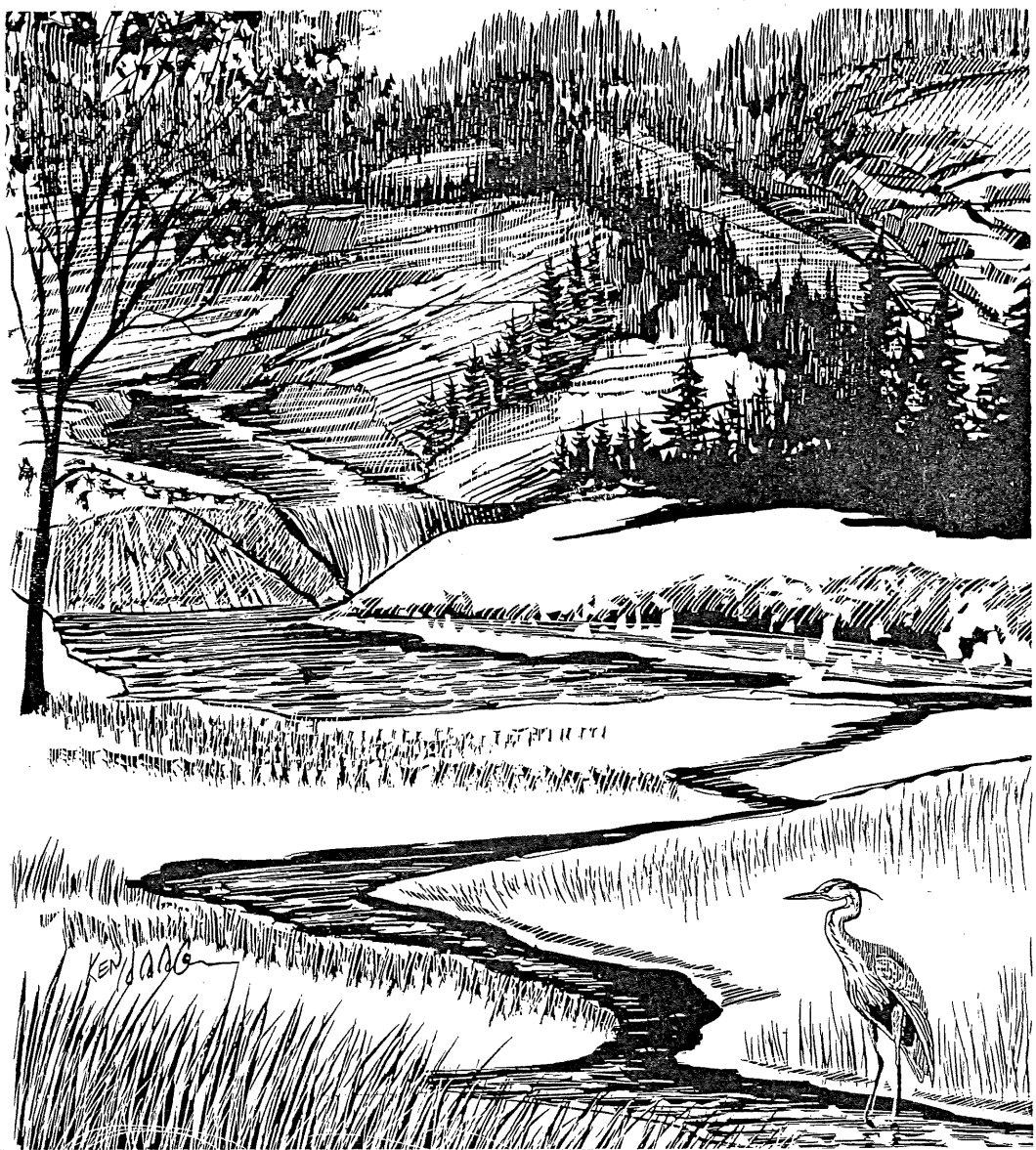
Competition may be for several things: food, cover, breeding sites, mates, or any other essentials. When two species compete, one species may be successful while the other is reduced in number, or both species may be reduced proportionately.

Man, in his efforts to change the relationship of predation, may upset the balance of competition. A deliberate reduction of fox, though intended to benefit rabbits, may be a bigger benefit to mice, which in

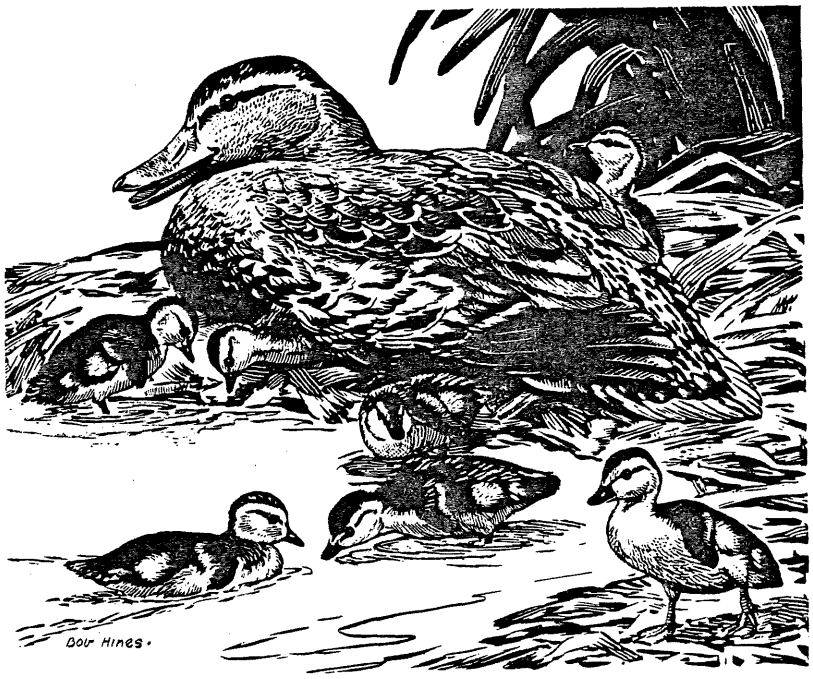
turn would become more numerous and collectively eat enough plants to cause a food shortage for rabbits.

Competition between individuals often reduces breeding performance, juvenile survival, and general vigor. Whether considered between individuals or species, competition helps to limit populations and gives a degree of community stability. Therefore competition, like predation, has definite positive value.

It is very difficult to visualize all the interactions of a biotic community. The many relationships, along with the cycling of materials, makes the components of wildlife communities very closely bound together. We cannot consider one species without giving thought to all others that live with it.



Mallard Family



Wildlife Dynamics*

Every hunter knows that game populations change--they are up, down, and in between. While wildlife managers work to improve the habitat so that game animals exist in huntable numbers, part of their job is keeping track of the population changes. The objective is to make hunting regulations as liberal as possible without jeopardizing the breeding stock.

To estimate game populations with some degree of accuracy requires an array of facts which we refer to as population statistics. Actually the information we must gather is basically the same as that tabulated for human populations by the public agencies responsible for vital statistics. To manage game efficiently we must know the birth rate, the life span, and the survival and death rates of various wildlife species. The process of population change is called population dynamics.

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*Written for Pennsylvania State University, Course 200, by William G. Sheldon, leader, Massachusetts Cooperative Wildlife Unit, University Massachusetts, Amherst, Massachusetts.

Average Survival:
Common Game Species and
Percent of Young That Live to Breeding Age

Species	Percent
Ringnecked Pheasant	15% (1 out of 7)
Bobwhite Quail	13% (1 out of 8)
Mallard Duck	32 to 45% (1 out of 3)
Ruffed Grouse	13 to 24% (1 out of 5)
Woodcock	20% (1 out of 5)
Cottontail Rabbit	8% (1 out of 12)
Gray Squirrel	35% (1 out of 3)
White-tailed Deer	70% (3 out of 4)

How Many Will There Be In The Fall?

The number of animals surviving the summer and available as game in the fall will vary from region to region, and from one year to the next. In good habitat and under favorable breeding conditions, average

Rough-legged Hawk

population renewal of common game species is depicted in the following table:

Variations in Common Game
Populations From Early Spring to Fall

Species	Adults in Spring	Totals in Fall
Ringnecked Pheasant	100	200 to 300
Bobwhite Quail	100	250 to 350
Mallard Duck	100	130
Ruffed Grouse	100	300 to 400
Woodcock	100	190
Cottontail Rabbit	100	500 to 600
Gray Squirrel	100	250
White-tailed Deer	100	140

Let's summarize by examining in the table below the annual death rates of young and of adults, resulting from diseases, predators, hunting and accidents.

Annual Mortality For
Common Game Species and Survival For Juveniles and Adults

Species	Young (Juvenile)	Adults
Ringnecked Pheasant	85%	40 to 65%
Bobwhite Quail	87%	77 to 82%
Mallard Duck	55 to 68%	35 to 55%
Ruffed Grouse	76 to 87%	50 to 58%
Woodcock	80%	41%
Cottontail Rabbit	92%	85%
Gray Squirrel	25%	?
White-tailed Deer	25%	13%

How Do We Know?

The figures presented on the previous page are estimates made by wildlife scientists after years of research. How do we count or predict wildlife populations when one may catch only fleeting glimpses of these creatures in the field? Some special techniques have been developed to assess the status of wild populations.

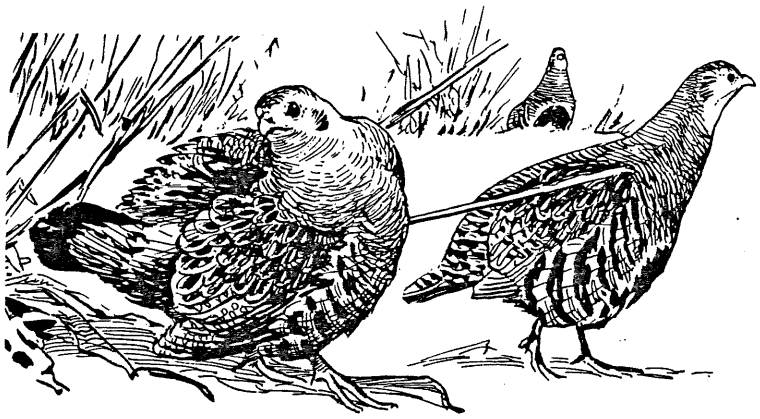
A few animals can be counted directly. Antelope, mountain sheep, and mountain goats of the west can be counted because they inhabit open country.

Most counts are on a sample basis. Methods have been developed to census waterfowl (from airplanes) by brood counts on sample breeding grounds and by annual counts of winter waterfowl concentrations. (Moose can also be counted in winter from the air.)

Many small game mammals are counted by repeated live-trapping and releasing of marked individuals. Populations can be calculated by the number of marked animals recaptured in successive trapping periods.

Deer density may be estimated by counting groups of droppings. Population trends of many game birds such as pheasants, ruffed grouse, woodcock, mourning doves, and bobwhite quail are determeined by tabulating the number sighted or the number heard singing, crowing, or drumming along representative routes in good habitat, and comparing data from year to year.

It is necessary to get such information as the ratio of females to males (sex ratio) and the number of young. Production of young and sex ratios can be measured by examining feather pattern of game bird wings--ducks, woodcock, bobwhite quail, mourning doves, ruffed grouse, etc.--collected in the fall by hunters.



Hungarian Partridge

Resident Wildlife Populations Cannot Be Stockpiled

The population of animals in any area is directly proportional to the suitability of the habitat, which is the concept of carrying capacity discussed earlier. High winter survival of any small game species will usually result in a high population density the following summer and fall. However, we know that extreme density creates stress, competition for food, cover and territory, plus friction within the members of a species--all resulting in low production and rapidly dwindling numbers.

Populations below the carrying capacity in the spring, provided the animals are in good breeding condition, can live and breed in the absence of stress; the result is much higher production and rapid natural restocking of the habitat. Nature has built into most species this power of compensation. We refer to it sometimes as the law of inversity--the denser the population the lower the production and the lower the population the higher the production.

Failure to take the surplus of rabbits in a given woodlot may result in over-use of winter foods, starvation or disease. Failure to take the surplus of large species such as deer, elk, or moose can also have serious long-range consequences. Surplus big game animals may die of disease or starvation while surviving animals are under-nourished. These surplus animals may destroy their winter range by over-browsing vegetation and gradually reduce woody plant reproduction. Years may be required before the range can recover sufficiently to once again support a large big game population.

Migratory Birds Can Be Stockpiled

Unlike resident game birds and mammals whose populations seem to be more dependent on natural factors rather than hunting, migratory waterfowl populations are affected by hunting pressure. Banding studies indicate that 20 to 60 percent of migratory waterfowl are shot each year. Unlike resident birds that can disperse in local areas and become highly "educated" from opening day hunting pressure, migratory birds are gregarious and may face continual "opening day pressure" for four to five months from Canada to Mexico.

Thus, it's important that the harvests be no greater each season than the annual reproductive capacity of each major population. If the management objective is to increase the population, the annual kill has to be less. The key point here is that migratory bird populations can be substantially reduced by overshooting, unlike many resident game animals! Consequently, stringent regulations and their enforcement is vital to perpetuation of waterfowl species.

Conclusion

Nothing has more impact on wildlife than destruction of habitat. Wildlings will decline where their habitat is disrupted, polluted or otherwise destroyed.

On the other hand, animal populations can respond rapidly to certain wildlife enhance projects, provided there is sufficient habitat for the burgeoning population. Thus, the challenge of the future is to maintain, preserve and restore natural environments where wild species can thrive.

Badger

4

Why Hunt?

In the beginning, man hunted to survive. Wild creatures provided him with food, and from their furs and bones he was able to fashion clothing and crude tools that would enhance his chances of survival.

Man of the 20th Century, however, does not have to hunt to survive. Nor is he constrained to be a professional football or hockey fan, to attend theatrical performances, to enjoy the fun of snowmobiling or ski-touring, nor to take his family fishing or boating. He pursues these activities not because he has to...but because he wants to!

It is with this attitude that we will analyze hunting, not as an activity that we must do, but as something that many enjoy doing. We will also examine the many advantages to all of us and to other living creatures through the preservation and restoration of natural habitat as a direct result of sport hunting.

This chapter will examine the following reasons why people want to hunt--and why hunting as a sport should be continued. We will look at:

Ancient Hunters, who hunted in order to survive,

Modern Hunters, who enjoy sport hunting as...

* a social activity with friends or family who enjoy hunting;
* a diversion from life's problems, and as a way of rekindling memories of past days afield; and
* a rewarding, outdoor recreation activity;

Hunting as one of several methods for managing and restoring wildlife populations;

Hunting as the best means for providing nearly all the revenues for purchasing lands for wildlife, restoring habitat, and financing state and federal agencies engaged in wildlife and habitat management.

◆ Ancient Hunters ◆

One of the major forces in prehistory, in the process that led to human beings, was the rise in hunting. There were changes as hunting became more and more prevalent, until it resulted in the reshaping of human-like creatures, both biologically and socially, and to such an extent that important aspects of our behavior today reflect the continuing influence of events that took place during the distant prehistoric past.

Noted Spanish philosopher Jose' Ortega Gasset, in his book Meditations On Hunting, wrote:

"Hunting was then, the first occupation, man's first work and craft. And as the center and root of existence it ruled, orientated, and organized human life completely... its acts and its ideas, its technology and sociality."

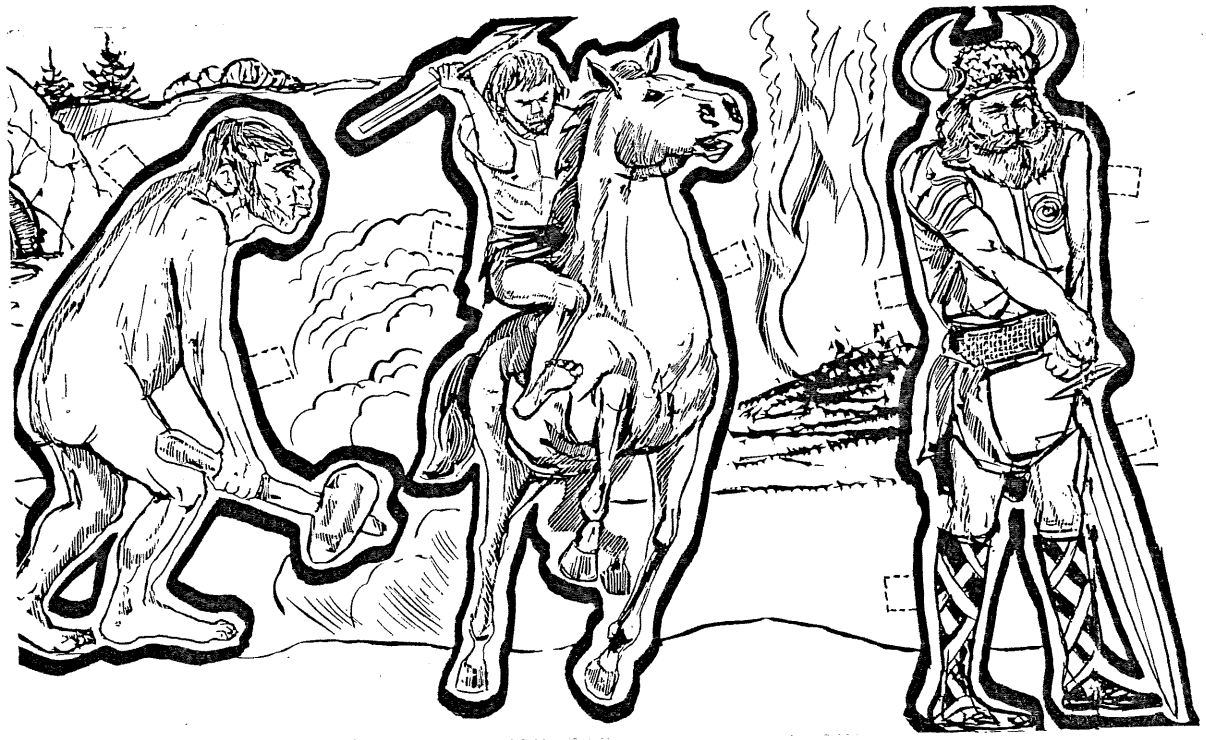
Hunting may have led to greater brain development in the evolution of man, because the most clever hunters caught their prey and thus lived to propagate their own species. It also led to socialization, primarily because hunting parties enjoyed greater success when killing large animals. Although smaller animals could probably be caught more easily by an individual, the larger animals provided greater quantities of meat plus the advantage of "large" hides that could be used for both clothing and shelter (Indian tepees, for example).

There is no evidence that ancient nor primitive hunting cultures "hunted for sport," probably because the "hunting for life's necessities" took up most of their time.

Ancient man did, however, hunt for another reason than necessity. Man revered birds and mammals for their superior ability to run, jump, fly, see, smell or hear. Early man believed that he could "capture" exceptional animal traits by reducing the animal to his possession. A remnant of that belief exists today in trophy hunting where many hunters seek to demonstrate their hunting prowess by outwitting the largest and wiliest "old buck" in a one to one chase. From ancient days to modern times, there has always been honor in social hunting systems for the bravest and most accomplished of hunters.

By studying ancient cave paintings as well as today's Eskimo hunting cultures, anthropologists have stated that early man felt so close to his food supply, that he made no clear distinction between the animals and himself.

Organized hunting 100,000 years ago may have also led to man's first use of tools, and the development of the brain concerned with language and long-range planning. But in the process, man clearly



respected and even worshipped the animals he pursued, sometimes to the extent that animals were thought to have souls that could be offended by the lack of respect.

With regard to hunting methods, ancient men were not limited by any lack of ingenuity. Converging fences and barricades, pitfalls, starting fires to drive game and driving animals over cliffs were among many techniques used by early hunters. Their weapons were just as varied; they included spears, nets, dogs, clubs, smoke suffociation, rocks, blow guns and the bow and arrow.

Historically, sport hunting has only been associated with leisured and ruling classes of people as traditional and formalized activities bound by rules, procedures, and even rituals. Occasionally, European ruling classes who claimed ownership of the game, would allow lower class people to enter game preserves in order to secure meat (these lower classes also poached at other times). Only in America has a hunting heritage evolved where game is considered the property of everyone.

◆Modern Man and Sport Hunting◆

What are the basic impulses that cause modern man to hunt? Some anthropologists believe there is an instinctive urge within us that may go back millions of years into the evolution of man. Whatever it is that evokes the hunting urge on frosty October mornings, few avid waterfowl hunters can ignore it.

Ortega Gasset described hunting throughout history as one of man's four principle modes (along with dancing, racing and making conversation) for seeking happiness. Dr. C. H. Clarke, a renowned wildlife expert and intellectual says, "The satisfaction is partly esthetic, but it goes much deeper in that it is rooted in the maintenance by man of an old, and harmonious relationship with nature, for wildlife is truly his prey as it is that of any other predator."

According to Gasset, "There is one general vocation common to all men. All men in fact, feel called upon to be happy." Most people have jobs which they perceive as laborious, and thus, most do not necessarily derive their greatest happiness from their livelihood. Men throughout history have turned to hunting for happiness. Particularly in rural areas, many men submerge their daily problems by heading for the duck slough or woods with their shotgun and hunting dog.

But Ortega argues that pleasure and happiness are not the same. Pleasure is passive, while happiness requires activity. The hunter achieves happiness not by relaxation or entertainment, but by a combination of pleasurable experiences and rigorous, dedicated effort.

"The truth is that the important and appealing aspect of hunting is neither pleasure nor annoyance. Happy occupations, it is clear, are not merely pleasures; they are efforts," Gasset claims.

The colorful fall leaves, deep blue skies, intriguing sunsets and sunrises, pleasant forest smells, low-hanging fog in an early morning marsh, or an effective retrieving dog--all provide many pleasures. Effort and annoyance come from long hours of dog training; trudging through mud to the duck blind; bone-chilling November mornings on a deer stand; hiking through tall grass or climbing a mountain. Even dressing game and dragging deer are not very pleasant. All these things mean work or effort, and often even pain. Perhaps pain heightens the emotions along with the pleasure and the end result is a memorable, happy experience.

A finely-disciplined athlete derives happiness from long hours of training and then success in a competitive situation. Hunters may also have this competitive drive--to compete and win in a contest between man and animal.

All of these reasons for hunting--happiness, social prestige and competition--are part of hunting, though an individual may not be motivated to hunt by any one factor as opposed to another. However, a common bond among nearly all hunters is the enjoyment derived from hunting with family and friends.

Hunting As A Social Activity

Hunting thousands of years ago may have actually caused man to develop social interactions and interdependency. However, today we do not hunt alone or in groups out of necessity. So most social interactions no longer center around hunting. Yet for the many that do hunt, the companionship with hunting partners is of great importance.

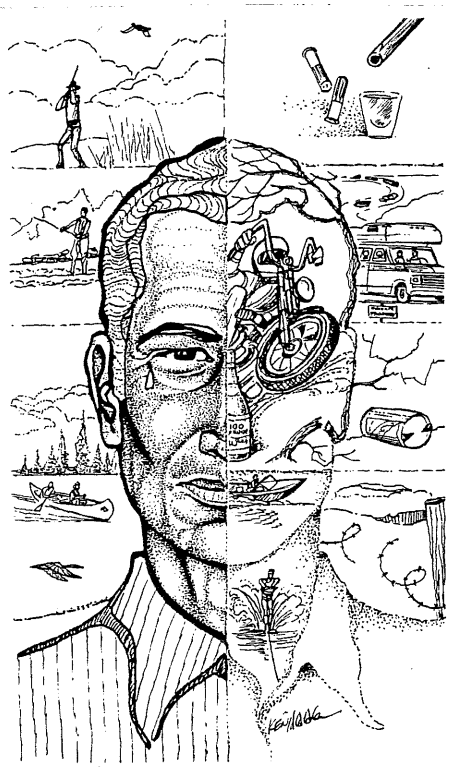
Avid hunters know that you can learn more about a man in one day of hunting, than you can over years of acquaintance. As a result, some friendships are strengthened and others are broken.

If you don't have the same appreciations and ethics as your hunting companion, hunting can be pretty miserable and even dangerous for at least one of you. So choose your hunting buddies with great care!

A diversion from life's problems and as a way of reminiscing with joys of past days afield.

Once again, let us return to the words of wisdom of the great philosopher Gasset, who wrote: "When you are fed up with the troublesome present, with being very 20th century, you take your gun, whistle for your dog, go out to the mountain, and without further ado, give yourself the pleasure during a few hours or a few days of being 'Paleolithic.'

Hunting peoples whose lives have not yet been subjected to the pressures of technological advances are, in many cases, less subject to continuous anxiety. And so, can hunting serve as an outlet for our pent-up anxieties?



As a hunter grows older, the number of cherished hunting memories, from fields and marshes, from old friends and from old dogs, increases. And during the off-hunting season, these memories and hopes for future hunting seasons are "hobbified" by reloading ammunition, by painting old duck decoys, and by curling up by the fireplace on a cold, winter evening with a book on "How to Hunt Grouse."

The memories of yourself as a boy with your Dad pulling you out of the sack at 5:00 A.M. on a chilly October morning to head for the duck slough before dawn...of new fallen snow and crisp, clear skies on the opening morning of the 1966 deer season,...your dog's first retrieve,... your first Canadian honker,....your first double on ruffed grouse,.... or that albino (red) fox that startled you on a deer stalk...all bind you to the past, and tie you to future expectations.

Though you know the past will never return, you feel closer to its memories by attempting to recapture it by identical experiences in similar places. Even the misfortunes of missing the "biggest buck you've ever seen," falling in a drainage ditch, or tipping your canoe over in a duck pond somehow become fond and humerous memories that bring you back year after year.

No true hunter questions the psychological uplift that he derives by diverting his attention for a few hours from pressing problems to past memories, concentrated hunting alertness, and anticipation of the exciting and rewarding events that a new hunt may bring.

Wrote Aldo Leopold: "To my dog and myself, that at daybreak I am the sole owner of all the acres I can walk over. It is not only boundaries that disappear, but also the thought of being bounded."

A Rewarding Outdoor Recreation Activity

Perhaps a major reason for hunting today, is that it is an excellent way of obtaining physical exercise in the out-of-doors.

From the Bureau of Census study for 1970 in the U.S.*

1) 18% of all households had at least one hunter.

2) 869,000 women hunted (1 in every 94).

3) 13,467,000 men hunted (1 in every 5).

4) 300 million recreation days are spent hunting each year.

(In Minnesota, over 29,000 people hunt deer with a bow, 275,000 hunt small game, and 300,000 hunt deer with firearms.)

*National Survey of Fishing and Hunting, 1970, Bureau of Sport Fisheries and Wildlife, U. S. Government Office.

Hunting As A Management Tool

Wildlife is a resource which usually cannot be stockpiled. Thus, if hunters are not allowed to cleanly harvest any annual overabundance of game, nature often takes over in a curel and harsh way.

When a deer herd goes into winter with numbers greater than the carrying capacity of its range, starvation will usually reduce the surplus. The poorly-nourished animals will also be more susceptible to predators and disease. As a result, fewer fawns will be born the following spring. If these natural forces do not complete the task of herd reduction, the eventual result will be animals of less-than-normal size and vigor.

On the other hand, research shows that a healthy deer herd, in balance with its range, can be reduced each year through hunting by as much as 40 percent with no ill effect on future population. Yet, in some states, hunters rarely harvest more than 15 percent.

An even higher percentage of game bird population can be harvested without hurting overall reproduction. Quail have an annual mortality rate of 75 to 80 percent whether they are hunted or not. Doves and pheasant are likewise limited far more by factors of feed, cover and weather than by hunting pressure.

So hunting is a useful part of today's wise game management practices, and by teaming habitat improvement with carefully regulated shooting seasons and bag limits, our wildlife managers make sure that hunters harvest only the surplus of game populations.

Revenue to finance acquisition of wild lands, habitat projects and research

The substantial, annual revenues from various hunting licenses, excise taxes, waterfowl stamps, wetland surcharges, and donations, are by far the largest revenue source for federal and state wildlife agencies. These monies are also used to purchase and maintain large public refuge and hunting areas,

which in turn provide wildlife habitat and generally preserve wild, natural areas.

Here, briefly are the major funding programs and their remarkable success stories:

1) In 1970, about 2,400,000 waterfowl stamps were sold in the U.S. including nearly 174,000 in Minnesota. Under the Migratory Bird Hunting Stamp Act of 1934 and before 1960, the money was allocated for land acquisition (within the U.S.), development and maintainance of waterfowl refuges, and enforcement of regulations. After 1960, the Act was amended to specify all duck stamps revenues (except Post Office expenses) for land acquisition for migratory birds.

These refuges are vital to waterfowl; more than 160 species of birds, a number of mammals, and fish are directly dependent on these wetlands.

Since 1934, over two million acres of land have been purchased with duck stamp revenues. Average annual receipts from the sale of duck stamps now totals about $11 million.

In 1961, Congress enacted the Wetlands Loan Act with $105 million in interest free loans being allocated. This money, used in combination with waterfowl stamp monies, have enabled the Fish and Wildlife Service to purchase 1.75 million acres of wetlands in the prairie pothole region of the north central states.

Under the Duck Stamp Act, any person who hunts ducks, geese or brant and is 16 years of age must carry a current migratory bird hunting stamp, signed in ink, along with his state hunting license.

Federal duck stamp

As of 1971, 60 million stamps had been sold. The first price was $1, but it was changed to $2 in 1949, $3 in 1958, and $5 in 1972.

2) The Pittman-Robertson Wildlife Restoration Act of 1937 provides for an 11 percent excise tax on sporting goods and ammunition. This is redistributed to participating states based upon the size of the state and number of hunting licenses sold. The monies go for wildlife projects; $700 million has been collected from excise taxes through 1974, or about $60 million per year in recent years.

3) Hunting license sales in Minnesota (in 1973) generated the following totals: resident small game: 275,295 at $6 a license (which includes a $2 wetlands surcharge); resident big game: 29,169 (archery) and 294,349 (firearm) both at $7.50 per license. In excess of $4 million is received annually from licenses. Between 1951 and 1975, more than $11 million from license surcharges had been used to purchase and develop wetland areas under the "Save Minnesota's Wetlands" Program.

4) Private organizations such as Ducks Unlimited (over $34 million has been collected for Canadian waterfowl projects), the Minnesota Waterfowl Association, the Minnesota Archery Association, the Nature Conservancy, and many Minnesota sportsmans clubs, and private individuals have contributed enormous sums for wildlife and habitat. No sporting activity, other than fishing, contributes as much money for habitat restoration and preservation. In addition, the many public areas purchased by hunter monies become general public-use sites for other outdoor recreation activities. Bird watchers, swimmers, canoeists, boaters, skiers, etc. take advantage of these public hunting areas.

Unless the general public decides to foot some of the bill for wildlife out of common revenue funds, monies from hunting and hunters will continue to provide nearly all the dollars for wildlife management and land acquisition programs.

5

A Hunting Ethic

Let us now try to develop a "hunting ethic" based upon the many things learned in previous chapters. This ethic should be based upon:

- Sound ecological and wildlife management principles (which promote regulated hunting);
- Humane shooting of birds and mammals, originating from a respect for these creatures;
- Conservation of natural resources including "wildlife" resources;
- A land ethic fostered by respect for the fragile interrelationship that exists between wild creatures, the soil, air and waters;
- Respect for oneself, fellow hunters and the legal rights of others (including their rights to public land and wildlife as well as to private lands).

The evolution of wildlife management in various parts of the world has followed a remarkably similar pattern, which is:

1. Regulations restricting hunting
2. Predator Control
3. Preserves (parks, forests, refuges, etc.)
4. Stocking and Game Farming
5. Environmental Control (habitat management, control of disease and other factors).

Wildlife management in Minnesota has evolved over these same five steps, but with a slight variation in the order in which they occurred.

In Minnesota, predator control began in 1849 when a bounty on timber wolves was established. The Bounty System survived until 1965, and during its 116-year existance, proved to be both ineffective and expensive.

Of course, there are more effective forms of large-scale predator control, but they are even more expensive than the bounty system and rely heavily upon the use of non-selective poisons (unacceptable because the poisons kill many non-target animals).

Minnesota's first hunting regulations, enacted in 1858, gave spring and summer protection to elk, deer, sharp-tailed grouse, prairie chicken, ruffed grouse and bobwhite quail. Regulations are established for many reasons. It is important to recognize the various biological reasons that necessitate different regulations for different species (i.e. for some species, hunting is a form of population control--for others, it has little effect).

The creation of preserves in Minnesota began with Camp Release State Park in 1889. Subsequently, many parks and refuges were established to protect a wide variety of wildlife species. However, recent research

studies have since shown that refuges are of little value to most species they were originally supposed to protect, including pheasants, grouse, squirrels, rabbits, etc. Conversely, waterfowl refuges have been essential to maintaining populations of ducks and geese.

First stocking attempt in Minnesota was probably in 1905 when 70 pairs of pheasants from Wisconsin and Illinois were released. The Game Protective League established a game farm in 1915, and in 1917 the Legislature made its first appropriation for game propogation.

Stocking of adult transplants was responsible for establishing pheasant and Hungarian partridge populations in Minnesota. However, restocking to bolster established populations of these game birds has proven to be both expensive and unsuccessful. South Dakota has never had a game farm or release program.

With the advent of wildlife research, the importance of the previous four practices was more clearly defined and put into perspective. Early in the 1930's wildlife experts such as Aldo Leopold recognized the shortcomings and limited application of such practices as stocking, predator control and refuges. Instead, he and other wildlife experts of that era prescribed environmental controls and habitat management as the key to wildlife abundance. Unfortunately, there are many people today who choose to ignore 45 years of wildlife research and management experience and continue to promote "substitutes" for habitat as easy answers for dwindling wildlife populations. Stocking, predator control and refuges are no substitute for habitat.

The Minnesota DNR presently has several wildlife habitat development programs. They include:

1. "Save the Wetlands"

   Purpose: to buy wildlife lands and manage them for wildlife.

Started: 1951

Funded: Sportsmen through surcharge on small game licenses.

Progress: 850 wildlife management areas ($11 million)

2. Wildlife Habitat Improvement Program

Purpose: to cost share with private landowners on wildlife habitat improvement projects (food plots, wetland development, wildlife shelterbelts).

Started: 1968

Funded: Sportsmen's dollars

Progress: Thousands of projects statewide

3. Acres for Wildlife

Purpose: Recognition of any private landowner who develops or preserves at least one acre of wildlife habitat for one year

Started: 1972

Funded: Sportsmen's dollars

Progress: 13,000 acres enrolled

4. Habitat-Pheasant Chick Program

Purpose: To educate, to provide additional habitat projects, and to provide a few extra pheasants for hunters.

Started: 1975

Funded: Sportsmen's dollars

Progress: Not fully evaluated as yet.

Efforts are also made by DNR's in other states to improve habitat for waterfowl and other migratory game birds that may frequent Minnesota. Considerable habit improvement is also being done in Minnesota's national wildlife refuges, all managed by the U.S. Fish and Wildlife Service. However, despite all these habitat programs, much more must be done.

◆Do not harvest mammals or birds which are protected by law, except during established hunting or trapping seasons.◆

Some animals at the top of their food chains are currently at all-time low population levels. Most of these species are classified as "endangered". However, we should not be misled into thinking that ALL species at the top of food chains are endangered. Many species exist in sufficient number to sustain a harvestable surplus.

For example, the "endangered" peregrine falcon has suffered greatly from the influx of pesticides into the environment. At this point, it can withstand no additional mortality and is fully protected by federal and state laws. On the other hand, the black bear has become so numerous that it has become a menace to oat fields and campgrounds in many areas of Minnesota. Hunting seasons for this large predator will help to maintain a proper balance of bear in Minnesota.

Discussion Questions

1) Discuss reasons for restricted shooting at certain species of birds and mammals in Minnesota. Which species are rare?

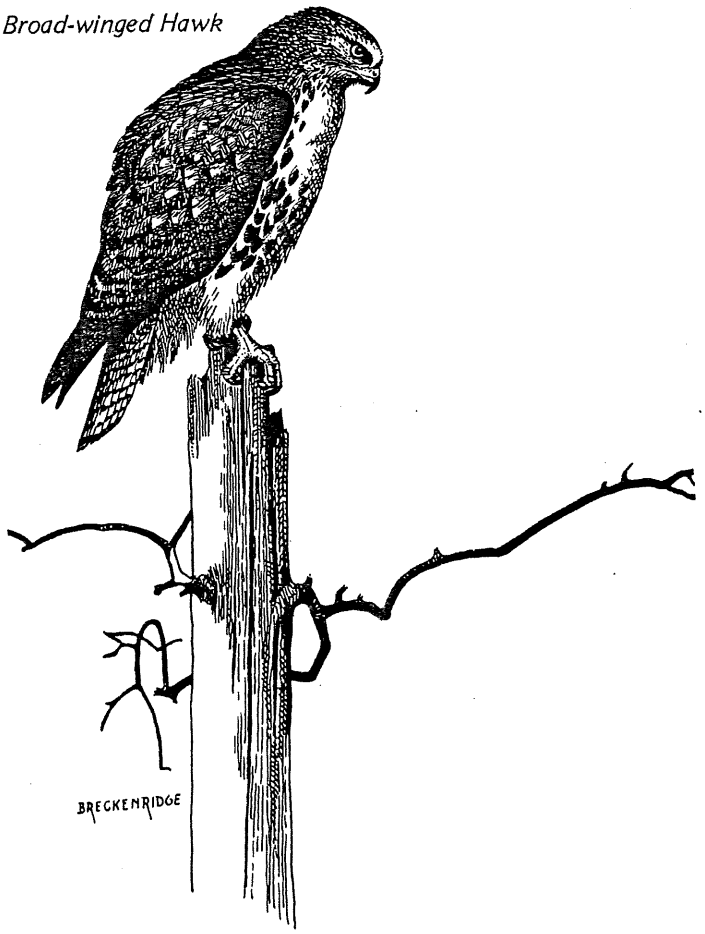
2) Why is it necessary to preserve some areas as strictly wilderness or semi-wilderness where little of man's influence is felt?

3) Are there any waterfowl in Minnesota (or pass through the state) whose breeding populations are extremely low in number?

4) What is the existing DNR management policy for timber wolves?

5) Where is the Black bear located in its food chains? What are the DNR management policies for it?

6) What major factors limit waterfowl populations in Minnesota? Is hunting a factor?



7) The same question as #4, but for ruffed grouse, deer and moose. You may want to refer to later chapters.

◆Hunt species whose populations are harvestable, but do not particularly vary with even "heavy" hunting pressure: ruffed grouse, cock pheasants.◆

Activities and Questions:

1) How closely do the MDNR's hunting regulations and Minnesota state laws follow these three hunting ethic principles based upon good management principles?

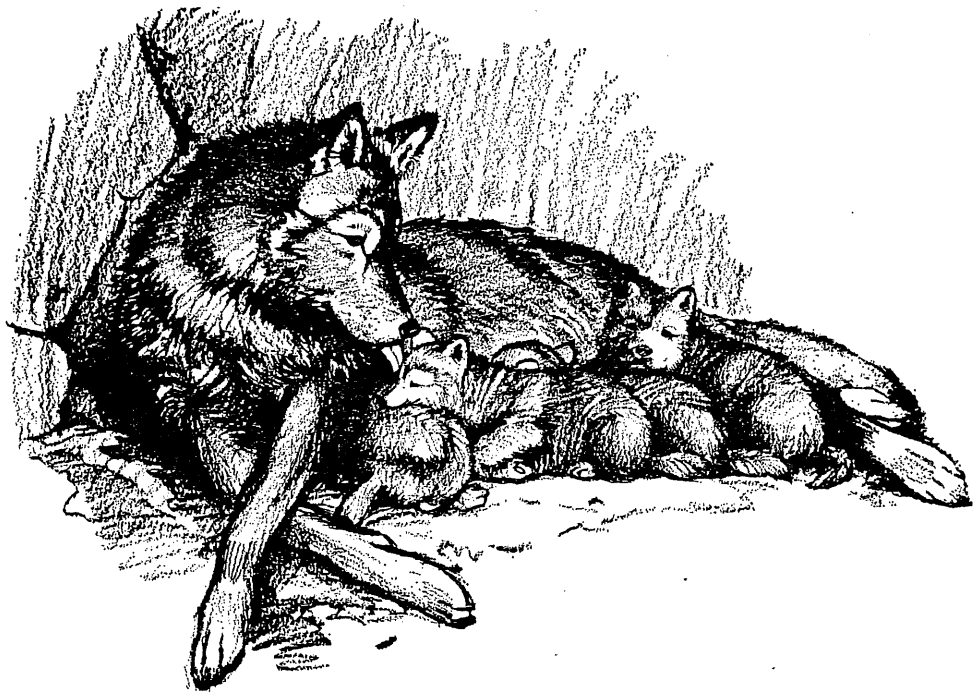
2) List and compare the animal and plant kinds and numbers of natural complex ecosystems and degraded ecosystems in Minnesota. (Compare a vacant city lot with a section of northeastern wilderness).

3) Is there any justification for shooting at birds or animals that do not follow criteria A, B, or C? What about predators? Rabbits in your

garden? Skunks because they smell bad or may carry rabies? Porcupines because they debark pine trees? Hawks and owls because they prey on domestic chickens or pheasants? Dogs running deer? Discuss all of these!

4) Dr. David Mech's studies on Isle Royale National Park, show that the island contained an estimated 440 moose (assume an average weight of 1000 lbs.) and 20 wolves (average weight equals 75 lbs.) in 1960. Does this follow a 10 percent energy (weight) transfer in the food chain? Why not? (dried weights? other animals in the food chain? other population and mortality factors?).

◆Support federal, state, and private projects for habitat restoration and preservation, as well as other management techniques. Join clubs or organizations that work to improve wildlife habitat. If possible, develop your own land or help a private land owner to do the same.◆



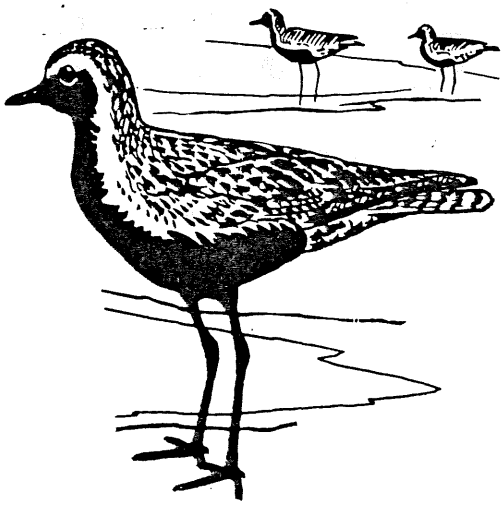
Timber Wolves

◆Support the programs of government and certain non-profit conservation organizations to acquire and preserve natural areas.◆ Minnesota has many unique wetlands, forests and prairie tracts which are in danger of being lost forever to the grinding wheels of progress. In many cases, these areas preserve vestige plants and animals, and provide fascinating study areas for professional researchers and also for college and school classes.

◆Help others to understand and respect all living and non-living things in the natural world--to become "stewards" of the land. Try to instill Aldo Leopold's "land ethic" in others.◆

Leopold describes his "land ethic" this way:

"Conservation is a state of harmony between men and land. By land is meant all of the things on, over, or in the earth. Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and waste the ranges; you cannot build the forest and mine the farm. The land is one organism. Its parts, like our own parts, compete with each other and co-operate with each other. The competitions are as much a part of the inner workings as the co-operations. You can regulate them cautiously, but not abolish them." From Sand County Almanac.



Golden Plovers

Stewardship

As A Life Style...

A Plea To That Majority

Your Creator has filled the earth
With all things necessary to sustain you
And has found them to be good.
While you dwell among the mortals
You may partake thereof.
Use them wisely and judiciously.
Guard them closely, squander them not.
For if you are untrue to this sacred trust
Mankind shall not be perpetuated,
But shall perish from the earth.

Richard J. Dorer

◆▶Practice conservation in your hunting.◀◆

1) Know and abide by MDNR annual bag limits and federal regulations on natural wildlife lands. Don't brag about "the number you shot-at or bagged."

2) Save your "distance marksmanship" for the practice range. A quick humane kill is more certain at short distances.

3) Don't shoot at game that you may not be able to retrieve. Use a good hunting dog. Dogs are enjoyable companions and conserve game.

4) Don't waste the game you take. Utilize as much of the meat, hide, feathers, etc., as possible. Maintain an attitude of conserving natural resources.

5) Don't shoot at targets you can't positively identify. If you don't know what it is, don't shoot! It might be a protected species, or, even worse, another hunter.

6) Practice marksmanship on clay pigeons and paper targets before and during hunting seasons (not over water areas or in public hunting areas, but in recognized, target shooting spots.) You may want to join an archery club or a trap, skeet, or rifle shooting league--a great off-season activity and a good way to sharpen your shooting skills.

7) Cultivate the habits of caring for your hunting clothes, boots, knives and firearms.

◆As a hunter, strive for humaneness.◆

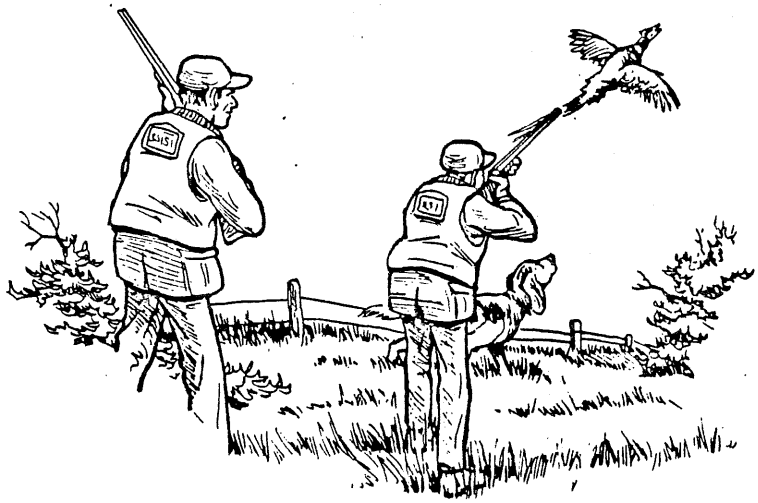
The fact that the hunter kills animals in his activities tends to concern not only anti-hunters, but many hunters too. Remembering our discussion about ancient hunters, this concern is not unusual, but perhaps expected by those who respect animals. It is also expected since the subject of "death" presents many unknowns, fears and uncertainties. However, like all animals, we must die someday. That is part of reality. Likewise, every species is part of a predator-prey relationship which is vital in the harmonious functioning of the natural community.

Dr. C. H. Clarke writes: "I can see no blame in the hunter, as long as his conscience, ruled by respect for nature, governs his actions."

Albert Schweitzer believed in no willful destruction of either plants or animals. But this philosophy breaks down when one is threatened by dangerous animals or disease-carrying insects; it also is inconsistent with the natural process of eating to live as well as animal predator-prey relationships.

Clarke believes on the other hand, "that the death that I inflict is right if harmony is maintained." For example, shooting of threatened or endangered species is not harmonious with the natural world because it "would imperil the position of the species in the living community," says Clarke. However, death should not be the result of cruel and wasteful killing; this wastefulness is not harmonious with nature and should induce guilt, he explains.

Thus humaneness is an ethical hunting principle that is essential in killing, and in showing respect for the mammal or bird. Many a deer hunter is noticeably shaken as he must suddenly deal death of an animal. Even though the hunter realizes that a quick, humane shot is the easiest death the animal could experience, simultaneous remorse over a kill is normal when one has a deep respect for living things.



◆▶Don't litter or vandalize property◆▶When you leave a hunting spot, leave only footprints! Pick up trash left by others. By respecting the land and its owner, you will help to preserve the hunting heritage for future generations.

Even though states may disagree on particular game laws or you may disagree with a particular regulation, don't break game laws. If you willfully disregard regulations, you are violating a special and ancient trust that you share with all hunting sportsmen.

◆▶Respect Yourself As A Hunter◆▶

Hunting, like other physical activities, is often physically, mentally, and emotionally taxing. The harder you work at hunting, the more you'll enjoy the successes it has to offer.

1) Keep yourself in good physical condition. Running or jogging along with other basic conditioning exercises before and during hunting season will increase your strength and endurance in the field.

2) Learn to identify wildlife and their tracks, trees and plants (wildlife cover and food). In the off-season, spring waterfowl identification, dog training, and trips to the woods and marshes provide extensions to your hunting experiences.

3) Develop self-control. Few experiences are more exciting than seeing animals close-up in the wild, particularly large animals. But that same excitement can reduce a hunter's ability to act calmly and safely. By taking several trips into the field or woods before hunting season, you can minimize the initial excitement of "seeing game."

4) Be patient with yourself. Hunting success can vary even for the most skilled hunter. Try not to measure your hunting successes just by the number of game animals seen or bagged. There are many rewards associated with hunting besides killing game including companionship, dogmanship and outdoor exercise.

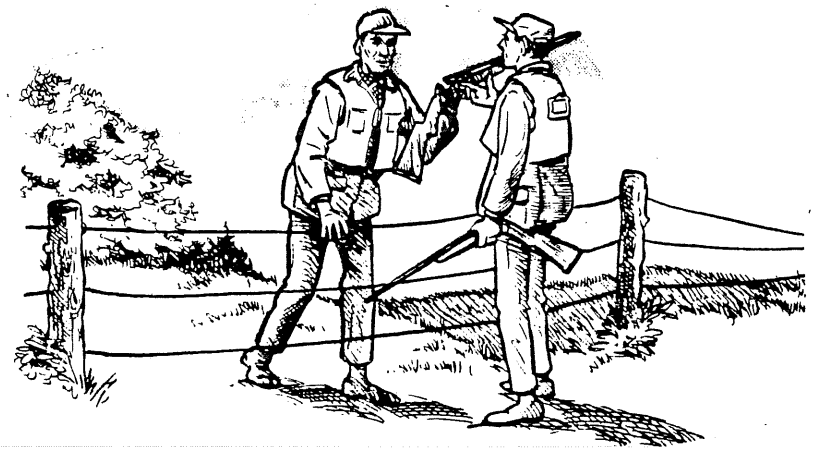
◆▶Respect Your Hunting Companions and Other Hunters◀◆

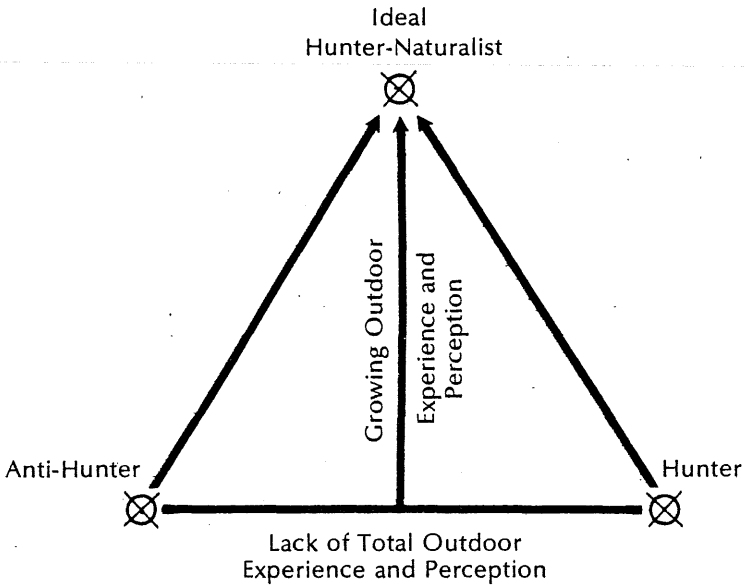
Hunting has proven to be a safer sport than swimming or fishing. Yet the fact remains that hunting entails the use of an instrument that can kill or maim other humans. Thus, the sport demands constant awareness of oneself and one's actions and strict adherence to rules of safety. Some of these rules and guidelines for hunting conduct include:

1) Always keep the muzzle of your gun under control. Never point it at anything you don't intend to shoot.

2) Never lean the firearm against anything like a table, car or tree where it might fall, and discharge or where your hunting dog might accidentally bump into it.

3) Don't criticize your companion for the type of firearm or clothes he wears. As long as clothes blend somewhat with the cover, meet safe state regulations (as in deer hunting), the "style" or "newness" of clothes or the "expensiveness" of firearms have little to do with the ethics, safety, hunter effectiveness, or companionship in hunting.





4) Don't belittle your companion's hunting dog. You may find yourself hunting alone when you discover that he had a closer friendship with his dog than with you.

5) Don't snap triggers on any firearms--your own or your companion's guns. In fact, never handle a companion's firearm at all unless you ask his permission. To a sportsman, his firearm is an admired, precision device that requires the best of care.

6) Always be as courteous and as safety conscious as you can while hunting with someone else.

7) Be ready and anxious to pitch-in with more than your share of the work on hunting ventures. Big game hunting in particular, is often very physically demanding. Don't saddle a few friends with all the chores.

8) Don't select a deer stand or waterfowl blind closer than 150 to 200 yards from someone else. The greater the distance apart, the greater the hunting experience. Respect the "rights" of others to enjoy the hunting privilege.

9) When sharing a waterfowl blind with a companion, decide which direction each of you will watch, develop a communication system such as "mark two north," and decide in which direction each will shoot. Never shoot near or over your partner.

10) Always be aware of what's behind your game target. A friendship can be lost by a hunter's lack of awareness.

11) On big game hunts (deer and moose), thoroughly plan your hunt with your group. Plan for all possibilities and keep all hunters informed as to location of other party members. Plan what each hunter will do if one kills or wounds a deer. Be on time at pre-determined meeting places. Develop a signal system of communication (like whistling with an empty cartridge).

12) It is wiser and safer if hunters unload their firearms when meeting as a group in the field. Late-flushing grouse or pheasant can suddenly create a dangerous shooting situation.

13) Always unload your gun before crossing deep ditches or fences.

14) Be extra careful about the possibility of accidental firearm discharge after a deer, goose or other exceptionally desired game animal has been bagged. The excitement which accompanies these situations may result in less concern for other things, especially caution with firearms. Consequently, the potential for a firearms accident increases.

15) When stopping to rest or clean game in the field, it's safer to unload your firearms.

16) Successful and safe hunting in a group or alone demands too much alertness to have your senses numbed unnecessarily by drugs or alcohol.

17) Never use the telescope on your rifle to look at other hunters --use binoculars instead!

18) When waterfowl hunting, try not to shoot in the general direction of other hunters.

19) Unload and case your guns when traveling by boat or canoe. A good idea is to tie the gun and case to the watercraft in case of an accidental tipover.

20) Respect the rule of "first blood" in hunting for it demonstrates your respect of other hunters. The hunter that made the first vital shot should get the animal, though this is not the case in a legal sense. Fighting over downed birds or mammals has no place in hunter sportsmanship.

21) Don't discharge firearms from motorized vehicles or shoot rifles over open water. These acts are illegal, but more importantly, very dangerous for you and your companions--certainly such acts are unethical with regard to fair pursuit.

22) If you are wearing brightly-colored clothes, don't go near other hunters' blinds or stands during small game seasons. Do not use red canoes near waterfowl hunters, slam car doors in hunting areas nor use noisy vehicles in close proximity to others. Over-used duck

calls have a similar effect on game and hunters. Remember, most hunting success and personal reward comes from strenuous effort (usually on foot) of fair pursuit, and with a minimum of mechanization and noise. The ancient arts of stalking or waiting for game involve slow movements (fast movements are usually alarm signals), natural sounds, and clothing colors and shades that blend with natural surroundings.

23) Don't claim a bird if you and your companions shot simultaneously. This is usually quite irritating to the other hunter.

24) A special area of concern between hunting companions occurs when one brings along new hunting companions; inexperienced sons, daughters or friends, novice dogs or a dog not liked by other hunters. Be aware of your companion's thoughts on these "new additions."

25) Inexperienced hunters, young or old, or inexperienced dogs should be taken out alone, rather than with large groups. An important consideration to other companions is the attitude of novice hunters. Remember that you too, were once "inexperienced," and novices (people and dogs) must learn sometime! Help young hunters learn safe hunting methods, skills and <u>most importantly, attitudes of respect</u> as discussed in this text.

26) If a hunting companion takes you to a "hot spot", don't return later with other hunters. This is one of the most grievous sins among the unwritten codes of hunting. Many friendships are lost and family squabbles have started over such disrespectable behavior.

27) Learn to hunt <u>with</u> dogs. Their natural instincts for hunting, flushing, and retrieving are far superior to ours. You will often

see more game with the worst possible dog than with the best possible man. Also, learn what a hunter's relationship with his dog is like. Learn what your companion expects from his dog and how this fits the relationship between you and your companion.

Don't ask to borrow a friend's dog. Many older dogs won't hunt without their master, or may run off looking for him in the field. Don't ask a companion's dog to retrieve birds to you; the animal was not trained for that. Don't give any commands to another's dog, unless the hunter asks you to. Try to avoid potential dog fights with other hunters' dogs. Don't overwork dogs, but treat them with care and love. They can be the finest friend one can have, and the best of hunting companions.

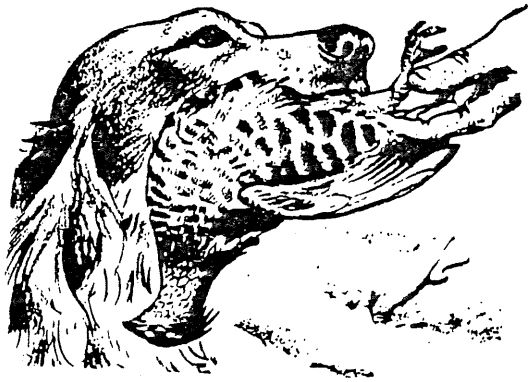
The romance and nerve-tightening drama of bird hunting is best captured by imagery. Perhaps a wiry, glossy-coated pointer quartering determinedly before his master, padding over autumn's fallen hues, melting the thin film of frost with every step.

Or, imagine if you will, a thick-coated labrador breaking ice in dogged pursuit of a fallen greenhead.

And behind the animal is a man who knows and loves dogs as much as he loves hunting. A man who has mellowed and learned the lore of woods, fields and marsh through the passing of many seasons, he still sees many more birds than he bags, but this game has become an addiction for which he desires no cure. Missed birds have come to represent that eternal variable that makes his sport stimulating and always new.

This hunter would hesitate to go afield without a dog. His philosophy has come to be that of more and more Minnesota hunters who have experienced the thrill and satisfaction of hunting over a well-trained, and well-mannered canine.

Not only is this brand of hunting personally satisfying and enjoyable, this use of a dog will greatly reduce the number of game birds wounded and lost. The good dog aids the good hunter. Together, they're a credit to their sport.



◆▶Respect For the Owner of Hunting Lands◀◆

Minnesota game animals are legally owned by all residents of the state, and so are all public lands. However, much game is found on lands for which private individuals and corporations have legal title. The surface of all public waters is governed by state law, though the land underneath or around the water may be privately owned. Hunters cannot demand to hunt game on private lands "because they legally own part of that game!" This is not only legally incorrect, but morally disrespectful of others' land rights. More correctly, both hunting and land ownership are privileges to be respected.

No matter what "the law" requires, each hunter has an ethical obligation to respect the owner by securing his permission to hunt.

1) Be courteous when you stop to ask permission. If you are refused permission, respect the landowner's decision.

2) Don't display or carry loaded firearms around farms or near rural houses. Accidental discharge may scare or injure people and livestock. Also keep your hunting dog under complete control near farms or livestock.

3) Always close gates if you go through them (game and fish law 100:29 Subd. 21). It's better to go under gates or fences rather than risk breaking them down. Imagine how you would feel if your livestock was running wild over the country-side because of careless hunters.

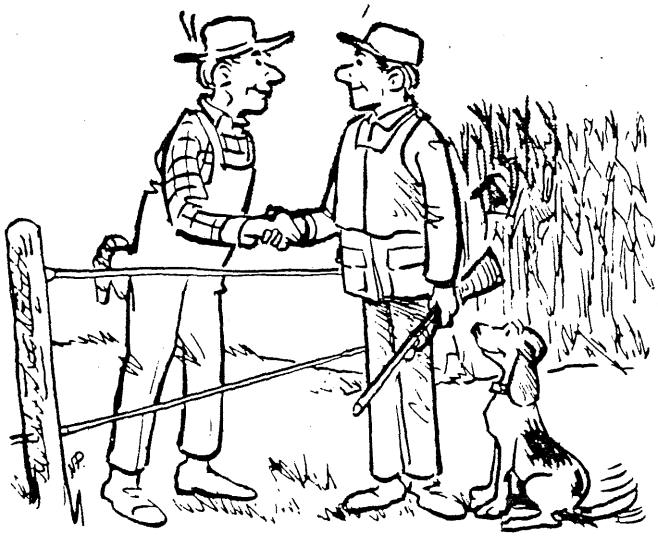
4) Be careful not to knock down unharvested crops and do not drive over grain fields. Fill any goose pits you may dig in farmers' fields.

5) Do not shoot a firearm unless you are at least 500 feet away from buildings, barns, corrals, etc. housing people or animals. It's

both dangerous and illegal. (100:29 Subd. 22).

6) When hunting near farms, be aware of what's behind your game target; pellets discharged high into the air may carry several hundred yards.

7) As you leave private lands, thank the owners again for allowing you to hunt. Offer the landowner a bird or two.



8) Treat public lands with the same courtesy as private lands. You are only part-owner along with some four million other Minnesotans.

9) Don't shoot at insulators for telephone or electric lines, or any other convenient target.

◆Respect for Non-hunters ◆

Though you may disagree with the opinions of non-hunters or anti-hunters, they have a right to their opinions too.

1) Don't arrogantly display bagged animals on your car. Few people will admire your hunting prowess or speak well of hunters after watching you drive by with a freshly-dressed deer dripping blood over your car.

2) Remember that most people today are born and raised in cities and suburban areas. Also, most people (four out of five) in Minnesota don't hunt. Many do not understand nor see any of the natural predator-prey relationships that exist in the wild, nor do they see cattle, pigs, or chickens slaughtered for meat products. Most people in our state do not regularly shoot firearms.

Hunting is a privilege, and you should strive to maintain that privilege! Therefore, hunters must be courteous and understanding with non-hunters. Point out to non-hunters that declining habitat is the greatest cause of declining wildlife populations and that all of us should support measures to purchase and protect wildlands.

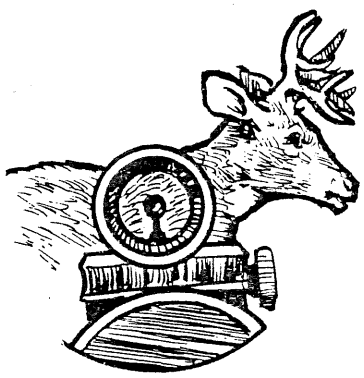
Much hunter and anti-hunter debate is centered around the "rightness" or "wrongness" of killing wild game. Aldo Leopold has provided a meaningful guideline for resolving this argument:

> "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

Today's carefully-regulated hunting seasons are designed to maintain stability and beauty in plant-animal communities through harvesting of surplus animal populations. It is up to the hunter to provide the integrity.

◆ Respect for Game Animals ◆

1) Always strive to get as close to game as possible, clearly identify target species, try to quickly and cleanly kill <u>one</u> animal (try not to flock shoot and possibly wound several others).



Though it is often tempting, try not to hurry your first shot. Make that first shot effective!

2) If you down a big game animal, approach it from the rear with your firearm ready. Kick the animal's rump; it it moves, dispatch the animal with a carefully-placed shot in its neck or head.

3) Never waste game. Neck or upper-shoulder shots on deer or moose waste little meat and result in quick, humane kills. Hides should be salted down (table salt will do), rolled-up and sent-in for tanning.

4) Meat may spoil if handled improperly. Contamination and heat are the main causes of meat spoilage. Animals should be properly opened and viscera removed as soon as possible. This allows the meat to cool and to prevent contamination from stomach or intestinal fluids. Birds can be dressed in the field and propped open with a small stick or grass. Meat should be protected from dirt and insects (covers that allow air flow but keep out insects are available commercially). Although experts disagree as to whether venison should be aged and if so, with or without the hide on, most recommend aging the meat for a week to ten days at temperatures of 32° F. to 40° F. Lightly salted meat will not freeze at slightly below 32°. Leaving the hide on will also reduce freezing possibilities, keep the meat clean, and reduce drying. Meat should not be frozen and thawed repeatedly.

5) Part of your hunt preparation should include the necessary items for proper care of meat, hides or trophies (if you plan to mount the head, don't cut under the neck or front shoulder, cut over the top of the neck):

a) Deer and especially moose may require pulleys for

lifting, special dragging or back-packing equipment, and a belt axe for dressing.

b) A knife that will hold an edge and a sharpening stone.

c) Several feet of nylon cord or rope.

d) Wiping cloths and insect-proof sacks.

e) Directions for proper gutting procedures or knowledge of such.

6) Many books are available containing wild game cooking recipes, as well as numerous magazine articles including several in The Minnesota Volunteer.

(July-August, 1973, pp. 56-62: Appendix D.)

Well-prepared duck, ruffed grouse, pheasant, or venison steaks can be a true delight on the table and a marvelous extension of hunting adventures.

◆▶Fair Pursuit and Sportsmanship◀◆

Sportsmanship in hunting includes fair pursuit of game. But what is fair pursuit? Is it possible for hunters to agree what constitutes fair chase?

Some people claim that a hunt is more sporting if a primitive device is used. If we pursue this logic, would not a club be the epitomy of sportsmanship? Maybe we could throw rocks at wild game? Obviously, it is not only harder to kill an animal with a primitive device, but it is more difficult to kill it humanely. Thus the bow hunter is challenged by the extreme difficulty of getting close enough to make a humane kill.

And so, in the final analysis, it is not a matter of which device we use, but how we use that device.

If we are to develop ethics along the lines of either--1) hunting tools: primitive versus modern, or 2) state hunting regulations, life could get pretty confusing! What is legal and sporting in one state, may be illegal and unsporting in another. Moreover, regulations affecting hunting devices and techniques change from year to year within a given state. This does not mean that regulations are to be broken. Laws provide boundaries to hunter behavior, <u>but they are not hunting ethics</u>!

The essence of hunting sportsmanship is that each hunter must establish his own meaning of fair pursuit which is based on ethical principles, and within the framework of state and federal regulations and his hunting partners' expectations of behavior and respect.

A Tribute to the Hunter

"I would rather take a boy hunting," the old saying goes. "than go hunting for the boy."

Today's parents might add a frantic footnote: "I would rather have the boy out hunting than hot-rodding around on the freeways, or taking a trip on drugs."

If one rejects the "either-or" options, he must recognize that hunting has been an American tradition since pioneer days when game birds and animals were often essential to the family's survival.

It is also a fact that the general non-hunting public enjoys, observes, and photographs wildlife throughout the United States which would not exist but for a well-documented history of hunter concern, bolstered by millions of sportsmen's dollars invested in the preservation of precious wildlife land and water areas.

Countless conservation careers were rooted in the hunting tradition. John James Audubon, Aldo Leopold and Teddy Roosevelt--all were famous hunters. An avid hunter, Richard J. Dorer, founded Minnesota's classic "Save the Wetlands" program in 1951. This program is still rescuing valuable wetlands today.

Minnesota sportsmen, in organizations large and small, have supported and invested heavily in wildlife programs which are most remarkable in their diversity and environmental implications.

Still, the hunter is confronted by his critic's question: "How can you call yourself a conservationist and go out and shoot wild creatures?"

The hunter is confounded by this criticism. Above all, sportsmen resent being "lumped as one" with the gun vandal and game law violator, which is as logical as classifying all citizens as "drunken drivers who shouldn't be allowed on the highways."

The hunting detractor that swats a fly, cuts a flower, dines on a chicken that rarely sees the light of day, or chomps on a steer from the slaughterhouse exasperates the nimrod.

Perhaps most frustrating of all: hunter and non-hunting environmentalists wasting their energies on debate which could better be dedicated to a common cause.

Minnesota DNR.

6

Wildlife, Habitat, And Hunting Techniques

White-Tailed Deer

Description

Generally, deer are not as large as the hunter believes. The back of an adult white-tail is seldom more than waist high to the average man. Average live weights for Minnesota deer in fall are: bucks, 170 pounds; does, 145 pounds; and fawns about 80 pounds.

A deer's weight will vary greatly during the various seasons of a year. Weights decrease during winter and increase in summer. Old deer are generally heavier than younger deer. Questions regarding record weights of deer are not easily answered because there has been no state-wide system of weighing deer and maintaining records.

A deer's live weight can be estimated by increasing the field dressed weight by 25 percent.

Coat colors - A Thin reddish summer coat is worn for about three months. It is replaced by a gray winter coat in September. The winter hair is longer and stiffer and the individual hairs have enlarged cavities filled with very light pith. The heavy winter coat provides insulation against snow and cold.

Age - In captivity deer may live longer than 20 years. In the wild, less than one percent reach the age of ten. The average life expectancy of a Minnesota whitetail is about three years.

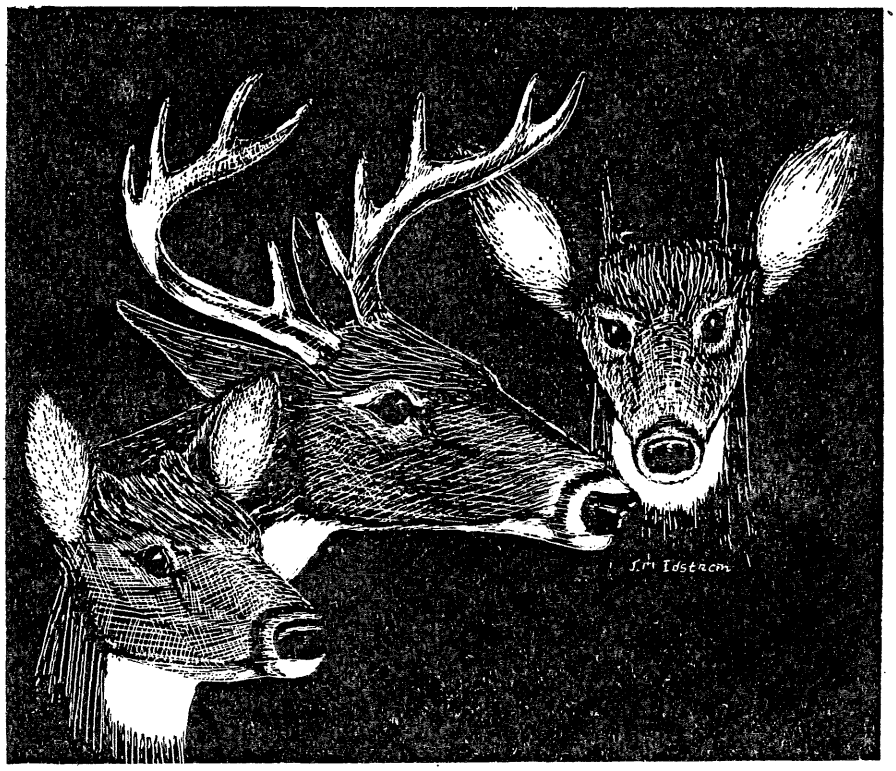
Teeth - Deer have incisor teeth on the lower jaw only, while the upper jaw has only a tough leathery pad. Molars are specialized for grinding woody stems. For 20 years, until about 1970, tooth replacement and relative wear determination was the best means of obtaining a deer's age. Recently, taking a cross section of the root of an incisor tooth, preparing it by laboratory

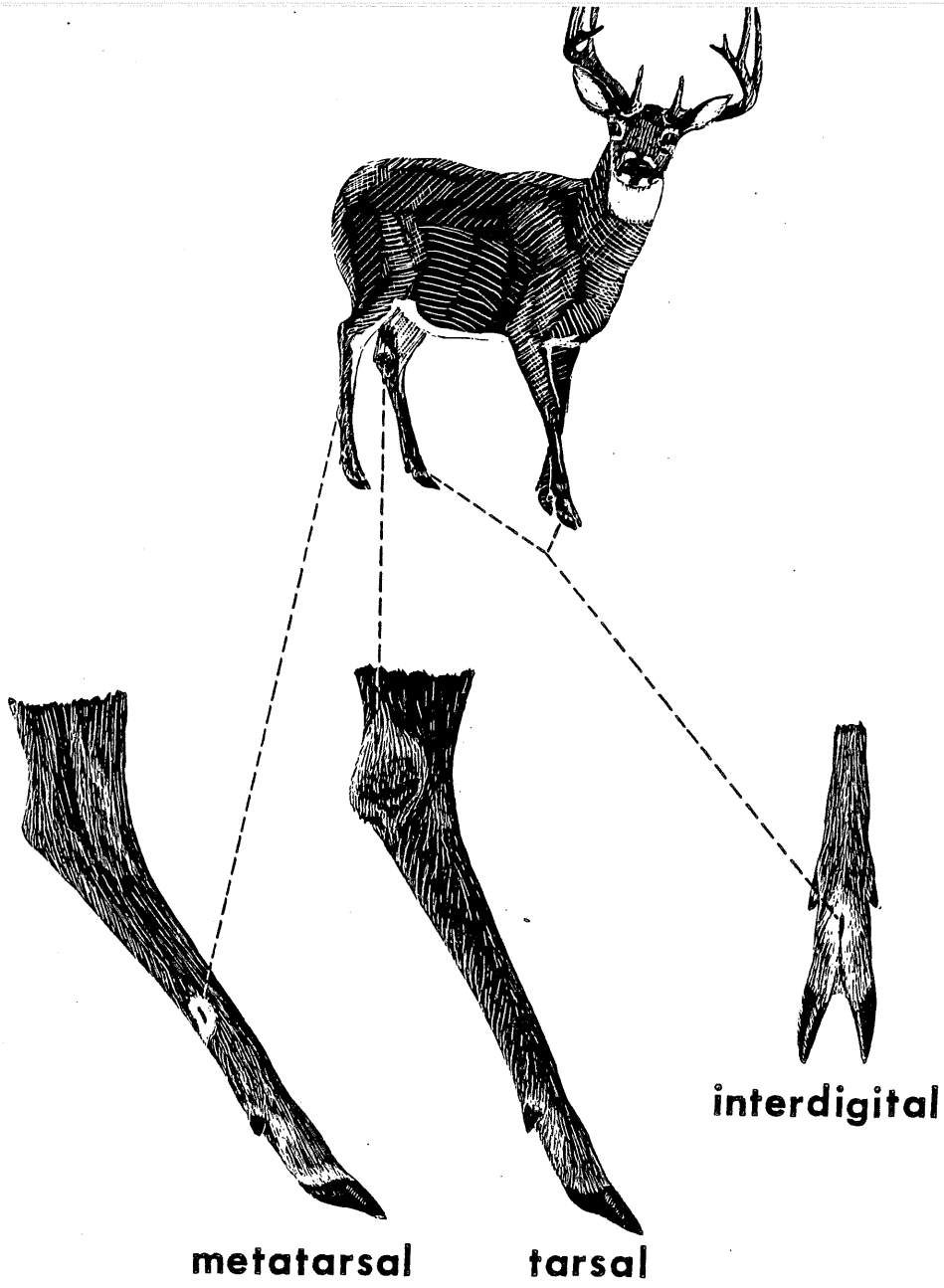
process, and counting the annual rings of cementum, has been used because of its greater reliability. Fawns can be separated from older deer in the fall of the year by checking the number of cheek teeth. Fawns will have only four cheek teeth (you must check carefully because of the many ridges) whereas adults have six.

Antlers - In the fall male fawns can be identified by the small knobs found in the dense hair of the forehead. Occasionally, these knobs will develop enough to project a short distance above the hair. The knobs are the pedicles or bony supports upon which antlers will grow the following spring.

The new growth of the adult antlers begins in the latter part of March and continues until late August. While growing the antlers are covered with a thin fuzzy layer of skin which is full of blood vessels. In September this "velvet" covering drys and peels and is removed by a short pre-rut period of antler rubbing.

Most bucks retain their antlers only until the breeding season wanes in December, though some hold them as late as March. The process whereby an antler dies and is shed is somewhat like that by which a leaf separates from the twig in autumn.





Scent glands - The glands found on the legs and between the toes of deer are apparently used to communicate a deer's location to other deer by scent for either sexual or territorial purposes.

Vocal sounds - Deer can make a variety of sounds. Perhaps the best known is the snort or whistle of the adult buck when alarmed. Bucks also emit grunting sounds when chasing does. The doe employs a soft murmur to call her young. Both sexes can bellow or bawl in fear or pain. Fawns may emit a shrill bleat when frightened or injured.

Reproduction

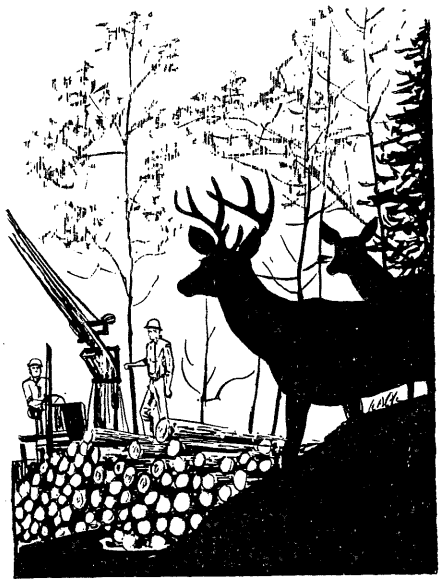
Bucks begin sexual activity in October. Small trees with patches of bark rubbed off by antlers are the first evidence of the buck's need to establish dominance or territory. Hardened and polished antlers backed by powerful, enlarged necks establish the superior breeding status of the larger bucks in their encounters with others.

As the actual breeding period or rut, begins, bucks begin to make scrapes. These are patches where the buck has pawed the ground bare and urinated. Such "sign-posts" apparently help bucks and does in locating each other. The rut is probably initiated by a combination of cooler temperatures and decreasing amounts of daily sunlight. The peak of the rut usually occurs in early November, varying with these initiating factors.

The whitetail buck is polygamous and is attentive to a particular doe for only a week or less before moving on to another receptive female. A few does come into estrus or heat as early as late September, but most are bred in November. The period during which the doe is recepetive to the buck is quite short, probably not more than 24 hours. If mating is not successful during the first period of heat, the doe comes into estrus about 28 days later, and again a third time if fertilization is not accomplished.

The fawns are born in late May and early June after a gestation period of about 210 days. At birth, fawns average six to seven pounds in weight.

Fawn production tends to be higher in southern areas of Minnesota, because of a greater supply of more nutritious foods and less severe winters. These factors result in a greater incidence of twins and triplets among older does, and in a 20 percent pregnancy rate among fawns. In northern areas single births and very few pregnant fawns are the rule.



History

Before the lumberjack period of the early 1900s, deer were rather uncommon in the northern evergreen forests. However, logging and burning removed the mature timber and encouraged succulent new growth of vegetation upon which deer feed. By 1920, deer were fairly common over much of the northeastern part of Minnesota.

During settlement of the southern counties of Minnesota, unregulated shooting reduced the herd to the extent that by 1880, deer had almost disappeared. At the turn of the century, the enactment of more restrictive game laws prepared the way for natural restocking of the farmland country.

This turned out to be a slow process because logging and fires in the northern counties were just beginning to make possible an expansion

of the northern herd. As their numbers in the north rapidly increased, deer began to gradually spread southward.

By the early 1940s deer had exceeded the carrying capacity of the range in many northern areas and crop damage complaints were frequent in the south.

Since 1950, Minnesota has experienced both a significant increase and a considerable decrease in the whitetail population. Favorable and unfavorable winter weather over a series of years has been the primary cause for these fluctuations.

The Minnesota deer population, as of summer, 1975, is below carrying capacity over much of the northern range. The size of the herd cannot be greatly increased unless the habitat deer need to survive unfavorable weather conditions is improved.

Range

The whitetail is found in every county of the state. Generally, deer density is affected by three broad ecological areas that exist in Minnesota. These are: the northern forest, once largely logged off, but now returned to tree cover which is maturing more rapidly than it is being harvested; The transition area, originally covered by hardwoods and parkland landscapes, which is now a mix of farmland and forest; The agricultural area, originally prairie, now almost completely under cultivation.

Habitat

Deer, like most wild animals, tend to avoid large tracts of homogeneous cover. Rather, they prefer an interspersion of various types of cover and openings. The many "edges" within such an area produce the

greatest variety and amount of deer browse. In regions of extensive forests, deer frequent the edges of lakes, swamps, streams and roads.

Large deer herds can be supported only where a large portion of the forest is in the brushy stage of reproduction. Much of the northern forest has now grown up to the "closed canopy" stage which shades out desirable food plants and shrubs below.

In addition to maturing forest, Minnesota is faced with natural plant succession toward a spruce-fir forest in many of the northern counties. Spruce-fir, the climax forest of this region, is poor habitat for deer. This natural succession toward evergreens is already far advanced in Cook, Lake, St. Louis, Koochiching, Itasca and Lake of the Woods counties.

To restore these areas as good deer habitat, many sites where balsam fir is invading aspen must be clearcut so aspen can return, thus producing more deer food.

This can be accomplished by commercial timber cutting or by special deer habitat projects. Timber sales are more desirable--and economical--but at this writing, their volume and distribution is not sufficient to meet deer management purposes. It is hoped that an increasing use of wood products will bring about the development of more young forest stands in the near future. At present, it appears that bulldozing and prescribed burning in selected areas will be a vital addition to commercial timber sales for the maintenance of adequate deer habitat.

The tendency of deer to concentrate in certain areas during winter is an important aspect of their habitat requirements. If areas which provide protection from strong winds and body heat loss are found only

at particular locations, deer may move several miles to gain that comfort. If widespread, conifer cover provides favorable conditions over much of the landscape, deer will remain in small groups on year-round range.

When deer populations first expanded in northern Minnesota, as a result of the greatly increased food supply in cut-over areas, uncut swamplands were relatively untouched by deer and thus provided a good winter food and shelter. As the years passed, these winter concentration areas were greatly over-browsed and as a result, the capacity of these areas to support deer was greatly reduced. Much of this reduction was permanent because young plants were killed off and old growth within reach of deer was eaten.

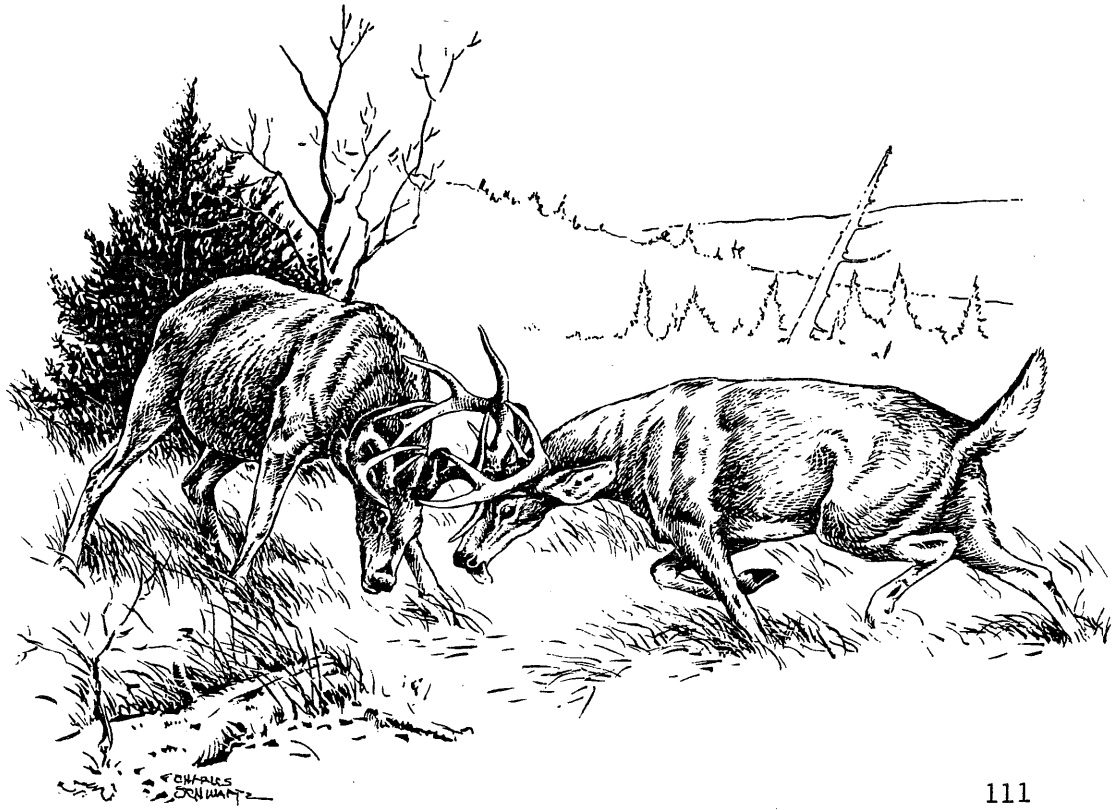
With reduced deer populations in recent years, some plant growth is returning within the wintering areas, though in some areas to such an extent that essential twig growth has grown too high for deer. It appears that too few deer can be as detrimental to the browse supply as too many.

Deer fare best in a diverse forest

Probably the most critical aspect of habitat is availability of high-quality forage for pregnant deer as they move out of winter concentration areas. This food requirement is best met by succulent new growth.

New green growth must be available at the earliest opportunity in late winter and early spring. Grasses, clovers, and winter wheat and rye that remain green over winter can give deer a head start toward regaining strength. Such vegetation can grow only in clearings that provide sufficient sunlight and freedom from woody plant competition. Such clearings, probably no larger than an acre or two in size, must be located adjacent, or nearly so, to winter concentration areas.

In agricultural areas, marshes, woodlots, and river bottom areas provide the only year-round cover for deer. Deer of the farmlands feed primarily at the expense of the farmer. However, there is a limit to how much of this will be tolerated. Deer, if they are numerous, can be extremely damaging to crops, especially orchards. Therefore, in agricultural areas, the need to maintain the deer herd at a size compatible with people and crops overshadows other aspects of habitat.



Deer Numbers and Deer Management

Management is necessary to maintain optimum deer numbers for man's enjoyment and satisfaction. However, deer should not become so numerous as to cause losses in farm and forest crops and create hazards to motor vehicles.

In Minnesota, with its varying ecological situations that affect not only deer density but also the deer's vulnerability to hunting, wildlife managers strive for this fine balance by using the only management tool at hand--hunting regulations.

A number of factors enter into the selection of hunting regulations that will produce the desired effect in any one area. Determinations must be made regarding:

1. The extent to which the current number of animals is above or below the limit that can be supported by the food supply;
2. Whether it is easy or difficult for hunters to take the number that should be harvested;
3. The number of hunters that can be allowed in an area while maintaining safety for people and private property.

Deciding whether the deer population should be heavily or lightly harvested, or perhaps not hunted at all, depends largely upon management goals regarding the size of the herd that should be carried over from year to year.

If the herd is to be held stable, a number equal to the annual reproduction should be harvested each year. If the herd needs to be reduced, more liberal regulations can be set. If the deer population has declined and hunting has become poor, it may be necessary to reduce, or even stop the harvest to allow the herd to re-build.

While using hunting regulations as the primary tool in deer management, other factors that reduce the number of deer must be considered. Winter weather is one of the most important influences. A series of winters with relatively little snow will allow deer to feed better and the resulting larger fawn crops will cause the population to increase despite hunting. This occurred from 1957 to 1964, making possible a deer harvest that increased each year, and a hunting success rate that remained above 40 percent despite an increase of 60 percent in the number of hunters from 1957 to 1965.

A winter with abnormally deep snow makes it difficult or impossible for deer to obtain adequate food. This causes the loss of many fawns, before or soon after birth, and the deer herd does not rebuild to the level of the previous hunting season.

If several severe winters follow in close succession the population will be drastically reduced. Seven of the ten winters since 1964 have been severe enough to cause reproduction losses.

To complicate the picture even more, the growing seasons of early 1974 and 1975 were delayed enough to create nutritional problems for deer and have also cut into anticipated production gains. As a result, the number of deer in northern Minnesota remains below the level that could be supported by the overall food supply.

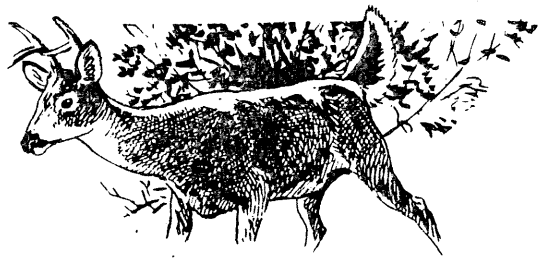
Deciding whether it is easy or difficult to take deer in a particular area affects the setting of regulations. For example, in the agricultural and semi-agricultural areas of Minnesota, deer must concentrate in shelterbelts, small woodlots or river valleys. Here, the hunter has a decided advantage over his counterpart in the heavily forested areas. And so, the season in these regions must be shorter to avoid overshooting.

Maintaining safety for people and property during the hunting season requires regulations that will not create an undue concentration of hunters. Thus, if surplus deer exist in any part of the state, it is desirable to open the bulk of the deer range as well.

Over the years there have been many heated discussions about whether any-sex deer hunting, buck hunting, or some combination of restrictions is the proper way to manage deer. These conflicts should disappear as people begin to realize that not all deer populations, habitat conditions, and hunter demands are the same, and that the tool needed for one job may not be the right tool for another.

In Minnesota, some areas require the restriction of bucks only hunting, while another area benefits by taking a limited number of antlerless deer in addition to bucks.

Special permits to harvest an established quota of antlerless deer are issued to hunters by means similar to that used for licensing moose hunters. The essential details are: As applications come in, they are given consecutive numbers. The applications are filed serially by these numbers. A computer using a standardized program to select random numbers is asked to select as many random numbers as needed to meet the quota. The drawn numbers are then matched to numbers on applications in the files. Applications with numbers that match computer derived random numbers receive the permits. All transactions in this system are recorded, audited by outside parties, and maintained available for inspection.



Hunting Techniques

Important to all hunting techniques is the necessity to scout a hunting area before the season begins. Securing permission from landowners, determining deer movement, locating and building stands are part of pre-season planning. Sighting-in guns and practice shooting should also occur far ahead of opening morning. Adequate planning for lodging and food is obviously necessary, but planning for the care of meat and course of action to be taken in case of an accident or emergency should not be neglected. Above all, every hunter should familiarize himself with the hunting regulations issued annually by the Department of Natural Resources.

Stand Hunting - Probably the greatest number of deer are taken by hunters who spend mornings and evenings, or all day, watching a promising trail or crossing. Even here, success depends largely upon a good knowledge of the area, especially the most likely lines of deer travel either in normal activity or when disturbed by other hunters. Wind direction should be noted when taking a stand to avoid having human scent carried toward the expected deer crossing. Quietness and a minimum of movement are essential even in tree stands.

Deer Driving - Many hunting parties find success in various forms of driving deer. In general, drives are carried out by having some members of the party take stands, while others walk through the woods toward them. Some deer may be moved forward while others may remain motionless or sneak back through the drivers. Experience shows that deer are adept at sneaking or remaining hidden within a few feet of hunters who claim "there isn't a deer around."

Deer hunters who engage in drives have to be particularly careful to avoid accidentally shooting each other.

Still Hunting - This technique requires more skill and patience - it is, in fact, the epitome of hunting. To be effective a hunter must work alone, move slowly, be careful of wind direction, and be constantly alert for a glimpse of a deer. A wet woodland floor or newly-fallen snow are almost essential if the hunter is to silently seek out his quarry.

Tracking Down Deer - This form of hunting is followed by very few hunters. It requires such skill, stamina, and desire to get a particular deer that practially all hunters accept some less demanding means of attaining their goal.

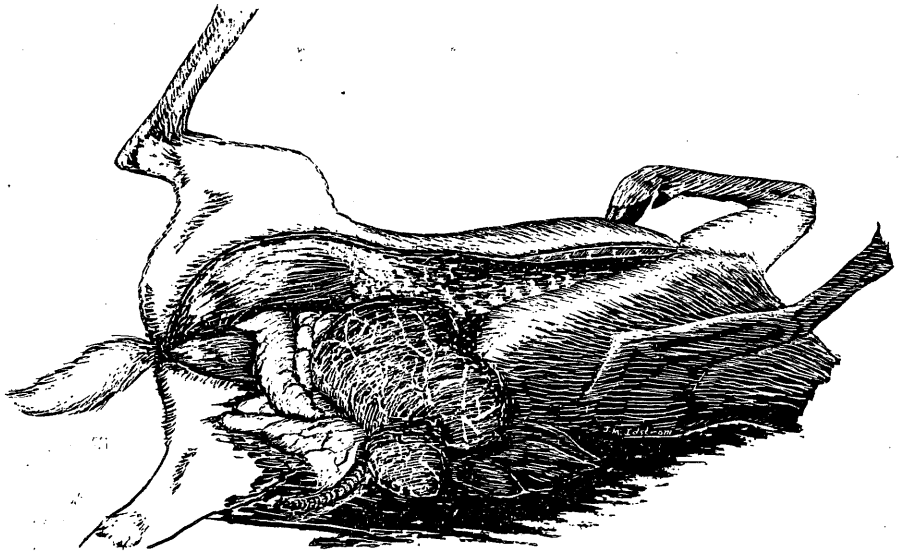
We have barely skimmed the surface regarding hunting techniques. Much more reading is needed if a hunter is to employ all the knowledge, skill, and effort possible to attain his goal. That point is not easily reached--it requires both the study of good books and much experience in the field.

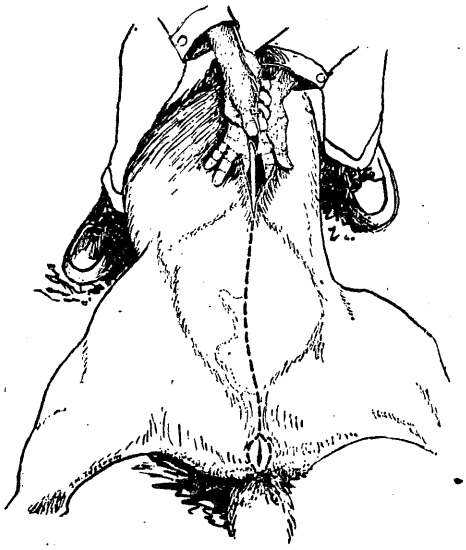
The following books provide some of the best information available that applies, at least in part, to Minnesota hunting conditions.

1. Whitetail - Fundamentals and Fine Points For the Hunter -- George Mattis, The World Publishing Co. - 1969 - New York and Cleveland.

2. The Complete Book of Deer Hunting -- Byron W. Dalrymple, Winchester Press - 1973 - 460 Park Avenue, New York, N.Y.

3. How To Bag The Biggest Buck Of Your Life -- Larry Benoit with Peter Miller, The Whitetail Press, Duxbury, Vermont - 1975.



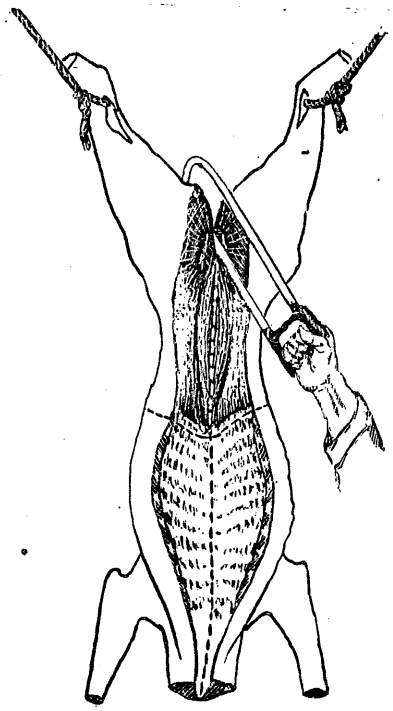


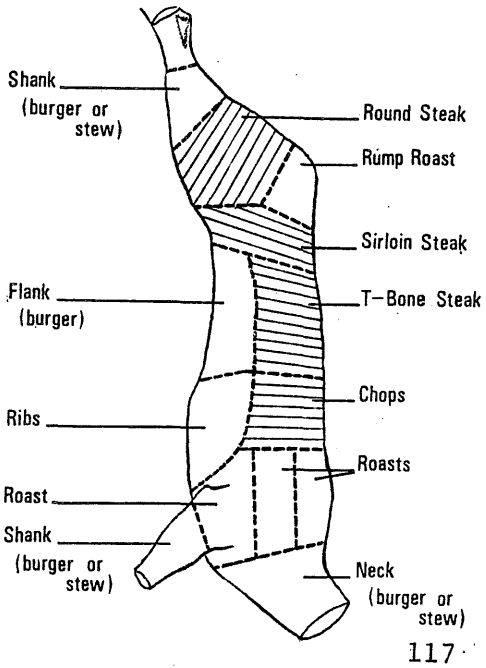
Dressing Your Deer

Many a deer hunter has been bitterly disappointed on "bringing home the venison" — spoiled! Proper handling and preparation of your deer is a must. And it's simply good conservation. Here, author John Idstrom illustrates (top, left to right), some basic steps in dressing out your white-tail.

First and foremost, affix your tag in a "proper and legal" manner, as shown at top left. Next, the author illustrates the "first step" in field handling. He also presents, in his story, some helpful hints on easy removal of viscera (above), and emphasizes precautionary measures which should be taken in the event of unseasonably warm weather. Drawings at bottom left show the various venison cuts which may be prepared with a meat saw and some applied practice.

(Note: Sketches on these pages are designed as visual aids for the text of the accompanying article by John Idstrom.)





MULE DEER

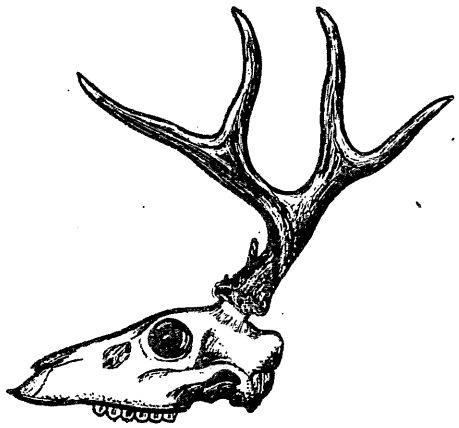
The mule deer is primarily a mammal of western states but each season a few are taken by hunters in the prairie counties of Minnesota.

Mule deer are about the same or slightly larger in size than whitetails. However, there are distinguishing characteristics that can be recognized in the field.

As indicated by the name, the ears of mule deer are noticeably larger. The white rump patch of undisturbed animals is more prominent on mule deer than on whitetails because the small, black-tipped tail covers very little of the white. Antlers differ in that whitetails have a series of tines arising from one main beam, whereas mule deer antlers branch into forks.

The two deer cousins also differ by the manner in which they run. The whitetail leaps from back feet to front feet while the "muley" springs on all four feet, as if on a pogo stick. Unlike whitetails, mule deer will often stop to look back at the source of disturbance after running a short distance.

Mule deer are legal targets during Minnesota's deer season.



Mule deer

Whitetail

Moose

Description

Minnesota moose are the same species as the Canadian moose. Both are smaller than the Alaskan variety, yet larger than a Wyoming subspecies. It is unusual for local moose to exceed 1,200 pounds.

A mature bull carries palmated antlers which begin growing in April and are usually shed in December and January. Normally the antler is not palmated until the third year. Antlers reach a maximum size around the sixth year, and then decrease in size after the tenth year. As in deer and bear, tooth sectioning is the only reliable method of determining age.

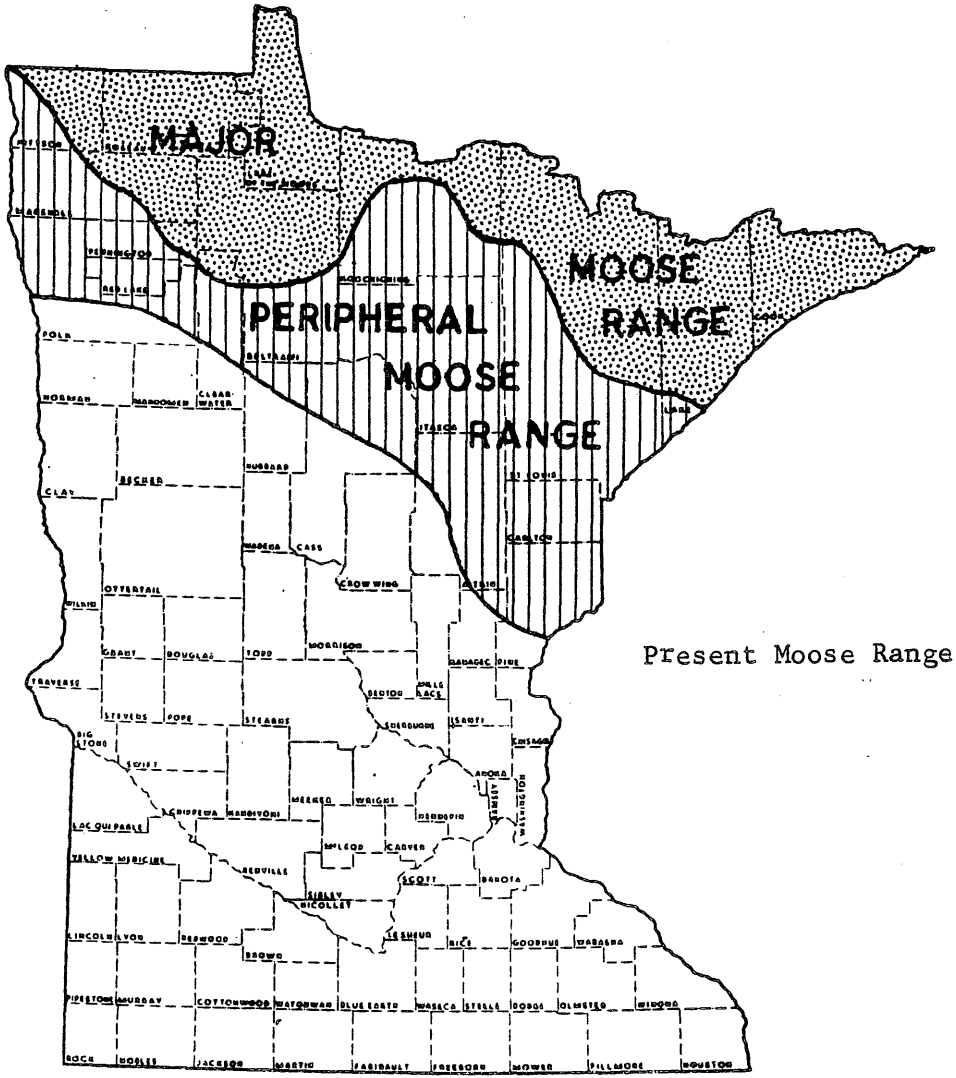
The front shoulder hump and flap of skin hanging below the throat (called a bell) are characteristic of mature moose. Coat color is dark brown to almost black except in the summer when it is lighter and more reddish in color.

Moose have rather weak eyesight, but acute senses of hearing and smell. They have long legs and splayed hooves which make them well adapted for moving about in marshy areas and along northern rivers where they feed on aquatic vegetation and various types of willows and shrubs growing along the edges of these waterways. Moose are also adept swimmers and may dive many feet below the water surface to feed on bottom-growing vegetation.

Range

Moose, the largest member of the deer-family, inhabits the flat lowland thickets of willow and aspen in northwestern Minnesota, as well as the lake and coniferous forests of the northeast.

Before settlement, moose were the most common big game animal in northern Minnesota, except in the extreme northeast area near the Canadian border where woodland caribou were most abundant.



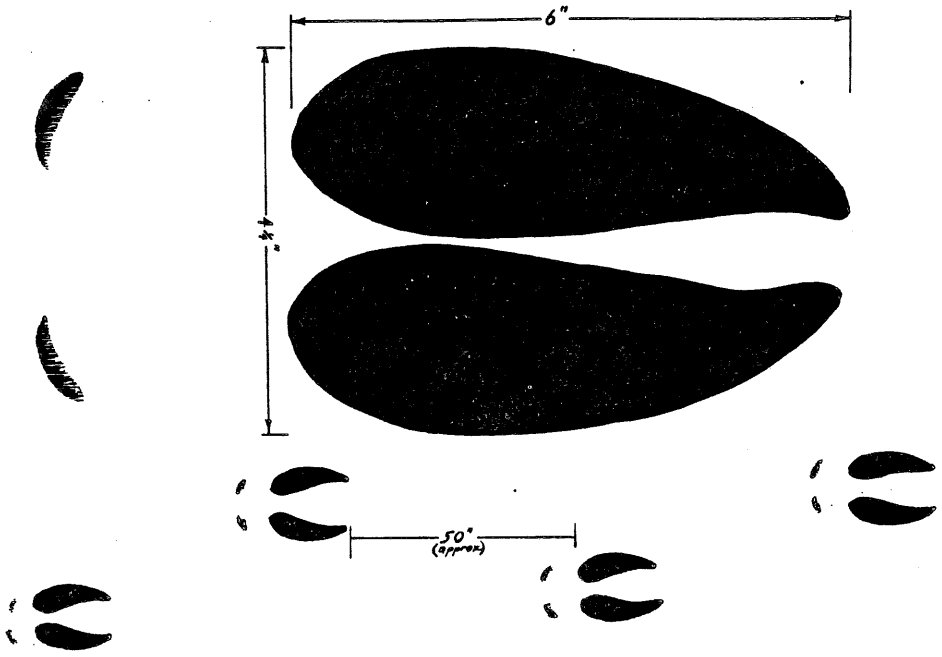
Present Moose Range

With the advent of lumbering, burning and uncontrolled shooting, moose numbers dwindled steadily until they were afforded protection by Minnesota law beginning in 1887. Additional laws were added to regulate hunting until the season was closed in 1922. Moose hunting remained closed for nearly 50 years, but despite complete protection, populations remained low (probably because of disease) during the first half of this period.

About 1950, moose populations began to increase until they peaked at 5,000 to 8,000 animals in the mid-1960s.

Moose calf - note the long stilt-like legs which are necessary in traversing the rugged terrain so indicative of their habitat.

Moose track. Tracks of trotting moose. Dewclaw imprints may show in soft sand, mud or snow.



Behavior

Moose may move about at any time of the day or night, but peak activity occurs at daybreak and sunset. Moose, similar to deer, are creatures of habit and usually feed and bed in the same general areas for several weeks if undisturbed. They prefer not to move about in windy or severe weather.

Moose seldom herd up. At most, they are found in groups of two to five animals, with smaller groups usually comprised of family members (cows give birth to one or two calves in May or June).

While they appear formidable, moose are seldom agressive, excepting the cow which feels its calf is in danger or the bull during rutting season. Bulls may direct their agression at another bull, or at small trees and brush as it rubs its antlers and paws the ground (called a wallow). The rutting or mating season usually takes place in September or October.

In summer and early fall, moose are found close to aquatic areas where they feed. As November approaches, they head for browse and cover on higher ground. Moose move into heavy cover as December's snows pile up; snow depths exceeding 30 inches may restrict their movement.

Moose are susceptible to several diseases. Moose sickness (caused by a parasitic roundworm), liver flukes and winter ticks can reduce moose populations. Roundworms may be transmitted by deer, which are little affected, but is fatal to moose, elk and caribou. In this manner, high deer populations could cause low moose populations by harboring the fatal "moose sickness."

Moose Hunting

Moose permits are issued by a random selection process mentioned earlier for anterless deer. Hunters apply for permits in groups of four. As applications come in, each part of four is assigned a consecutive number. Later, a computer selects as many random numbers as there are available permits. Application numbers are matched with computer-drawn numbers to determine the successful applicants. Each successful party of four hunters is then permitted to take one moose.

All transactions in this system are recorded, audited by outside parties and are available for inspection by the public.

Of prime consideration in moose hunting is "how to handle the moose carcass". This thought may keep hunters close to water, trails or roads. Moose float in water and can be towed behind a boat or canoe. Pulley hoists, backpacking equipment, a hatchet, knife, sharpening stones, and cloths are essential for dressing-out, quartering, and transporting the heavy meat and head.

Hunting late in the season, as in December, usually means there will be snow to enhance visibility and facility tracking. However, because the rut is over, bulls are less active during this time of the year.

Be sure to check state laws regulating the use of snowmobiles, boats or canoes for hunting. Use rifles of sufficient caliber and deep-penetrating bullets in order to produce humane kills. And, be prepared for a lot of work! A thousand-pound moose has the combined weight of four or five very large deer.

Elk

Elk (wapiti) of North America and Woodland Caribou

Before the advent of whiteman, elk were common throughout Minnesota except in the north-northeast forests. However, the latter was home for woodland caribou as late as 1885. Early settlers killed many elk for meat and hides in the 1800s and early 1900s. Agriculture, forestry, fencing, settlements and poaching reduced the caribou herds to only a few animals by the 1930s.

The Commissioner of Conservation established the Red Lake Wildlife Refuge in 1932 to try to preserve habitat for a remnant caribou herd (which at the time was the last remaining herd in the continental U.S.).

Ten caribou were captured in Canada and reintroduced into Minnesota north of Upper Red Lake in 1938 in hopes of re-building the herd.

However, the transplanting was not successful. Individual caribou have been reported in various places in years since the transplanting, but it is believed that they wander back and forth from Ontario herds. Caribou are not legal big game animals in Minnesota.

Most of Minnesota's native elk disappeared before 1900; elk hunting was prohibited after 1892. A total of 56 elk, most from Jackson Hole, Wyoming, were brought to Minnesota and placed in enclosures near Lake Itasca in 1914-1915. All but 14 animals died within a year. However, after that the herd population stabilized and eventually increased in number. In 1935, 27 elk were taken from the Itasca enclosures and released in Beltrami County. The herd gradually grew to about 100 animals in the 1940s, and could be seen in Lake-of-the-Woods, Roseau and Beltrami Counties.

Today, the elk herd has dwindled to 10 to 20 animals with poaching or shooting by irate farmers being the primary mortality factor. Elk are grazing animals and prefer alfalfa, oats, or barley from farm lands.

It is not likely that either caribou or elk will be re-established as big game animals in Minnesota. Man's activities have encroached too extensively into the former habitat of these animals.

Woodland Caribou

Black Bear

Black bear are usually black, but variations of brown are sometimes seen. Bears weigh only one-fourth of a pound at birth, but may attain a weight of 500 pounds as an adult.

At close range, bear have good vision, and excellent senses of smell and hearing. They are fleet afoot and may reach speeds of 30 MPH. Bear are also adept swimmers.

Very little was known about the black bear until Lynn Rogers, then a University of Minnesota research student, began an extensive bear project in 1969 near Isabella.

With techniques such as radio tracking and chemical analysis, Rogers gathered information about feeding habits, denning, mating, territory establishment, mortality factors and family relationships. Bear were captured, fitted with radio transmitters, weighed at different times of the year, blood samples taken, and teeth extracted for aging purposes. Blood samples revealed the presence of parasites, provided nutritional status, and gave an indication of possible, natural mortality factors.

Bear begin their hibernation between late September and early November, and emerge around April. During hibernation, they may lose up to one-third of their body weight. During the denning period, females give birth to their young. Cubs (usually two to three per litter) stay with the mother about a year and a half, and then the female will breed again (alternate years). Females don't breed until about 3½ years old. Both sexes of bear may live up to 20 years of age.

Bear are normally shy of humans and will scurry off or rapidly climb trees when alarmed. However, females with cubs can be quite unpredictable.

Other than a female with cubs or mating animals, bear are seldom seen together, preferring solitary lives. Some bear may move great distances in one or two days, perhaps 5 to 15 miles, either to feed or maintain territorial boundaries.

Range

Minnesota's primary bear range is the northcentral and northeast woodlands, though an occasional bear is seen elsewhere.

Habitat

Woodland habitat is preferred by the bear--the more extensive the better. Best bear habitat would probably contain more deciduous trees than is usual in extreme northeastern Minnesota, but the omnivorous feeding habits of this animal permit adaptation to the extensive forest regions in the north.

Rogers believes that mixed aspen-birch forests may be most favorable for bear. Bear are omnivores, eating both plants and animals. Ants, green vegetation, acorns, berries during the summer, and garbage, when available, are preferred. Bear eat little meat (unless carrion or garbage is found) and will seldom kill any animal for food.

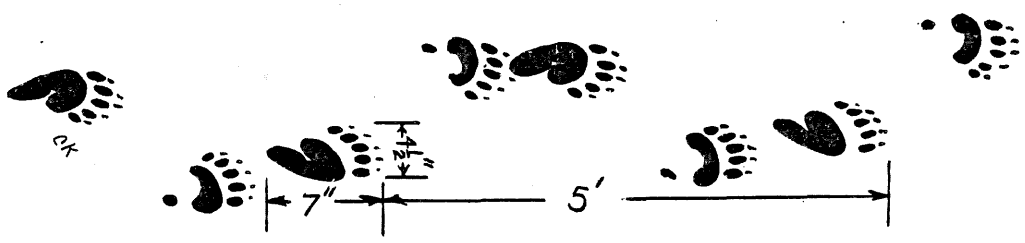
Hunting

The black bear was classified as a big game animal in 1971. Prior to that it was unprotected and was taken throughout the year.

Today, bear are hunted beginning in September with the hunting season continuing about six weeks. However, bear can be taken with bow or arrow during the archery deer season or during the specified days of a deer hunter's firearm season. It is illegal to use dogs to hunt bear in Minnesota. Bear may not be taken within one quarter mile of a dump, and cubs are protected.

In Minnesota, most hunting is probably done similar to deer hunting. Hunters move slowly through the woods, while others take stands. If the bear's daily movement to water, feeding, or bedding areas can be established, hunters can wait along trails.

In order to locate likely bear areas, hunters should look for sign, i.e., tracks, droppings, beds, or disturbances around carrion. Carrion or strong-smelling decaying meat is sometimes used as bait to attract bear to the waiting hunter. One thing is certain, bear hunting is extremely difficult, with most bear taken by chance rather than by plan!



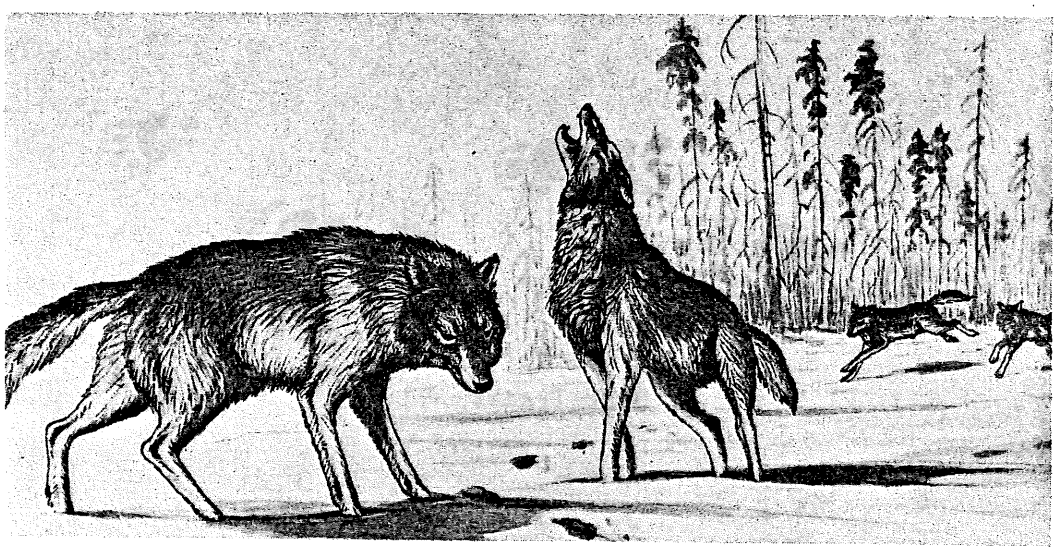
Bear Tracks

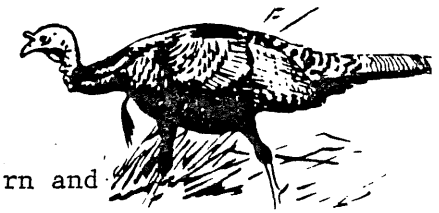
Eastern Timber Wolf

The timber wolf probably lived throughout Minnesota in pre-settlement times, though it was primarily an animal of wooded wilderness. In recent years, its main range has been the northeastern and north-central counties. The timber wolf is most common along the Canadian border in Cook, Lake and St. Louis Counties. The Department of Natural Resources estimates the 1975 wolf population to be between 800 and 1200 animals.

At this writing, timber wolves are completely protected by the Federal Endangered Species Act of 1973. The high level of the wolf population in Minnesota does not warrant such a classification and the DNR has petitioned the U.S. Department of the Interior to remove the timber wolf from endangered status in Minnesota.

The Minnesota DNR favors a management plan that will: 1) guarantee the survival of timber wolves in as great a distribution and density as practical; 2) minimize the conflict between wolves and domestic stock; and 3) permit surplus wolves in non-wilderness areas to be utilized as a recreational resource, primarily for hunting and limited trapping.





Wild Turkey

Turkeys were once scattered throughout much of eastern and southern U.S., but were virtually eliminated by unregulated shooting in most states.

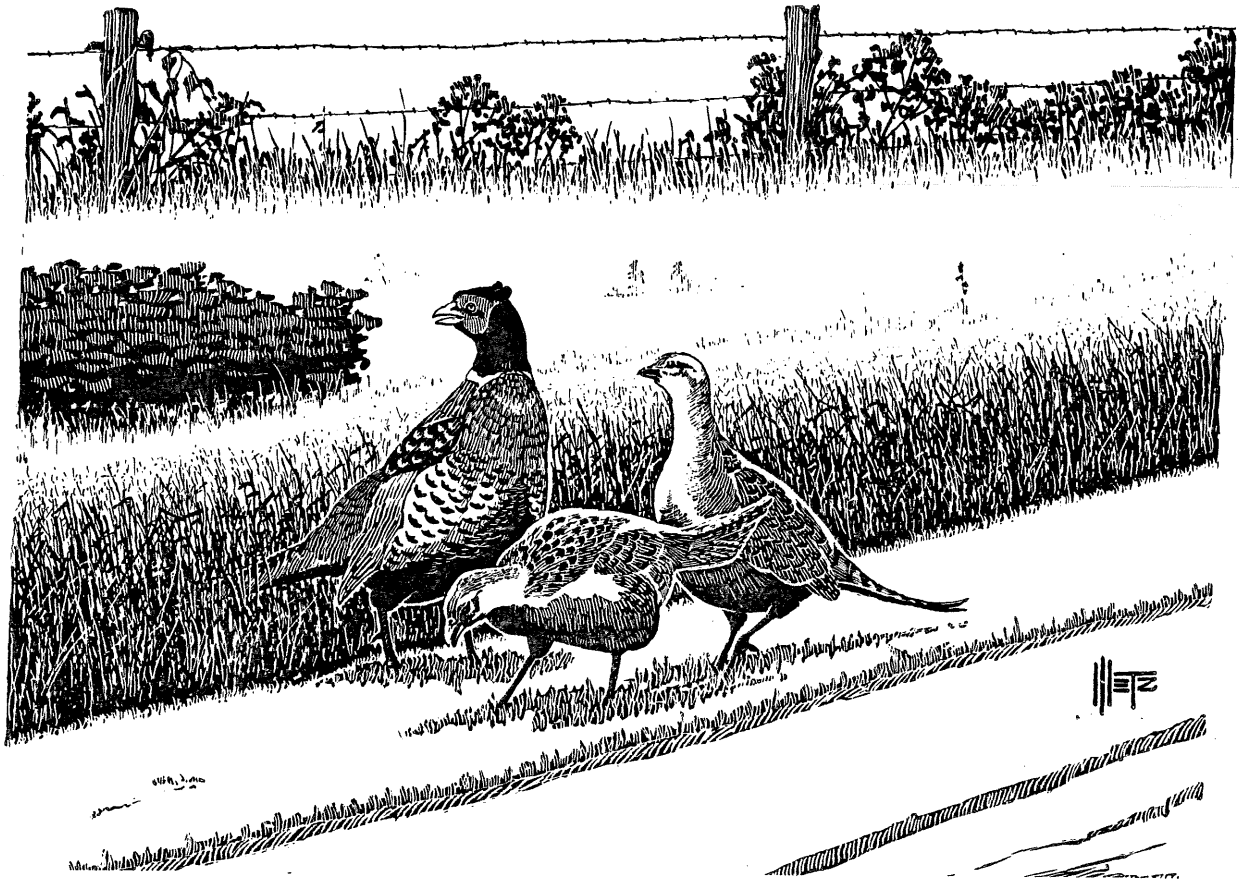
For years, wildlife managers have felt that the southeastern corner of Minnesota in Winona and Houston counties contained ideal wild turkey habitat. Plantings of several hundred pen-raised turkeys were made in 1926, 1936, and 1957 in those areas, and all attempts failed.

In 1964 and 1969, however, a total of 68 wild-trapped turkeys from Nebraska and Arkansas were released on the Whitewater Refuge and Wildlife Management Area in southeast Minnesota. From these transplants has grown a flock of 1,000 to 1,300 birds.

Although the hen may weigh only 15 pounds, a wild "tom" may total as much as 25 pounds. The birds are elusive, cautious and difficult to spot. They are naturally wary and exhibit amazing speed both in the air and on the ground.

The Minnesota Legislature has yet to authorize the Department of Natural Resources to establish a hunting season on turkeys. Biologists point out that hunting tends to make turkeys very wary of man. It is this intense wariness that is necessary to keep birds from feeding in and near farmyards where they might come in contact with various poultry diseases.

Turkeys are hunted in many other states and are considered by many sportsmen to be the ultimate upland game bird. Minnesota biologists have determined that enough surplus turkeys already exist so that a limited hunting season, perhaps designed on a hunter drawing basis, could be held without adversely affecting the state's steadily-increasing turkey population.



Ring-necked Pheasant

Known technically as Phasianus colchicus, this unique strain of pheasant is better adapted to its modern American range than any other game bird. With adequate food and cover, he's just about impervious to cold and can withstand extremely hot summers as well.

The ringneck cock is a large bird, normally weighing just under three pounds. The male is a symphony of russet and copper flects of green, white and black. Vivid crimson patches frame his eyes, and the black head-feathers are shot with iridescent violets and greens. Usually, but not always, there is a white neck ring. By contrast, the softly-toned hen has relatively subdued brown and black markings that fade into light buff and cream on her underparts...a perfect camouflage.

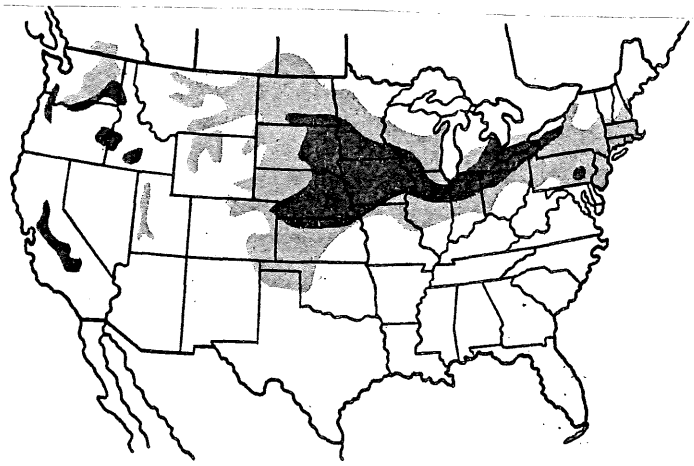
When chased, a running rooster usually breaks into the air with a noisy clatter, shouting his hoarse "ca-ak! ca-ak!" Handicapped by a

low ratio of wing area to body weight, the air-borne pheasant compensates by beating his wings more than three times per second. A rooster pheasant has been radar-timed at 38 miles per hour as he entered his glide, and 48 m.p.h. at top speed. They may fly a mile or more, and though normally leveling off at 25 feet, have been known to fly at a 100-yard altitude for 2½ miles.

Besides being resistant to heat and cold, the ringneck is well equipped to resist food shortages. It is not uncommon for birds to survive at least a week without food, even in the most severe weather. They are quick to regain weight, strength, and cockiness. Of all game birds and mammals, the pheasant probably is the least susceptible to disease and parasites.

In spite of his basic ruggedness and resistance to disease, the pheasant is fairly short-lived. The average life span for most pheasants is less than one year. The population is always a young one, with huge annual turnover. Winter storms without shelter present a hazard, especially blizzards and sleet storms followed by plunging temperatures.

North American Distribution



Best Pheasant Range

Fair to Medium Pheasant Range

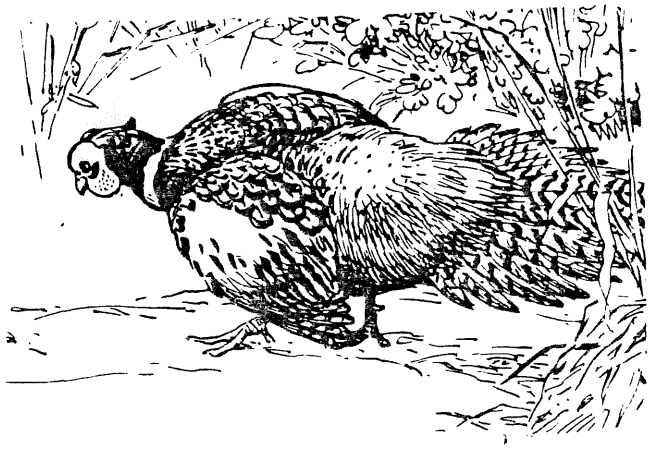
History

First introduced in 1905, pheasants increased in numbers with additional plantings until Minnesota had its first pheasant season in 1924. Some 300 birds were bagged in that first season. By 1930, 531,000 ringnecks were taken from the exploding population. Peak pheasant harvests occurred between 1934 and 1943 where the annual hunters' bag ran between 1 million and 1.8 million birds. From 1940 to 1963, yearly takes declined slightly, but still averaged about 1 million birds. The latter period corresponded with the Federal Soil Bank Program in Minnesota (1955-1964) in which farmers left large acreages of undisturbed grasslands.

From 1964 to 1973, pheasant harvests steadily declined to about 200,000 birds per year. With human populations increasing, land for "people food" has taken precedence over nesting and cover areas for wildlife. Roadsides and farmhouse windbreaks are the principle nesting and winter cover areas remaining in Minnesota pheasant country.

Range

Pheasants now inhabit all areas of south and central Minnesota. The greatest concentrations have been in the southwestern and south-central parts.



Habitat

Pheasants like the good things in life and this means the best farmlands. Just as the richest soils produce the best crops of wheat, corn and potatoes, they also produce the best pheasant crops, if cover is available. In the best range, croplands are associated with about 25 percent wasteland (wooded, brushy, ungrazed grasslands) where pheasants can nest and find winter cover.

Although they will roam widely to fulfill their many life needs, pheasants spend most of their time on about a square mile or less, if the area provides food, winter cover, loafing cover, travel lanes and nesting and roosting cover. In the fall, they'll move around a bit more as cover becomes scantier, farming activities step-up and the hunting season stirs everything.

Then comes winter when survival itself is a day-to-day challenge. At this time, their movements hinge directly on weather, cover and food supplies. When winter descends in all severity, they drift toward denser cover and may congregate near farm windbreaks, or in large marshes. They prefer marshes for cover, but as these fill with drifted and blown snow, they retreat to woodlots, farm groves, brushy bottomlands, and other heavy cover. Even then,they seldom move more than three miles from their summer haunts. Wintering pheasants tend to flock, sometimes by the hundreds, and occasionally segregate by sex. This segregation often prompts casual observers to believe that the roosters far outnumber the hens, or vice-versa.

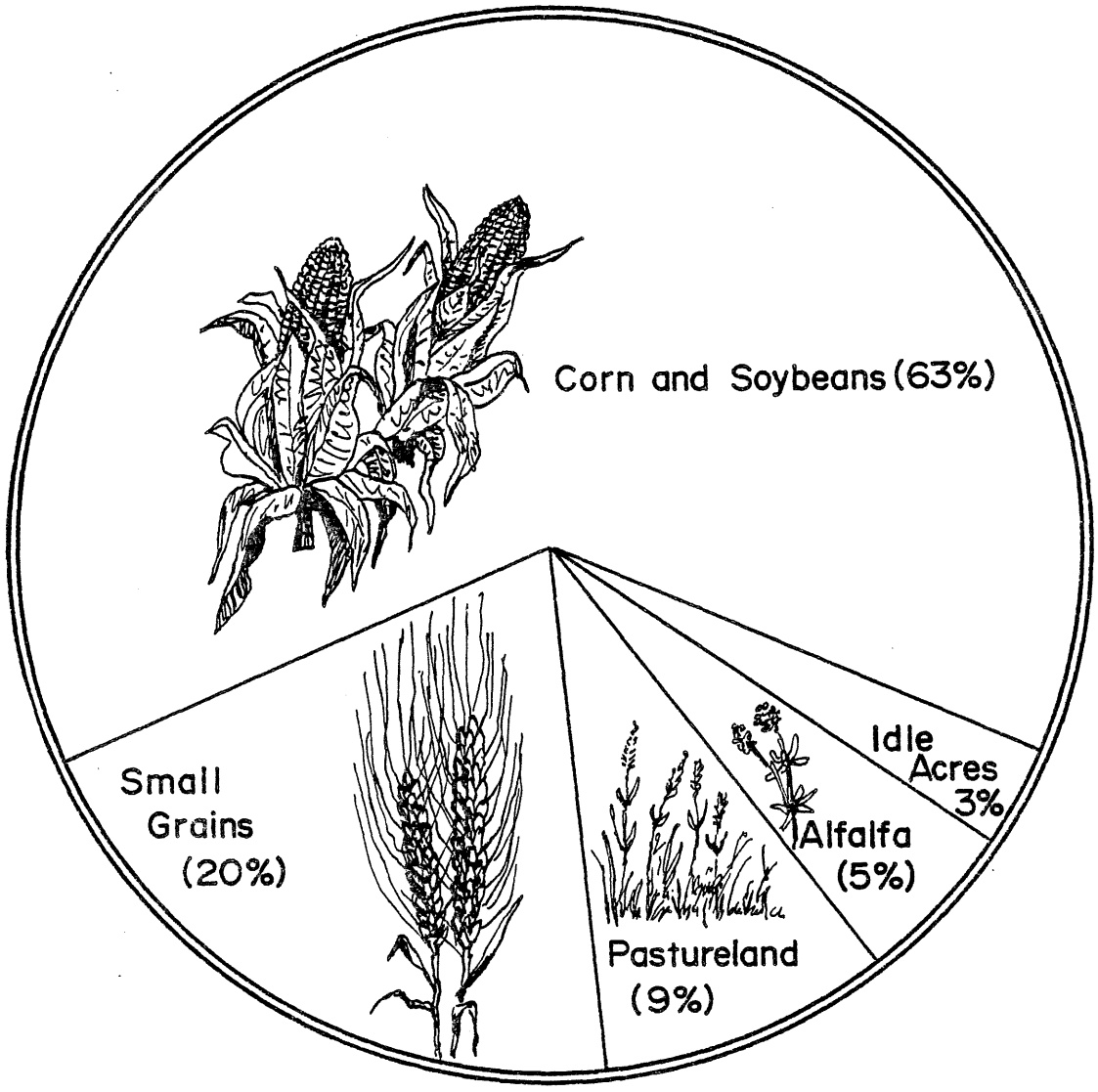
Behavior

Cock pheasants are highly polygamous; one rooster for every five to ten hens is ample for reproduction. The production of young is assured by having a plentiful supply of female birds carried over the

winter; hence the closed season on hens. A typical Minnesota spring finds first nests established during April and May, in old dry grasses and sedges or at marsh edges. Eggs in the first nest average about 12 and require 24 days to incubate. If incubation is completed, about 90 percent of the eggs will hatch. The hen pheasant will renest two to three times if her first nest is destroyed.

With favorable weather conditions, about 50 percent of the hens present in the spring will be successful in raising a brood. Others will have been lost to hay mowers or other mortality factors.

The staple diet of adults is corn, wheat, oats, soybeans and wild plant seeds. However, during their first eight weeks, chicks derive the protein needed for rapid growth by feeding on insects.



The Pheasant's Diet

Mortality

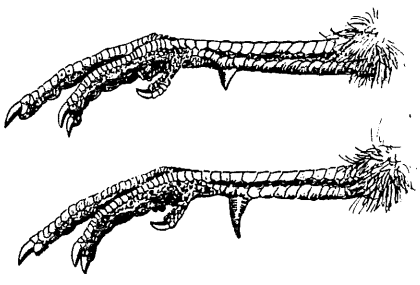
High-speed haymowers operating in alfalfa fields or roadsides, both popular nesting spots for pheasants, take a deadly toll of hens, chicks and eggs. Pheasants are also killed by predators, from exposure to severe storms--especially during winter--or from starvation. However, the latter factor has been greatly over-exaggerated. Where pheasants are well established in good habitat, starvation is seldom important.

Pheasant management and hunting seasons have always been subjects for debate. Some people believe there should be more and longer seasons; while others argue for fewer and shorter seasons.

The survival of hens is extremely important in determining the next year's pheasant population. For this reason, Minnesota and most other pheasant states have a rooster-only hunting season.

A newly-hatched pheasant crop will include about one-half hens and one-half roosters. Even though the population contains enough roosters to provide one for each hen, the biggest, most powerful roosters will attract, defend (against other competing roosters) and breed a "harem" of hens each spring. Up to 90 percent of the roosters are not necessary for reproduction. These extra male birds provide hunters with many hours of outdoor recreation.

Fall rooster hunting is good management as far as the birds are concerned. But we must also consider the hunter and the farmer. Part of our goal is to distribute the birds fairly and to provide maximum recreation. Several basic facts should be considered in this regard.

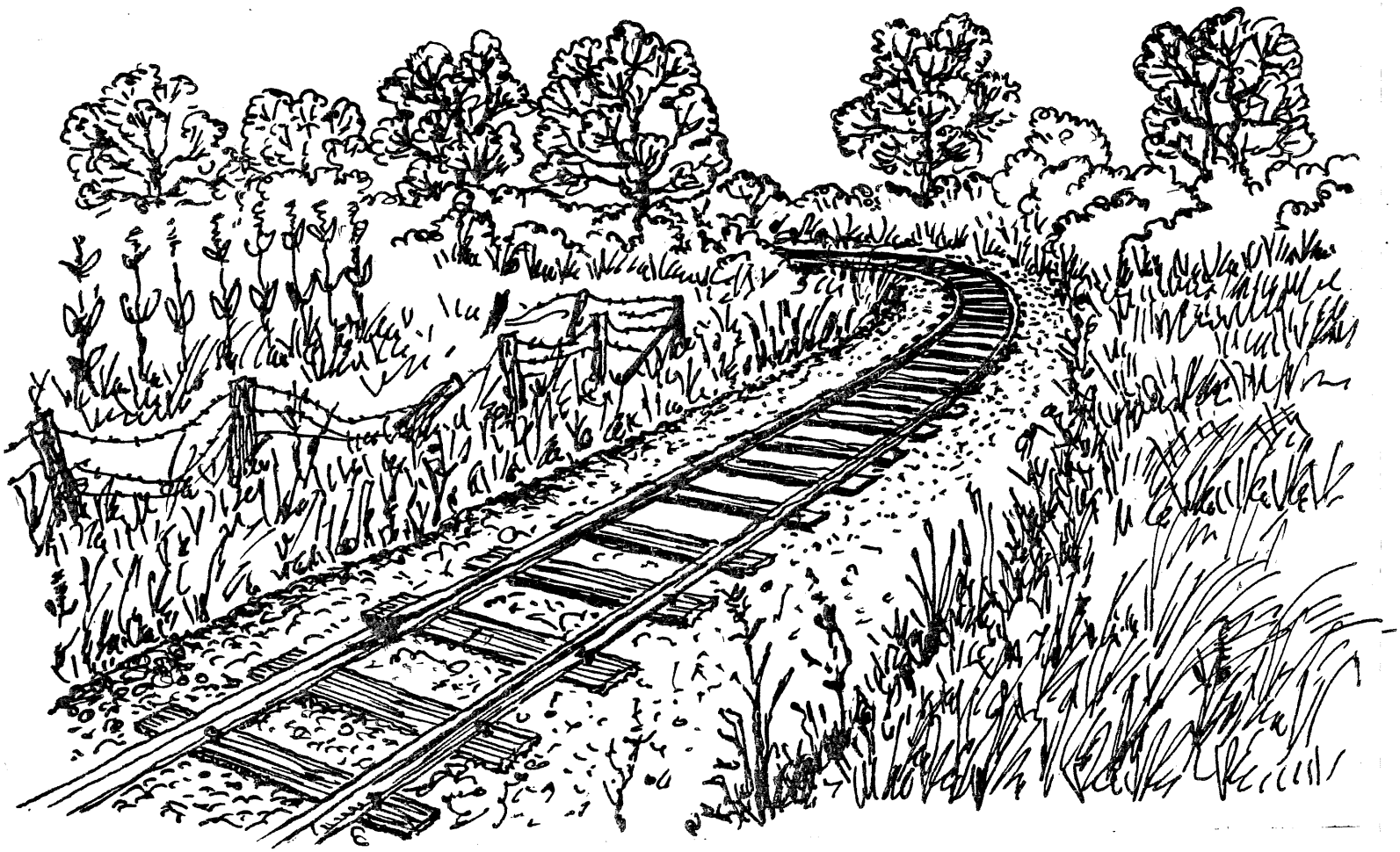


Spur Length

Young cocks are equipped with dull-colored, blunt spurs less than 3/4-inch in length, above. Adult spurs are shiny black, pointed and over 3/4-inch long, below.

From 75 to 85 percent of the season's kill of pheasants occurs during the first nine days of a 30 or 40-day season. Nearly an equal amount of the hunting pressure occurs during the same period. Most of the corn is normally not harvested until the last week in October. Before this time, farmers are busy and most do not have time to hunt.

If the birds are plentiful, a large bag limit will still allow plenty for all. If they are scarce, a smaller limit will give some assurance that the easy-to-get birds will not be too heavily hunted on the first



Pheasant Country

weekend, thus distributing them among more hunters and over a longer period of time.

In summary, the MDNR suggest that 1) we should have a season on roosters every fall; 2) the season should be as long as possible; regardless of the number of pheasants; and 3) the bag limit should be adjusted from year to year according to the bird population to assure distribution of the harvest.

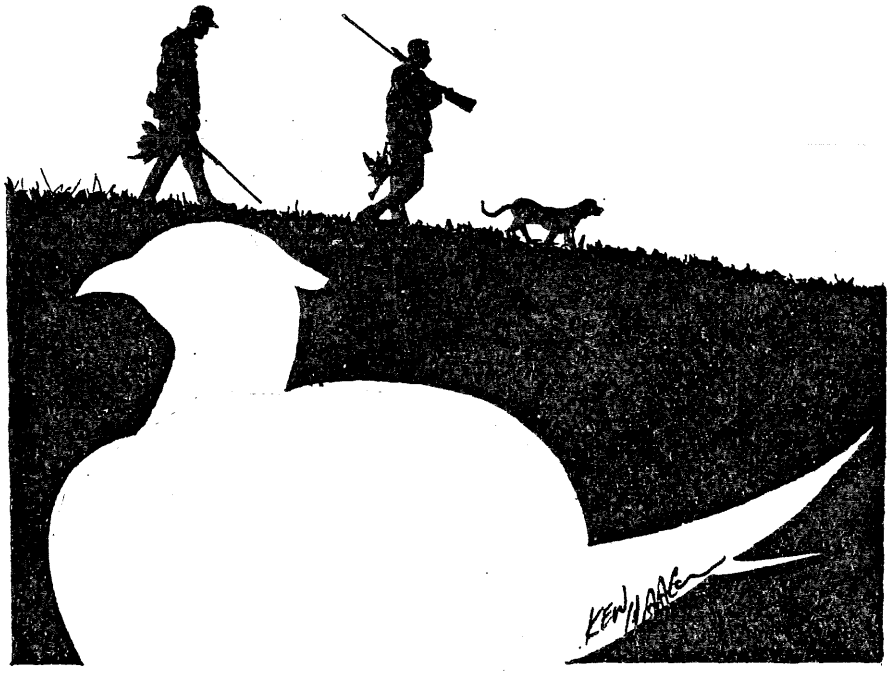
Hunting

It doesn't take much preparation to hunt pheasants. A small game hunting license, a shotgun and access to pheasant country are the basic requirements. A good dog is a great help for locating birds and retrieving wounded birds. In fact, a good dog will double the satisfaction of the hunt and put more birds in the bag. Labradors, springer spaniels, Britanny spaniels and German shorthairs are all good. Training is the most important element in developing a good dog.

Now for guns. The brand and guage of shotgun are largely of personal preference. A full-choked gun is fine for far-out shots, but modified or improved cylinder barrels usually offer the best all-around combination.

Early in the season, the birds scatter as singles or in small flocks. On mild days, they spend most of their time in standing corn, if it's available, and will roost in hayfields or grain stubble. Grassy swales, idle acres, and wetland edges are also attractive to pheasants and especially worth checking late in the day when the birds go to roost.

As the season progresses, the birds seek heavier cover and a quiet approach can sometimes put the hunter in the midst of a sizeable



flock on the lee side of a heavy marsh, willow thicket, woodlot and other such area.

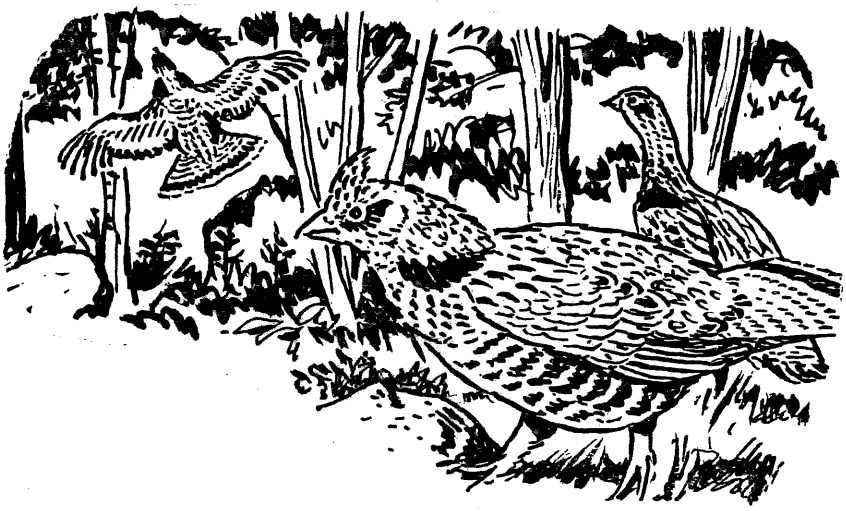
Pheasants will either go out a block or so ahead, or sit tight and let the hunter pass by. Later in the season, roosters spook easily and have to be approached "on the sly", or driven out to hunters stationed inconspicuously at the end of the cover.

Many hunters prefer to hunt in groups of two to five. Others are loners who like to work small patches with their dogs, though groups of 10 to 20 will work the big cornfields.

Cooking Tips

The pheasant's flesh is lean with few fat deposits and the meat dries when being cooked. To reduce the loss of moisture from skinned birds, cover with cooking oil or strips of bacon before baking.

Cut the skinned pheasant into serving-size pieces and season with salt and pepper. Brown in butter or cooking oil; add one cup of half milk and half cream and one can of mushrooms. Cover the pan, then simmer until meat is tender.



The Ruffed Grouse, commonly but mistakenly called a "partridge", is the number one upland game bird in Minnesota

Ruffed Grouse

Description

The Ruffed Grouse is about one-half the size of a pheasant. It measures between 15 and 18 inches long, and weighs between one, and one and one-half pounds. We have two color phases (overall color of the bird's feathers) in Minnesota; red and gray. Both phases are found throughout the grouse range. The gray phase is more common in the aspen areas of the north and the red phase is more pronounced among birds in southeastern and central woodlands.

The bird is noted for its fan-shaped tail marked by a broad, dark band. It also has a concealed neck ruff--from which it got its name--which the male puffs out during display and courtship.

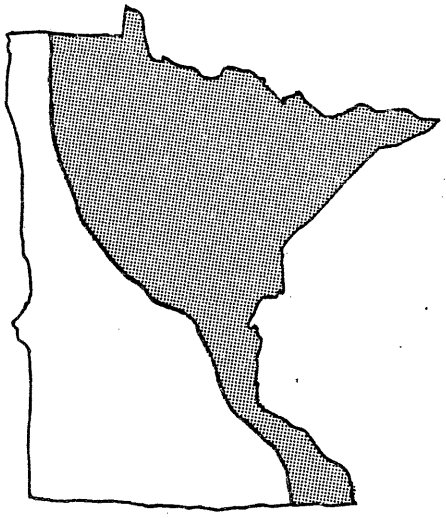
The Ruffed Grouse is well-equipped to survive in a land of heavy snowfall. Each toe is lined with tiny outgrowths called pectinations. These small growths measure about one-tenth of an inch, thus making each toe about twice as wide as normal. These natural "snowshoes" enable the grouse to travel over all but the very softest snow without sinking in.

History

The Ruffed Grouse has probably existed in Minnesota's northwoods for thousands of years. Man's activities in recent years have created great declines in the number of Prairie Chickens, Sharp-tailed Grouse and Bobwhite Quail. But his activities have caused the Ruffed Grouse to expand both in range and population. For example, countless acres of mature woods have been logged off, with new growth of trees and shrubs sprouting up. This new growth, expecially of aspen trees, is the favorite habitat of the Ruffed Grouse.

Range

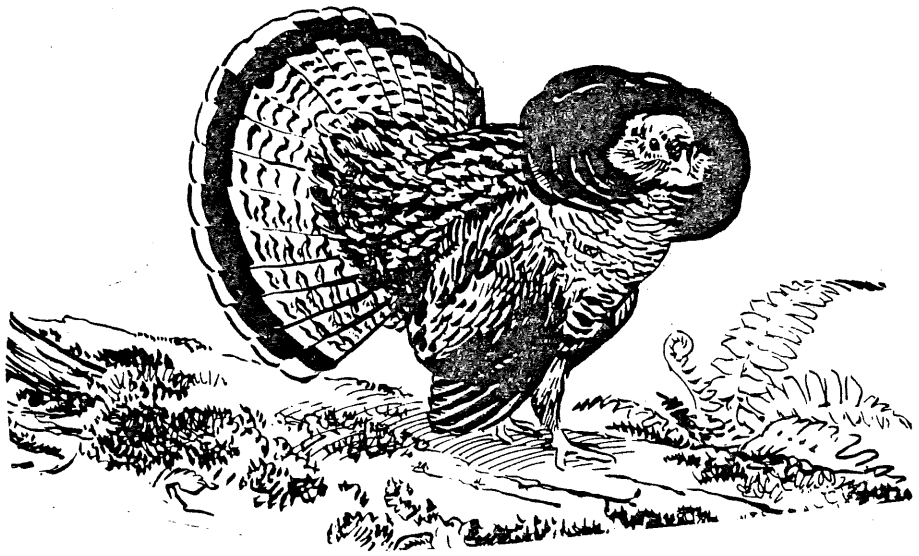
The Ruffed Grouse is one of the most widespread game birds in North America. It is found in 37 states and throughout much of Canada. The bird is found in all of our forested regions of northern, central and southeastern Minnesota.



Habitat

In Minnesota, Ruffed Grouse prefer second growth hardwood forests (woods that have grown up after logging) with scattered evergreen trees (those trees with needles). They are found also in alder lowlands and open evergreen forests and seem to be most abundant in forests recovering from fire. Woodland-field edges are frequently used by the birds for feeding.

The birds are usually found in or near their favorite foods--the buds and leaves of aspen trees, clover, and all sorts of berry-producing shrubs including raspberry, blueberry, pin and choke cherry, grape, thornapple and rose hips.



Drumming Male Grouse

Behavior

In early spring, courtship begins when the male picks out an old log or stump and starts to drum. He does this by beating his wings in the air, starting slowly as a series of distinct thumps. As the wings gain speed, it sounds like a rapid beating of a distant drum. The sound produced resembles that of a basketball dropped on a wooden floor.

Drumming usually starts before daylight and may continue through the morning. This is his signal to the females who are attracted to the log where mating occurs. (A drumming log can be recognized by the collection of inch-long, white droppings).

Grouse usually build their nests in May or June at the base of a tree, stump or log, amidst a stand of hardwoods. Usually, there will be a trail, narrow road or natural opening within about 100 feet of the nest.

A clutch may vary from 9 to 14 eggs. If the first nest is destroyed, the female may renest, but will lay a smaller clutch. Incubation lasts about 23 days.

Ruffed Grouse do not normally gather in large flocks. Their home range is typically quite small and the birds spend the greater portion of their life in an area of about 40 acres. Thus, it is important that all seasonal habitat requirements exist in relatively small units of woods.

Mortality

Studies have shown that predation, largely because of goshawks and great horned owls, may be an important cause of grouse mortality. Hunters annually harvest about 450,000 birds, but this number may vary from as low as 100,000 to almost one and one-half million birds from year to year.

Grouse are noted for having ups and downs in population, usually occuring over a ten-year period. Reasons for these large variations are not fully understood though research is underway to find out why.

Hunting has very little impact on the overall grouse population. Even in the most heavily hunted areas, enough birds will remain to breed the following spring. This is true even during years when birds are scarce.

Winter presents problems for grouse although the bird has adapted well to this difficult time. The birds survive better in years of deep snow when they are able to "burrow-roost" in the fluffy snowdrifts. Grouse bury themselves in the snow where they spend the night safe from cold temperatures and storms. Burrow-roosting also hides the birds from their winged predators.

It may seem surprising, but it is actually warmer inside the snow than above it. The insulating quality of soft snow is so great that the temperature may be as much as 50 degrees warmer for a grouse beneath the snow, than for one exposed to the elements. A grouse may "burrow-roost" as long as 23 hours a day when temperatures are extremely cold.

Management Techniques and Problems

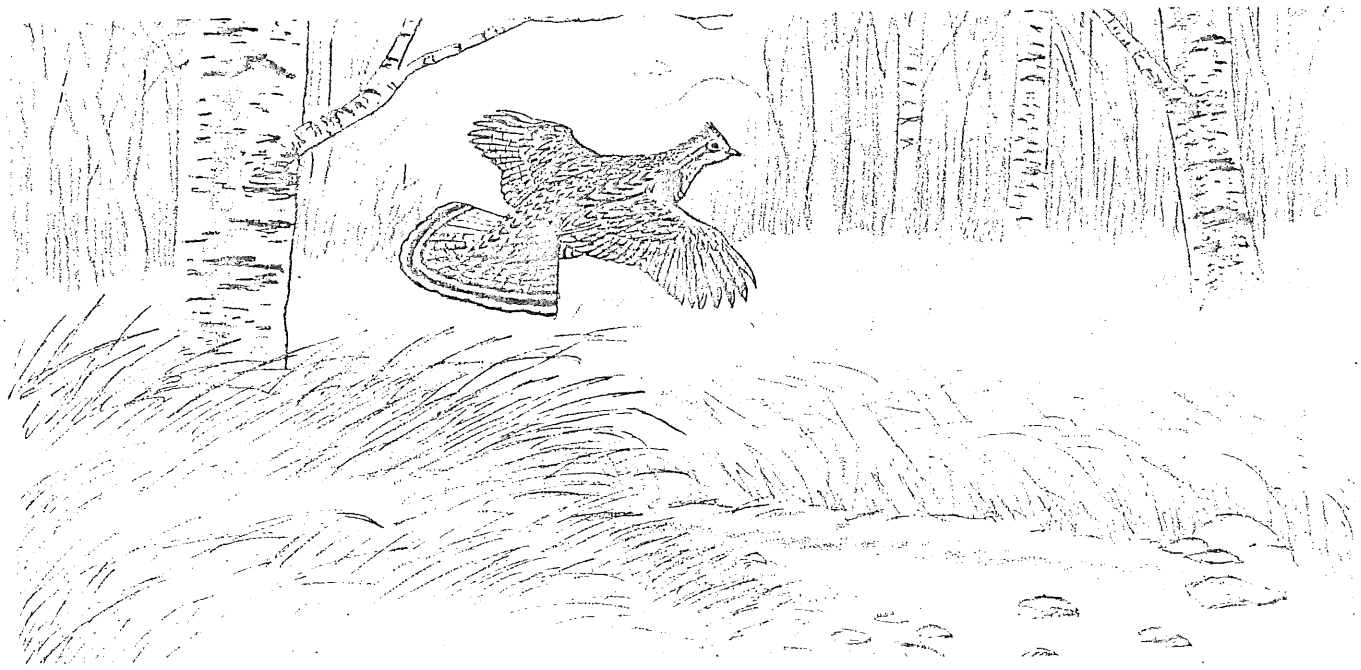
Research is continuing on management techniques to produce more Ruffed Grouse. It is known that a mature forest is little-used by grouse. Therefore, cutting and planting in small forest areas--from 10 to 20 acres in size--appear to be most beneficial to grouse. Grouse also appear to benefit from new trails or other openings, especially those areas seeded to clover, a popular food.

Currently, improving habitat for these birds is quite expensive. Thus, most habitat improvement should be tied in with sound forest management, such as carefully locating various logging activities.

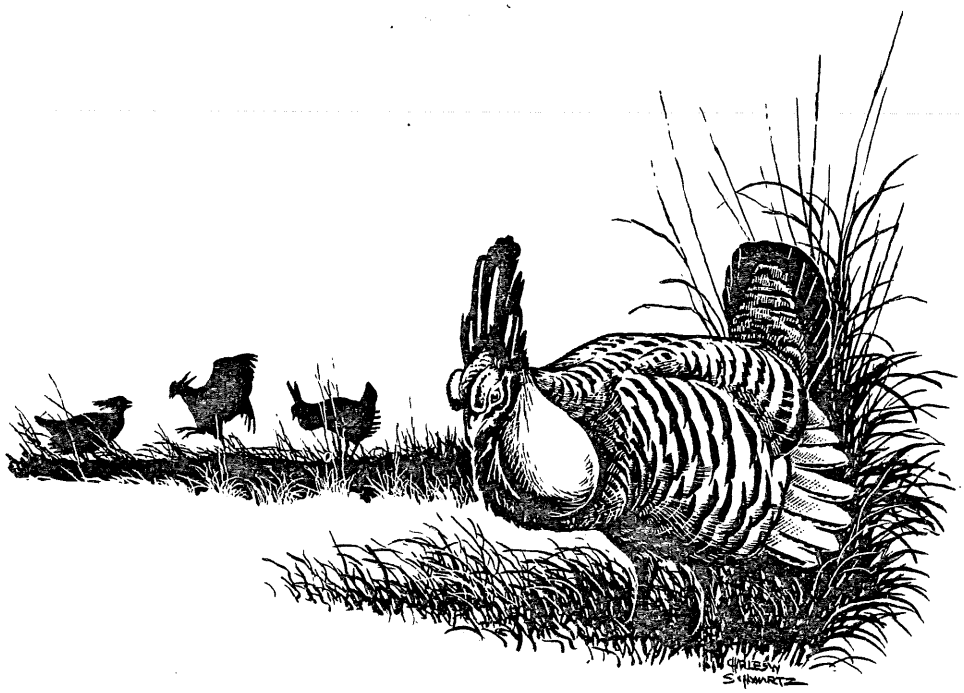
The Future

If Minnesota's forests continue to be logged as they mature, the future of the Ruffed Grouse will remain bright. However, we can expect continued ups and downs in its population.

It should be noted, however, that conversion of Minnesota's forested areas to other uses will remove more and more grouse habitat. Changing land-use practices are turning forested acres into croplands, highways, shopping centers, residential developments, industries and recreation centers. When the trees go, so do the grouse.



Grouse in Typical Woodland Habitat



The Prairie Chicken or Pinnated Grouse

Description

The male prairie chicken averages slightly more than two pounds in weight and females about a half-pound less. They have feathered lower legs, as do all members of the grouse family. However, the Prairie Chicken has exposed yellow skin along the back edge of its legs. This has earned it the nickname "old yellowlegs."

The Prairie Chicken is identified by its rounded tail and heavily barred stomach region. The bars run across the entire breast from the throat downward.

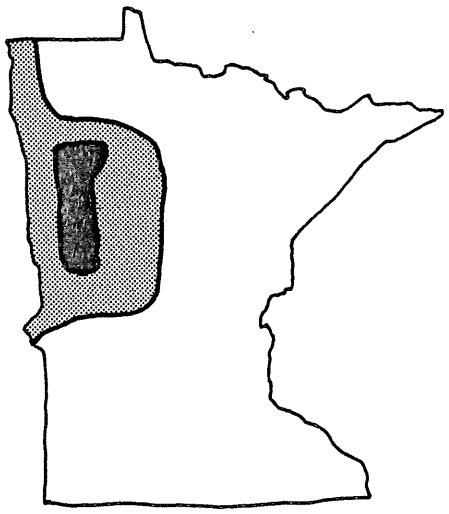
The bird has long erect neck feathers or "pinnae" from which it derived its name, Pinnated Grouse. Males have bright, orange-yellow eyebrows and air sacs. The air sacs are used for making the booming call associated with mating behavior.

History

Bird experts can find no evidence that prairie chickens were in Minnesota before the coming of the white man. If present, they were only in the extreme southern portion of Minnesota. More likely, the bird entered the state from the east and south sometime around the early 1800's. It may have followed the early pioneers into our state from Iowa and Wisconsin. The pioneers converted the forests and brush to grasslands, much to the liking of these birds. These habitat improvements spread in a northwesterly direction from the southeast corner of Minnesota.

Range

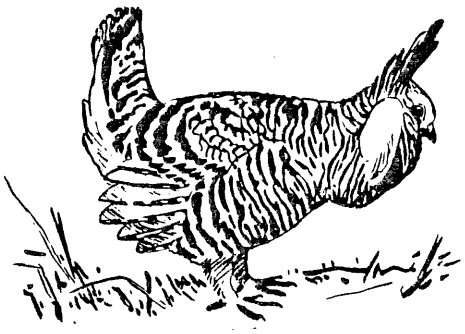
Today, the Prairie Chicken has been backed into a small corner of northwestern Minnesota including the following counties: Red Lake, Polk, Norman, Mahnoman, Clay, Wilkin, Becker, Ottertail and Wadena.



Habitat

Grasslands are essential to Prairie Chickens, and quality of the grasslands is just as important as quantity. This bird thrives in medium and tall grasses. In fact, its grassland should have an average springtime height of at least 20 inches and should be dense enough to conceal a nesting bird.

Corn and small grains furnish more than four-fifths of the Prairie Chicken's food during late summer, fall and winter. Corn is a favorite food. Its diet in early spring is plant buds, but the birds will also dine on greens and many types of berries. Young chicks live largely on insects, switching later in life to plant food.



Booming Male Prairie Chicken

Behavior

Probably the most unique thing about the Prairie Chicken is its elaborate courtship display. In late winter or early spring, male Prairie Chickens select a piece of land called a "booming ground." Males gather here daily in the early morning and evening.

Most booming grounds are located on open ridges, grassy knolls, or slight rises in the land. Often the same site is used year after year. Some booming grounds have been used for over 40 years!

During the courtship display, the male inflates his orange-colored air sac and produces a booming call which can be heard for a distance of up to one mile. The male also dances about, opening and snapping shut his tail feathers and stamping his feet rapidly.

Although there are many males present on the booming grounds, each defends his own small territory against other males.

Females do not visit the booming grounds until late March, and then only for a brief time. Actual mating does not take place until April.

The hens begin nesting activities at the height of the courtship display, usually around May 1st. Nests are constructed on the ground, usually within a mile of a booming area. They are very flimsy, lined with dead grasses, and are located in natural hollows or in depressions scratched out by the hen.

The average clutch is 12 eggs. Like the pheasant, the Prairie Chicken will renest if the first nest is destroyed. However, the number of eggs in her next nest, as well as their fertility, will be reduced. Incubation period is between 21 and 23 days. As in the case of the pheasant, Prairie Chicken youngsters are able to leave the nest with their mother within hours after hatching.

Mortality

Prairie Chickens are preyed upon by fox, coyote, badger and many other predators including hawks and owls. Although these birds have not been hunted since 1942, their numbers have dwindled as undisturbed grasslands have been lost.

Management Techniques and Problems

There is widespread concern among conservation organizations and agencies regarding the future of the Prairie Chicken in Minnesota. Thankfully, something is being done to preserve and protect this bird for future generations to enjoy.

As mentioned earlier, undisturbed grasslands are essential to Prairie Chickens. In northwestern Minnesota, most of the grasslands which have escaped the plow are used for grazing and hay lands.

Prairie Chickens cannot exist in areas where most of the land is used for continuous crop production. Grazing and haying reduce cover, and the birds seldom survive on grasslands which are cut for hay each year.

Grasslands that lay undisturbed for more than 10 years are also undesirable to Prairie Chickens. The grass species lose their vigor, allowing broad-leaved plants to take over.

Before the whiteman, grasslands were developed and maintained by natural wildfires. With this in mind, modern-day wildlife managers are once again turning to fire to provide good habitat for Prairie Chickens. The technique, called "prescribed burning" is usually done in the spring, after considerable planning, and only during the best weather conditions. Prescribed burning keeps the grassland in good condition for Prairie Chickens by preventing the invasion of timber and unwanted brush onto a prairie. In addition, it causes lush new growth that will provide excellent nesting cover.

Food plots are also being maintained for chickens on several state Wildlife Management Areas. In these areas, corn, oats, buckwheat or millet may be planted and left standing to provide a winter food source.

The Future

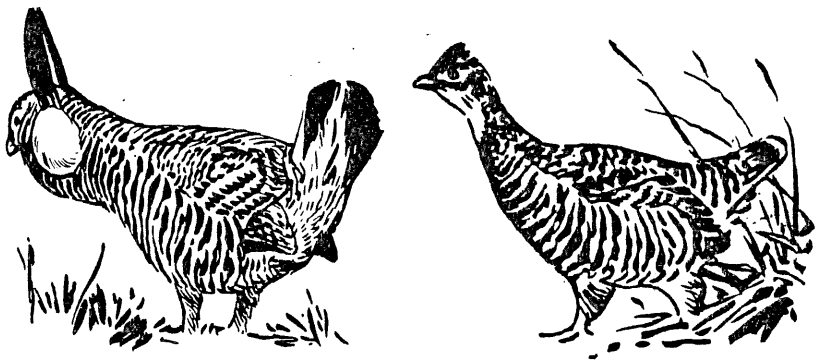
There are an estimated 4,000 Prairie Chickens in Minnesota. Hopefully, this total will be maintained or even increased in the years to come because of several management programs.

The Department of Natural Resources has classified the Prairie Chicken as a "threatened" wildlife species in Minnesota. And so, in addition to its management techniques, the department has begun a program to acquire grasslands inhabited by the birds.

This wildlife land acquisition program, which is supported mainly by a special tax on small game hunting licenses, has already rescued some 25,000 acres of wetlands and grasslands within the Prairie Chicken range. A Federal agency, the U.S. Fish and Wildlife Service has saved another 7,000 acres and a private organization, the Nature Conservancy, has purchased another 3,400 acres with more to be acquired in the future.

The Nature Conservancy and the DNR have jointly employed a wildlife manager who will be responsible for improving habitat for Prairie Chickens on those lands now owned by the Conservancy.

Concern for these birds has resulted in the establishment of the Minnesota Prairie Chicken Society which will work with government and private organizations to preserve and develop Prairie Chicken habitat. Because of these few dedicated Minnesotans, there will always be Prairie Chickens in our state.



The Hungarian Partridge

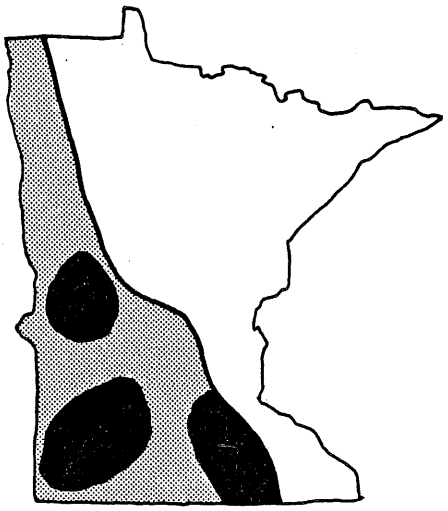
Description

The Hungarian Partridge averages about a foot in length and weighs slightly more than one pound. Its back is a brown color marked with buff and gray. Its throat, cheeks and sides are clearly gray. The outer tail feathers are reddish brown, which are more easily seen when the bird spreads its tail during flight.

History

The "Hun" is the only true "partridge" in Minnesota. Like the pheasant, it is an introduced game bird. It was first brought to America from Hungary or Czechoslovakia in the 1800s, though it was not released in Minnesota until the early 1920s. The first Minnesota hunting season for Hungarian Partridge was 1939. Seasons have been held each year since then, except in 1947.

Range



The Hun is found in many areas of Minnesota, but primarily in the southwestern and west-central counties. Despite its widespread distribution, the Hungarian Partridge have never been as numerous as pheasants.

Habitat

The required habitat of Huns is similar to that of the pheasant except that they are generally found in more open areas. They require agricultural lands consisting of small grain fields and grasslands, with only some fields of row crops such as corn and soybeans.

Behavior

Hungarian nests are typically found in grassy-type vegetation also required by pheasants. A clutch will contain from 15 to 20 eggs which hatch after 24 days of incubation. Although the hen incubates the eggs, both parents help care for the young.

Hungarians typically gather in coveys of 20 birds or less. Coveys usually roost in a small circular group in open grain stubble or short grasslands.

As with other game birds, insects provide high energy during their first weeks of life. As the birds get older, grain and wild plant seeds make up most of their diet.

Mortality

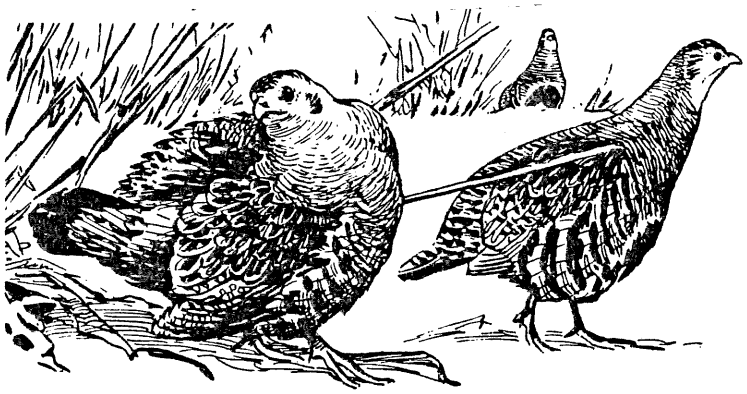
The Hungarian Partridge is a ground nester and prefers dense grassy areas. Thus, it is subject to nest destruction by mowing. In Washington State, a study revealed that farming practices destroy 85 percent of all Hungarian nests! Seventy-two percent were destroyed by mowing alone. The Hungarian Partridge may renest if a nest is destroyed, but not as often as the pheasant.

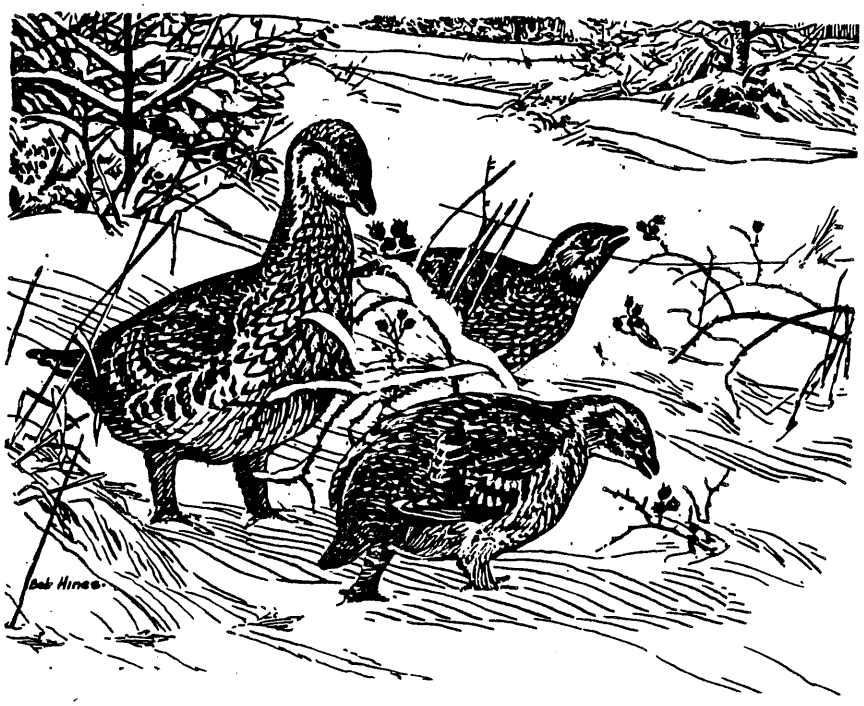
Like the pheasant, the Hun is very susceptible to other disasters during nesting and brooding seasons. Heavy, cold rains kill many young birds. Predators also take their share. However, the Huns can survive deep snow better than the pheasant because they often will "burrow-roost" and thus escape cold temperatures.

The annual hunting harvest of Hungarian Partridge is from 15,000 to 20,000 birds in Minnesota. Most are taken by pheasant hunters. Hunting does not adversely affect Hun populations. These birds are difficult targets and their tendency to frequent open areas makes them hard to locate.

Management Techniques and Problems

Management efforts by the Department of Natural Resources have consisted primarily of controlling the harvest of Hungarians through hunting regulations. No habitat management programs are being carried out specifically for this species. However, many of the Department's 900 Wildlife Management Areas contain grassy-type vegetation that is beneficial to these birds.





The Sharp-tailed Grouse

Description

The Sharp-tailed Grouse is often mistaken for the Prairie Chicken. They are about the same size, but their similarities end there. They have no noticeable neck tufts as do Prairie Chickens. The Sharptail's breast feathers are predominately white with scattered V-shaped markings of brown. Its tail is pointed, and its overall color is much lighter than that of the Prairie Chicken.

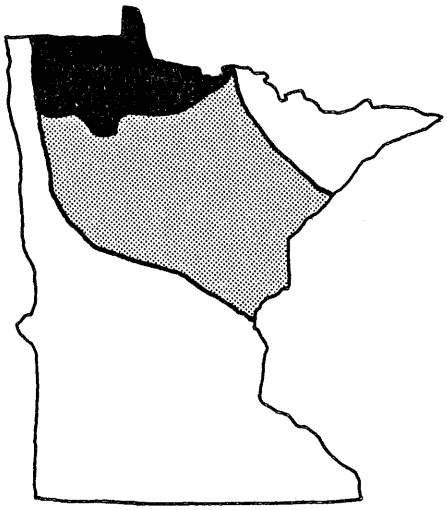
History

The Sharptail was at home in the brushlands and open areas of forests before the white man arrived. When the brushlands and forests were cleared, creating better Prairie Chicken habitat, the sharptails declined.

One of the earliest writings about the Sharptail came from the log of Lewis and Clark. Lewis wrote how these birds were different from those seen further to the southeast (Prairie Chicken). He was the first to call them "sharptails" although he also referred to them as "pointed-tailed prairie hens."

Range

Principal range of the Sharp-tailed Grouse in Minnesota includes Kittson, Roseau, Lake of the Woods, Marshall, Pennington, northern Clearwater counties in the northwest and Carlton, Aitkin and Pine counties in east-central Minnesota. There are, however, remnant flocks of birds scattered throughout other counties in northern Minnesota.

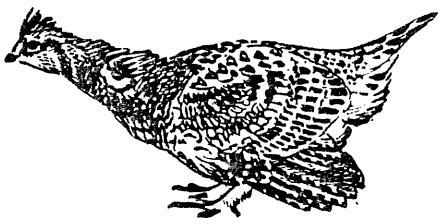


Habitat

The Sharptail is a bird of mixed grass and brushlands. Typical habitat consists of a large proportion of unplowed land covered with grasses, herbs and shrubs, with a few small patches of scattered hardwoods. They also can be found in the brushy cranberry bogs of that region.

A certain amount of agriculture helps to keep brushland from progressing into mature forests. Prairie fires once did this.

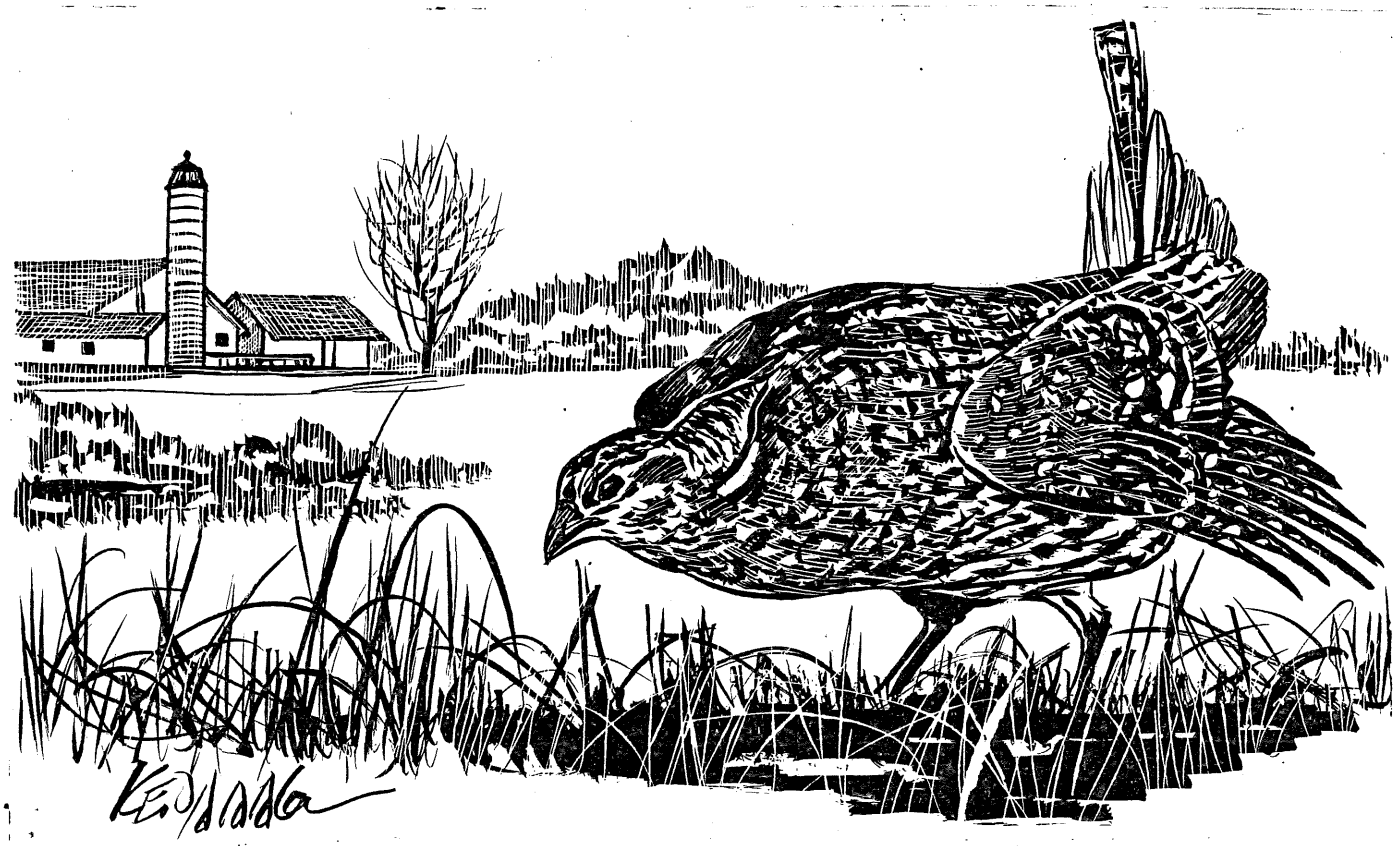
Favorites in the diets of these birds are leaves and flowers of wild plants, seeds and berries. During fall the birds feed on grains and seeds and switch to buds, twigs and catkins of birch, aspen and other trees in the winter. Sharptails also consume many insects, especially when the birds are still young.



Behavior

The mating behavior of the Sharptail is much like that of the Prairie Chicken. The male birds gather on the "dancing" or "hooting" grounds in early spring, preferably at a slightly elevated clearing. They strut around like toy soldiers, and the vibrations from their stamping feet are heard for some distance. They also hoot or boom weakly by forcing air from their lungs into the voice box and the bare skin-pouches on the sides of the neck. In some areas Sharptails and Prairie Chickens share the same dancing grounds.

The Sharptail nest is a hollowed-out depression, lined with a few feathers and plant debris, and usually located within a half-mile of the dancing ground. Eggs average 12 per nest and require about 24 days to incubate. They may renest if their eggs are destroyed.



In late summer and early fall, groups of birds join together to form large "packs" numbering up to 200 birds, often of only one sex. The packs, which are difficult to approach, stay together until early spring when the breeding season begins. Often, these packs may be seen flying off to feed in the morning or on their return flight to woodlots and small patches of timber where they will roost.

Mortality

Annual hunting seasons have been held since 1948, with an average harvest of 60,000 birds. Hunters find the Sharptail a very sporty bird and a fine addition to the table--It has dark sweet meat with a flavor somewhat similar to that of wild duck.

In addition to hunting, nature's predators including owls, hawks and many four-footed animals feed on the Sharptail and its eggs. It should be noted that Sharptails--like every other game bird discussed in this manual--can easily withstand hunting pressure and the work of predators. It is the continuing loss of habitat which has resulted in a continuing decline in its numbers.

Management Techniques and Problems

Management programs include prescribed burning and special food plots along with carefully regulated hunting seasons. Future projects will be carried out on land retired under government programs or on tax-forfeited lands.

The Future

The statewide population trend of Sharp-tailed Grouse appears to be downward. Habitat continues to be lost because of intensive farming practices in addition to more reforestation.

Snowshoe Hare

Small Game Mammals

Several species of small mammals are hunted during established seasons. They include: raccoon, fox squirrels, grey squirrels, cottontail rabbits, jackrabbits and snowshoe hares.

While these species are less popular among hunters than deer, grouse and pheasant, they are certainly no less exciting to hunt and provide delicious table fare.

Many hunters enjoy the nearly six-month long Minnesota rabbit season. Rabbit hunting is especially enjoyable in late winter when tracks are easy to see on snow-covered ground.

Squirrel season, normally opening in mid-September, is the first hunt of the fall season for many sportsmen. Father-son teams, with their trusty .22 caliber rifles, enjoy many days afield. Squirrels are hard to see, and difficult to hit.

Most hunters make the mistake of hurrying through squirrel woods. Slow movements, stopping for several minutes to listen, and a trained eye make squirrel hunting successful.

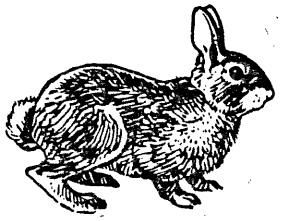
Gray Squirrel

Pine Squirrel

Squirrel Identification

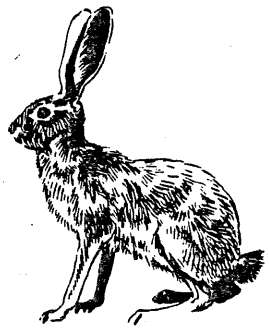
The eastern gray squirrel is common throughout most of Minnesota. It is somewhat smaller than the eastern fox squirrel, but much larger than the red squirrel. The gray and fox squirrels are the target species for Minnesota squirrel hunters.

The fox squirrel is readily identifiable by the rusty-gray color over most of its body, and a yellowish-orange belly (unlike the white belly of the gray). Fox squirrels are usually not found in northern Minnesota.



Cottontail Rabbit

Snowshoe Hare



Whitetailed Jackrabbit

Rabbit and Hare Identification

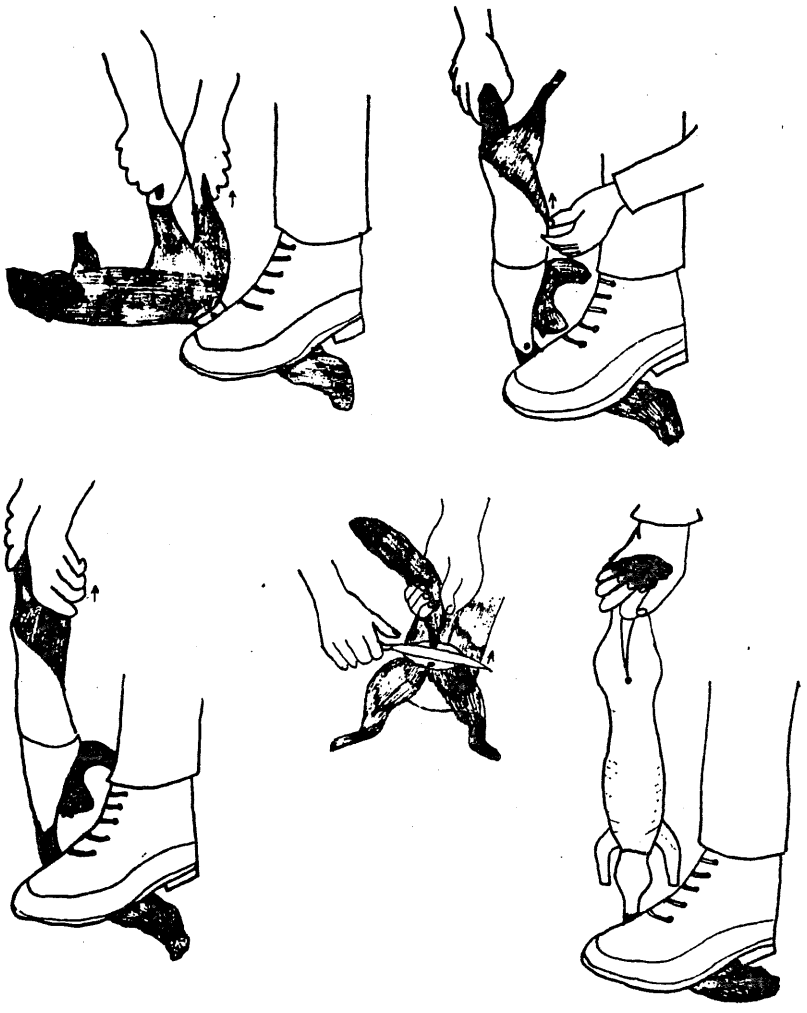
The eastern cottontail is common throughout the state except for the north-northeast section. It has a white "cotton" tail and is usually seen near heavy cover morning or evening.

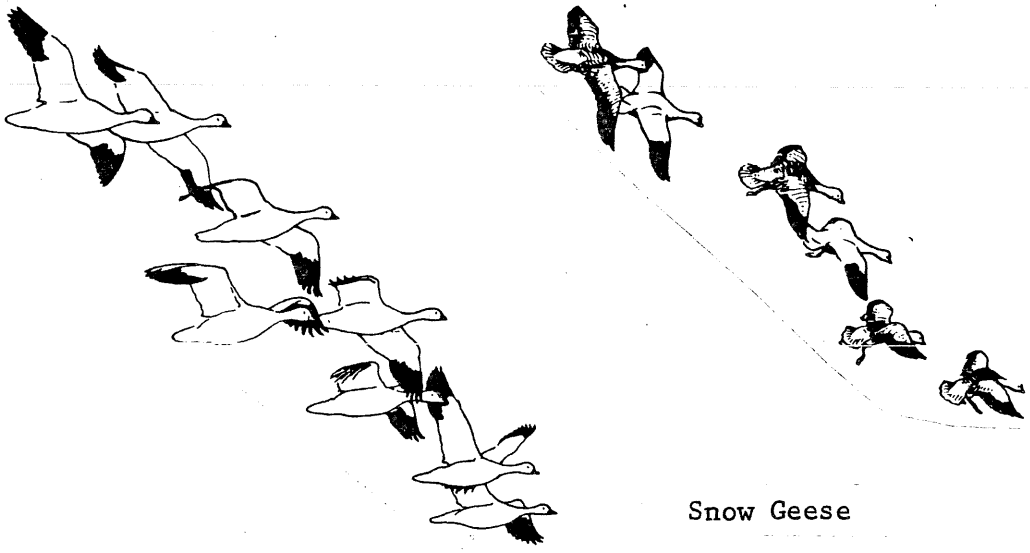
The snowshoe hare is found in north-northeast forests and swamps. Its coat is dark brown in the summer; white in winter.

The whitetail jackrabbit is found in the prairie and forest transition areas of Minnesota. The "Jack" is easily identified by its large body size and tall ears. When surprised it will usually bound off--resembling the hopping gait of a kangaroo--but when alarmed, will drop low to the ground and accelerate to an amazingly fast speed.

From pioneer families to the small game enthusiasts of today, knowing Americans have savored the meat of squirrels and rabbits. Rabbit and squirrel meat may be prepared for the table in the same manner as chicken--fried, roasted, baked, broiled or stewed. It is delicious cooked--or smoked.

"With Know-How . . . It's Easy"





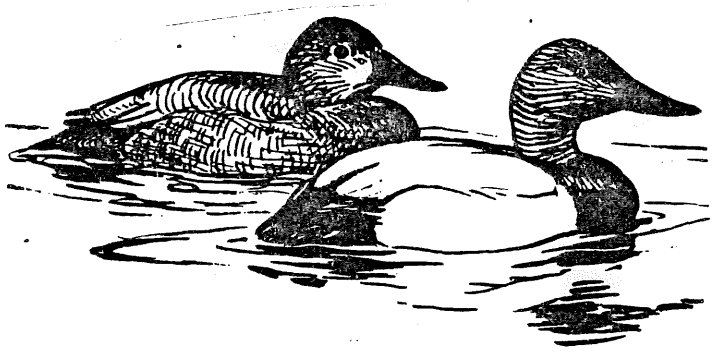
Snow Geese

Migratory Birds

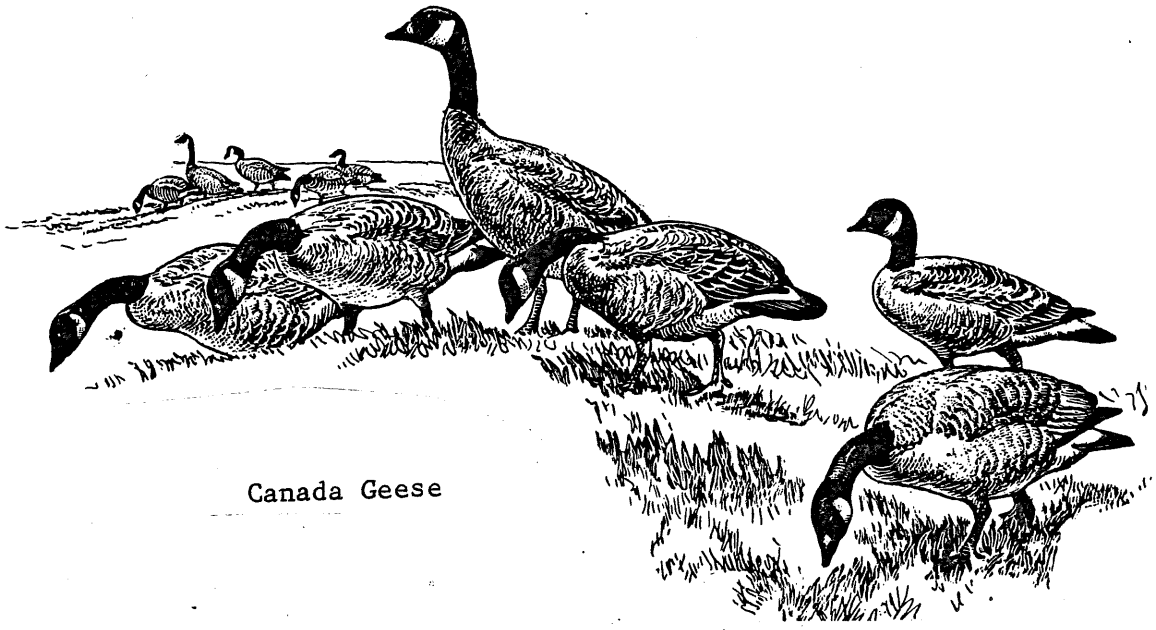
The majority of Minnesota's migratory game birds are ducks and geese. However, there are a number of other migratory birds--some hunted and some protected--but all encountered by hunters. Some of these non-game types include owls, hawks, swans, loons, cranes, herons, gulls, doves, pigeons, bitterns, rails, gallinules and coots.

Waterfowl have long been hunted in Minnesota. However, early settlers felt concern over the great quantities of these birds killed by market gunners. As a result, the first Minnesota law protecting waterfowl was passed in 1871. The first regulated hunting season for waterfowl was in 1877 and market hunting was outlawed in 1901.

Annual production of ducks in Minnesota is about 500,000 to 1,000,000 birds. The majority of these "home grown" ducks are also shot here.



Canvasback Ducks

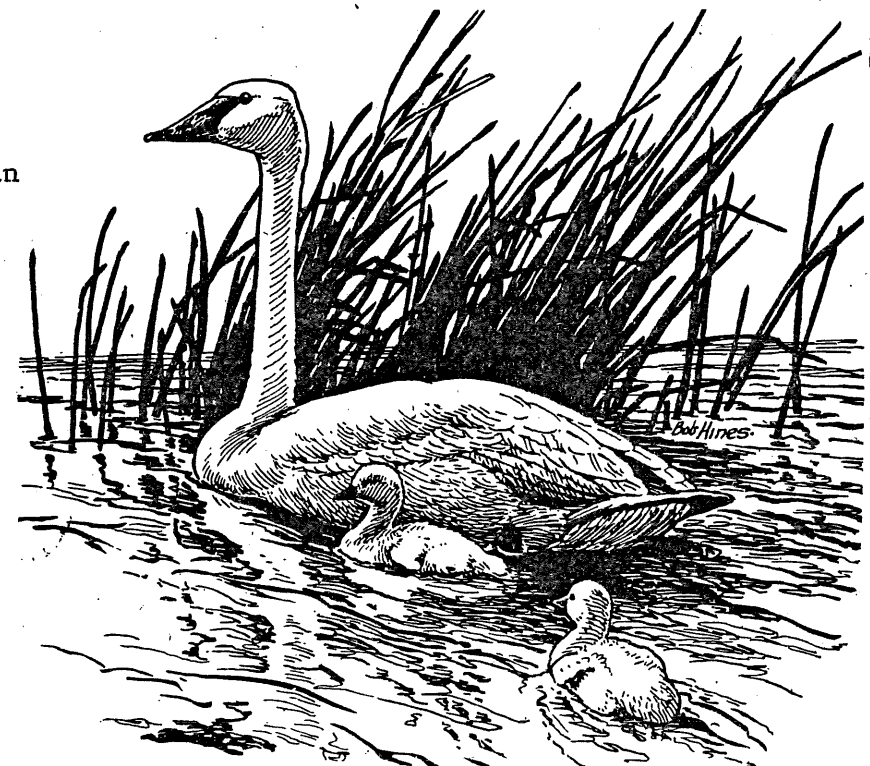


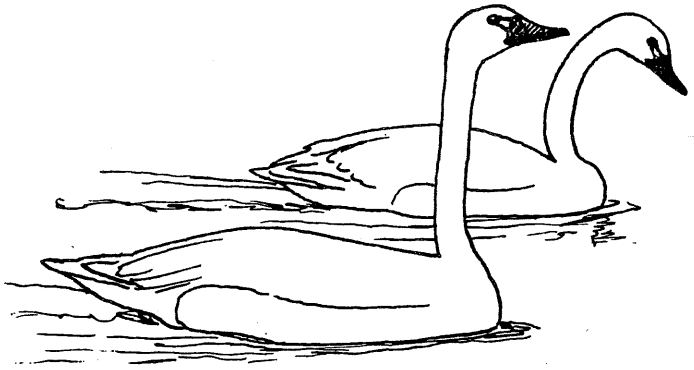
Canada Geese

Swans and Geese

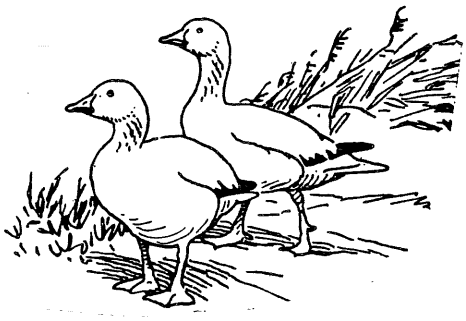
Most common swan in Minnesota is the whistling swan, though a few trumpter swans are found in and around Hennepin County at special refuges. The White-fronted Goose, Lesser Snow Goose (with its darker color phase, the Blue Goose), and the Canada Goose (with several subspecies that vary in size from the three pound Cackling Goose to the six-pound Giant Canada Goose) are legal to hunt in Minnesota during open goose seasons.

Trumpeter Swan



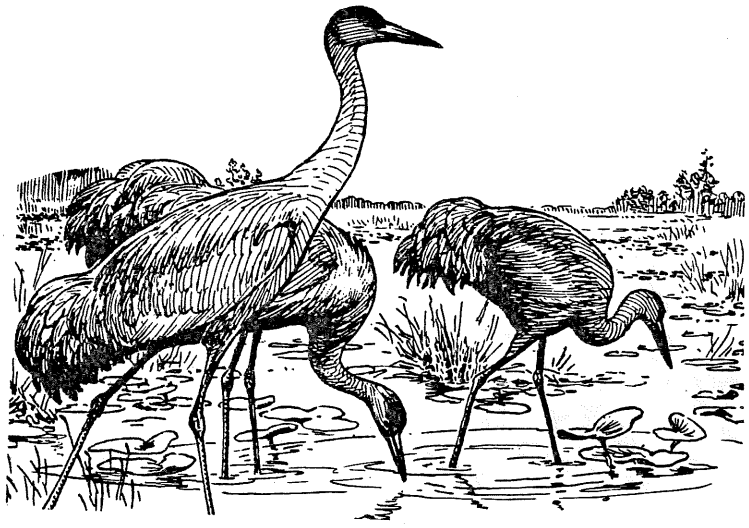


Whistling Swan

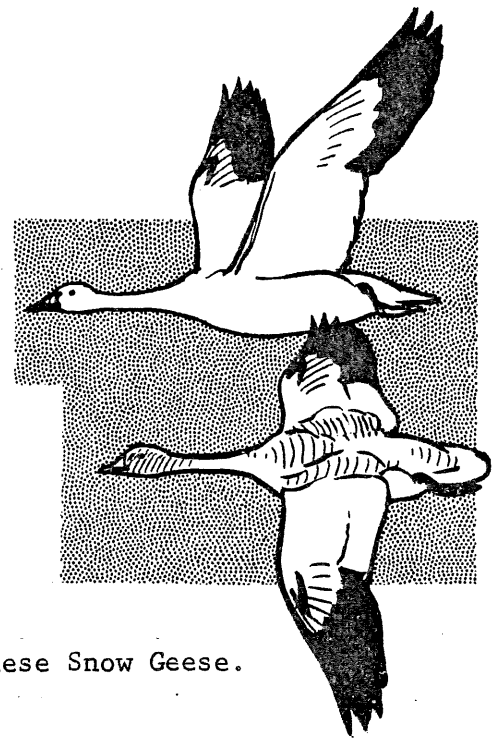


Snow Geese

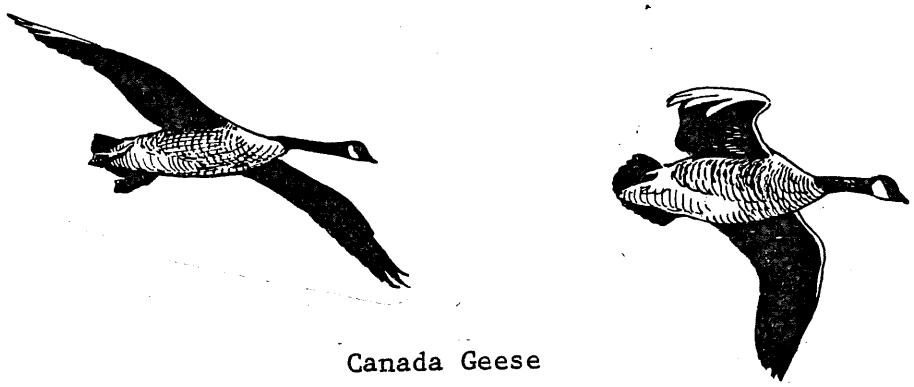
Many species of swans and geese, may be confused with other birds. Whistling swans, protected in this state, are sometimes mistakenly identified as snow geese. However, snow geese are much smaller birds and have black wing-tips. Sandhill cranes and Great Blue Heron are also protected but may be confused with Canada Geese because all have dark feather coloration. Blues and Snows fly together in the same long-line or V-shaped flocks, and their high-pitched, harsh voices are distinctive.



Sandhill Crane



Note: Black wing tips on these Snow Geese.

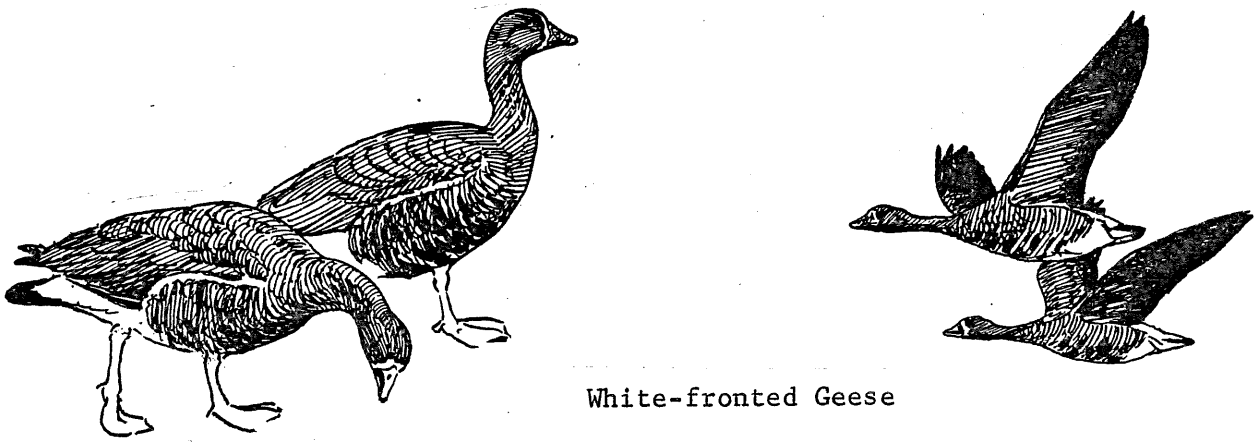


Canada Geese

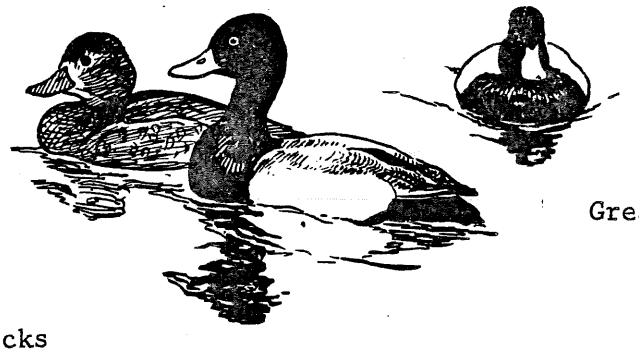
The Canada Goose is distinguished by a dark gray body, black head and neck, and white cheek patches. "Honkers" do not fly in flocks with other types of geese. The various subspecies, which vary greatly in size but otherwise appear similar, make it difficult for hunters to judge the distance from blind to geese. Canada geese are noted for lifetime mating and for their large V-shaped formations that truly herald in the fall season.

White-fronted geese, though common in western flyways are only occasional visitors in the western counties of the state. Their coloration appears dark and their breasts are flecked with dark feathers. They have a melodious and distinctive call.

Geese can differentiated in flight from ducks by their larger size, longer necks, and slower wing beats. Geese often appear to be flying much slower than their true speed.



White-fronted Geese



Greater Scaup

Ducks

There are five Tribes (a biological grouping) of ducks found in Minnesota:

1) Anatini -- these ducks are usually referred to as Dabbling Ducks, Puddle Ducks or Surface-feeding Ducks. The Mallard, Pintail and Shoveller are examples. Their nests are usually built on uplands.
2) Athyini -- these usually are called Diving Ducks. This group includes Redheads, Canvasbacks, Ring-necked Ducks, Scaup and others. They frequently build their nests on wet reedy marshes, often over water.
3) Cairinini -- its only representative in the U.S. is the Wood Duck. They nest in trees or man-made boxes, and are classified as a Dabbling Duck.
4) Mergini -- this includes Scoters, Buffleheads, Goldeneyes, and Mergansers. Their diet includes mostly aquatic animal life. They are classified as Diving Ducks. The Hooded Merganser, Goldeneye and Bufflehead nest in trees or man-made boxes.
5) Oxyurini -- the Ruddy Duck is the only representative in Minnesota. Like the loon, our state bird, it has a great deal of difficulty getting around on land because its legs are located far back on its body.

The identification of waterfowl on the water and on the wing, is extremely important since hunting regulations annually specify not only how many waterfowl can be shot, but which ones. Several of the following publications are excellent for identifying purposes:

Ducks At A Distance* published in 1963 by the U.S. Fish and Wildlife Service and is available through the U.S. Government Printing Office.

Minnesota Waterfowl Identification Guide printed by the Mississippi Flyway Council and is available from the Minnesota DNR.

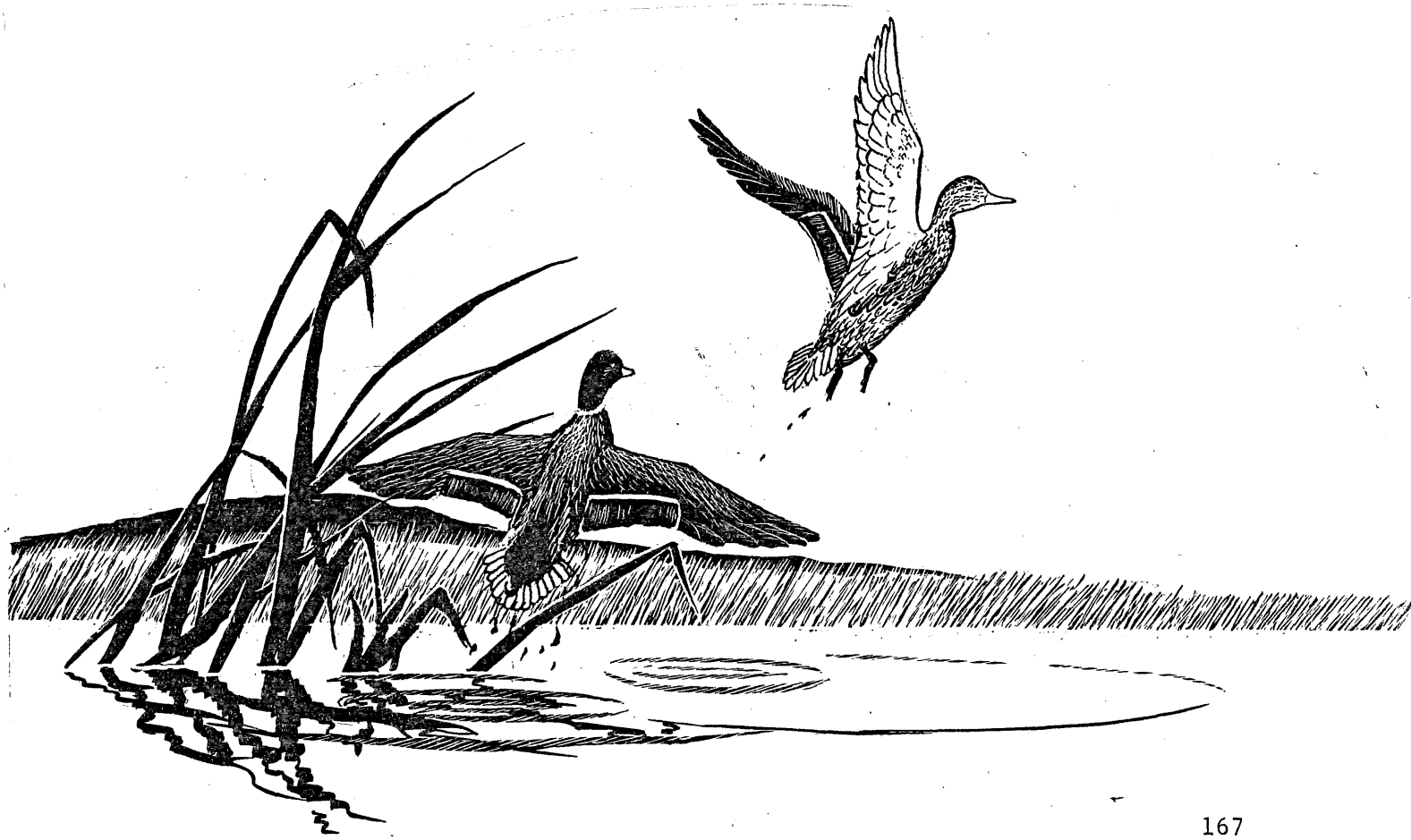
Gamebirds, a Golden Nature Guide Book, found in most bookstores.

A Field Guide to Birds, by Roger Tory Peterson is found in most bookstores.

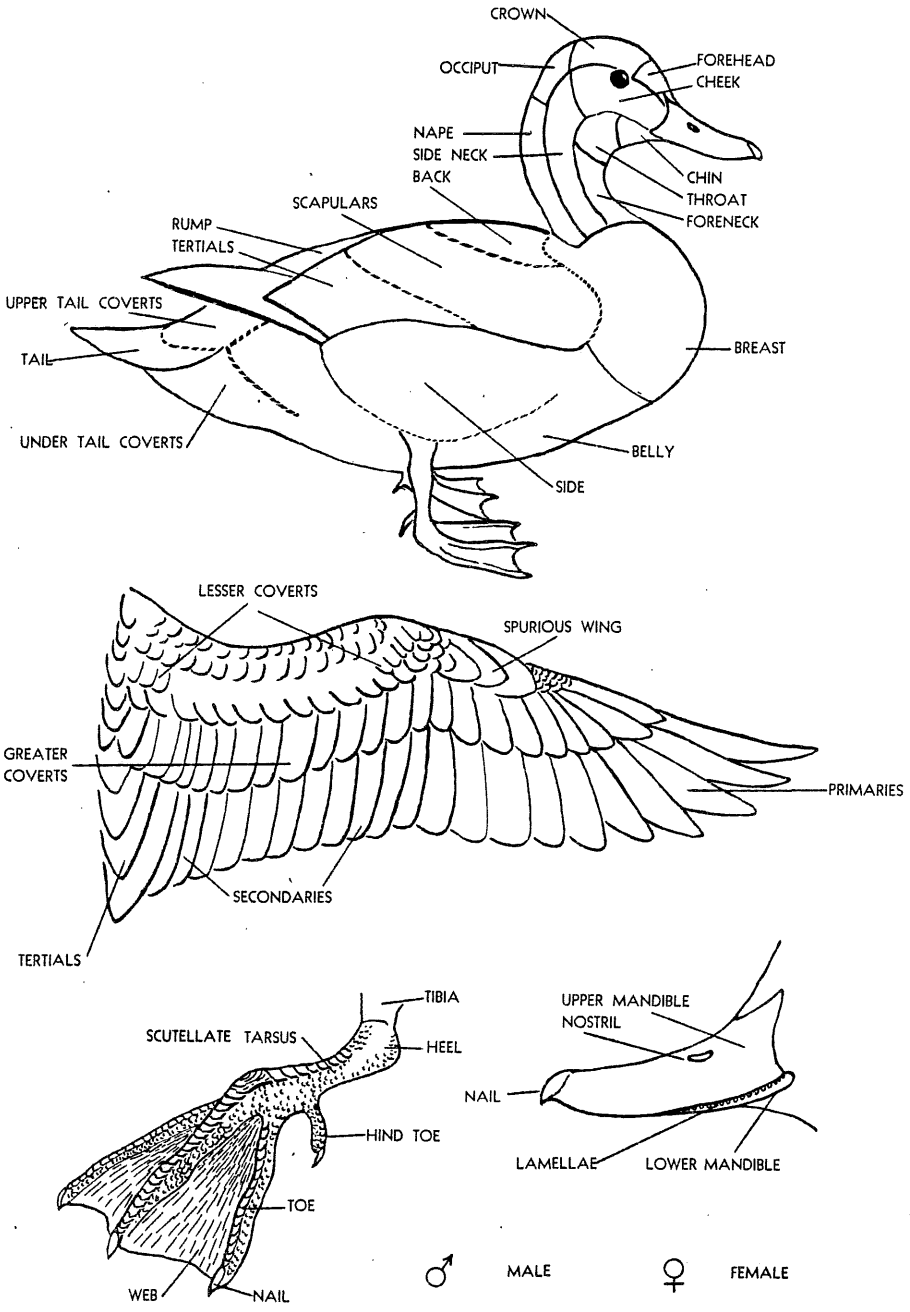
Ducks, Swans and Geese of North America, by F. H. Kortright is available at many bookstores.

*This publication is provided as part of the course.

In duck identification, it is important to know the fundamental differences between the two general groupings, between different types of ducks, and between sexes.

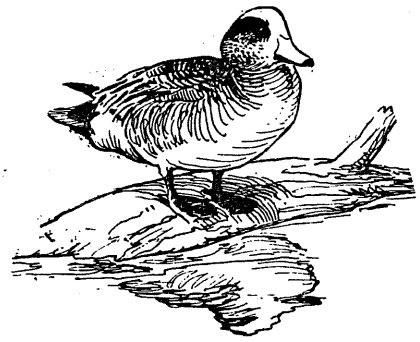


TOPOGRAPHY OF A DUCK



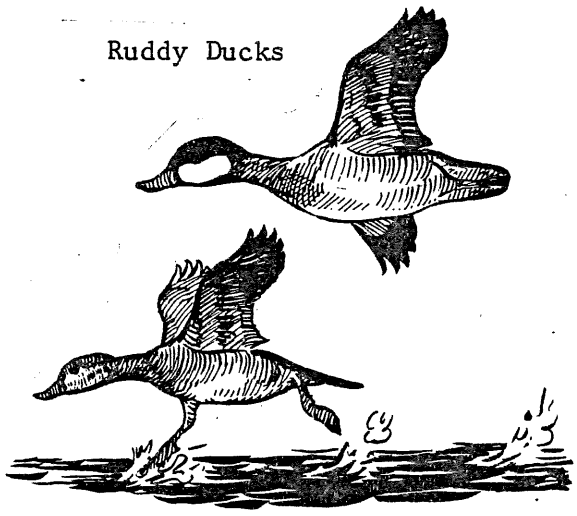
Comparison of Identifying Characteristics of Dabbling & Diving Ducks

Species	Mallard, Black Duck, Gadwall, American Widgeon, Pintail, Green-winged Teal, Blue-winged Teal, Shoveller, Wood Duck	Redhead, Ring-necked Duck, Canvasback, Greater Scaup, Lesser Scaup, Common Goldeneye, Bufflehead, Old Squaw, White-winged Scoter, Ruddy Duck
Feeding Habits	Feed in shallow waters by tipping or dabbling	Dive for food in deeper waters
Posture on Water	Tail carried high giving the appearance of being tipped forward	Tail held low in water so back is more sloping than in dabblers
Rising from Water	Jump upward and are quickly in flight	Patter along surface of water for some distance before becoming completely airborne
Flight	Wing beat slower than in divers. Neck may be inclined upward. Most puddle ducks fly in loose formations	Wing beat rapid and neck held straight out
Placement of Legs	Near center of body, facilitates walking on land	Towards rear of body. Facilitates swimming and diving but walking appears difficult
Speculum	Generally colored and iridescent	Generally gray, white, or black and lacks iridescence.
Hind Toe	Without lobe	Lobed



American Widgeon

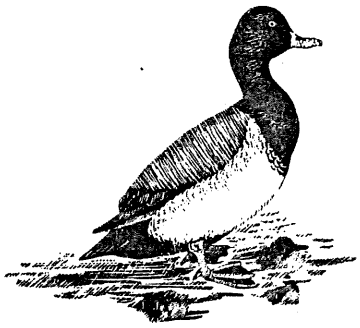
Ruddy Ducks



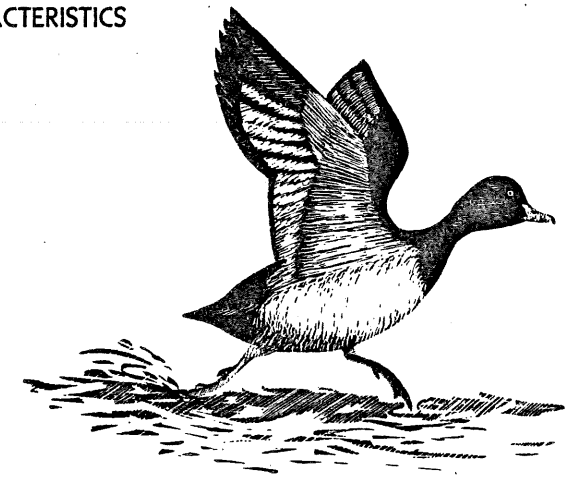
DIVING DUCK CHARACTERISTICS

(Aythyinae)

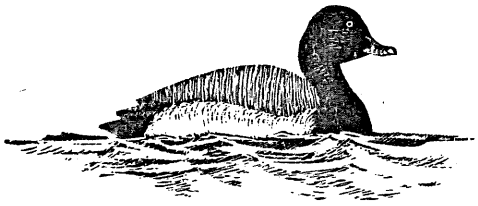
HIND TOE LOBED, FOOT LARGE



LEGS SET NEAR REAR OF BODY



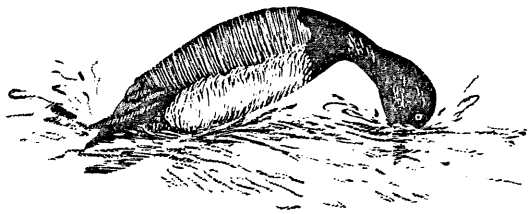
ON TAKE OFF PATTER ALONG SURFACE FOR SOME DISTANCE



USUALLY SWIM WITH TAIL HELD CLOSE TO WATER

SPECULUM GENERALLY DULL, LACKS IRIDESCENCE

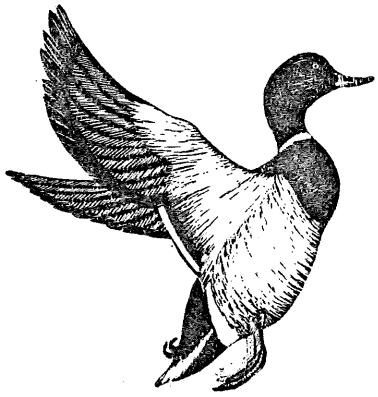
DIVE COMPLETELY UNDER WATER TO SECURE FEED

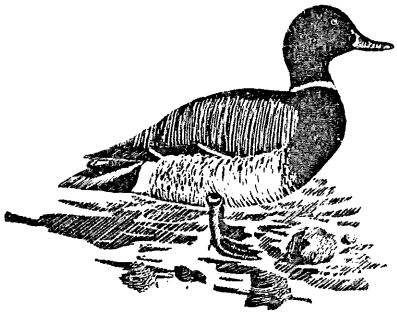


PUDDLE OR DABBLING DUCK CHARACTERISTICS

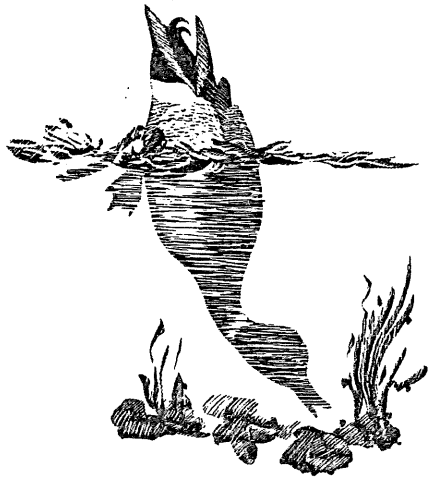
(Anatinae)

TIP UP TO FEED, RARELY DIVE



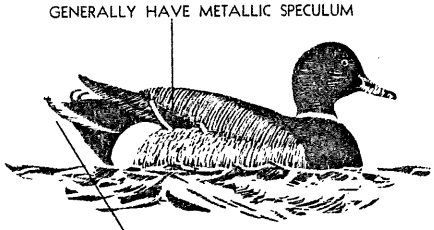


LEGS PLACED NEAR CENTER OF BODY

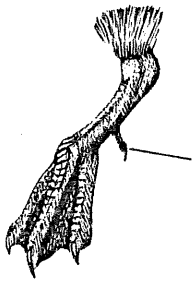


SPRING INTO AIR ON TAKE OFF

GENERALLY HAVE METALLIC SPECULUM

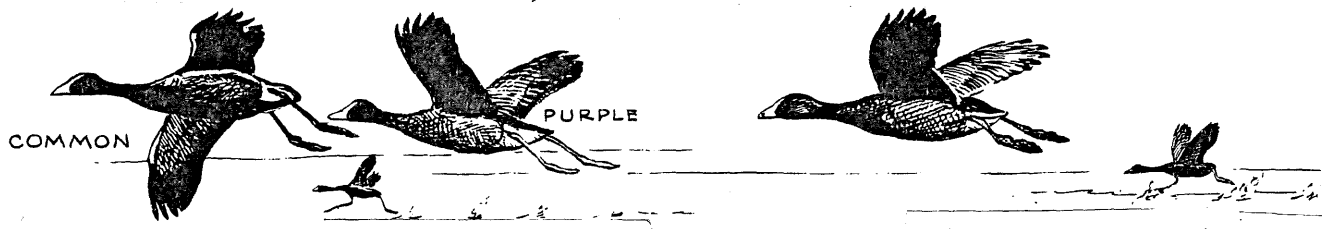


USUALLY SWIM WITH TAIL HELD CLEAR OF WATER



HIND TOE NOT LOBED

FOOT SMALLER THAN IN DIVING DUCKS



GALLINULES (Legal Game Bird)

GALLINULES ARE STOUT-BODIED, LONG-LEGGED, SWIMMING AND WADING BIRDS, FOUND IN MARSHES AND SWAMPY LAKE BORDERS.

COMMON GALLINULE: RED BILL, BLACK HEAD, GRAY BODY; FOUND IN MOST STATES.

PURPLE GALLINULE: PURPLE HEAD, NECK, AND FLANKS, RED BILL, PALE BLUE FOREHEAD, YELLOW LEGS; FOUND IN SOUTHERN AND SOUTHEASTERN STATES.

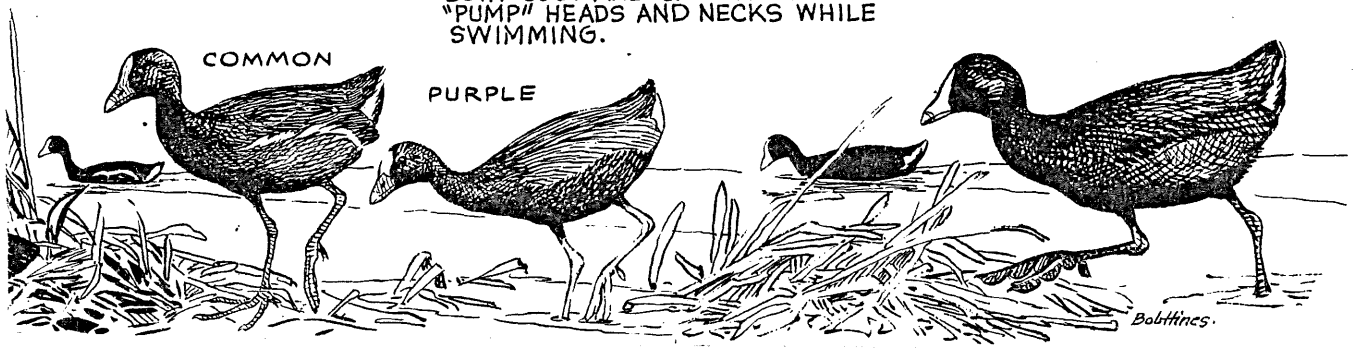
COOT (Legal Game Bird)

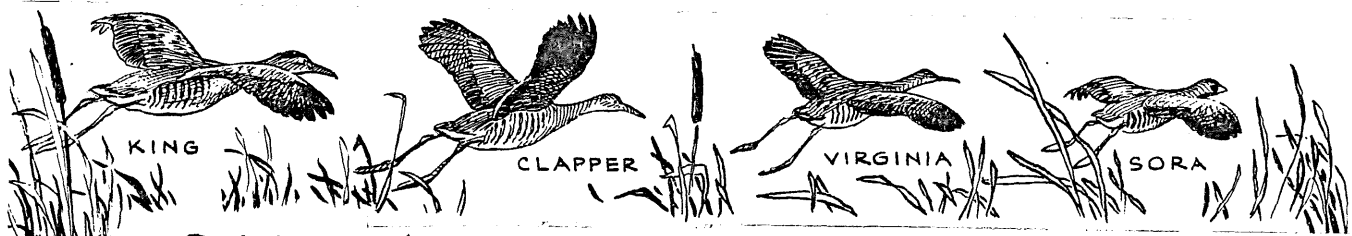
DUCK-LIKE IN APPEARANCE, WITH BLACK HEAD, DARK GRAY BODY ~ BILL AND UNDERTAIL FEATHERS WHITE.

IN THE FALL, USUALLY APPEARS IN SIZEABLE FLOCKS; WILL OFTEN INVADE MEADOW AREAS TO FEED ON GRASSES.

IN FLIGHT, TRAILING EDGE OF WING SHOWS THIN WHITE LINE.

BOTH COOT AND GALLINULES "PUMP" HEADS AND NECKS WHILE SWIMMING.





RAILS (All Legal Migratory Game Birds in Minnesota Except King Rails)

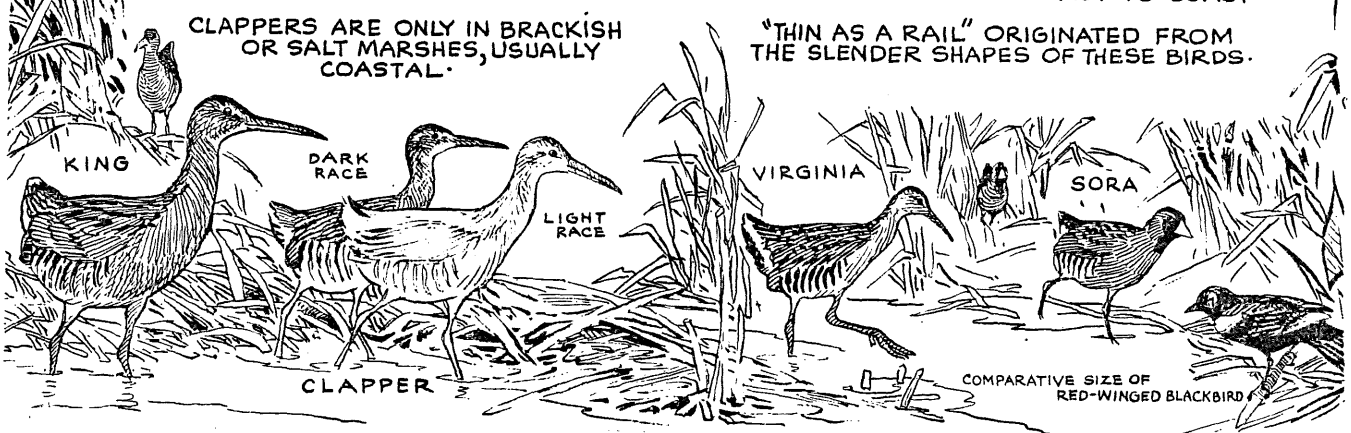
RAILS ARE SLENDER, CHICKEN-LIKE BIRDS OF MARSHES AND WET MEADOWS. TAILS ARE SHORT···TYPICALLY CARRIED 'COCKED.' THE WINGS ARE SHORT AND ROUNDED··· FLIGHT IS WEAK, WOBBLY, AND USUALLY FOR SHORT DISTANCES··· BODY COLORS ARE BROWNS, BLACKS, AND GRAYS.

KING RAILS OCCUR IN AREAS EAST OF THE GREAT PLAINS.

CLAPPERS ARE ONLY IN BRACKISH OR SALT MARSHES, USUALLY COASTAL.

VIRGINIA RAILS AND SORAS ARE FOUND FROM COAST TO COAST.

"THIN AS A RAIL" ORIGINATED FROM THE SLENDER SHAPES OF THESE BIRDS.



Why Identification Is So Important!

1) Species Management - What are the hunting restrictions on certain species?

2) Know what you are looking at - for maximum esthetic pleasure from the environment.

3) Bag limit - What waterfowl species are legal to hunt? Which birds are protected?

4) Which birds of a certain type are expected in a certain habitat.

How To Identify -- Clues To Assist In Identification.

1) Size - Compare the Canada goose with the Blue-winged teal.

2) Shape - Compare the short neck of the hawk with the long neck of the Canada goose.

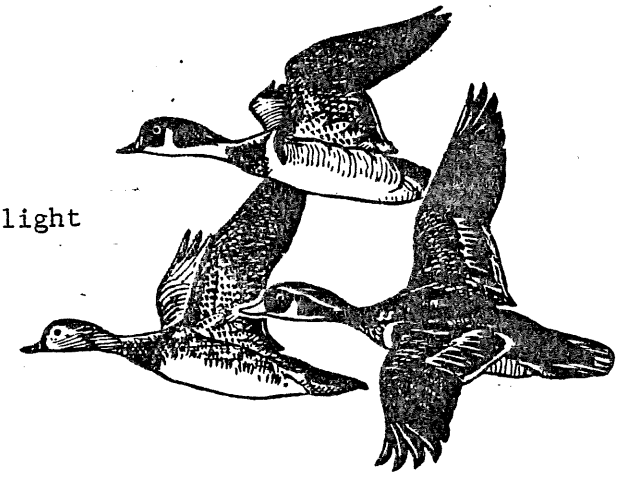
3) Manner of Flight - Compare the fast, darting flight of the teal with the slow, deliberate formation flight of the gulls.

4) Habitat - Compare puddle ducks or shallow water birds with diving ducks.

5) Field Marks - Compare the black head and neck and white cheek of the Canada goose with the green, white, red and black coloring of the Shoveler.

6) Call - Compare the laughing sound of the gull with the scream of the hawk.

Woodducks In Flight



Hunting Waterfowl

There are three basic types of hunting for waterfowl: pass shooting, blind shooting and jump shooting.

Pass Shooting

Many Minnesota waterfowlers engage in pass shooting for ducks and geese, though the latter are hunted by this technique more than any other.

Pass shooting for geese is done by standing along refuge borders or bodies of water where geese are concentrated to shoot at the birds as they leave for the fields to feed or as they return to the marsh.

In years past, shooting along refuge boundaries has caused friction between hunters primarily because so many are concentrated in relatively small areas. However, a solution to "firing line" shooting has been demonstrated at Thief Lake Wildlife Management Area in northwestern Minnesota.

Under the new system, hunters send postcards to Thief Lake any time after a specific deadline (usually in early September), specifying three alternate hunting dates, in order of preference. The cards are processed as they are received, and each part of up to three hunters is sent confirmation of the date and instructions to report to the refuge check station no later than 5:00 a.m. on the day of the hunt.

At the check station, all parties are given a thorough briefing on hunting regulations and hunter responsibilites in the refuge. Then, each party draws numbered ping-pong balls from a tumbler to determine the order of blind selection. The party drawing number one can choose any of 58 blinds pinpointed on an aerial photograph.

One Type Of Pit For Goose Hunting

The blinds are located along the refuge's western boundary at approximately 100-yard intervals. Each hunter is limited to six shotgun shells, and when each hunter in the party has a Canada goose, they are required to vacate the blind and report to the check station.

After mid-October, when goose activity declines, hunters are no longer required to register for blinds and are not limited in the number of shells they can use.

Preliminary figures for the past season indicate that about 2,500 goose hunters took more than 2,000 geese at Thief Lake.

Blind Shooting

Blinds for waterfowl hunting can be constructed either along the edges of water or in fields where birds are likely to feed. They should be at least 100 to 200 yards apart.

Field blinds are made by digging pits or by hiding behind either artificial or natural camouflage such as rock piles, hay bales or tree branches. A blind should blend naturally with surrounding, should not destroy natural areas or crops or become a future hazard for farming activities.

Prepare for field shooting by first locating feeding areas. For geese, this means locating a flock without disturbing them and allowing them to leave naturally. While the geese are back at the lake, the hunter will then construct his blind in anticipation for an exciting hunt the following day.

Water blinds are often constructed on points of land or grassy islands. They too should blend naturally with surroundings.

Decoys and calling are frequently used in blind shooting. Whether artificial decoys are used on land or water,they should simulate natural ducks in color, profile and positioning. Diving ducks often sit in groups out in the water while puddle ducks are scattered along and on the shore.

Ducks most often come into the decoys against the wind, thus, blind placement is important. Leave spaces for waterfowl to land in the decoys, and one or more decoys might be placed at the 40-yard distance to give you a distance measurement on shooting.

Other techniques that some hunters find successful are: Placing several goose decoys near their duck spread, or a group of divers out in the water, and puddle duck decoys next to shore. Never, mix puddle and diver

duck decoys. Divers usually prefer larger lakes--and the bigger the lake, the more the decoys. A small pond only requires a few puddle duck decoys. On land, use more feeding goose decoys than sentinel decoys.

Calling waterfowl is a real art. Experience can come from listening to calling experts, records, or real ducks and then trying to imitate these sounds. Most waterfowl callers call too loudly and too frequently. On still days and for close birds, calling should be done softly. Low flying ducks are more susceptible to calling than high-flying migrating birds or birds heading for known feeding areas. Concentrate on calling a few close birds and stop calling when they begin to come in.

Though problems among hunters are virtually nonexistent at Thief Lake, problems continue to arise on lakes and marshes where large concentrations of hunters are found. However, most of the "friction" between hunters can be eliminated if hunters would abide by some commonly accepted rules.

*Pass shooters should stay at least 100 to 200 yards apart and conceal themselves properly.

*Don't sky-bust; allow the birds to descend to within gunshot range--40 yards or closer.

*Don't overuse your duck call. Too much "coaxing" will often send ducks high-tailing off to another body of water.

*Respect another hunters calling. If a flock of ducks responds to another hunter, allow him to have first crack at the ducks.

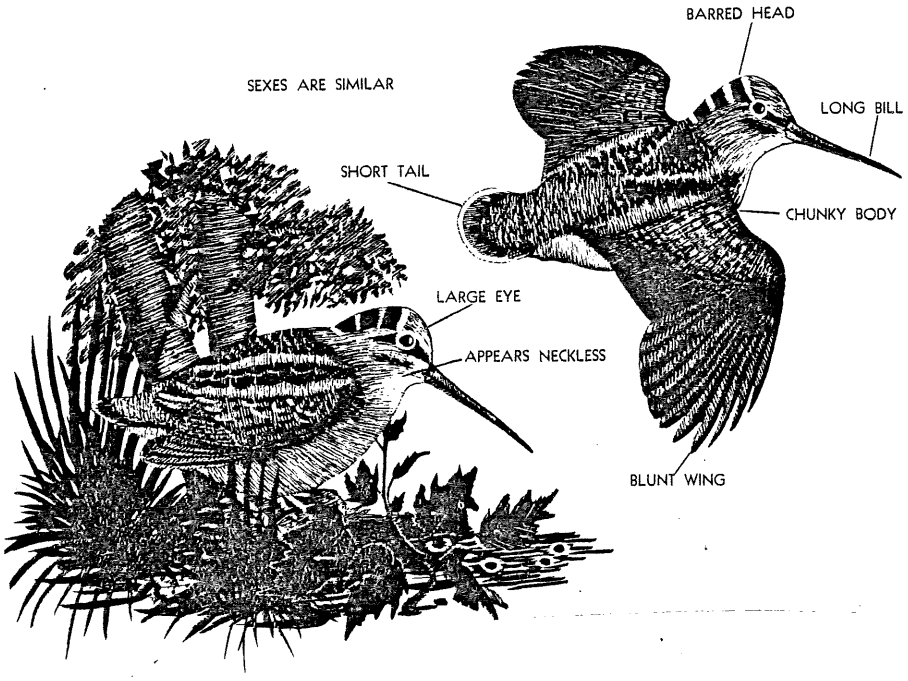
*Retrieve your ducks as quickly as possible; and return to the blind as quickly as possible.

*When entering or leaving a marsh, take a route--if possible--which does not encroach upon another hunter's shooting territory.

Jump Shooting

This method is more difficult with geese because they are more wary than ducks, and often post "sentinels" to watch for danger. Most jump shooting is done around marshes or ponds and often with a good flushing and retrieving dog. Many ducks will hold tightly and flush after the hunter has passed.

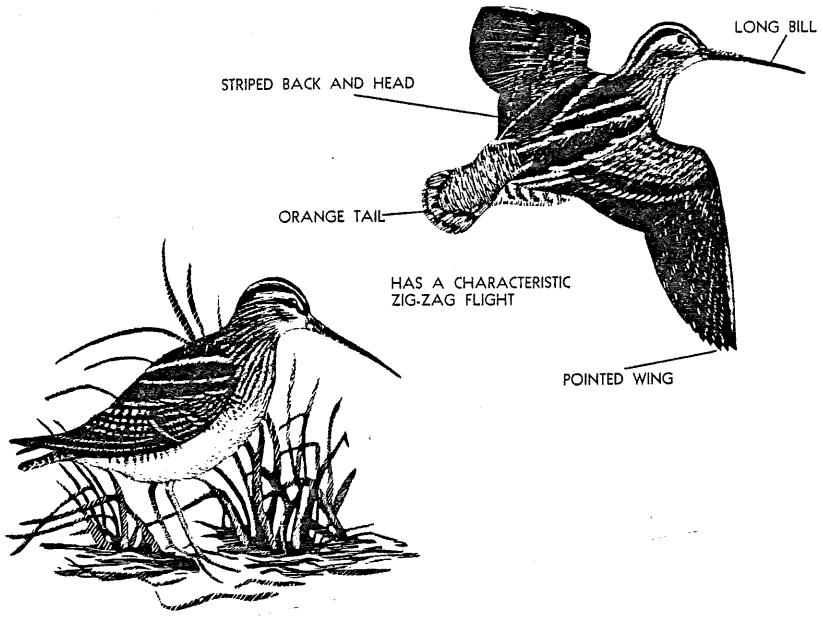
No matter which way you hunt, retrieving birds immediately is essential. Downed birds may swim, crawl or float away from where they landed or you may forget where the first bird fell after additional shooting. This is part of the conservation ethic in hunting, and to help this cause, a good retriever on uplands or in the water has no substitute.



Woodcock

An upland game bird that is growing in popularity among hunters is the woodcock. It is most active during early morning or near sunset, and can be found around thickets of alder, hazel or aspen. This little bird (less than one-half pound), flushes out of thickets when alarmed, flies in an erratic path, and sets down not far away from where it was flushed. Since they flush at close range and are small to find when downed, dogs are almost essential for hunting these exciting game birds.

Principle diet of the woodcock is worms and grubs. Usually they favor woods along a stream or small pond. Much of this type of habitat is disappearing in eastern states, though Minnesota has an abundance of good habitat. Cook, Mille Lacs, Kanabec, Carlton, and Pine counties are known to have good woodcock populations.

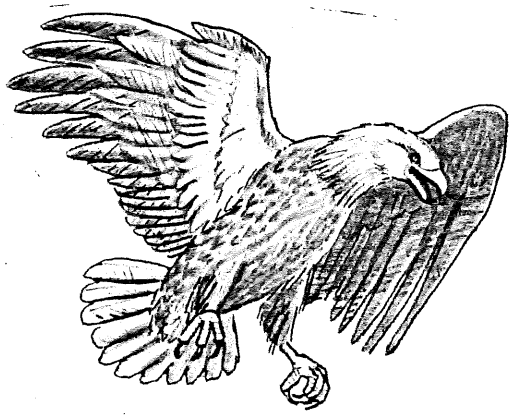


Wilson's Snipe or Jacksnipe

The snipe is similar in appearance to the woodcock, both being small brown birds with long bills. However, their habitat preferences differ; snipe prefer bogs and flooded meadows.

Snipe feed on insects along shorelines, mostly at night. Waterfowl hunters often flush them out of tall grass along marsh edges. They rise straight upward uttering a cry that sounds like their name: "snipe," and then fly in an erratic, twisting path. Like the woodcock, they are a tasty delicacy.

Protected Species



Bald Eagle - Our National Emblem

Shape - Large head and short tail; wingspread of 6 to 7½ feet.

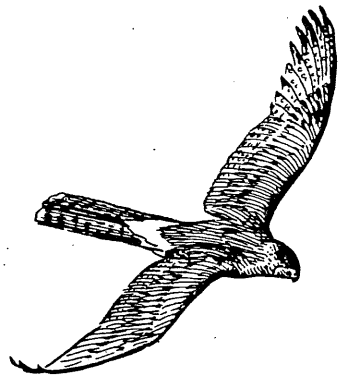
Field marks - Dusky head and tail until four years old; adult has white head and tail with brown body.

Habitat - Near oceans, rivers and lakes.

Flight - Deep strokes and soars on flattened wings.

Call - Harsh creaking voice.

Primarily a scavenger.



Marsh Hawk

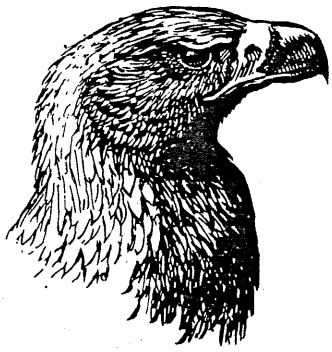
Shape - Slim bird with rounded wings and long tail.

Field Marks - Males are pale grey; females, streaked brown.

Habitat - Meadows and marshes

Flight - Glides with long, narrow wings held preceptively above horizontal; prominent white rump patch always conspicuous in flight (both sexes). Tilts from side to side low over the marsh.

Call - Weak nasal whistle



Golden Eagle

Shape - Large head and short tail; 6 to 7½ foot wing spread.

Field Marks - Immature and adults have dark coloration including heads. Immature may show some white on wings and tail. Eagles have longer bills than hawks.

Flight - deep strokes and flattened wings in soaring.

Hunts live small game unlike its scavenger cousin, the bald eagle.

Red-Tailed Hawk

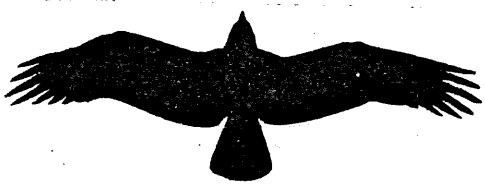
Shape - Large, broad wings and robust body.

Field Marks - Adult has broad reddish-brown tail, white breast and streaked belly; immature bird lacks the red tail.

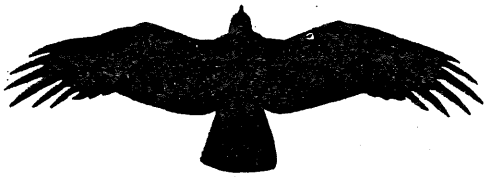
Habitat - Breeds in dry woodlands.

Flight - Soars and circles overhead and drops on prey in a steep dive.

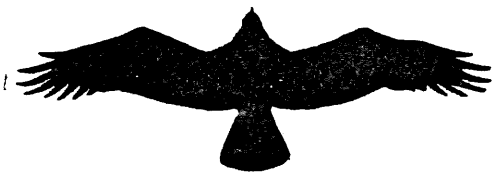
Call - High rasping squeal.



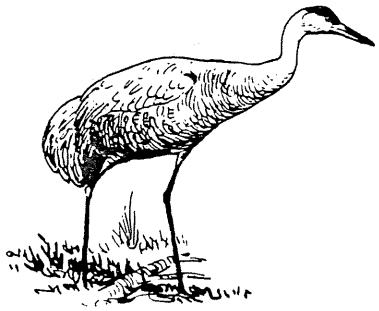
Bald Eagle



Golden Eagle



Osprey



Sandhill Crane

Shape - A long-legged, long-necked gray bird with a bald red forehead. Neck is fully extended in flight, unlike the heron's folded neck.

Call - A deep rolly K-r-r-r-r-oo repeated many times.

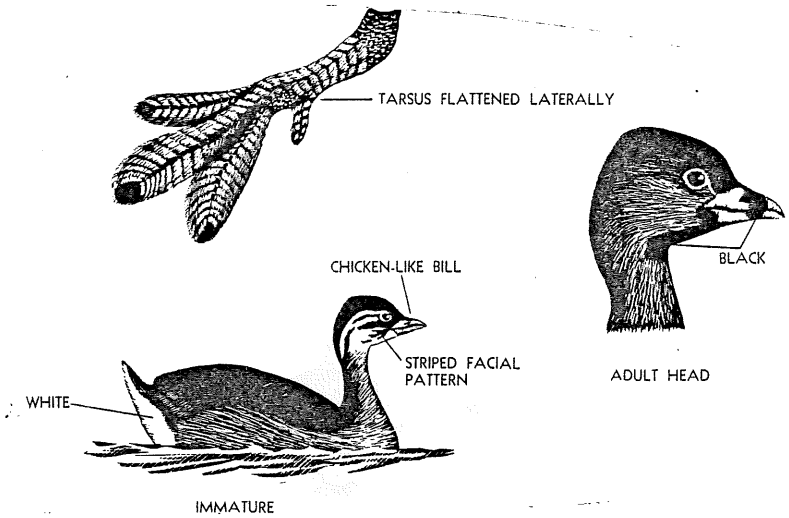
Herring Gull (often called Sea Gull)

Shape - Short neck, stout body, long-pointed inverted wings and pink legs.

Field Marks - Shades of grey, white and black.

Flight - Soars like a hawk, slow and deliberate.

Primarily a scavenger.



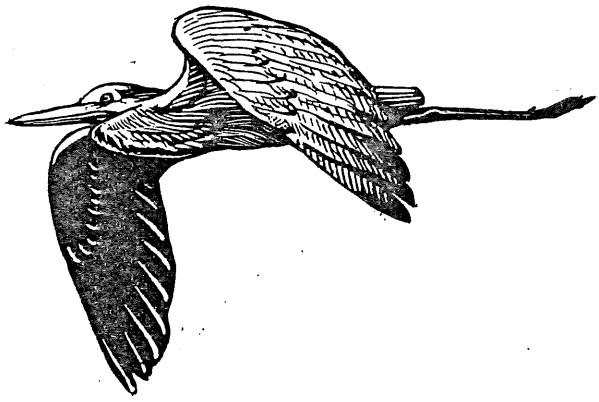
Grebe

A swimming and diving bird.

Shape - Short tail and wings; short legs placed far back on body; flat lobes on toes.

Flight - Weak and hurried with head held low.

Pied-billed Grebe most common one on Atlantic seaboard.



Great Blue Heron (often called Crane)

Shape - Long legs, neck and sharp-pointed bill.

Field Marks - General blue-grey coloration

Size - Largest of wading birds.

Flight - Neck is folded and legs extend straight back.

Habitat - Common on both fresh and salt water.

Call - Four hoarse croaks.

7

Outdoor Navigation

No matter how we travel, whether we walk, drive or fly, we depend upon some type of navigational aid. Most of the time we navigate by using our eyes to note certain landmarks: street signs, churches, schools, tall office buildings, directional signs, etc. Close your eyes and try to walk about--even in your own home....you form a mental map of where things are, and proceed accordingly.

If we are in unfamiliar territory, we usually use road maps, county maps, topographic maps, etc. to guide us by attempting to identify various landmarks as they appear on the map.

To navigate successfully, people must have a nearly constant awareness of their relationship to north, south, east and west. These are the cardinal points of direction.

We should make it a habit to practice direction-finding. It can

be done in your house or office, on the highway, and in new locations. Few people will ever enjoy hunting, hiking, or other outdoor activities if they are constantly getting disoriented, lost, or proceeding in the wrong direction. Being lost or disoriented in a large, forested area can be a traumatic experience.

Most people orient themselves to the cardinal points by noting the sun's location. At noon, standard time, the sun is approximately due south.

An outdoors-person should note the positions of the rising and setting sun at different times of the year. Check these positions with your compass some time.

Every hunter should be able to locate the North Star (Polaris) and The Big Dipper. These celestial bodies are visible on clear nights from all parts of Minnesota.

Constantly keep yourself oriented in respect to the cardinal direction points by using visible, distant landmarks.

Check the direction of wind movement and general direction of upper cloud movement before you start on a hike. They provide orientation over short duration as long as the wind doesn't change direction. Use your compass periodically to check this.

◆ Map Reading and Navigation ◆

Before you enter a large area to hunt, check the map of the area for obvious landmarks such as roads, railroads, lakes, valleys, hills, creeks, ditches, buildings, etc. Check the direction of these landmarks relative to where you start your hunt, and before you actually begin.

Some roads, such as township roads, run parallel or perpendicular to cardinal directions. Check the directions of roads, power lines, and railroads on the map.

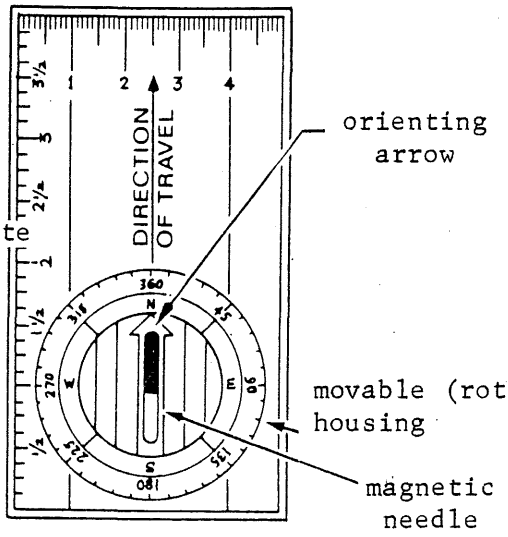
By far the best outdoor map is a U. S. Geological Survey topographic map. Maps of various scales for Minnesota and other states can be ordered through the U. S. Geological Survey, Denver Federal Center Building 25, Denver, Colorado 80225. These maps are accurately drawn from aerial photos and show prominent landmarks of all kinds. Contour lines indicate hills, valleys, and the degree of drop or rise in the earth's surface. Water areas, from swamps to rivers, are depicted.

Secure one of these maps and learn to read the information that it provides. A map symbol sheet is also readily available from the U. S. Geological Survey.

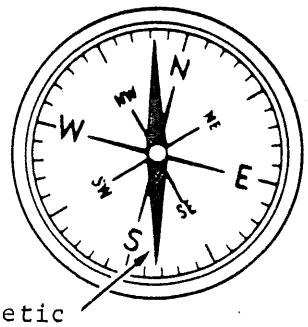
◆ Use of the Magnetic Compass ◆

Always carry a compass when hunting. The compass points at magnetic north, not geographic or true north. The difference between true and magnetic north is called magnetic declination. The declination of a particular location is indicated on topographic and some other maps. In Minnesota, the declination angle is 4^{o} - 7^{o} depending on the specific location. Before you hunt, check the declination as well as your heading in relation to where you start on the map and your destination.

ORIENTEERING COMPASS



WOODSMAN'S COMPASS



Types of Compasses

A. The Dial Compass: Consists of a round dial with numbers on the outside and a magnetic needle suspended on a bearing in the center of the dial. This model is not recommended for orienteering.

B. The Floating Dial Compass: Same as above, only the whole dial turns or "floats" on a bearing. Not a good choice unless you purchase an expensive model.

C. The Cruiser Model Compass: A dial compass with numbers reversed on the outside dial and a free spinning needle. These models have a sighting device and their long needles make them accurate. This style of compass is easy to use and is popular with hikers or campers.

D. The Orienteering Compass: These compasses are best for use with maps and for serious outdoor use. Orienteering compasses have a built-in protractor for determining direction from maps. They are easy to use and are the logical choice for the serious hunter, camper, or hiker, who will use maps in their travels.

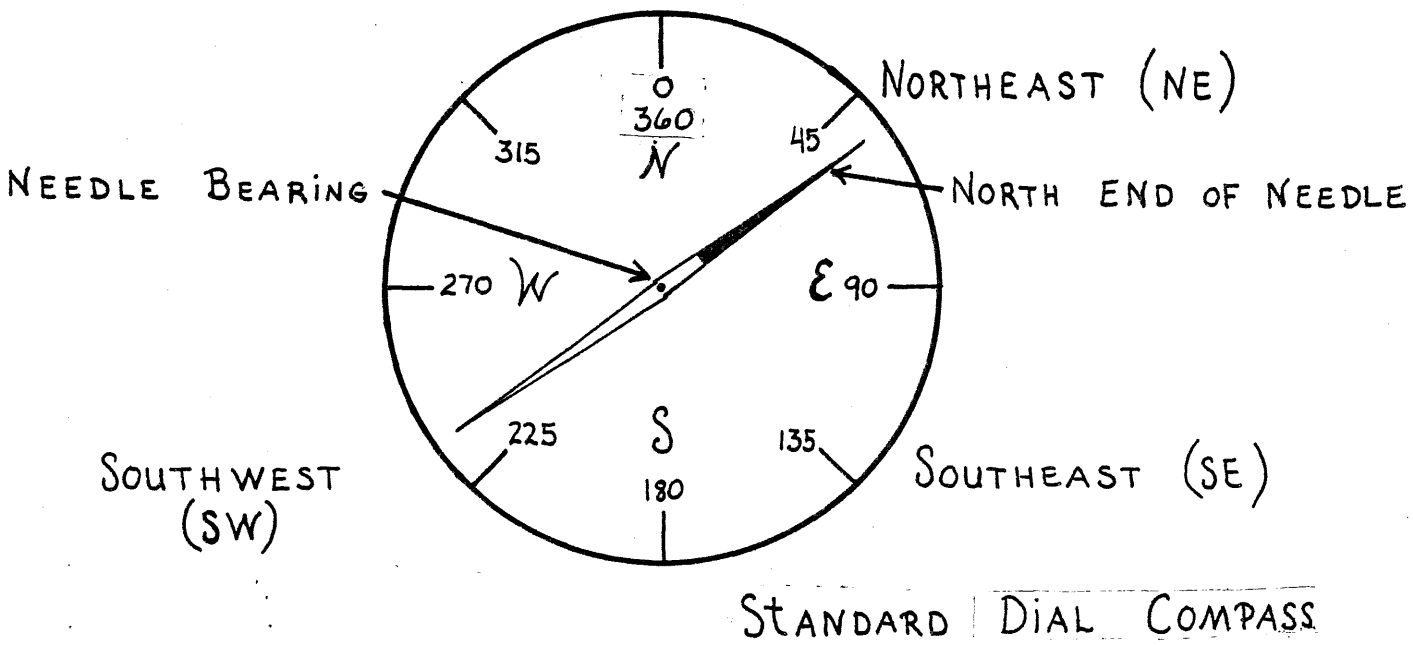
How A Compass Works

The earth acts like a gigantic magnet. There is a plus and minus pole. One of these (the plus pole) is called the north magnetic pole.

It attracts the north end of the magnetic needle. The magnetic north pole is not in the same location as the true north pole. Hence, a compass points to magnetic north, not to true or geographic north.

The Compass Dial

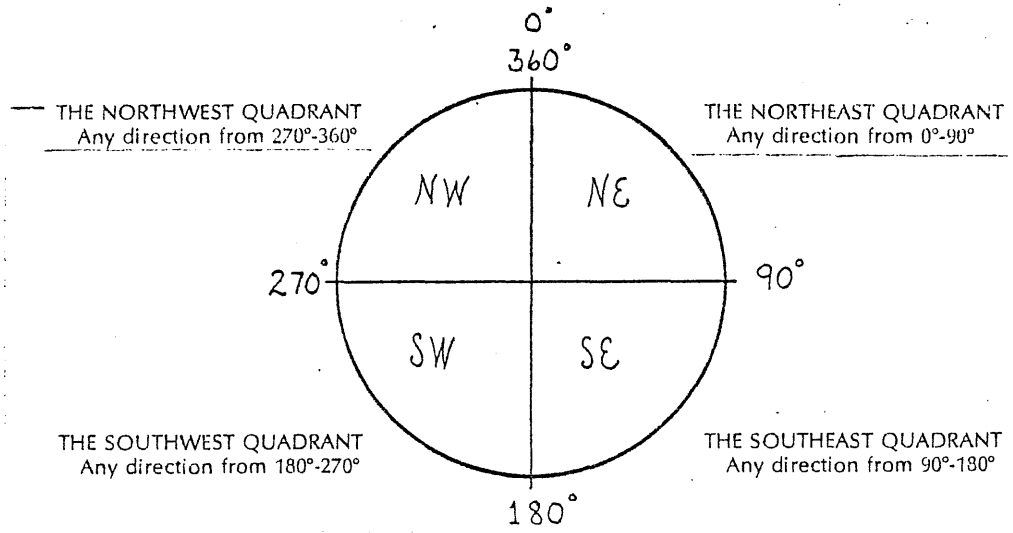
Compass dials are graduated from 0-360 degrees, clockwise around the dial. North is 0 or 360 degrees, East is 90 degrees, South is 180 degrees, and West is 270 degrees.



STANDARD DIAL COMPASS

Quadrants

Nearly all compass errors are quadrant errors involving 180 degree mistakes. For example, if someone wants to go in a direction of 40 degrees, he may read the wrong side of the magnetic needle and really be travelling in a direction of 220 degrees (40+180) which is in the Southwest (SW)



quadrant. So instead of travelling Northeast, he is travelling Southwest! 180 degree errors are the compass error that people who are lost often make. If you determine from your map the approximate direction or quadrant in which you will travel, this error won't happen to you. Try some examples. Fill out the chart below. The first one is done for you.

Example:

DEGREE READING	QUADRANT
240	SW
19	
7	
316	
283	
90	
107	

Direction-Finding Using a Map and Compass

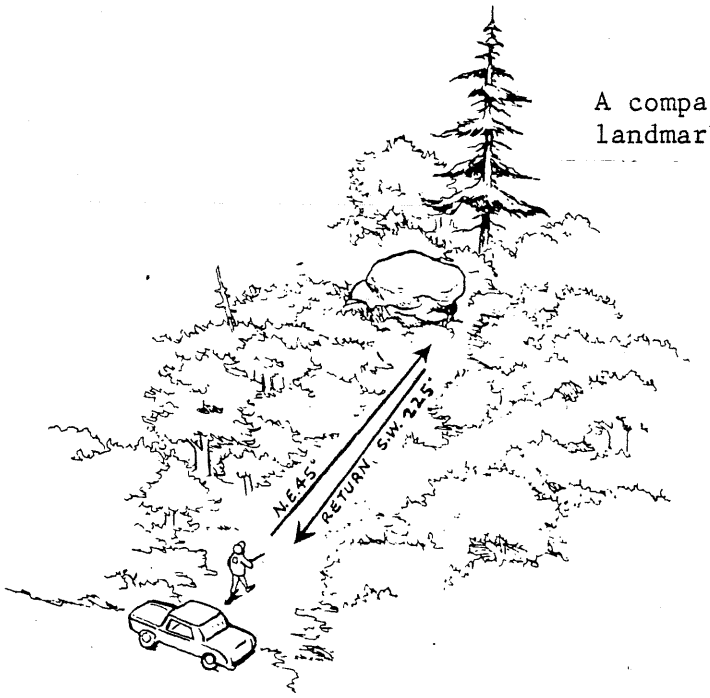
Place the map on a flat surface away from metallic objects that might attract the compass.

1) Align the North end of the map so it is pointed towards geographic or true North.

2) Place the 0° -180° line of the compass parallel to any north-south line on the map.

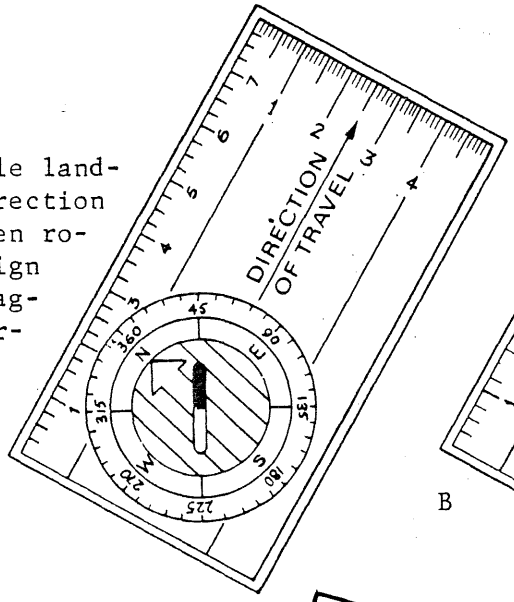
3) Locate your position on the map and your destination (or your general direction of desired travel). Draw a line between these two. Place the compass at your position with the same north-south alignment as in #2. Be careful not to move the map as you do this.

4) The compass's magnetic needle should point at magnetic north. REMEMBER: You must allow for the magnetic declination for the area you are in. Refer to the bottom of your map to determine the amount of declination.

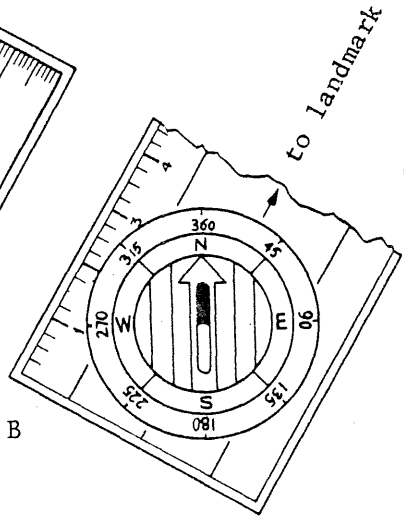


A compass, used knowledgeably with a map and prominent landmarks, can be the outdoorsman's best friend.

To find the bearing to a visible landmark, point to it with the "direction of travel" arrow (as in A), then rotate the movable housing to align the orienting arrow with the magnetic needle (in B). Read bearing (here about 35°) at base of travel arrow.

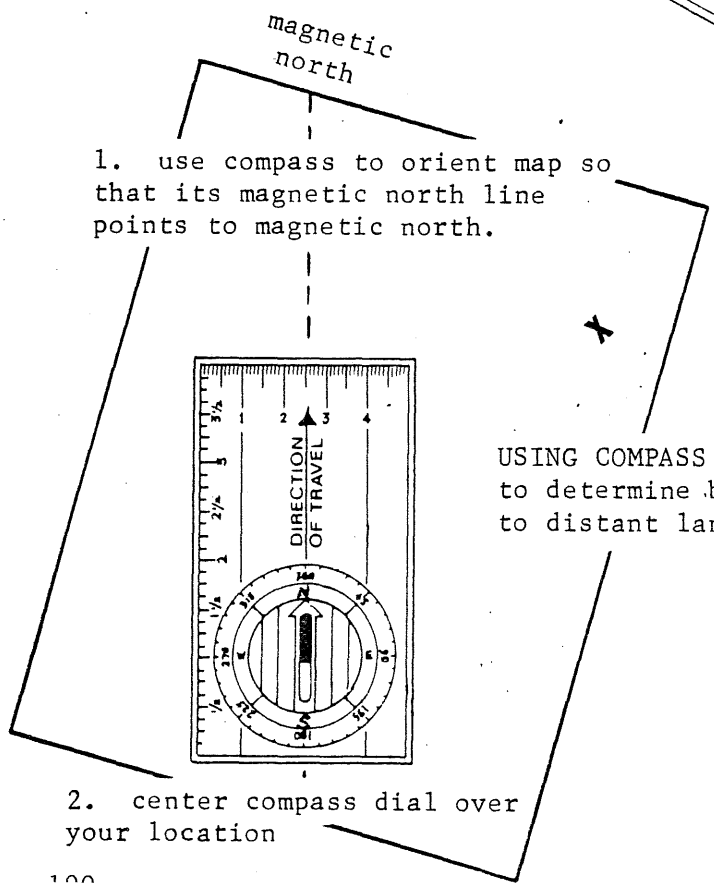


A



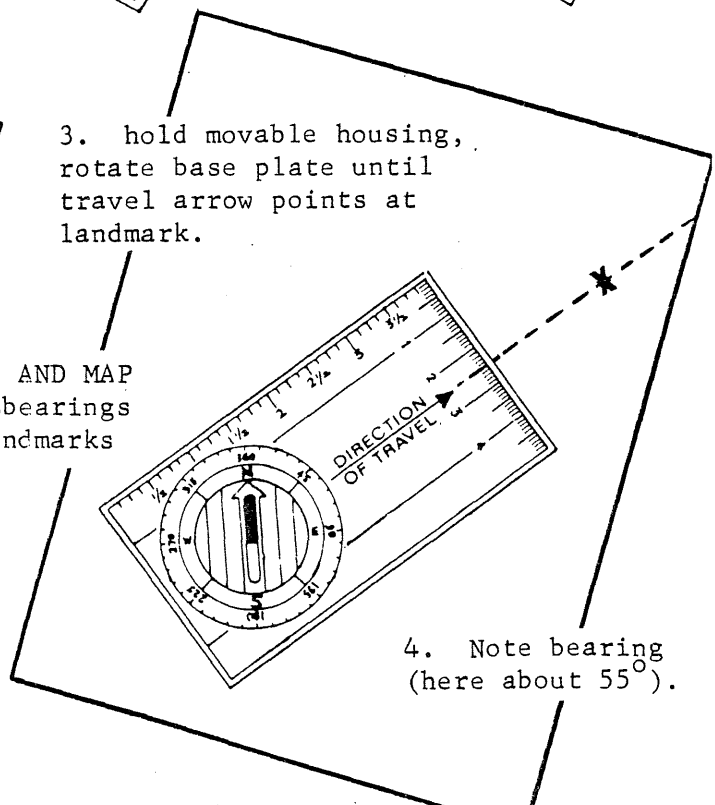
B

USING COMPASS AND MAP to determine bearings to distant landmarks



1. use compass to orient map so that its magnetic north line points to magnetic north.

2. center compass dial over your location



3. hold movable housing, rotate base plate until travel arrow points at landmark.

4. Note bearing (here about 55°).

5) If you are using a compass with a fixed dial and free-floating needle, place the center of the compass at your starting point. The bearing of the line which you have drawn on the map can be read on the compass dial where the line intersects the dial. Remember to allow for declination.

EXAMPLE: If the map information indicates the declination to be 6^{o} degrees east of north, this means the compass needle will point 6^{o} degrees east of north. You must subtract 6 degrees from your compass reading to determine any true north bearing on the map.

6) If you are using an orienteering type compass (with a transparent base and a liquid-filled, movable dial) place the edge of the compass along the line of your desired route. Be sure the direction of travel arrow on the base points toward your destination. As you hold the compass on the line rotate the dial points to north as indicated on the map. (The magnetic needle may be disregarded as you do this.) The bearing of your desired route can now be read at the Index Pointer. Remember to allow for declination. (see example above).

7) You may now use your compass in the field to aid you in arriving at your destination. All you must do is hold the compass in your hand, allow the needle to be attracted to north. Move your body until the needle points to the N on the compass dial. Face the direction of the bearing to your destination. Pick out an object on the horizon along this bearing. Walk to it and repeat this process until you reach your destination.

8) As you do this you should use the map to remain constantly oriented to visible landmarks as they are represented on the map. To help you do this, always orient the top or north end of the map to true north.

A compass without a map is generally worthless. A good map by itself can be used to determine one's position and route of travel. However, the best situation of all is to have a good map and a compass, know how to read the map, and how to use the compass.

Many lost persons who are lucky enough to be found did not have a map. Many that are found with compasses in their possession never took the time to learn how to use them.

Each year about 150 outdoor enthusiasts become lost and require rescue by some agency. Probably hundreds (or even thousands) more become lost for a while and are found without reportable incident. A little preparation and practice on your part can help you to avoid joining their ranks.

◆ What To Do If Lost? ◆

A well planned hunt and knowledge of navigation should make getting lost nearly impossible...but most of us don't always plan as well as we should. So now you're lost!

- Don't panic.
- Don't travel at night.
- Don't travel at all until you have decided on a plan. If you're really lost in vast, unfamiliar country, it might be best to remain at that spot to let people look for you. If you're disoriented because of cloudy weather, try to wait it out until it clears.

- Conserve your resources and try to signal to people that might be looking for you.
- Build or use what you can find for some sort of shelter from the weather. In the winter, make yourself a snow hut of some kind; snow is an excellent insulation.
- Try to start a fire with wet leaves or green boughs that make lots of smoke. Birch bark burns even when wet. Fires keep you warm, dry your clothes, and act as a signal for searchers. Be sure to gather plenty of firewood before you light your fire.
- Hopefully your emergency pack included:
    1) Matches in a waterproof case,
    2) a small mirror to signal with,
    3) plastic bags and aluminum foil for eating, drinking and cooking,
    4) nylon line and a hook or two for fishing and animal snares,
    5) a plastic rain parka to keep you dry, or to be used for collecting dew for water,
    6) a couple of candy bars for needed energy, and
    7) an extra compass and map.
- If you have plenty of ammunition, three successive shots are a universal signal of distress.

If you get lost, however, and you feel no one will miss you for a few days, and it's absolutely necessary to find your way out aline, you can try what one veteran forester did. He called his method "foolproof." See what you think.

While training an elusive deer, he realized his quarry had led him to an unfamiliar part of the woods. He was unable to recognize a single landmark. The sun had slipped behind clouds and the woods were absolutely still.

He felt for his compass, then realized it was home in a second pair of trousers. More annoyed than frightened, he knew a search party would eventually find him when his wife alerted authorities of his absence. What he didn't want to face though was the ridicule of forester friends for getting lost like any tenderfoot who wandered into the woods.

Nearby stood a tall oak. He decided to call it his "headquarters tree." With his hand axe he blazed four cuts around its circumference, quartering the tree into 90-degree segments.

From one mark he paced off a half-mile "looking for anything I recognized." As he walked, he blazed trees, back-sighting always to follow a straight line.

Twice he returned to his tree because he failed to see a single familiar landmark. The third time out--180-degrees from his first half-mile walk--he came to a trail he recognized.

What if he had not found a familiar landmark?

"Simple," he said. "Then I would have walked a mile in each direction from my tree. If I still hadn't found anything, I would have walked two miles. In time, I had to come to something--a road, trail, stream, high point of land--to help me find my way out. If you keep your wits about you," he added, "it's impossible to stay lost."

Fire Plan Maps Available

Fire Plan Maps are designed primarily for fire prevention and control. However, they are excellent guides for anyone—hikers to hunters—venturing into Minnesota's woods.

Each map is 12" x 12", printed on 15" x 18" plastic-coated paper, and presents one township (a 36-square mile area) on a scale of 2" = 1 mile.

Maps show roads, lakes, streams, railroad tracks, trails, ponds, and power lines (but no contours).

For an index of maps available, write to:

Minnesota Department of Administration, Documents Section, 140 Centennial Office Building, St. Paul, MN 55155.

Ask for "Index: Fire Plan Maps for Hunting." The index, which is free, tells how to order maps—at 75 cents each—by township and range number.

GLOSSARY OF TERMS

ALGAE - Simple one-celled or many-celled plant, usually aquatic, having no true root.

ANNUAL PRODUCTION - The total number or amount of plants or animals produced in a year.

AQUATIC - Growing or living in or upon water.

BIOSPHERE - The layer of atmosphere and earth surface that supports all living organisms and the water, air and soil that make up the living environment of Earth.

BIOTIC - Of or pertaining to living things.

BIRD - A group of warm-blooded vertebrates with feathers and wings.

BROOD - Usually a group of young birds hatched at the same time and cared for together.

BROWSE - Twigs or shoots of shrubs, trees, or woody vines which animals feed on.

CARNIVORE - An animal of the order Carnivora (flesh eating animals).

CARRION - Decaying flesh of a dead animal.

CARRYING CAPACITY - The number of organisms of a given species that the environment of a specific area can support on a sustained basis. Usually determined by the least favorable period of the year.

COMMUNITY - An association of plants and animals living together in a particular area.

COVER - Material that provides protection to animals, usually refers to vegetation.

CYCLE - Regular fluctuations in the (size of animal populations in a given area).

DECIDUOUS - Pertaining to plants that shed their leaves in the fall of the year.

DECOMPOSER - Living organisms, chiefly fungi and bacteria, that break down tissues of dead plants and animals and make them available for use by green plants.

DENSITY - The number of organisms per unit area.

DIVERSITY - Physical or biological complexity of a system. A diverse ecosystem contains many different plants and animals.

ECOLOGY - The branch of biology that deals with relationships of living things or groups of living things to each other and to their environment.

ECOSYSTEM - An area of nature that includes living organisms and non-living substances interacting to produce an exchange of living and non-living parts.

EFFLUENT - Discharge from a home or industrial sewage disposal system.

ENVIRONMENT - Total surroundings. Includes the natural and modified air, land, and water, people and their inventions, animal life, plant life, other organisms, and sound and climate.

EUTROPHICATION - Condition of high nutrient enrichment in an aquatic ecosystem, supporting a larger amount of primary aquatic life, (plankton-summer blooms) which depletes the oxygen supply.

FAUNA - The animal life of a region or time.

FLORA - The plants of a region or time.

FOOD CHAIN - The transfer of energy and materials stored in green plants which are eaten by animals which in turn are eaten by other animals.

FOOD WEB - Complex interlocking series of food chains.

HABITAT - The locality where a plant or an animal lives and grows.

HERBICIDE - Chemical that injures or kills plant life.

HERBIVORE - An animal that feeds almost entirely on plant life.

HIBERNATION - Passing the winter in an inactive, sleeping condition, generally in a den.

INSECTICIDE - Substance or mixture of substances designed to destroy or repel insects.

INVERTEBRATE - An animal without a backbone.

IRRUPTION - A sudden increase in numbers.

LAND USE - A term used to designate how land is used, such as residential for homes, commercial for business, industrial for factories, agricultural for farms.

LIMITING FACTOR - Conditions in the environment which restrict the number of animals in a given area.

LITTER - A group of young mammals.

MAMMAL - A group of warm-blooded animals with hair on the body, and females with milk glands for feeding young.

MIGRATION - Moving from one region to another at regular periods for feeding or breeding. Usually returning to the same general area.

NATURAL RESOURCES - Capacities and materials supplied by nature.

NATURAL SUCCESSION - The orderly change of one group or association of plants and animals to another until a stable community is formed. Once such a stable community is formed, further changes are slow or occur over much longer periods of time.

NICHE - The special function and place of an organism in the community.

NOCTURAL - Active at night.

NUTRIENT - Element or compound that is an essential raw material for organism growth. Examples are carbon, oxygen, nitrogen, phosphorous, the dissolved solids and gasses in water.

OMNIVORE - An animal that feeds on both plant and animal life.

ORGANISM - An individual living plant or animal.

OVERCROWDING - Too many organisms in relation to the capacity of the habitat to support them adequately.

PESTICIDES - Chemicals used by man to control insects, plant diseases, vegetation, and higher animals.

PHOTOSYNTHESIS - Complex process in which green plants make sugar and release oxygen from carbon dioxide and water. Chlorophyll and sun energy are necessary.

POLLUTION - The presence in the environment of substances of such character and in such quantities that the natural quality of the environment is degraded. It may impair resource usefulness or render the environment offensive to the senses of sight, taste, or smell.

POPULATION - All of the individual animals of a species in a given area.

POSTING - The act of placing signs which restrict entry to or activity on property.

PRAIRIE - Extensive level or rolling grassland.

PREDATION - The act of one animal killing another animal in order to survive.

PREDATOR - An animal that kills other animal life to survive.

PREY - Animals killed and eaten by another animal.

PRIMARY CONSUMER - A plant eater that converts plant tissue into animal tissue, thus making plant energy available to other animal organisms.

PRODUCERS - Green plants that convert sun energy and nutrients into plant food upon which all other life depends.

RANGE - Geographic area occupied by an animal. Movement of an animal throughout the area it occupies.

RESIDENT - An animal that lives in a given place year around.

SCAVENGER - An animal that feeds on carrion.

SECOND-GROWTH FOREST - Plants which develop naturally after cutting a virgin forest.

SECONDARY CONSUMERS - Animals that feed on other animals.

SHOOTABLE SURPLUS - Excess of game above the carrying capacity of the environment.

TERRITORY - An area defended by an animal against others of its kind. Sometimes this area is defended against other animals.

UNGULATE - Any of the hoofed mammals.

VERTEBRATE - An animal with a backbone.

VIRGIN FOREST - A forest that has not been disturbed by harvesting of trees for timber or other purposes.

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2) "Before You Hunt", 27 min. Available through: Film Loan Service, MDNR, 350 Centennial Office Bldg., St. Paul, MN 55155.

3) "A Question of Hunting," 28 min. Presented by Remington Arms Company, Inc. Available through: Modern Talking Picture Service, Inc. 2323 New Hyde Park Road, New Hyde Park, N.Y. 11040


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