Mammals of Glacier National Park

by

R. R. Lechleitner

INTRODUCTION

Throughout the ages mankind has been interested, for one reason or another, in the animal life surrounding him. Animals have been a source of curiosity, danger and admiration, and their use as food and clothing goes back to prehistoric times. With the advent of civilization many of man's relation with the other animals have changed. Some of the animals have been domesticated and others exterminated, but the most remain much as they were and man will always be striving to know more about them, particularly the mammals.

WHAT ARE MAMMALS?

Mammals are the warm-blooded backboned members of the animal kingdom that possess hair. Most of them give birth to living young and all nourish their offspring with milk produced by special glands known as "mammary glands," whence the name "mammals." As a group they are among the most successful of all the animals. They have invaded almost all areas of the earth and occur in every habitat type. For example, porpoises and whales are entirely aquatic, the kangaroo rats live in arid deserts, gophers and moles live almost entirely below the surface of the ground, dogs and deer live on the earth's surface, squirrels and martens are at home in the trees, and bats have developed wings and taken to the air.

There are 57 species of mammals known to occur in Glacier National Park, and in the following pages each of these is listed along with notes as to its appearance, distribution and habits. The mammals are arranged into Orders which are very broad groupings of animals of more or less similar form and habits. Within each Order they are further arranged into Families which are more precise groupings of more closely related animals. It is hoped that this arrangement will help the reader to identify, understand and appreciate these mammals more fully.
PARK WILDLIFE PROTECTED

Glacier National Park embodies nearly 1600 square miles of spectacular mountainous country along the Canadian border in northwest Montana was set aside as a National Park by Congress on May 11, 1910, to be preserved for the enjoyment of this and future generations.

Among the primary functions of the park is the preservation of the native animals in their primitive condition, while providing the public with a maximum opportunity for observing them. Presentation of the animals to the visitors is done in a natural way and no animals are encouraged to rely on man for their support. Thus the park animals are not like those seen in a zoo where they are removed from their natural surroundings and made wholly dependent upon man. The animals here are protected from being killed, harmed or molested by man, but are in no way restricted except where they are an eminent source of danger to the visitors. Problems stemming from injury to persons or damage to property frequently arise, but are usually solved by means other than those requiring killing the animals or drastically interfering with their normal existence.

Rules and regulations regarding the visitors and their relations with the mammals have been made, not only to protect the visitors, but also to protect the mammals. Under park protection many of the mammals, especially the bears and the deer, have lost much of their inherent fear of man and thus may appear exceedingly tame. As a result many visitors insist upon giving these animals various foods, most of which are not beneficial to them. These feeding incidents have resulted in injury to the visitors and adverse effects upon the animals, therefore the National Park Service has had to pass a regulation prohibiting the feeding, teasing or molesting of any of the larger mammals in the park. We request your cooperation in this matter and hope you will abide by this simple request. Remember it is for your own welfare and that of the mammals themselves.

HOW PARK GEOGRAPHY AND CLIMATE AFFECT LIVING THINGS

Most of Glacier National Park consists of mountains and U-shaped valleys, all the result of sedimentation, upheaval and subsequent erosion, first by water and then by ice in the form of valley glaciers. The peaks of the park rise abruptly from the prairies to the east and elevations range from approximately 3,000 to 10,500 feet above sea level.

The Continental Divide, which divides the waters of the continent between the Atlantic and the Pacific Oceans, runs its zig-zag course lengthwise through the park dividing it into eastern and western halves. The vegetation on the western slope is predominantly similar to that of
the inter-mountain and Pacific Coast areas, while that on the eastern side resembles that of the southern Rocky Mountains. Most of the moisture laden air currents arrive from the west and as they rise over the western foothills they become cooled and drop their moisture. Thus the western slope receives the greatest precipitation. The winters on the west side are less severe than on the east side, temperatures average higher and high winds are less frequent. Therefore, conditions are in general more favorable for the development of the dense timber stands in the western valleys than they are on the eastern slopes.

Within these general limits there is a great variation in vegetation depending upon the altitude. The general altitudinal vegetation types occur in definable belts referred to as life zones, and each zone may contain certain mammals characteristic of it. Four different zones are represented in the park and are quite readily distinguishable, one from the other.

The lowest, or Transition Zone, is essentially open forest or prairie type. On the eastern side of the Continental Divide it is represented by finger-like projections of prairie into the lower valleys. On the western slopes it is relatively rare and consists of isolated groups of open stands of Ponderosa Pine, grassland or sagebrush, most of which are located along the North Fork of the Flathead River.

Above the Transition Zone lies the largest of the four, the Canadian Zone. This is a dense forest type of habitat and consists primarily of spruce, fir, lodgepole pine, hemlock and larch, with areas of cottonwood and aspen. Not only is this the most extensive zone in the park but it is also the habitat of the majority of the park animals.

Higher on the slopes, before the timber gives way to the almost barren peaks, there is a relatively narrow belt of stunted trees known as the Hudsonian Zone. Here dwarfed alpine fir, white-bark pine and alpine larch are found growing in clumps and tenaciously clinging to life under very adverse conditions.

Above the timbered areas lies the Arctic-alpine Zone. Here the vegetation is predominantly perennial and stunted. Many species of herbaceous plants are present and many are brightly colored. During the short summer blooming season the high mountain meadows are usually resplendent with a profuse display of wildflowers. Above the mountain meadows are the rocky slopes, windswept cliffs and peaks where all vegetation is sparse, but where some tiny, hardy species of plants may be found.

None of the mammals appear to be strictly confined to any one zone, but some are found more abundantly and more characteristically in a
certain zone or zones. For example, the marmots are in general more often found in the Hudsonian and Arctic-alpine Zones and the martens are most abundant in the densely forested areas of the Canadian Zone. The general distribution of the individual mammal is indicated under the appropriate heading on the following pages.

Much of Glacier's charm arises from the opportunity to observe animals in a wilderness setting in which even the visitors feel themselves a part. The thrill of seeing a bear along a trail, a moose feeding in a woodland pond, or a squirrel visiting a picnic table hoping for a tidbit is an enjoyable experience enjoyed by young and old alike. Living things—plants and animals—contribute greatly to the visitor's enjoyment of the scenic grandeur of the area. It is the author's hope that this booklet will supply information that will not only provide a better understanding of the ways of these mammals but will also result in greater enjoyment when you chance upon them in your journeys through the park.

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R. R. Lechleitner
GLACIER’S MAMMALS

Order INSECTIVORA: Insect Eaters

These small insect eating mammals have very simple teeth, small eyes, long snouts and minute ears. Of the world’s nine families and over 300 species of animals in this order only one family and three species are found in the park. The moles belong in this order, but are not known to occur in the park or in western Montana or Alberta.

Family SORICIDAE: The Shrews

The shrews are all small mammals (less than 6 inches in total length) and included in the family, but not represented in the park, is the smallest North American mammal, the pigmy shrew. Shrews are nervous, savage little creatures that live close to the earth and use a variety of organisms as food. They are primarily insect eaters, but will eat almost any type of meat, and at times will attack and kill meadow mice which are much larger than themselves. They are extremely active and require enormous amounts of food, eating up to three times their own weight in food each day. They may be active at any time of the day and do not hibernate in the winter. They are relatively short lived and most of them probably do not survive much more than a year. The teeth of shrews are considered quite primitive as many of the cheek teeth have but one point or cusp, a character referred to as unicuspid. The patterns exhibited by these unicuspid teeth are a great aid in identifying certain species of shrews, for in outward appearances the animals may be quite similar. They all have rather elongated muzzles and full rows of these sharp pointed teeth, but are not closely related to the rodents, which are only superficially similar.

Water Shrew
Sorex palustris navigator Baird

General Appearance:

This is the largest shrew in the park. The muzzle is sharply pointed, the eyes minute, and the ears tiny, scarcely showing above the short fur on the head. The tail is almost as long as the body and covered with short hairs. The feet each have five toes and are relatively large for so small a mammal. The toes of the hind feet are fringed with short stiff hairs and the third and fourth toes are joined at the base giving the feet a web-like appearance. The fur is
extremely short, has a definite sheen and is a blackish-brown color on the back and sides blending to a lighter gray underneath. The tail is dark above and light below, except for the very tip, which is uniformly black. The tips of some of the black hairs may be tinged with white giving the animal a grizzled appearance. Total length about 6 inches, tail about 3 inches, and hind foot about 0.8 of an inch.

Distinguishing Characteristics:

The small size, pointed noise and unicuspid teeth will identify the animal as a shrew. The black color, total length of about 6 inches and lateral fringes of stiff hairs on the hind feet will distinguish it from any other shrews in the park.

Life History:

Water shrews make their homes under the overhanging banks of the streams and ponds. They can swim with ease and can even run across the surface of the water. They feed primarily on insects but other small animals and even vegetable matter may be eaten. It is claimed that they feed at times on small fish, but proof of this is lacking. Like other shrews, they appear to be short lived, perhaps never exceeding 18 months of age. The young are born during the spring and summer months and each female may have several litters per season. Minks and snakes feed upon water shews at various times.

Park Distribution and Abundance:

These shrews are common along most of the water courses in the park, but are seldom seen, probably because of their secretive habits and the very nature of their habitat. Occasionally one may catch a glimpse of these energetic little creatures hunting long the banks of a stream or scurrying rapidly over the surface of the water in pursuit of some prey.

**Cinereus Shrew**
*Sorex cinereus cinereus* Kerr

**Rocky Mountain Shrew**
*Sorex vagrans monticola* Merriam

General Appearance:

These two shrews are almost indistinguishable both in general appearance and habits and thus will be treated together. The muzzles are sharply pointed, the eyes minute and the ears tiny. The feet are small and delicate and the tails are almost as long as the bodies. The fur is relatively short, soft, and a uniform light-brown color above, blending to a lighter grayish-buff on the bellies and bottoms of the furred tails.
Distinguishing Characteristics:

The pointed muzzles and small sizes will identify them as shrews, and the sepia-like color and the lack of lateral margins of hairs on the hind feet will distinguish them from the water shrew. The cinereus shrew is smaller than the Rocky Mountain shrew, seldom exceeding 3.7 inches in total length, whereas the latter may be up to 4.4 inches in total length. The two shrews may be readily distinguished by the patterns of the upper unicuspid teeth. In the Rocky Mountain shrew, the fourth unicuspid is the largest but in the cinereus shrew they are all of the same size, or if different the third may be the larger. (See diagram below.)

Life History:

These shrews are dwellers of the forest and grassland floors where they scurry about in the litter in search of insects and other invertebrate animal food. They are extremely active both during the day and at night and do not hibernate in the winter, but make their way about under the crusted snow. At times they may come onto the surface in the winter and their tiny tracks are often seen for short distances before they disappear again into their sub-snow home. The young are born during the summer months and their life expectancy is quite short, seldom exceeding 18 months. Many animals such as hawks, owls and a variety of carnivorous mammals may kill and eat these shrews, but often the shrews may be killed by these animals but for some unknown reason are left unconsumed.

Park Distribution and Abundance:

Both of these shrews are very abundant in the park, but because of their small size and their habits they are seldom seen. They undoubtedly play an important role in the biological dynamics of the area and may even be a controlling factor of destructive forest insects. A close examination of the litter on the forest floor almost anywhere in the park will reveal evidence of their presence in the form of tiny runways constructed beneath the duff or under a decaying log.

Order CHIROPTERA: Bats

Bats are the only mammals capable of true flight. Other mammals which are often improperly referred to as flying mammals, are actually capable only of gliding motions made possible by various body membranes.
The forelegs of bats are modified into rather effective wings with a membrane of skin which extends from the greatly elongated bones of the hand and the forearm to the sides of the body and back to the hind legs. In all species of bats in the park there is also a thin skin membrane connecting the hind limbs to the tail.

The ears of bats are in general quite large for such small mammals and have in their center a rather long leaf-like appendage referred to as the tragus. These ears and their tragi play an important part in the life of the bats for it is by means of them that they can avoid or find various objects while in flight since their eyes are small and of rather limited use. The bats emit ultrasonic vibrations of high intensity through their mouth and nostrils. These ultrasonic waves, upon striking an object, are reflected back to the ears of the bats. In this manner the animals may know the location of objects in their path and can avoid or capture them as the case may be. Thus the bats actually hear their surroundings, and gain an accurate, effective sound picture of their environment by this built-in sonar equipment which in principle is similar to that used on ocean vessels to detect enemy submarines or to map the ocean floor.

Bats have been considered as obnoxious animals by many people for centuries, and many tales have arisen of their troublesome and fearsome nature. Most of these tales are pure fiction, for in reality most bats are quite helpful to man. They have no affinity for women’s hair and are not a common source of any human parasites. All of the bats in this area are insect eaters and as such do men a great favor by devouring countless millions of these troublesome pests.

Family VESPERTILIONIDAE: Evening Bats

All of the bats in the park belong in this family. They are insect eaters, flying chiefly at dawn or dusk; during the day they are inactive, hanging upside down in a variety of dark roosting places. This daytime inactivity is more than a common sleep for many of them, since during this period the metabolic rate, heart beat, and breathing rate drop below normal and the condition is not dissimilar to that of true hibernation. During the winter months bats may go into a prolonged hibernation period or migrate south to a more favorable climate.
Silver-haired Bat
Lasionycteris noctivagans Le Conte

General Appearance:
This is a black or dark, brownish-black bat with many of the hairs on the upper parts tipped with white giving the animal a somewhat silvery appearance from above. The tail membrane and the blunt wide ears are also black and the former may bear rows of tiny wart-like projections containing hairs. Total length about 3.8 inches, tail about 2 inches and wing spread about 11 inches.

Distinguishing Characteristics:
This is the only bat in the park which is black in color and on which many of the black hairs are tipped with silver.

Life History:
These bats are essentially forest dwellers especially where the trees border on streams or open meadows. They are inactive during the day, roosting upside down under the bark or in the deep foliage of evergreen trees and their presence is often indicated by the squeaking noises they make when alarmed. At dusk they may be seen flying over the streams and meadows in search of insects which are their only food. During the winter months they may migrate southward to a more favorable climate. They mate in the fall months and the one or two young are born early the following summer.

Park Distribution and Abundance:
Much work needs to be done on the distribution and abundance of bats in the park. This species is probably the most common one in the park for there are extensive areas of suitable habitat available for it in the lower forested sections. It does not fly until almost dark and so may go unnoticed in areas where it is quite abundant. Nearly all open meadows or streams surrounded by stands of trees probably have goodly numbers of these bats.

Big Brown Bat
Eptesicus fuscus pallidus Young

General Appearance:
This is the largest of the bats definitely known to occur in the park. The fur is long and soft and of a uniform light brown color above, blending to a lighter brown on the under surface. The flight membranes are a blackish-brown and only sparsely haired. The ears are relatively short and rounded, and the tragi are not as pointed as those of the little brown bat. Total length about 4.5 inches, tail about 2.5 inches and wingspread about 11.5 inches.
Distinguishing Characteristics:

The uniform light brown color of the upper parts, small rounded ears and large size will help to identify this bat.

Life History:

Like the little brown bat this species is a night flyer, but it emerges from its roosting place in an old building, hollow tree or rock crevice later in the evening than does its smaller relative. Its flight is slower and more even than that of the other bats in the park. Only one offspring is born in the summer and is cared for by the mother for at least a month and perhaps longer. It has not been determined whether this species hibernates or migrates to the south, and it is entirely possible that both situations occur.

Park Distribution and Abundance:

This bat is considered as uncommon in the park. Only one specimen has been collected. This one was killed by a car on the highway just inside the west entrance station. Perhaps it occurs in greater numbers than has been supposed and because of its late flying habits has not been encountered more often. More work is needed to determine its exact status in the park and surrounding areas.

**Little Brown Bat**

*Myotis lucifugus alascensis* Miller

General Appearance:

This is a small, dull brown, delicately proportioned bat with slender ears and tragi. The fur is soft and rather long. The sexes are colored alike but the young are much darker than the adults. Total length about 3.5 inches, tail about 1.6 inches and wingspread about 9.5 inches.

Distinguishing Characteristics:

It is rather difficult to distinguish this bat from several of the others occurring in the park without using technical terms unfamiliar to the layman or without the use of precise measurements. The uniform pale, yellowish-brown color will help to distinguish it from the long-legged bat which is in general more reddish brown. The ear of this bat when laid forward does not extend far beyond the nose, whereas that of the long-eared bat exceeds the nose by at least 3/16 of an inch. The big brown bat is much larger.

Life History:

These bats are primarily night flyers appearing at dusk flying over water, meadows or among trees. Their flight is quite rapid, erratic and wavering and seldom far above the ground. During the day they hang
head downward in some dark place, usually in barns, attics or eaves of houses. Because of these congregations and their associated fecal droppings, odors and disturbing squeakings they sometimes cause concern to the human occupants of these places. A single young is born during the early summer and it may be carried by the mother on her evening flights for several days after birth. The young can fly in about one month’s time and soon become self-sustaining. In late fall or early winter the bats may either hibernate in a nearby cave where temperatures are moderate or migrate to the south.

Park Distribution and Abundance:
These bats are fairly common at lower elevations in the park especially around buildings, particularly at park headquarters, at the Lake McDonald Hotel, Many Glacier Hotel, Rising Sun Campground and the Two Medicine Chalets.

Long-legged Bat
*Myotis volans interior* Miller

General Appearance:
This is a small, dark brown bat with rather short, narrow, pointed ears and blackish-brown unfurred membranes. Total length is about 3.8 inches, tail about 1.7 inches and wingspread about 9.4 inches.

Distinguishing Characteristics:
The dark brown color, small ears, and small size should identify this bat.

Life History:
Little factual information is available on the habits of this bat, but its life history is probably quite similar to that of the little brown bat in many respects.

Park Distribution and Abundance:
The long-legged bat is apparently scarce in the park but more intensive study is needed to determine its exact status.
Long-eared Bat
Myotis evotis chrysonatus Allen

General Appearance:
This is a small light brown colored bat with long narrow ears which, when bent forward, extend beyond the nose by at least 3/16 of an inch. The membranes are dark brown in color and largely unfurred. Total length 3.3 inches, tail about 1.6 inches and wingspread about 9 inches.

Distinguishing Characteristics:
This is the only bat in the park on which the ears, when flattened, extend past the nose for any considerable length.

Life History:
Little is known of the life history of this bat. It is reported to hang at rest in caves or trees and to migrate south during the winter months.

Park Distribution and Abundance:
The status of this bat in the park is largely unknown. A small colony was found in a deserted house near Camas Creek in 1949 and none has been found since.

Order CARNIVORA: The Carnivores or Flesh Eaters
The teeth of the mammals in this group are more or less specialized for a diet of meat and all of them at times may use meat as a source of food. However, only certain of them are strictly meat eaters, the majority using vegetable foods to a considerable extent.

Eighteen different species of carnivores representing four families are found within the boundaries of the park.

Family URSIDAE: The Bears
These are carnivores with a large stout body and a rudimentary tail. They walk on the soles of their feet after the fashion of man and have five toes on each foot, each equipped with fixed claws. The cheek teeth are flat and adapted to crushing rather than for shearing as is the case in the majority of the carnivores.

Black Bear
Ursus americanus cinnamonum Audubon and Bachman

General Appearance:
Almost everyone from childhood on is somewhat familiar with the general shape and structure of bears. The black is a medium sized bear with a shaggy coat, which varies in appearance with the time of year. It is long, thick and glossy in the fall just before hibernation and in early spring immediately after emerging. During the summer months the animals
undergo a molt and their coat may become extremely shaggy. The color varies greatly with individuals, ranging from deep black to almost blond. The particular sub-species in the park contains many brown-colored bears and is appropriately called "cinnamonum" or cinnamon. The claws of the black bear are relatively short and slightly curved, those on the front feet being only slightly longer than those on the hind feet. The face has an almost straight profile and the rump area appears as high if not higher than the shoulder region. Adult bears may weigh from 200 to 500 pounds, with an exceptional individual even heavier.

Distinguishing Characteristics:

This is a black, brown or blond-colored bear having a straight facial profile, lacking a hump on the shoulder area. The claws of the front feet are only slightly longer than those of the hind feet. This bear climbs trees with ease.

Life History:

Bears are omnivorous, eating a variety of food, including vegetable matter. Insects also are a favored item but almost anything will be eaten. In this area the bears are active only during the spring, summer and fall months, hibernating during the winter in caves, decaying logs, holes in the ground or beneath overhanging cliffs or patches of dense vege-
The hibernation is not particularly deep and the animals may be readily roused.

Bears in the park mate during the summer, with the peak of breeding in late June and July. The young usually number two but three are not uncommon. Occasionally there may be four in a litter. The young are born in February or March while the mother is still in hibernation and weigh less than a pound at birth. They are quite blind and helpless when born but manage to fumble around for the mother’s nipples on which they greedily suckle. When they are ready to leave the den in late spring they weigh from five to ten pounds.

The cubs stay with the mother during the first summer and are guarded carefully. Even when quite young they are expert climbers and will go scurrying up the nearest tree at the slightest indication of danger or at the warning growl of the mother. It is an extremely unwise person who will approach too closely a mother bear with cubs or get between the mother and the cubs. While the cubs are with the female she does not come into breeding condition and they will hibernate together that fall. The next summer they are left to fend for themselves and the mother bear will mate again. Thus under normal conditions the young are born to a female every other year.

Bears are normally shy animals and not vicious as is often believed. If left alone they will usually cause no harm. Sudden loud noises are especially dreaded and will usually set the animals running or climbing up a nearby tree. However, if they are cornered they can be formidable opponents, for their speed and strength is surprising. Bears have few enemies other than man. The cubs are sometimes killed and eaten by other bears or by other large carnivores such as the mountain lion.

Park Distribution and Abundance:

Black bears occur in almost all regions of the park below the upper limits of tree growth but seldom do they wander higher into the alpine meadows. Estimates place the number of black bears in the park at around 400. They are one of the major wildlife attractions of the park and are seen more often than any other large mammal. Several “bum” bears habitually linger along the Going-to-the-Sun Highway in the upper end of the McDonald Valley. Visitors frequently are not content to observe or photograph the bears but insist upon feeding them. This is an exceedingly detrimental, unwise and unsafe practice and is therefore against park regulations. These are wild animals which should be left to forage for themselves. The “highway bum bears” tend to lose their fear of man and often become exceedingly dangerous. Each year several foolish people are injured because they disregarded the fact that
these are powerful wild animals capable of inflicting grave injury and should be treated with the respect due them. It is perhaps unfortunate that the bears are the ones which suffer most when it is necessary to destroy one because of these encounters with man, for they are in reality just being themselves—normal wild animals.

It is doubted that the physiology of bears can adjust to the variety of foods that are received from visitors. Furthermore, feeding makes them rely upon the human being and neglect their inherent foraging habits. Since this type of feeding occurs only during a short period of the summer and not in the early spring and late fall, which are the critical period in the bears’ lives, they are left at these times without this means of subsistence. Sometimes the bears are so spoiled by people feeding them that they have little regard for the presence of man. They then get into the campgrounds and raid the garbage cans and any other source of food. All food should be kept in strong containers or in a securely locked car, for the bears are rummagers by nature and will tear apart flimsy structures to get to the food they contain.

When bears become a serious nuisance or menace to life or property in the park they are trapped alive by means of a large metal cage on wheels. Once caught they are taken back away from the main highways and released. This operation is often ineffective with some troublesome individuals. If they persist in these destructive actions or become a danger to human life they must be eliminated.

It is the policy in the national parks not to kill any of the animals, except to protect human life. Likewise it is contrary to policy to present animals to the visitor in an artificial situation. It is a much greater thrill to observe one bear in its native habitat digging for insects or mice than it is to observe a dozen of them slopping in a garbage can or pit.

REMEMBER: IT IS DANGEROUS AND UNLAWFUL TO FEED, TEASE OR MOLEST THE LARGER MAMMALS OF THE PARK.

DO NOT FEED THE BEARS

Grizzly Bear

*Ursus arctos horribilis* Ord

General Appearance:

The grizzly is a large bear with a massive head, robust body and stout legs. The shoulder area is decidedly higher than the rump. The claws of the forefeet are longer than those of the hind feet and only slightly curved. The face has an almost "dished-in" profile and the eyes are proportionately small and set wide apart. The fur is dense, long and
coarse, being at its finest in the late fall or early spring. The color varies with individuals but is generally a light shade of brown with the ends of the longer hairs of the head, shoulder and back area tipped with a silvery white. It is because of these silvery-tipped hairs that the animal often has been called "Silvertip." These are the largest carnivores in the park and may weigh between 350 and 900 pounds with individuals occasionally even heavier. The Alaska brown bear, which is the world's largest carnivore, is a sub-species of the grizzly bear.

Distinguishing Characteristics:

The brown color and silvery-tipped hairs combined with the high shoulder area, long claws of the front feet and dished-in facial profile serve to distinguish the grizzly from the black bear. The tracks made by the front feet of a grizzly can be identified by their large size and by the fact that the imprints made by the long claws are found a considerable distance in front of the toe prints. Tracks of the black bear have the claw marks set quite close to those of the toes. Grizzly bears seldom climb trees and then with difficulty.

Life History:

Little factual information is available on the habits and life history of the grizzly bear in this area. They appear to be great wanderers
and in general are most often found above timberline in the alpine meadows during the summer. Occasionally they are seen on the lower forested slopes particularly around rock slides and open areas. The long, slightly curved claws of the forefeet are very useful tools for digging and the bears use them to turn up the earth in search of food. One may often see places in the alpine meadows where extensive plots of turf have been uprooted by them, in quest of the bulbs of lilies, onions or other plants, as well as meadow mice, pocket gophers, ground squirrels and marmots. They will eat almost any animal they can catch and it is doubted if there are any in the park that they are unable to kill. In the spring they may frequently be seen at the base of rock slides and avalanche areas where they often find winter-killed carcasses of animals such as deer and elk. Simply because bears are seen eating such animals does not mean that they have killed them, although they undoubtedly do so at times. Grizzlies are reported to cache uneaten parts of food and to defend these caches against intruders, including other bears.

Like the black bears they hibernate in the winter months, but from the records available in the park area their periods of hibernation appear to be of a shorter duration. Mating occurs in the summer and the cubs are probably born the following spring while the mother is in hibernation. There are usually two cubs but three have been reported in the park. The cubs probably remain with the mother for their first summer and hibernate with or near her during their first winter, as is the case with black bears.

These bears are usually more secretive and wild than black bears and are seldom seen by park visitors. They are not as tolerant of humans as black bears and at times may defy approach beyond certain limits. A mother grizzly with cubs should certainly be left alone for she will defend the cubs against any encroachment. Any grizzly is an animal to be greatly respected and to be observed only from a distance.

Park Distribution and Abundance:

Because of their wildness and secretiveness it is extremely difficult to obtain estimates of the numbers of grizzlies in the park. Latest figures indicate that approximately 100 of these lordly mammals make the park their home. They may be encountered in almost any area of the park but are reported most often in the higher elevations. For the past several years their diggings have been prominent in the Logan Pass area along the trail to Hidden Lake. They seem to come into this area usually toward the latter part of August and the first part of September.

If a grizzly bear is seen along any of the trails in the park it should not be molested nor approached too closely. Usually if avoided it will mind
its own business but if the bear appears to want the trail it is wise to grant it and a discreet retreat is probably in order. Never attempt to become too familiar with this animal nor become too alarmed in its presence. Keep a level head and by-pass the bear or, if necessary, go back.

The grizzly bear was once a rather abundant animal throughout the western United States but because its presence is incompatible with human occupation it has disappeared from much of its former range. The national parks, such as Yellowstone and Glacier, along with a few primitive areas in the national forests of Wyoming, Montana and Idaho, are the last stronghold of this regal beast in the United States. It is hoped that here they may maintain themselves in goodly numbers into the future. The grizzly is without a doubt one of the most magnificent representatives of our original North American fauna and deserves a place where it can live and thrive to be seen and enjoyed by the American public.

Family **CANIDAE**: The Dogs

This family is composed of dog-like carnivores with rather long legs and sharp muzzles. The cheek teeth of the family are adapted for both shearing and crushing. The domestic dog belongs in this group and probably had its origin from wild species of the Old World.

**Rocky Mountain Wolf**

*Canis lupus irremotus* Goldman

**General Appearance:**

This is a large, powerful, dog-like animal with a fairly long, bushy tail and erect, slightly pointed ears. The fur is relatively thick, long and coarse. There is great variation in color among individuals but little change according to the time of year and no color distinction between sexes. The color may vary from an almost pure white to a more normal grizzled-gray or a deep black. Of the wolves seen in the park the black color phase seems to be abundant and it is possible that this subspecies is *occidentalis*, since the subspecies *irremotus* is listed as light colored. The males are larger than the females and may weigh up to 200 pounds, although 150 pounds is probably closer to the average.

**Distinguishing Characteristics:**

The dog-like form and extremely large size will usually identify this animal. Some dogs are similar in appearance to wolves and hybrids between the two species are known. In the park, however, any extremely large dog-like mammal with long, rangy legs and a shaggy tail which is always held low is probably the wolf. Coyotes are smaller and usually a grayish-brown in color with a black tip on the tail.
Life History:

The wolves now present in this area are essentially forest animals. Travelling in groups or packs usually composed of family aggregations, they may range great distances in search of their food which consists of a variety of animals. The larger hoofed animals such as the deer, elk, moose and mountain sheep are probably preferred items.

Wolves usually make a home site or den in a cave, crevice, log or hole in the ground. There the young are born in the spring, about 63 days after mating, and may number from three to fourteen. The pups are cared for by both parents and at times even by other relatives. The voice of the wolf is not dissimilar from that of a large sled dog but the howl is reported as more chilling and eerie. This howl differs greatly from the yapping call of the coyote, being more throaty and drawn out.

Anyone interested in further information on the life history of wolves is invited to read the book by Adolph Murie, "The Wolves of Mt. McKinley National Park," which is listed in the bibliography at the end of this publication. It is, without a doubt, one of the finest life history studies ever undertaken on this animal and makes enjoyable and educational reading.

Park Distribution and Abundance:

Whenever man makes inroads into any wilderness area some of the wild animals which formerly occupied the area must go. The wolf is one of the first to disappear. Once the wolf was well distributed over the United States but it has since been exterminated over much of this area and is now found only in a few isolated spots. Glacier National Park is one of these remaining hold-out areas for the wolf in the United States. Wolves were at one time very common in the park area and about the turn of the century were still present in fair numbers. They apparently were absent from the area for a number of years but since 1943 repeated reports of their appearance have been made by park personnel and visitors. The 1953 wildlife census lists three wolves actually seen by rangers and several instances of tracks being observed. Local residents near the North Fork of the Flathead River report seeing wolves on various occasions but mostly during the winter months. It is quite probable that the wolves seen in the park and surrounding areas originate in Canada. On May 27, 1950 a female black wolf was shot within the park boundaries while in the act of running down a calf on private land. The following measurements were taken from the specimen two days after it was killed: weight, 130 pounds; height at the shoulder, 34 inches; length from tip of nose to tip of tail, 70 inches; tail, 22 inches; head, 13 inches; between the ears, 7 inches; toenail to heel pad of front paw, 6 inches; girth of
chest, 34 inches. The head of this individual was made into a mount and now hangs on the wall in the administration building at Park Headquarters.

General Appearance:

This is a slender, dog-like animal about the size of a small German shepherd dog. The tail is bushy and the sharp-pointed ears are held erect. The coyote resembles a small wolf except for the relatively large and more pointed ears and the more slender muzzle. The fur is thick, coarse, and in general, a grayish-brown in color. The sides of the body and the muzzle may be decidedly brown and the underparts almost white. There is a small black tip on the end of the tail. Total length about 45 inches, tail about 13 inches, hind foot 7 inches and weight about 35 pounds.

Distinguishing Characteristics:

The dog-like form will place the animal in this family. The smaller size, large pointed ears and general coloration will help distinguish it from the wolf. The tip of the tail is black whereas that of the red fox is white.
Life History:

Coyotes are shy, secretive animals, primarily active at night but sometimes seen abroad during the day. Quite cunning and sly, they feed on a variety of plants and animals. Almost anything that can be captured and killed is eaten, but it is likely from all the available evidence that small rodents and rabbits make up the largest portion of their diet. Vegetable matter is eaten at times and in the fall months berries are an important item. Coyotes may kill and eat deer but it is usually hunger-weakened adults or young that are taken and these depredations are not an important check on the deer population, except in extreme conditions. Coyotes feed on carrion including deer which starved or have been killed by other means.

During July 1954, I watched a coyote along the Going-to-the-Sun Highway a short distance from the West Entrance station. The animal was busily hunting along the roadside ditch. It cautiously walked along with its nose rather close to the ground, then paused and made a leap forward landing hard on its front paws. Then it reached down with its muzzle and greedily gulped down the morsel that was held between the paws. This procedure was repeated several times while I watched and not every time was there a tidbit under the paws. I was never certain just what the coyote was catching but mice runways were in evidence in the grass and I presume they were mice, although I cannot discount the possibility that it was grasshoppers for they too were present and are a favorite food of coyotes.

Coyotes make their home in a variety of locations such as holes in the ground, crevices in rocks and rotten logs. They have one litter of from three to ten young each year. The gestation period is about 60 days and the young are born about April or May. Either or both parents may care for the playful pups and during the summer months the entire family may be seen out on a hunting trip. Few animals other than man prey on the adult coyote, but eagles, horned owls and wolves may kill the young.

The voice of the coyote is an irreplaceable part of the West and to hear several of them sound off with their yapping howls is indeed a wonderful thrill. They may howl at dawn, dusk or throughout the night but are seldom heard in the daytime. The voice is a yapping, barking type quite different from the mournful howl of the wolf, yet is more drawn out and howling than the sharp yap of the red fox.

Park Distribution and Abundance:

Coyotes are relatively abundant within the park and recent estimates place their numbers at about 400. They may be found in almost all habitats from the prairie valleys of the east to the tops of the mountains.
and down into the deep forests of the west side. Because of their shy and elusive nature they are seldom seen by visitors. Occasionally an individual is seen along the highway where it may be feeding on ground squirrels or other animals killed by automobiles. For the past several years an individual has been seen frequenting the vicinity of Apgar Campground and every winter a rather tame coyote visits the Many Glacier Hotel, only to disappear into the forest with the arrival of the visitors in summer.

As a result of its depredation on chickens, sheep and other domestic animals the coyote has been persecuted over much of its range. In recent years a new highly potent poison named "1080" has been used at bait stations to kill these animals. The poison has proven quite effective and the coyote, unfortunately, has almost been exterminated in much of its former range. However it is a quite versatile animal and has shown some comeback against the poison by moving to remote areas and even by extending its range farther to the east to places where it formerly did not occur. In the park the coyotes are not harmed, but are left as they were before man came into this area. They are undoubtedly one of the most interesting and important parts of the intricate scheme we call nature.

**Western Red Fox**  
*Vulpes fulva macroura* Baird

**General Appearance:**

The fox is a small, slender built, sharp-nosed dog-like animal with a rather large, bushy tail. The fur is long and soft and may vary greatly in color but is generally a reddish brown with the feet and backs of the ears black, and the tip of the tail white. There are three color phases of the fox and each is given a separate name in the fur trade although they all belong to the same species and are simply genetic variations. The three types are: red fox, colored as above; cross fox, general color yellowish with a blackish-brown cross on the shoulder area; silver fox, black except for the white tip on the tail and lighter underparts. There may be individuals which show various degrees of intergradation between any of these color patterns and instances are known of all three color phases occurring in one litter. Males may be slightly larger than females but there is no sexual difference in color. Total length is approximately 40 inches, tail 16 inches, hind foot 6 to 7 inches and weight 10 to 15 pounds.

**Distinguishing Characteristics:**

The dog-like form, sharp muzzle, erect, pointed ears and the large, bushy white-tipped tail will readily distinguish the red fox.

**Life History:**

The red fox in the park is decidedly different in its habitat prefer-
ences than is its eastern farmland relative. The foxes of the park seem to prefer the higher or more secluded habitats far from the presence of man, and are seldom found in the grassy valleys of the park or in farmlands surrounding it. They are quite agile, secretive and cunning and thus are seldom observed although their tracks may be seen in many of the more remote timbered areas and in the alpine meadows. Their food consists of a variety of plants and animals including grasses, herbs, berries, insects, amphibians, reptiles, birds and mammals. They are active throughout all the months of the year and during the day as well as at night, but are probably most active at dawn or dusk.

Foxes mate in February or March and the 3 to 9 young are born about 60 days later. The pups are cared for by both parents and are reared in a den made in a rock crevice, cave, hollow log or hole in the ground. By the end of their first summer the young foxes are able to fend for themselves and may leave the den to make their own way. The voice of the fox is listed as a short series of yaps not unlike those of a small terrier.

Park Distribution and Abundance:

The red fox is rather rare in Glacier but occasionally individuals or their tracks may be seen. The 1953 wildlife census lists one seen near Many Glacier and two seen crossing the highway near the Two Medicine entrance station. When hiking in the high country one should be alert for possible signs of these interesting members of the park’s fauna.

Family **FELIDAE**: The Cats

This is a family of highly specialized carnivores, who are almost wholly dependent upon meat for food. The cheek teeth are well adapted for shearing and not for crushing as in the bear family. There are five toes on the front feet and four on the rear feet, all of which are equipped with sharp retractile claws. Domestic cats belong in this family and probably descended from an early, Old World wildcat.

**Rocky Mountain Cougar**

*Felis concolor missouensis* Goldman

**General Appearance:**

The cougar is a large, lithe, unspotted cat with a long cylindrical tail. The coat is soft, short, and a tawny brown or gray in color. The muzzle, backs of the ears and tip of the tail may be almost black, and the underparts are much paler than the upper parts. The young are spotted until about one year old, at which time the spots disappear. The males resemble the females but are larger and may weigh up to 200 pounds, but the average weight is closer to 150 pounds.
Distinguishing Characteristics:

The large size, tawny brown or gray color and the long cylindrical tail serve to identify this animal.

Life History:

The cougar is known by a variety of names including: mountain lion, puma, panther, painter and catamount. It is a rather shy, secretive animal and its presence in an area is usually indicated only by the large cat tracks made in snow or mud, or by the cached kills of deer or other animals which sometimes may be found. Ever since this country was discovered the cougar has been much feared by man and has come to be an almost legendary animal. Much of this fear is unfounded, for the animal is so shy that it readily avoids man; however, if cornered or if it has young to be defended, it is an animal to be much respected. The cougar is most active at night but may also be about during the day. Preferring the brushy or rough, broken country, it is a great traveler and may range up to fifty miles from the home den which is usually located in a natural cave or hole in the rocks. The cougar preys on almost any of the animals found within its range. Deer are perhaps the most preferred food, but the list includes many others such as elk, moose, porcupines, marmots, rabbits and mice.
Deer and other hoofed animals are readily killed by the cat springing onto their backs and breaking the spinal column. After eating its fill the lion often covers the remaining parts with dirt or brush and returns to them again for another meal.

Although mountain lions kill and eat deer it is seriously doubted whether they can control the numbers of deer to be found in any area. The number of deer killed by lions is probably a reflection of the number of deer in the area and the conditions of the deer range. When deer are abundant in an area lions usually will be found nearby, and it is probably more correct to say that the number of deer present may determine how many lions can live in an area rather than vice versa. Lions undoubtedly kill deer of all ages but it is perhaps the young and weak animals that are most often taken. The lions may act as checks against a rapid increase of the deer population and help prevent it from reaching numbers where it will overuse its range, although evidence indicates that in the long run their checking effort is not sufficient to overcome the natural increase in numbers possible through the reproduction of deer. Certain it is that the cougars are detrimental to individuals in a deer population, but their affect on the population as a whole is either insignificant or perhaps even beneficial.

Cougars have from one to five young in a litter. The young may be born at any time of the year and about 90 days after breeding. The kittens are blind at birth and are covered with black spots. The eyes open in about ten days but the spotting may persist throughout the first year. They are not weaned until they are about 3 or 4 months old and may remain with the female parent until they are two years old. The adult cougar has few enemies and the young are carefully guarded by the parents.

Park Distribution and Abundance:

Cougars are very wide-ranging and seldom observed. Their tracks are regularly seen in almost all areas of the park. They probably never become abundant in any one area and it is suspected that they now occur in the park at a reasonable density. In the areas surrounding the park they are relentlessly and perhaps foolishly hunted because of their reported depredations on livestock, but in the park they are left as they are and should be—a normal part of the original fauna of the area.

**Canada Lynx**

*Lynx canadensis canadensis* Kerr

General Appearance:

The lynx is a long-legged, bob-tailed cat about the size of a small
shepherd dog. The ears have rather long ear tufts which are black in color. The feet are proportionately large and heavily furred. There is a pronounced ruff of fur present on each cheek area extending down from the sides of the head. The fur is long, extremely fine and silky, a grizzled gray tinged with black above and blending to a buff-brown on the sides. The under parts are lighter, almost white, tinged with buff-brown. The last inch or so of the tail is completely black. Males are larger than the females and weigh between 20 and 25 pounds.

Distinguishing Characteristics:

The bobbed tail, small size and gray color will readily distinguish the lynx from the cougar and any other animal in the park except the bobcat. The bobcat superficially resembles the lynx but the following characteristics will distinguish the two animals: The ear tufts of the lynx are usually longer than one inch, those of the bobcat are under one inch. The feet of the lynx are quite large for such a small cat while those of the bobcat are not so disproportionately large. The terminal portion of the tail of the lynx is completely black whereas that of the bobcat has a series of blackish rings on the upper surface. The bobcat is usually more spotted, with grayish areas, and the hair is not as long and silky as that of the lynx, giving the animal a more slender appearance.
Life History:

Lynx are roamers of the deep coniferous forests of the park, traveling many miles in a rather circular route, which is repeated at intervals. They feed on a variety of small animals but snowshoe hares are reported to be the staple item of diet. They are able hunters but probably kill by stealth rather than by persistent chase, for like all cats, they tire easily. Lynx are very wary animals and are seldom seen although they may be quite abundant in an area.

Like other cats they are active throughout the winter months and during this period the large feet serve as rather effective "snowshoes." The tracks of the lynx in the snow are large (about 3 to 4 inches in diameter) and lack claw markings, resembling those of the cougar except for the depth to which they sink in the snow and the length of the stride. The tracks of the bobcat are much smaller and resemble those of a large house cat.

Mating occurs in the winter and the two to four young are born about 63 days later in the spring. The young are cared for by either or both parents in the den located in a cave, hollow log or under an overhanging bank. The young may remain with the female parent for one year by which time they are nearly full grown.

Few animals prey on the lynx, probably because it is able to avoid any which are large enough to kill it.

Park Distribution and Abundance:

The lynx is not a common mammal in the park but its tracks are occasionally seen in the dense forest during the winter. It is reported to be a very cyclic animal, varying greatly in numbers over a series of years. The average length of time between these peaks of abundance is approximately 10 years and the peaks follow those of the snowshoe hare, its preferred prey. Within the park the evidence is too slight to indicate whether the lynx population fluctuates or not.

Pallid Bobcat

Lynx rufus pallescens Merriam

General Appearance and Distinguishing Characteristics:

The bobcat is similar in appearance to the lynx except for the difference already described under that species.

Life History:

The habits of this cat, in general, are similar to those of the lynx, but it is found more often in shrubby or semi-open and semi-arid locations.

Park Distribution and Abundance:

The bobcat is more southerly in its continental distribution than is the
lynx, but the ranges of the two overlap to a considerable extent, the park being one of these overlap areas. Bobcats are rather rare in the park but occasionally they are seen or their tracks are noted in the brushy valleys. Because of the deep snow and lack of extensive suitable environment it is doubted if this cat ever was very abundant here.

Family MUSTELIDAE: The Weasel Family

Members of this family are characterized by having a set of scent glands located at the base of the tail. The odors emitted vary from the almost pleasant musky scent of the marten to the repugnant scent of the mink and skunk. When alarmed these animals can eject the secretion of these glands, and with the aid of the swishing tail the droplets can be thrown considerable distances. The skunk is probably the best known and most notorious representative of the group.

Wolverine

*Gulo gulo luscus* Linnaeus

General Appearance:

This is the largest land representative of the weasel family. It has a bear-like form with a broad stout head and a powerful neck. The ears are short, the legs sturdy and the feet have curved claws on each of the five toes. The tail is rather bushy and relatively short, being only about one-fourth the length of the body. The fur is coarse and generally a rich deep brown in color with two broad pale-yellowish stripes running from the shoulder to the rump where they merge. There may be yellowish white spots on the throat or chest. Body length is from 30 to 35 inches, tail 7 to 9 inches, and weighs from 20 to 35 pounds. The males are larger than the females.

Distinguishing Characteristics:

The sturdy bear-like body, the bushy tail, brown color and pale yellow stripes on the side of the body serve to distinguish this animal from any other in the park.

Life History:

The difficulties inherent in studying an animal as rare, solitary and wide-ranging as the wolverine are apparent. For this reason little is known of its life history. Much has been written concerning its habits but the majority of these stories have been carried down from the many-told tales of trappers and woodsmen and in the course of retelling much fancy has crept into the history of this animal. The various accounts give to the wolverine a voracious appetite, a marvelous strength and a cunning second only to that of man. Many are the tales of wolverines fol-
following a trap line set for martens and breaking up the sets, eating the captured animals and bait and never themselves getting caught. It is said that even the bears will give way to these powerful members of the weasel family, and that they occasionally attack the larger members of the deer family such as elk and moose. Some of this reputation has probably been earned by the wolverines, but much is probably only legendary.

They are quite solitary in their habits and roam over a great territory and their activity in the park does not seem to be confined to any particular habitat. They may range freely from the valley meadows through the heavy stands of timber up into the alpine country above timberline. The mating occurs during the summer and the 3 or 4 young are born in early spring. The female constructs a bed and guards the young with a tenacious fierceness. Wolverines have no known enemies other than man.

Park Distribution and Abundance:

Because of their solitary and wide ranging habits these animals were probably never very abundant within the park. Occasionally individuals are observed at various localities in the park and tracks are often seen in the snow.

While on a trip from Logan Pass to Hidden Lake on the afternoon of the 11th of July 1951, with a group of nine visitors I saw a wolverine resting on a rock above the Clements moraine. When the animal saw us it ran diagonally across in front of us at an estimated distance of 75 yards. It ran with a bounding motion, making about three feet at each leap, and upon entering a grove of small alpine fir it climbed into the lower branches and was lost from view. The footprints left in the snow were about 2.5 inches in diameter and showed well the marks of the five toes and claws. These occasional glimpses which one may obtain of this rare and interesting animal in its native habitat are indeed thrilling events.

Selkirk Marten

Martes americana abietinoides Gray

General Appearance:

The marten is a weasel-like animal about the size of a small house cat. Its fur is quite soft and heavy, consisting of a dense under fur of short soft hairs covered by a longer glistening set of guard hairs. The color is a rich dark brown on the back and sides becoming darker on the bushy
tail and upper surfaces of the feet and legs. Many of the animals in this area have a bright orange patch on the throat, but the extent and brilliance of this patch varies with the individual. The nose is quite pointed giving the animal a fox-like appearance from the front but the ears are relatively small and rounded. Total length is between 22 and 30 inches, tail 7 to 8 inches, ears about 1.5 inches in height and weight up to 4 pounds. Males are decidedly larger than females but the sexes are colored alike.

Distinguishing Characteristics:

A dark brown animal about the size of a small house cat. The pointed nose, long fur, and erect ears readily distinguish it from the mink, and its dark color, small size and climbing habits from the fox. The pine squirrel is much smaller and has a clear white under surface.

Life History:

Martens make their home in the dense stands of pine, spruce and fir. Their chief food consists of small mammals such as squirrels, mice and rabbits, but many other items are taken including various birds, reptiles, amphibians and insects. Vegetable matter may at times make up a considerable part of the diet, especially during the late summer and fall period when nuts, fruits and berries are readily available. The animals can travel through the trees with great rapidity, and it is said they often run down and catch pine squirrels among the limbs. They often forage along the forest floor where they catch mice and other surface-dwelling animals. Activity is not confined to the night, but martens are seldom seen because of their habits. When startled they often climb quickly into the lower branches of the nearest tree where they will hiss, growl or snarl at the intruder.

Mating occurs in the summer during the months of July and August. The young, numbering from 1 to 4 are born in April or May approximately nine months later. The female usually makes a nest in a hollow tree or hole in the ground where the young, which are born blind and helpless, are protected for several weeks. After their eyes are open they may accompany the mother on hunting trips in the surrounding forest. With the approach of winter the young are almost as large as the adults and difficult to distinguish from them. From this time on they must forage for themselves for the martens are not a sociable family type of animal.

The American martens are close relatives of the Russian sables and
command a high price on the fur market. Within the park the martens, like all animals, enjoy complete protection from hunting and trapping and are left for the enjoyment of those who may see them in their forest habitat. It is quite probable that the park serves as a reservoir area for the outflow of excess martens into the surrounding forests where they are occasionally trapped.

Park Distribution and Abundance:

Martens are distributed throughout the forested areas of the park, being most common along the North Fork of the Flathead River. They are often seen along the numerous trails which cross this area, such as those to Logging and Quartz Lakes. In recent years they have been reported by visitors near the Lake McDonald Hotel on the west side and near Sun Point on the east side of the park. They are probably the most common carnivore in the park.

**Fisher**

*Martes pennanti columbiana* Goldman

**General Appearance:**

The fisher is a large dark brown mammal resembling a sharp-nosed cat with short legs. The general color varies from a dull brown to almost black, with the forward upper parts often grizzled and the tops of the feet and legs generally blackish. The tail is relatively long and bushy. Total length of males range from 36 to 38 inches, tail approximately 15 inches and weight up to 18 pounds. The females are much smaller than males and seldom exceed 6 pounds in weight.

**Distinguishing Characteristics:**

A rather large dark brown marten with grizzled head and shoulder area and lacking the pale orange throat patch of the true marten.

**Life History:**

The fisher was so named because of its fondness for fish, but the name is a misnomer, for the animal is not aquatic in habit, nor does it fish. It is actually a large marten, living in the forests where it eats a variety of food including marten, porcupines, squirrels, mice and at times fish. It is a very powerful animal and is reported to have killed such large prey as the lynx, fox and raccoon. The porcupine is one of its favorite foods. These it kills by turning them over and ripping open the unprotected belly area. It can climb with great agility and is able to catch martens in the tree tops. Recent studies seem to indicate that even though fishers are climbers, they only do so on fairly rare occasions. Fishers have few natural enemies, for those animals large enough to kill them are perhaps not able to catch them. The fishers mate within a week after giving
birth, making the period of gestation almost one year in length. Births occur in February or March and there may be from 1 to 5 per litter.

Park Distribution and Abundance:

If present at all in the park, the fisher is extremely rare. In recent years there have been several reports of fisher tracks in various areas but no specimens have been collected. The last sight record was at Waterton Lake in 1946. Bailey (1918) reports that several of these animals were trapped in this area before it was a national park.

**Otter**

*Utra canadensis evera* Goldman

**General Appearance:**

The otter is a rather large aquatic mustelid with a round slender body and a long, powerful, tapering tail. The head is rather flat, the ears are low and barely visible, the legs are very short and the feet are webbed. The fur is very dense, short and has a high durability. The color is a uniform dark brown on the back and sides blending to a light buff on the throat and cheeks, with prominent facial whiskers. Total lengths range from 40 to 45 inches, tail lengths from 12 to 15 inches and weights from 18 to 25 pounds.

**Distinguishing Characteristics:**

The large size, slender body, tapering tail covered with fur and the four webbed feet readily identify this animal.

**Life History:**

Otters have the most highly developed forms for an aquatic life among the land mammals. Their long lithe bodies, powerful tails and webbed feet make them well adapted to a water environment. They make their way along the larger streams and lakes hunting fish, birds, mammals, reptiles, amphibians and invertebrates. Otters are able to catch even the fastest of fish but it is likely that the major portion of their diet consists of the slower forms often referred to as "rough fish." They are great wanderers and may follow circuitous routes for many miles along the streams and lakes. Occasionally they may wander far from water and make cross country trips to new localities. Otters are quite sociable and are often found in pairs or groups. Otter slides are located along a stream, pond or lake on a steep bank in the mud or snow, where the animals take turns sliding down the bank and into the water.
Otters give birth to their young in late winter or early spring. The young are guarded by the female in a den built in a hole in a bank, an abandoned beaver lodge or occasionally in a hollow log. The voice of otters is extremely variable and has been described as ranging from a light snuffle to a high, shrill whistle.

Park Distribution and Abundance:

Otters are not very common anywhere in the park but are occasionally seen along the larger streams and lakes. Several reports have been made of otters being seen along the Middle and North Forks of the Flathead River and their tributary streams, and it is probable that in these drainages they occur most commonly. In late December 1950, while on a field trip into the North Fork country, I observed signs of at least three different otters along Camas Creek.

Otters are active in the daytime and a constant watch should be kept for these animals along the larger streams and lakes in the park, for they are truly intriguing animals to observe.

**Western Mink**  
*Mustela vison enermumenos Bangs*

General Appearance:

The mink is a slender weasel-like animal about two-thirds the size of a small house cat, but with a relatively slender body. The tail is only slightly bushy and almost half as long as the body. The legs are short and the feet have five toes which are furred, but not webbed. The general body color is a rich glistening brown with patches of white present on the chin, throat and chest or belly. The fur is relatively short and extremely fine and glossy. The males are almost twice as large as the females but both sexes are colored alike. Males have a total length of about 24 inches, with tails about 8 inches and may weigh up to two pounds.

Distinguishing Characteristics:

It is a dark brown, weasel-like animal, larger than a weasel and smaller than an otter. The fur is shorter than that of the marten and lacks the orange throat patch. Most often seen along water courses and seldom if ever climbing trees.

Life History:

Minks are semi-aquatic mammals, following along water courses in search of their food which includes fish, birds, snakes, frogs and various invertebrates. Being tireless hunters, they travel considerable distances in search of food. They are expert swimmers and can easily capture most of the small water-dwelling animals. Minks appear to have little fear of
any other animal, even man, and if cornered will hiss and snarl with rage. They can be formidable opponents even to animals of larger size. Mating occurs in the months of February and March and may be quite promiscuous. The female gives birth to from three to eight young in April or May, approximately 42 to 45 days after mating. The young are blind at birth and are zealously guarded by the female until they leave the nest some six to eight weeks later. They may accompany the mother throughout the summer, but after that time they are as large if not larger than she and leave to forage for themselves. The great horned owl is listed as one of the few natural enemies of the mink.

Park Distribution and Abundance:
Minks are fairly common mammals along the stream banks and lake shores throughout the park. They appear equally at home in the dense forests of the west side and in the willow bottoms of the prairie meadows of the east. The major habitat requirement seems to be water in one form or another. The animals may sometimes be observed traveling nervously along the banks of bodies of water especially at dawn or dusk.

Weasels

There are three species of weasels found in the park. Since they have life histories which are in many ways quite similar, and because of the limitations of space only one of these will be treated in detail.

Short-tailed Weasel
*Mustela erminea invicta* Hall

General Appearance:
The weasel is a slender-bodied mammal with a small head, low ears and short legs. The tail is round, slender and about one-third the body length. The color varies seasonally in this locality, the summer color being uniform buff to chocolate-brown above and white underneath and the tail a uniform brown except for the last inch which is tipped with black. With the coming of winter the brown hairs are shed and replaced completely by white hairs, except for the black tip on the tail. In spring there is another molt and the white hairs of the back and tail are again replaced by brown. The total length is approximately 7 to 13 inches, tail
length 3 to 4 inches and weights up to one-fourth pound. Males are decidedly larger than females but the sexes are colored alike.

Distinguishing Characteristics:

Its small size, round, almost snake-like body and small head should identify it as a weasel. The white under parts and comparatively short black-tipped tail will distinguish it from the other weasels in the park.

Life History:

Weasels are very carnivorous in their habits. In the park area it is quite probable that mice make up the majority of their food, but a variety of animals may be taken. The prey is usually killed by a bite at the base of the skull, after which the weasel may eat part of the prey, especially about the head and neck regions, leaving the rest untouched. It is claimed that these wiry, nervous little animals actually kill for the sheer joy of killing. They are so fearless that they will often attack animals much larger than themselves and there is little doubt that these encounters sometimes have adverse effects upon the weasel itself. They are primarily nocturnal in habit, but are often seen abroad during the day. Being both curious and bold they will enter almost any opening. Their home may be located in a variety of spots including holes in the ground, in trees, in logs and sometimes under rock ledges. They are essentially land dwellers although they can climb well and may do so on occasions.

Mating occurs in midsummer in this species and from 4 to 8 young are born the following spring. The young are blind and helpless at birth and are cared for by the female for several months. They are usually weaned in about six weeks and by the end of their first summer may be as large as the adults and difficult to distinguish from them. Weasels probably are killed by a variety of other animals such as great horned owls, foxes, coyotes, minks and fishers, but because of their speed and agility it is doubtful if this occurs often with adults.

In the winter months when weasels of the north are colored white they are referred to as ermine.

Park Distribution and Abundance:

These are the most common weasels in the park and may be found in a variety of habitats from the valley floors up to the high mountain mead-
ows. They may sometimes be seen around buildings or running across the trails or roads.

**Long-tailed Weasel**

*Mustela frenata oribasa* Bangs  
*Mustela frenata longicauda* Bonaparte

This is the largest of the weasels in the park, although a large male short-tailed weasel may be larger than a small female long-tailed weasel. The tail is black-tipped and proportionately longer than that of the other two weasels. The yellow-tinged under parts help to differentiate this animal from the short-tailed weasel, which is pure white underneath.

The long-tailed weasel is not very common in the park but several of them have been seen at times, particularly on the east side of the Continental Divide. One large male was regularly observed around the Orientation Circle at Logan Pass in 1953 and 1954.

**Least Weasel**

*Mustela rixosa rixosa* Bangs

This is the smallest of the weasels. The female has a total length of only about six inches. The tail is very short (only about 1 or 1.2 inches) and lacks the black tip found on the tails of the other two weasels.

Until 1953 this weasel was unknown in the park. One specimen has been collected in the Two Medicine area and it is quite probable that the animals may occur rather sparingly in other areas of the park.

**Montana Badger**

*Taxidea taxus montana* Shantz

**General Appearance:**

The badger is a large, powerful, flat-bodied member of the weasel family. The legs are short and the front feet are armed with long heavy claws (over one inch in length) used in digging. The tail is short but bushy, and the fur is long and coarse giving the animal a distinctly shaggy appearance at times. The head is comparatively small and flat. The general coloration is silver-gray grizzled with black. The face has a distinct black and white appearance due to a base of brownish-black divided by a median white stripe and white hairs on the jaw areas. The under parts are much lighter than the top, blending from dull gray to white. Males are not much bigger than females and may weigh up to 25 pounds.

**Distinguishing Characteristics:**

The squat body, short legs and grizzled-gray color in conjunction
with the white face markings will distinguish the badger from any other mammal in the park.

**Life History:**

Badgers are residents of the prairies and open meadows adjoining the woodlands. They prefer meadow or prairie areas with a rather loose soil and an abundant supply of ground squirrels. They are powerful diggers and catch ground squirrels and pocket gophers by digging them from their dens. The animals are most active at dawn and dusk but may be seen at any time of the day. The abundant large holes dug in the ground are good signs of their presence in an area. If cornered away from their hole the animals will turn on their adversary and snarl and hiss in defiance, but if given a moment's respite will dig themselves into the earth with amazing rapidity, for they are in reality shy animals. Badgers apparently pair during the summer and both parents may care for the young which appear above ground in June or July in this vicinity.

**Park Distribution and Abundance:**

Badgers are common animals on the prairies to the east and occur in the valleys of the park on the west side. At present they are absent from the Belly River valley, probably due to the absence of ground squirrels in that area. On the west side of the park they are found in many of the meadows interspersed among the coniferous forests of the lower altitudes. They may be readily observed in the meadows along McDonald Creek from the foot of Lake McDonald to the junction of the stream with the Middle Fork of the Flathead River.

During the summer of 1951, in the Cutbank Valley, I surprised a badger away from its hole. While snarling and hissing at me with the front end, its rear end was busily digging a hole in the ground aided at times by powerful shoveling of the long-clawed forelegs. In a short time the animal had literally disappeared backwards into the ground.

**Plains Skunk**

*Mephitis mephitis hudsonica* Richardson

**General Appearance:**

The skunk is a small headed, heavy bodied, black and white mammal about the size of a house cat, with an extremely bushy tail. The legs are
short and the claws on the front feet are well developed for digging. The color may vary from almost pure black except for a small white head patch and white hairs on the tail to a conspicuous black and white appearance formed by two large white stripes which run from the white head patch to the rump and even appear to blend into the tail. There is considerable variation in the pattern among individuals even in the same race. The fur is long, dense and glistening. The males are larger than females. Total length from 21 to 24 inches, tail from 6.5 to 7.5 inches. Large males may weigh up to 8 pounds.

Distinguishing Characteristics:
The long hairs, stout body, and black and white color serve to readily distinguish this animal. When aroused it emits a disagreeable odor which ends all doubt of identification.

Life History:
Skunks are slow-moving night wanderers of the prairies, meadows and other open areas. Occasionally they may be seen abroad in the daytime but the animals are primarily nocturnal. They obtain their food mainly by digging in the earth, rotting logs and other places. They will eat almost anything they can catch, but insects make up a great part of their diet, along with mice, frogs, snakes, birds and eggs. They may dig their own burrows or take over those of the woodchuck or badger.

They mate in February and March. The young, numbering from 4 to 10, are born blind and helpless after a gestation period of about 51 days. They nurse for 6 to 7 weeks and may later accompany the parent on trips afield.

Park Distribution and Abundance:
Much to the relief of many campers, skunks are relatively rare within the park, but are occasionally seen in the lower valleys, particularly on the east side of the divide.

Order RODENTIA: The Rodents or Gnawing Animals
This is the largest order of mammals found in the park, both in numbers of species and numbers of individuals. Twenty-five different species of rodents representing six families have been recorded here.
The teeth of these mammals are specialized for both gnawing and crushing. The front teeth are adapted for gnawing and consist of only two incisors in the upper jaw, and two in the lower jaw, all of which are continually growing during the life of the animal and are being continually worn away at the tips. The cheek teeth are separated from those of the front of the jaw by a wide space, and are adapted for crushing the materials gnawed loose by the incisors.

The rodents of the park are quite varied in their habits and in their adaptations to various habitats. The beavers and muskrats are aquatic; certain of the squirrels are adapted to a life on and beneath the ground; others to a life in trees; the pocket gophers live an almost exclusively subterranean existence; mice are well adapted to a variety of situations on or near the surface of the ground. The park rodents vary greatly in size, ranging from the beaver which may weigh 60 pounds, down to the small white-footed mouse which weighs but a few ounces. The rabbits were once classified in this order, but are now considered to be distinct from rodents and so are classified in another order, the Lagomorpha, or leaping mammals.

**Family SCIURIDAE: The Squirrels**

This family contains a number of rodents which the ordinary citizen is not likely to regard as closely related to the familiar tree squirrels. The size varies greatly among the various species, ranging from the small chipmunks to the rather large marmots or woodchucks. Their modes of existence are also variable and include the tree-climbing habits of the tree squirrels, gliding of the flying squirrels, and the burrowing of the marmots and ground squirrels. Nevertheless, they are all closely related and have the following characteristics in common: a well-haired tail, no external cheek pouches, four toes on each front foot and five on each hind foot, at least four rooted cheek teeth on each side of the upper and lower jaw, and a rather rounded head.

**Columbian Ground Squirrel**

*Citellus columbianus columbianus* Ord

**General Appearance:**

This squirrel is about the size of a large house rat, with a rounded head, short ears, robust body, short limbs, and a short moderately bushy tail. The claws of the front feet are much larger than those of the hind feet and are well adapted for digging. The general coloration is a grizzled, mottled gray, blending to a reddish-brown on the legs and under parts. The front part of the head, extending from the nose to the ears is generally a bright reddish-brown. It is because of this conspicuous red mark
that the Indians of the region often refer to these animals as "red-noses." The tail is only about one-quarter the body length, rather heavily furred, and colored much like the rest of the body except that the longer tail hairs on the upper surface may have a decided white tinge. Total length is about 13 inches, tail about 3.5 inches and weight up to 1.5 pounds, although the average adult usually weighs about one pound.

Distinguishing Characteristics:

The squirrel-like form, size and general gray color with the bright reddish-brown on the face and brown under parts will readily distinguish this animal from any other in the park.

Life History:

Probably because of their burrowing habits ground squirrels are commonly called "gophers" by the residents of the northwest; however, they are not true gophers. The only gophers found in the park are the pocket gophers which belong in a separate family and have external fur-lined cheek pouches used for carrying food materials. Ground squirrels have only internal cheek pouches which are not fur-lined. The pocket gophers are seldom seen above ground, while the ground squirrels spend most of the daylight hours out of their burrows during the summer months. These squirrels are strictly ground dwellers, making their burrows in the soft earth, although they may at times climb onto rocks, logs or stumps in order to gain a better view of their surroundings, or clumsily climb into the lower branches of a shrub in search of some succulent berries.

Their burrows are found in a variety of situations and may be dug in almost any location where there is sufficient soil to accommodate the long tunnels and various chambers. Each burrow may have several openings, one of which is used as a main entrance and the others as secondary or emergency exits in case of invasion of the tunnel system by some enemy such as a weasel or a badger. The tunnel system may be quite complex and have a number of chambers located within its tortuous routes. One chamber usually contains the main nest which is constructed of dried grasses and twigs and is kept rather neat, while other seldom-used chambers and defecating areas are also found. The burrow system is usually equipped with a number of drains which serve to protect the main areas and nesting chambers from excessive water which may enter during periods of heavy rainfall or heavy snowmelt. Old unused tunnels are soon plugged with earth by the occupants.

These squirrels are quite tolerant of other individuals of their kind and often great numbers of them occur in the same meadow. They feed primarily on green vegetation such as sedges, grasses and herbs, but seeds
often make up a large part of their diet. During the summer months they may be seen scurrying about over the meadows devouring tremendous quantities of the various plants. They rely mostly on sight for the detection of their enemies, and when an enemy or strange object is thought near, the squirrels stand on their hind feet, their bodies stiffly erect with the front paws bent down at an angle. If a strange object is sighted the squirrel emits a loud chirp and this is soon echoed by others in the group. If the object approaches closer the chirps increase in frequency and intensity and when the squirrels are completely alarmed the chirps are blended into a final twittering series of notes and all of the squirrels go scurrying for the nearest burrow entrances, which are usually not far away.

They are active in the daytime and only during the spring and summer months. During the winter they go into a deep, prolonged hibernation sleep which is not broken until the following spring. While in this hibernating state the squirrels are lying on their backs tightly curled up in a vertical direction so that the tops of their heads are flat on their laps with their tails extending up and over the head areas, thus resembling compactly wound bundles of gray fur. In the park the squirrels in the valley are the first to emerge from hibernation in the spring. They first make their appearance in late April or May when the higher elevations are still deep under the winter's snow. They mate soon after emerging and the young are born about a month later, but do not appear above ground until they are about one month old. The squirrels of the higher meadows emerge much later, first appearing about June, some of them actually tunneling up through several feet of heavily packed snow to reach the surface.

The summer months are spent primarily in obtaining food so that sufficient fat can be accumulated for the long winter sleep. The squirrels of the valleys which are the first to appear above ground in the spring, are also the first to disappear from the scene with striking suddenness. This earlier hibernation of the valley squirrels may be related to a drying of the valley vegetation at this time of the year. It is also quite possible that due to the earlier awakening these squirrels have by this time been able to accumulate the stores of fat necessary for hibernation, whereas the squirrels of the higher regions have not yet been able to do so. The squirrels of the higher altitudes may still be in evidence at the time of the first fall snowstorms in September, and in some favorable years a few may still be seen in early October.
Ground squirrels are a prized food of almost all of the carnivorous animals in the park. Badgers and grizzly bears often dig them from their burrows. How successful the latter are in this operation is open to question and it is quite probable that the bears are more capable of capturing them in their winter burrows while they are hibernating, for the digging activities of the grizzly bears at Columbian ground squirrel burrows show a decided increase in the fall months. Weasels enter the dens of the squirrels, and other predators such as the coyote, bobcat, lynx, cougar, golden eagle and horned owl, undoubtedly catch them when they are above ground. It is no wonder that these rodents are so wary and suspicious, for their enemies are indeed quite numerous.

Park Distribution and Abundance:

The Columbian ground squirrels are the mammals most commonly seen by the park visitor. They occur in the meadows and open areas of the valleys, on the sides of the mountains, and up in the mountain meadows in all areas of the park except the Belly River Valley. They may be seen standing erect as ten pins along almost all the roads in the park, or busily eating in any of the meadows. They are especially numerous around the campgrounds and hotels where they are sometimes bothersome, for they are fond of almost any kind of food and are not averse to raiding food supplies left unattended by campers. Their chirping calls are constantly echoing throughout almost all areas of the park. In my estimation, they are one of the most interesting and fascinating animals in the park, and the sight of one of these fat squirrels standing erect on its hind legs, its nose busily sniffing the air, and its belly literally flopping to the ground is indeed a ludicrous one. Their antics are one of the most intriguing parts of a visit to this portion of the northwest.

Mantled Ground Squirrel
_Citellus lateralis tescorum_ Hollister

General Appearance:

This is a striped ground squirrel about 1/2 to 2/3 the size of the Columbian ground squirrel. The head and shoulders are a deep rich reddish brown giving the effect that the animal wears a brown mantle, hence its name. The eye is surrounded by a definite whitish-yellow "eye ring." The back and rump are a grayish-brown with two rather broad white or whitish-yellow stripes on each side, extending from the shoulder to the rump, each of which is bordered on each side by
black areas. The under parts are much lighter, ranging from a creamy-white to a buff-brown. The tail is about one-third the length of the body, only moderately heavily furred and dark brown in color. The total length is about 12 inches, tail about 4 inches and weight about one-half pound.

Distinguishing Characteristics:

The squirrel-like form and the two broad whitish yellow stripes bordered by black, not extending onto the neck and head, will identify this animal. The chipmunks are much smaller, have an additional dorsal black stripe and there are two white stripes on the face, one above the eye and one below it. The thirteen-lined ground squirrel is smaller, more gray and has several stripes on the back alternating with rows of spots.

Life History:

Much like that of the Columbian ground squirrel except that they tend to be less gregarious and are more likely to be found in rocky environments.

Park Distribution and Abundance:

Mantled ground squirrels live on the mountain slopes in almost all areas of the park but nowhere do they appear to be abundant. They may be found at many places along the Going-to-the-Sun Highway, including the parking area above the west side tunnel, the parking area at the Loop and at the Baring Creek Bridge. These cute little ground squirrels easily lose their fear of man and can be approached quite closely. Remember, it is not wise to become too familiar with them for they are capable of inflicting painfully severe bites and scratches. They are rodents and rodents are known to carry diseases which may be communicated to man.

**Thirteen-lined Ground Squirrel**

_Citellus tridecemlineatus pallidus_ Allen

General Appearance:

This is the smallest and slimmest of our ground squirrels. The color is a pale chestnut brown with some black intermixed, through which there are about 13 longitudinal solid and interrupted stripes running from the shoulder onto the rump. The under parts are much lighter and the tail is an almost reddish brown color toward the tip. Total length is about 11 inches, tail about 4 inches and weight about one-half pound.
Distinguishing Characteristics:

The numerous stripes on the back consisting of alternating longitudinal solid lines and longitudinal rows of spots, will distinguish this animal from any other in the park.

Life History:

Like the other ground squirrels but is more secretive in its habits and quite silent.

Park Distribution and Abundance:

These squirrels are rare in the park but occasionally are seen in the St. Mary Valley and on the prairie lands just east of the park, especially near brushy coulees. One of these squirrels has been seen in the grass meadows of the Belly River Valley, a place where none of the other ground squirrels is known to occur.

The Chipmunks

There are three species of chipmunks in the park. Since they are difficult to distinguish from each other and their life histories are in general quite similar they will be discussed together.

Buff-bellied Chipmunk
*Eutamias amoenus luteiventris* Allen

Rufous-tailed Chipmunk
*Eutamias ruficaudus ruficaudus* Howell

Timberline Chipmunk
*Eutamias minimus oreocetes* Merriam

General Appearance:

The chipmunk is a slender squirrel-like animal, larger than a mouse but but smaller than any of the ground squirrels. The ears are moderately long, the nose rather pointed, and the tail almost as long as the body and only slightly bushy. The claws of both the front and hind feet are short, curved and adapted for climbing. The overall color is a reddish-brown on the back, blending to a lighter buff or white on the under parts. The back is striped with four light whitish-buff stripes and five black stripes. The center stripe is black and extends from the head to
the rump. On each side of the face there are two light stripes, one above the eye and one below it. The tail is a chestnut brown above, and lighter beneath.

Distinguishing Characteristics:

The pattern of stripes on the back and on the face will distinguish them as chipmunks. The timberline chipmunk is smaller than the other two, tends to be more pale, almost yellowish in color, and has a shorter tail. It is found at or near timberline, whereas the other two are found in the main forested areas lower down on the mountains. The buff-bellied chipmunk may be distinguished from the rufous-tailed chipmunk by the fact that the shoulder, belly and under surface of the tail of the former are a buff yellow-brown in color while the belly of the latter is more gray and the shoulder area and tail more red.

Life History:

These are active little creatures usually seen scurrying about the vegetation of the forested areas, or in the case of the timberline chipmunk, on rock slopes at or above timberline. They make their homes in underground nests dug into the soil, usually at a stump, between the spreading roots of a tree or beside a log or rock. They climb readily and with ease, either at the approach of danger or in search of succulent berries on shrubs. Their food consists of these berries along with a varied assortment of nuts, seeds, buds and even insects. Unlike the ground squirrels they appear to consume little green matter. They have internal cheek pockets and can cram them with seemingly huge quantities of seeds or berries which are carried to the burrow or some hiding place where they may be eaten or stored.

They are active only during the daytime and only during the warmer months. In winter they remain in the burrows in a semi-hibernating condition; however, on warm sunny days in the winter they may appear for short periods.

Chipmunks mate in the spring and have from 4 to 6 in a litter. There is usually only one litter per year. The young are blind and naked at birth and are attended by the mother for a relatively long period of time.

Their voice is quite diagnostic and consists of both a single high pitched chirp used as a call note and a trilling series of chirps used as an alarm note. It is neither so melodic nor so loud and piercing as the call of the ground squirrels. They have many enemies as almost all of the flesh-eating reptiles, birds and mammals prey on them.

Park Distribution and Abundance:

Chipmunks are very abundant in Glacier and may be found in almost all situations from the valley floors up onto the higher mountain
slopes where the trees give way to the mountain meadows. In general, the buff-bellied chipmunk is most often found in the lower areas, the rufous-tailed chipmunk appears to favor the intermediate forested areas and the relatively rare timberline chipmunk may be seen on rocky slopes above timberline. Of the three species, it is difficult to say which is the most abundant, but perhaps it is the rufous-tailed chipmunk since it has more available habitat.

Richardson Pine Squirrel
Tamiasciurus hudsonicus richardsoni Bachman

General Appearance:
This is a bushy-tailed, brownish-red tree squirrel about the size of a large house rat, although more slender, with a short, dense, soft fur. The winter coat is grayish-brown above and a dirty white below, while the summer coat is much redder above and the under parts are almost pure white. The ears are moderately long and equipped with conspicuous tufts in the winter, but in the summer these tufts may be entirely lacking. The tail is more bushy than that of any other squirrel in the park and is colored a reddish-brown with the extreme half almost pure black. The claws on all four feet are short, curved and well adapted for climbing. Total length is about 12.5 inches, tail about 5.5 inches and weight about \( \frac{3}{4} \) pound.

Distinguishing Characteristics:
The squirrel-like form, bushy tail, brown-colored back and white under parts will distinguish this animal. The marten is much larger and never has white under parts.

Life History:
These are energetic tree-dwelling squirrels which inhabit the coniferous forests of the park. They make their homes in hollow trees, in old woodpecker holes or in fallen logs. Extremely expert climbers, they scurry about in the higher branches with great dexterity and seeming abandon. Their food consists mostly of the seeds of the cone-bearing trees and they are usually seen busily cutting the cones from trees or opening those which have already fallen.

They are active only in the daytime but throughout the year. Since they do not hibernate they must have a source of food during the winter months and a strong storing instinct partly answers this need. During the summer months many of the seeds which are collected are not eaten but are carefully stored in food caches in holes in the ground or in old rotten logs. Many of these caches are never again found by the squirrels. Some are found and eaten by other animals, while others may be left
undisturbed and thus contribute to the distribution and planting of the seeds of some of the trees.

The animals are quite inquisitive and when an intruder approaches they usually climb into the lower branches of a tree where they may gain both safety and a better view. From this vantage point they usually give forth a raucous, harsh, scolding chatter. This call, as well as a loud single call repeated at intervals, can often be heard throughout the forests of the park.

Pine squirrels mate in the spring and the young, numbering from 4 to 6 are born about 6 weeks later. They are blind and naked at birth and are cared for by the female parent. If the nest is disturbed she may move the young to a new location.

Although the squirrels are expert climbers, it is claimed that martens can capture them in a chase through the tree tops. Perhaps fear plays an important role by making the squirrels frantic and thus more easily captured.

Park Distribution and Abundance:

Pine squirrels are found throughout all timbered areas of the park and are one of the most conspicuous animals in the area. Because of their inquisitiveness and noisy manner they can hardly go unnoticed, and even in the dense forests where other mammals appear missing they will usually make their presence known. Their numbers appear to fluctuate quite markedly from year to year and it may be a case of available food supplies, or perhaps of predator pressures. In the summer of 1954 a female gave birth to, and raised, a litter of young on a tool shelf in the garage at park headquarters. When the young were about ready to leave the nest she decided to move them. This was accomplished by a young one crawling up on her chest and grasping her about the neck. Then she proceeded to carry it to the new location after which she returned for the next, and so on until all were safely moved.

Broad-footed Flying Squirrel
_Glaucormys sabrinus latipes_ Howell

General Appearance:

The flying squirrel is a brown, soft-furred, big-eyed tree squirrel about the same size as the pine squirrel. There are two broad lateral folds
of furred skin which extend along its side from the fore to the hind feet. The ears are short for a squirrel, and the tail is about as long as the body and very flat and wide. The fur is quite long and extremely fine in texture. The color is a light to dark brown with a slate-colored underfur on the back and sides blending to a yellowish-white or cinnamon on the belly. The large, dark eyes help give the animal a very handsome appearance. Total length is about 12 inches, tail about 5 inches and weight about one-half pound.

Distinguishing Characteristics:

The general brown color, large eyes, the flaps of skin along the sides of the body and the broad, flat tail will readily distinguish this animal.

Life History:

Flying squirrels are probably the most secretive of the mammals in the park. Unlike any of the other squirrels they are strictly nocturnal and are never seen about during the day unless routed from their nests in a hollow tree. They are almost exclusively arboreal but do come to the ground in search of their food which consists primarily of tree seeds, although other foods are readily eaten, including meats.

The flaps of skin on the sides of the body along with the fairly large flat tail equip the animals with effective gliding surfaces. They are not flying animals in the true sense of the word. The squirrels climb to the tops of the trees and then with a leap into space they flatten their bodies, spread out the membranes and the tail and swoop down onto the ground or onto a nearby tree. The glide may actually be in an ascending direction toward its completion.

Mating occurs in the spring and there are usually from three to six young in the single litter.

Many species of animals prey on flying squirrels and undoubtedly owls are important predators.

Park Distribution and Abundance:

Flying squirrels are quite abundant in the timbered areas of the park, especially on the western slopes. Because they are active only at night they are seldom seen and may go unnoticed even where they are very numerous. Their fondness for a variety of foods sometimes gets them into trouble as they will raid food stores left unattended. At times they may alight with a thump on the roof of a cabin or cottage causing alarm to the occupant, but in general they spend their lives in the park unobserved and unnoticed by man.
Montana Hoary Marmot
*Marmota marmota nivaria* Howell

General Appearance:

The marmot is a chunky bodied terrestrial squirrel about the size of a cocker spaniel with short ears set close to the rounded head. The tail is about one-half the length of the body, cylindrical and moderately bushy. The claws are stout, short and well adapted for digging. The fur is rather coarse and colored a silvery-gray, grizzled with black from the neck and shoulders onto the back, and blending to a reddish-brown on the rump and tail. The top of the head and face is decidedly black except for a white patch on the nose in front of the eyes. The under parts are a dirty white but the feet are black. Males and females are colored alike, but the males tend to be larger, with a total length of about 29 inches, tail about 8 inches and weight 10 or 12 pounds, with individuals even heavier.

Distinguishing Characteristics:

The large size, chunky body, general silvery color and the black head with its distinctive white patch on the nose will distinguish this animal. The sharp piercing whistle which the animals emit is also quite diagnostic.

Life History:

Hoary marmots are close relatives of the woodchuck or groundhog and are sometimes known by these names. They are also called “whistlers” or “whistling marmots” because of their whistled call notes. They are restricted in distribution on our continent to the northwestern section, extending from northern Washington, Idaho, and Montana along the Rocky Mountains to Alaska.

Marmots are essentially high elevation animals, digging their dens among the rock slides at or near timberline. They are not particularly social and appear to live solitary lives except for family groups which may tend to congregate in a particular rock slide. Food consists primarily of green vegetation with an occasional meal of bark. They are active during the daylight hours in the summer months. In the fall they retire to their burrows among the rocks where they spend the winter in a deep hibernation.
Mating occurs in the spring and the young, numbering about five, are born about a month later. When the young are about one-fourth to half-grown they make their first appearance above ground. There they are carefully guarded by the mother and at this time of the year the sharp, piercing whistle of the marmots can be heard echoing about the mountain meadows. The animals spend most of the summer months busily eating large quantities of grasses, sedges and herbs in order to gain a reserve of fat for the long winter's sleep. However, not all the time is spent in food getting, for the marmots are fond of lying flat on a warm rock basking in the mid-day sun. In this position they are quite inconspicuous and may go unnoticed to all except the careful observer.

Marmots are quite wary and at the approach of an intruder will stand erect on their hind feet and emit their clear, sharp, warning whistle. If the intruder approaches too closely they lope off toward the den where they disappear from view; however, if the observer is patient and remains quiet and motionless for a short time, they may soon appear again above the ground.

Marmots are a favored food of many large carnivorous birds and mammals. Grizzly bears are a constant hazard but the marmot's wariness and the fact that the dens are usually built in a slide of large rocks where the bears cannot unearth them, afford the animals considerable protection.

Park Distribution and Abundance:

Hoary marmots are abundant in all areas of the park at or near timberline. On the steep mountain slopes in places where the timber has been removed by avalanches they may be found at relatively low altitudes. Along the Going-to-the-Sun Highway hoary marmots are found as low as 3500 or 4000 feet on the west side below the tunnel near the Fossil Algae exhibit. There is an interesting family of marmots found along the road above the Weeping Wall. These animals have lost their usual wariness and their fear of man, probably because of constant harmless contacts with him. They can be approached rather easily and are readily photographed and observed. Marmots are often observed in the Hanging Gardens surrounding Logan Pass. On the naturalist-conducted hikes to Hidden Lake they are an item of extreme interest.

Family CRICETIDAE: Native Rats and Mice

This is an extremely large and varied family of rodents which is ordinarily divided into two major groups or subfamilies: the Microtine rodents, having small inconspicuous eyes and ears, and the Cricetine rodents which have large conspicuous eyes and ears.

The Microtine Rodents

The Microtines are small mouse size to large muskrat size, robust-
bodied rodents with short legs and often a short tail (the muskrat tail is long and compressed). There may be several litters of young per year, the young born primarily in the summer months after a gestation period of about three weeks. These animals are active throughout the winter months and during the day as well as at night. Their food consists almost exclusively of vegetable matter, ranging from seeds to the green succulent stems and leaves. They live in a variety of situations. The muskrat leads an aquatic life, the bog lemming prefers a moist, grassy type of environment and the big-footed meadow mouse lives along the streams in the high mountain meadows. Many of the species in this group are commonly referred to as voles.

**Cantankerous Meadow Mouse**  
*Microtus longicaudus mordax* Merriam

This is a small (about 7 inches total length) brown to grayish-brown and black mouse with a relatively long (2.5 inches) furred tail, short rounded ears and small eyes. The tail of this mouse is longer than that of any other mouse which it may otherwise resemble. The tail is about 3 times the length of the hind foot. This mouse is abundant in wet woods about the park.

**Drummond Meadow Mouse**  
*Microtus pennsylvanicus drummondi* Audubon and Bachman

This is a small (about 6 inches total length) brown to grayish-brown mouse with a short furred tail (about 1.5 inches) small eyes and tiny, rounded ears. The molars are unrooted and on the medial surface of the second molar is an extra process which is very diagnostic. The phenacomys resembles this mouse in external appearance but is lighter in color and has a distinctive pattern on the rooted molar teeth. The tail of the cantankerous meadow mouse is much larger than the tails of either this species or the phenacomys. These mice are very common in the wet or semi-moist meadow environments at lower elevations and their numerous runways on the surface and just under the surface of the ground are evidence of their presence. Occasionally, while walking through these meadows, one may surprise these little creatures and they will be seen scurrying away on their well built trails through the vegetation.

**Gale Red-backed Mouse**  
*Clethrionomys gapperi galei* Merriam

As the name indicates, the distinguishing character of this microtine rodent is the reddish-brown back. This is usually quite pronounced but some of the color prases may lack the reddish color and then the
mouse can only be distinguished from similar species by characters found in the skull. The hard palate of this species ends in a square shelf, whereas this is not true of the others. This mouse is found in more dense forest situations than is any other microtine. It is rather abundant on the west side of the park and common in the dense cedar forests of the McDonald Valley.

Alberta Phenacomys

Phenacomys intermedius levis Howell

The phenacomys is a small (about 5 inches total length), grizzled-brown mouse with gray under parts, small eyes and tiny round ears. This animal is difficult to distinguish from the Drummond meadow mouse and the lemming mouse without recourse to tooth characters. The molar patterns of this species are quite diagnostic and will readily separate it from the Drummond meadow mouse. The upper incisors of the lemming mouse have longitudinal grooves, but those of this species and the Drummond mouse do not. This is a fairly common mouse in the high mountain meadows and cirques of the park.

Northern Bog Lemming

Synaptomys borealis chapmani Allen

The bog lemming is a small (about 5 inches total length), grizzled, grayish-brown mouse with a short furred tail and tiny ears and eyes. The upper incisor teeth have distinct longitudinal grooves, a character which will set this mouse aside from any other microtine rodent found here. This mouse is apparently quite rare in the park but several specimens have been collected. These were taken in rather moist grassy environments in the North Fork of the Flathead River drainage and are the only specimens of this species at present known from Montana.

Big-footed Mouse

Microtus richardsoni macropus Merriam

This is the giant of the meadow mice in the park, some individuals even exceeding ten inches in total length. It is a grizzled grayish-brown on the upper parts blending to a grayish-brown underneath. The large size will distinguish this mouse from any other found here. The muskrat is larger but has a long tail that is flattened laterally.

The big-footed mouse is found along the numerous stream courses of the high mountain meadows. Its
trails are quite large and may be seen along the banks of the streams. It also constructs underground tunnels along the banks, and the holes leading into them are quite large and evident. The Hanging Gardens surrounding Logan Pass is an extremely accessible area where the activities of these animals, and sometimes the animals themselves, can be observed. Little information is available on their life history or on the status of their population in the park.

**Rocky Mountain Muskrat**

*Ondatra zibethica osoyoosensis* Lord

The muskrat is a large (total length about 20 inches), brown, silky-haired, aquatic microtine with a long, much compressed and sparsely-haired tail. The hind feet are much enlarged and lack webs, although they possess hair fringes which add to the effective swimming surface. The claws of the front feet are short and slightly curved, thus well adapted for digging. Muskrats are actually large meadow mice which have become adapted to a life in the water. They are expert swimmers and spend a majority of the time in or near the water. Their home may be constructed in a hole dug in the bank or they may build an elaborate house of matted vegetation and mud. They are quite prolific and may have several litters of about six young each per year. They are not extremely common in the park, but may be found along some of the slower moving streams or in some of the ponds or lakes of the west side.

**The Cricetine Rodents**

There are only two species of these rodents in the park. The sagebrush white-footed mouse and the Osgood white-footed mouse are the same species but different races or subspecies.

**Sagebrush White-footed Mouse**

*Peromyscus maniculatus artemisiae* Rhoads

**Osgood White-footed Mouse**

*Peromyscus maniculatus osgoodi* Mearns

These are small (about 6 inches total length) mice, with long tails (about 2.5 inches) and large conspicuous ears and eyes. The adults are
a pale orange-buff above and white underneath, but the young are slate
grey above and white underneath.
They are probably the most abun-
dant mammals of the park and may
be found in goodly numbers in
almost any environment. They
range from the forests and mead-
ows of the lower regions up onto
the barren, rocky mountain peaks
and cirques. They are nocturnal
in habit and thus are seldom seen,
but sometimes at night they may
be observed scurrying across the
roadways in the light of the automobile headlights.

**Bushy-tailed Woodrat**

*_Neotoma cinerea cinerea* Ord

General Appearance:

This is a large (about 15 inches total length) rat-like rodent with a
long bushy, flattened tail, large ears, a pointed nose and large dark eyes.
The long facial whiskers are quite conspicuous. The color varies from a
grayish-brown to an almost orange-brown above with distinct white under
parts. The heavily furred tail is gray above and white below.

Distinguishing Characteristics:

The rat-like form, large size, the long bushy tail and prominent fa-
cial whiskers will readily identify this animal.

Life History:

These animals are often given the name of “pack rats” or “trade
rats” because of their habit of picking up shiny materials such as wrist
watches, bottle caps, buttons, tin-
foil, money, etc. If the rat hap-
pens to be carrying something at
the time of a new find, this item
is usually dropped in favor of the
new one. Thus it appears the ani-
mal has made a “trade.” This,
at times, may be quite aggrava-
ting. Imagine the indignation
when one awakens in the morn-
1ng to find he now possesses a shiny
bottle cap in place of a wrist
watch or a silver dollar.

Ordinarily the rats make their home of a pile of sticks and other
assorted materials in rocky places beneath a huge boulder. Signs of their presence are shown by the numerous excrements about the entrance and on the surrounding rocks. They also make their nests in buildings, especially if the occupants have been gone for some time. The animal’s excrement possesses a strong, nauseating odor and if they take over a building it may become a very unpleasant place for human beings. These odors may persist for long periods after the animals have gone.

Park Distribution and Abundance:

They are quite common in the park and their presence may be detected in rock slides or about deserted buildings and seldom used cabins. They cause some concern by gaining entrance to these cabins, and precautions must be taken to make them “rat-proof.”

Family ZAPODIDAE: Jumping Mice

These mice differ from the others by having long hind legs, very long tails and being well adapted for jumping. The incisors of the upper jaw show distinct longitudinal grooves. There is only one representative of this family found in the park.

Rocky Mountain Jumping Mouse
Zapus princeps idahoensis Davis

General Appearance:

This is a small (about 9 inches total length) mouse which has long hind feet adapted for jumping and an extremely long tail (about 5.5 inches). The hair is short and soft on the body and scarce on the tail. The back is colored a dark grizzled brown, contrasting strongly with the yellow-buff sides, while the under parts are white.

Distinguishing Characteristics:

The extremely long tail (longer than the entire body), the contrasting color pattern and the long hind feet will distinguish this mouse from any other.

Life History:

Jumping mice are dwellers of the dense grass stands of the meadows in the park. They do not make distinct trails as the other mice do, but appear to go about at random through the vegetation in search of their food which consists largely of seeds, fruits, and succulent green parts of plants. The mice make nests underneath the ground and during the win-
ter they retire to them where they go into a deep hibernating sleep. They are the only mice in the park known to hibernate. The young are born in these underground nests in spring and soon leave to make their own way in the world.

When startled these animals can leap tremendous distances, sometimes covering six or eight feet in one jump. Ordinarily they appear to walk in a normal manner and unless disturbed they may not leap.

Park Distribution and Abundance:

These little jumpers are common in the grassy meadows of the park both in the valleys and in some of the higher mountain regions.

Family **GEOMYIDAE**: Pocket Gophers

Members of the family *Geomyidae* are burrowing rodents spending most of their time beneath the surface of the ground. They have large furred, external cheek pouches which are used for transporting food. There is only one member of this family definitely known to occur in the park.

**Brown Pocket Gopher**

*Thomomys talpoides fuscus* Merriam

General Appearance:

The gopher is a short-legged, stout-bodied brown rodent about 7 inches in total length with extremely small eyes and ears. The tail is short (about 2 inches) and sparsely haired. Two fur-lined cheek pouches open to the outside on the sides of the mouth. The fur is short and soft, a grayish-brown and buffy-white below. The claws of the forefeet are long and only slightly curved, but the claws of the hind feet are much shorter and not as well adapted for digging.

Distinguishing Characteristics:

The brown color, the sparsely-haired tail and the external fur-lined cheek pockets are diagnostic.

Life History:

These little rodents live an almost exclusive subterranean life. They dig their burrows just below the surface of the ground in the soft soil, eating on the roots of plants growing above the tunnel system. They push the earth from the tunnels up onto the surface and these characteristic mounds may be seen in many meadows of the park. The mounds are often called "mole hills," which has led to the misconception that these
animals are moles. Moles however, are insectivores and not rodents. There are no moles known to occur in the park or in Montana or Alberta.

If one opens a gopher's burrow system it is not long until the occupant will appear to re-plug it. These gophers can move with ease either forward or backward in their tunnels. They probably feel their way through the darkness of the tunnels by using their sensitive facial whiskers and tactile tail areas, since eyes are almost useless in such darkness.

The gophers are active in the winter as well as in the summer but during the winter they may build their tunnels close to the surface, so that the dirt is pushed up against the snow. With the coming of spring the snow melts leaving the winding mounds of earth as mute evidence of the gopher's winter activity. There are about 6 young born per female in the spring within the tunnel system.

Many animals prey upon the gophers. Coyotes, badgers, bears, cats and others may dig them from their burrows and large birds such as the horned owls may capture them during their infrequent visits to the surface.

Park Distribution and Abundance:

Pocket gophers are abundant in most of the grassy meadows of the park from the valley areas to the high mountain hanging gardens. Because of their subterranean habits the gophers are seldom seen, but their works are a conspicuous feature of the park meadows. In the Belly River valley meadows ground squirrels are rare or absent but pocket gophers are abundant.

Family **ERETHIZONTIDAE**: Porcupines

These are large, stoutly built rodents with the upper parts of the body covered with quills, loosely attached to the skin. Most of the members of this family are found in the tropics and only one species is found in the United States and Canada.
Yellow-haired Porcupine
Erethizon dorsatum epixanthum Brandt

General Appearance:
The porcupine is a large, robust bodied, clumsy rodent with long, sharp quills on the back and sides of the body and over most of the thick muscular tail. The head is rather small with a blunt snout and inconspicuous ears. The legs are short and very stout and the feet are equipped with long, curved claws for climbing. The fur is composed of long, soft hairs and a mixture of much longer, hard, glistening hairs among which are intermingled the sharp, stiff, barbed spines or quills. The quills are lacking and the hairs are sparse on the under parts, but quite thick on the back and tail. Adults appear mostly yellow but the young seem almost completely black. The quills on an adult are yellowish-white tipped with black. Total length about 32 inches, tail about 9 or 10 inches and weight about 15 pounds. Some individuals may range to 30 or 35 pounds in weight.

Distinguishing Characteristics:
The large size, clumsy appearance and the body and tail glistening with quills readily identify the porcupine.

Life History:
Porcupines are solitary wanderers of the forested areas of the park. They make their homes in holes in trees or in natural caves or rock crevices. They can climb readily although in a rather clumsy manner, characteristic of all their movements.

Their major item of food consists of the bark of nearly any species of tree, but their appetites are indeed strange for they will eat almost anything which contains traces of salt which is apparently a favored item of diet. Axe handles, boxes, saddles, door steps, seats in pit toilets, and various other items may be damaged or destroyed by these gnawing beasts. For some unaccountable reason, some of the porcupines in the park have developed an appetite for rubber. This often causes great dismay to motorists who may park their cars along the Going-to-the-Sun Highway overnight at locations between the switchback on the west side and Sun Point on the east side. It is a wise man who will cover his car wheels with rocks, sticks or preferably wire, if he must leave his car overnight along the road between these two places. The porcupines cause considerable damage to park vehicles, such as road graders and snowplows, in this manner. Not only do they chew on the tires but at times they will gain entrance into the engine compartment where they will chew on radiator hoses and ignition wiring, thus precautionary measures must be taken if these vehicles are to be left along the road at the higher elevations.
Porcupines apparently mate in October or November and it is only at this time that they are seen traveling in pairs. There is usually only one young born to each female. The young at birth are exceptionally well developed and can soon fend for themselves. They weigh more than a pound at birth and thus are larger than the newborn young of the black bear. The quills are perfectly developed although soft at the time of birth, but upon exposure to air they harden and the animal is equipped with a rather effective protecting mechanism from that time on. The young suckle only for a very short time and are soon weaned to a diet of bark.

Porcupines cannot throw their quills as is commonly thought. When the animals are approached, they turn their backs on the intruder and thus present a rather formidable defensive fortress. If the intruder ventures too close the tail may come about with a snap and the unlucky attacker receives a body full of sharp spines, driven deeply by the force of the blow. The quills are hollow and sharply tipped and on these long sharp tips there are many tiny, almost microscopic barbs. These barbs make the quills difficult to remove, and if the quill is allowed to remain in the muscle the action of the barbs may cause it to penetrate more deeply. If one is stuck with quills and wishes to dislodge them he should withdraw the quill with a rapid, straight pull, and immediately treat the area with a strong antiseptic.

Although the quills provide the porcupine with rather effective protection, these are lacking on the belly area and this spot is quite vulnerable. Several animals, notably the fisher and the cougar, have learned to kill porcupines by turning them over and ripping open the unprotected belly areas. However, the attackers do not always go unharmed and many instances are known of these animals being stuck with numerous quills.

Park Distribution and Abundance:

Porcupines are quite abundant in the park and appear to be more numerous in the higher regions. They are mostly nocturnal in habit and thus are not often seen during the daytime. I have counted as many as 24 of these animals on one night trip along the Going-to-the-Sun Highway between the switchback on the west side and Sun Point on the east side. Occasionally they do damage around some of the patrol cabins and ranger stations and for this reason they are apt to be considered as undesirable pests. They appear to have little to recommend them, nevertheless they occupy a definite niche in the park fauna and are deserving of protection in keeping with wildlife policies of the national parks.
Family \textit{CASTORIDAE}: Beavers

This family contains the largest of our North American rodents. The tail is broad, flat and scaly and the hind feet are webbed as a specialization for an aquatic existence. Only one species is represented in the park.

\textbf{Beaver}  
\textit{Castor canadensis missouriensis} Bailey

General Appearance:

The beaver is a chunky, robust bodied rodent with a rounded head, short ears and a broad flat tail. There are five toes on the fore and hind feet, those of the hind feet being connected by webs of skin. The front feet are not webbed and are more adapted for grasping than for swimming. The fur has a fine quality and is composed of very soft, short underfur and a more glistening coat of harder, longer guard hairs. The color is a rich dark brown blending to a lighter brown underneath. The tail is covered with blackish-brown flat scales and is without hair. Total length about 40 inches, tail about 15 inches and weight about 30 to 40 pounds. Some individuals have been recorded in excess of 60 pounds.

Distinguishing Characteristics:

The large size, chunky build, brown color, webbed hind feet and the broad, flat unfurred tail all help to distinguish the beaver. The otter is more slender and the tail is round, tapering and completely furred.

Life History:

Beavers are aquatic in habit and seldom are they found far from water. They may make their homes along streams, lakes or ponds. The type of home which is constructed and utilized appears to depend upon the particular situation in which the beaver is located and sometimes it may even depend upon the nature of the individual beaver. This home may be in a hole dug in the bank or in an ingeniously built lodge. The majority of the beavers construct a lodge of mud and tree branches. This lodge may be quite elaborate in construction and usually contains several chambers which are used as living quarters and which are kept quite clean. The entrance or entrances to the house itself are located under water and may be some distance from the house. These entrance holes are easily spotted in clear water, for the frequent use by the residents causes the bottom of the pond in these locations to be swept free of debris. If the beavers are located along a stream they usually construct a dam or series of dams to raise the water level about the house and cause the stream to flood out onto the surrounding area where a source of food is thus made more readily available.

The food consists of the bark of trees, primarily aspens, willows and cottonwoods in this area. These same trees are also used in constructing
the lodges and dams. The dams are built in a rather efficient manner and are quite strong. The sticks are intricately interwoven and plastered together with mud so that the completed structure is not only quite sturdy but also watertight. Spillways are located at one or more places along the breast of the dam and if the dam is broken the beavers will immediately set about to repair it and the speed with which the repair job is completed is astonishing.

The food and construction materials come from trees located near or in the water around the home of the animals. The trees are felled by chewing them off near the base. The animals stand on their hind feet and gnaw huge chips from the tree until it is cut through and topples to the ground. When the tree has fallen they commence to cut it into sections for use. Material that has not been eaten may be transported to a site near the den or lodge for future food, or it may be used in building or repairing the dam or lodge. The food stores play an important part in the life of the beavers, for they do not hibernate and must have food supplies during the winter when the pond may be frozen. Thus in the winter they may spend much of their time in the comfort of the snug lodge and need only go a short distance for meals at these food caches, shoved into the mud at the bottom of the pond.

It is popularly believed that beavers always fell the trees in the direction they wish, but there is much evidence to indicate that this is not
always the case. Many are the instances of trees cut through which never reached the ground because they fell in the wrong direction and became lodged against another nearby tree. In the park there is one known instance where a beaver cut through one tree six times and each time the tree remained lodged in another. The tragic part of this story is that the last time the tree was cut its butt end fell on the beaver and pinned it to the ground. The beaver was dead on discovery, providing clear evidence that at least this animal did not know which way the tree was going to fall.

Beavers do not always finish the job of cutting through a tree at one attempt. If the tree is large, two or three night’s work and perhaps the efforts of more than one beaver are required to fall it. Apparently they do not continue at one tree until it is completed but may have many trees in the area in a half-cut state at one time. Sometimes the animals never return to a cutting that has been started and the tree dies and becomes useless for them. Along Mud Creek, just off the North Fork Trail, there is a tree which has three rings cut in it, the last one completely cut through felling the tree. Each of these rings is about 8 inches above the last. It appears that in this case the beaver started to fell the tree but abandoned the work. In the meantime snow fell and when the beaver returned to the tree the old cut was under the snow and the beaver above it. It then proceeded to cut a new ring around the tree but again did not complete the job. Snow fell again and the process was repeated, this time higher yet, but this time it was completed and the tree fell.

Beavers are social animals as far as family groups are concerned. Each female will accept only one male and this acceptance may exist for the life of the animals. Mating occurs in the late winter and the 2 to 6 young are born in late March, April or even May after a gestation period of from 94 to 128 days. The young are completely furred and have their eyes open at birth, but are rather dependent on the mother for a considerable period of time. Each typical beaver lodge contains a male and a female and their offspring for two years, that is to say, the young that were born this year and those born the year before. When the young beavers approach their second birth date they are forced by the parents to leave the home lodge and must find a place of their own.

Beavers have few enemies capable of overpowering them in the water, although otters perhaps occasionally kill the young. On land beavers may fall prey to some of the larger carnivores such as bears, cats, or wolves.

Park Distribution and Abundance:

Beavers are rather common along most of the streams, ponds and
lakes in the lower elevations of the park near suitable food supplies. Recent estimates place their numbers in the park at approximately 1000 individuals. Because of their habits they may often denude an area of food trees and make it incapable of supporting them any longer. They must then move to another location where this same process begins again. Thus, there are many spots to be found where beavers were once present but are now absent, although the old lodges and dams are still there.

Beavers are essentially nocturnal in habit, but are often abroad during the day, especially in the early morning and late evening. To observe them one should take a hiding place near the lodge or dam at dusk and remain quiet and motionless. The beavers will soon make their appearance and then can be observed quite closely. Unfortunately, at these times the light is not always best for photography, but with patience, equipment and knowledge of photography, good pictures and of these animals in their natural habitat may be obtained.

Order LAGOMORPHA: Pikas, Hares and Rabbits

These animals superficially resemble rodents but are anatomically quite different. The incisor teeth number 4 above and 2 below and the upper pair are so arranged that only the larger front pair is functional. The second pair is located immediately behind and almost hidden by the first. The enamel of rodent teeth is confined to the front surface but on these animals the enamel extends completely around the tooth. There are five toes on the fore feet and four on the hind feet.

Family OCHOTONIDAE: The Pikas

Tiny rabbit-like mammals with small rounded ears, no visible tail and with the upper incisors deeply grooved in front.

Rocky Mountain Pika
Ochotona princeps princeps Richardson

General Appearance:
The pika is a buff or gray colored, round eared, tailless, rabbit-like mammal about the size of a house rat. The fur is short and extremely soft. The upper parts are a brownish-gray and the belly is white. The sexes are colored alike and about the same size. Total length about 7 inches, hind foot about 1.5 inches and tail lacking. Weight about one-fourth pound.

Distinguishing Characteristics:
The small size, the short, rounded ears and the lack of a tail should serve to identify this animal. The voice is quite distinctive and con-
sists of a bleat ("eek" or "yamp") often repeated at frequent inter­vals. Once heard and associated with the animal it is seldom mistaken
for any other call.

Life History:

Pikas are known by a variety of names, including conies, rock rab­bits, little chief hares, little rock farmers, calling hares and McGinty
rabbits. They make their homes in alpine rock slides located near an
abundant supply of green grasses, sedges and herbs which serve as their
food. The animals are extremely industrious and during summer days
they may be seen hurriedly scurrying about over the
rocks or in the adjoining
meadows gathering food. Some of the plants are eat­en immediately but many
are cut and carried under
an overhanging rock near
the bursow. Here they are
dried and piled much as a
farmer cures hay. These
"haystacks" are used as a
source of food during the
long winter months when the rock slide is covered with snow. The pikas
do not hibernate but move about freely within the snow-covered slide
area. When spring arrives the food supplies are almost exhausted, but there
is a new supply of green, succulent plants available both for present food
supplies and for storage for the next winter period.

Pikas mate in early summer and the young, numbering about 3 or
4, are born about midsummer. By the end of the warm season the young
pikas are almost fully grown and may be seen about with their parents
aiding in the fall harvest.

Many animals prey on the pikas and their only safety is in the nearness
of the rock slide home. Mountain lions, grizzly bears, coyotes, martens,
weasels, eagles and hawks all are known to feed upon these shy little
furred creatures. However, it is doubted if any of them but the weasel
is very successful in capturing them unless they are taken unawares
or caught far from the rock slide.

Park Distribution and Abundance:

Pikas are very common in rock slides near timberline in all areas of
the park, and they may occasionally be found in suitable sites in the
lower elevations, such as the slides along the Going-to-the-Sun Highway
at St. Mary Narrows, Baring Creek bridge and near the Weeping Wall. They are often seen on the Ranger Naturalist-conducted hike to Hidden Lake. Just before reaching the view point of the lake the trail passes through a saddle between Clements and Reynolds mountains where a number of pikas make their home in a slide of red Grinnell argillite.

The animals are very timid and disappear quickly among the rocks at the slightest alarm. Their squeaky bleats are a certain indication of their presence and if one has the patience to remain motionless near the slide, the animals will soon reappear and go about their daily routine, sometimes approaching as close as 4 or 5 feet. Since they are primarily active during the day and can be viewed so closely, it is possible to obtain good photographs of them.

Family LEPORIDAE: Hares and Rabbits

These are land-dwelling mammals which travel by leaping. The hind feet and legs are elongated, the ears large and the tail short. Hares are in general larger than rabbits and have longer legs and ears. They do not dig burrows in the ground but spend their resting moments in "forms" on the surface of the ground. Rabbits commonly dig burrows and will readily take shelter in an underground system. Hares give birth to young which are fully furred, have their eyes open and are quite active soon after birth. The young of rabbits are born naked, blind and are completely helpless for some time afterwards.

When this country was first settled, little heed was paid to these characteristics when naming the members of this family and so the distinction between the two groups has been all but smothered. The snowshoe rabbit and the jackrabbits are true hares and not rabbits as their names would indicate, but the cottontail and brush rabbits are appropriately named.

None of the true rabbits is known to occur in the park.

**Rocky Mountain Snowshoe Rabbit**
*Lepus americanus hairdi* Hayden

**General Appearance:**

This is a medium sized hare (about 3 pounds) with large hind feet and moderately large ears, which are generally held erect. The color varies with the season. In the summer the animals are brown on the upper parts blending to a white underneath, with the tips of the ears and the upper surface of the tail black. With the coming of fall the animals begin a molt in which the summer hairs are shed and replaced by white winter hairs. At this time of the year the animals appear mottled brown and white,
but this condition lasts only a short time and they are soon pure white except for the very tips of the ears, which remain a blackish brown. The sexes are colored alike and are of the same size. Total length about 18 inches, hind foot about 5 inches, tail about 1.5 inches and weight about three to four pounds.

Distinguishing Characteristics:

The rabbit-like form, medium-large ears and short tail with its blackish upper surface will distinguish this animal from any other in the park.

Life History:

Snowshoe rabbits get their name from their large, broad, furred hind feet which enable them to travel easily on top of the snow. They are also known as varying hares because of their change in color with the seasons, and perhaps this name is more appropriate. They make their homes in the timbered areas of the lower and middle elevations, especially along the fringes of meadows and other open places. Their food consists of the foliage and bark of many shrubs and trees as well as grasses and succulent herbs. The gnawed bark of the shrubs, the round flattened droppings and the well defined trails through the vegetation are all signs of their presence in an area.

The snowshoe rabbits mate during the summer months and one adult female may give birth to 2 or 3 litters of from 2 to 3 young during this period. They appear to be quite cyclic in abundance, having peak numbers occurring approximately every ten years. The causes underlying such cyclic abundance are still unknown and at present the source of much discussion in scientific circles.

The Canada lynx is reported to be the principal enemy of the snowshoe rabbit and it has been shown that in some areas the relative numbers of these animals closely parallels those of the snowshoe rabbit.

Park Distribution and Abundance:

Snowshoe rabbits are quite common in the forested regions of the lower and middle altitudes of the park, but as in other areas, their numbers seem to vary within an approximately ten year rhythm. At times one may see places where the chewed shrubs and old droppings indicate a former high population, but at present they are not in evidence in any great numbers. They are protectively colored both in the summer and
winter and often go unnoticed. Occasionally they are seen along the trails or highways or in the meadows bordering forested areas or around ranger stations and hotels. They are apparently most active at dawn or dusk at times when photography is most difficult.

**White-tailed Jack Rabbit**  
*Lepus townsendi campanius* Hollister

General Appearance:

This is a large hare (about 7 pounds) with extremely long ears and a relatively large, puffy white tail. The hind feet and legs are large and the front legs long, giving the animal a lanky appearance in spite of its rather chunky body. The color of the coat changes with the season like that of the snowshoe rabbit. In the summer the rabbit is a grayish-brown above blending to a white underneath. The tips of the ears are black and the tail is completely white. In the winter the brown hairs are shed and replaced by white on all areas except the black tips of the ears where the new hairs are again black. Total length about 26 inches, hind foot about 6 inches, tail about 3.5 inches and weight about 7 pounds.

Distinguishing Characteristics:

The rabbit-like form, large size, long ears and the completely white tail will readily distinguish this animal.

Life History:

White-tailed jack rabbits are denizens of the open country where they rely upon their keen eyesight and speed for eluding their numerous enemies. They can attain high speeds and have been known to cover a distance of 20 feet in one leap.

Their food consists of a variety of vegetation, ranging from the bark of shrubs to weeds and agricultural crops. At times they may cause extreme damage in agricultural areas and in these regions are considered as pests.

The breeding season appears to be confined to the warmer months at this latitude and there may be more than one litter born to a female in one season.

Park Distribution and Abundance:

These jack rabbits are primarily prairie dwellers in this region. They are common on the Blackfoot Indian Reservation to the east of the park, and occasionally individuals are seen in the open areas of the eastern valleys in the park. They are most often seen in St. Mary, Cut Bank, Many Glacier and Belly River valleys.
Order **ARTIODACTYLA**: Even-toed, Cloven-hoofed Animals

These mammals literally walk on their toe nails. All of the members of this group found in the park have two hardened hoofs on each foot which touch on the ground when they walk. They are all plant eaters, terrestrial in habit and relatively large in size. Two families containing six species of deer and cattle are found in the park.

Family **CERVIDAE**: The Deer Family

Members of this family are more or less familiar to everyone, for they include some of the most conspicuous and colorful members of our natural North American fauna. All adult males possess antlers, which are bony outgrowths of the frontal bone of the skull. The antlers are shed each year and are subsequently regrown. The growth process and shedding of the antlers is intimately associated with the sexual activity of the animals, and of all the North American species, only the caribou females possess antlers. With the moose, elk and deer only males have antlers under normal conditions, however, under certain abnormal conditions females are known to grow them.

The antler growth and shedding pattern is essentially the same for all species of the park. In the late winter or early spring the bony outgrowths begin to develop from the skull and growth continues through the spring and summer months. During the period of growth the antlers are relatively soft and tender and covered with fine hairs known as “velvet.” With the approach of the fall mating season and the subsequent changes in the sex glands of the animals, the antlers begin to harden to bone. It is quite probable that at this time, due to construction of nerves and blood vessels which have nourished the growing bone, the antlers begin to itch and the animals rub them against trees and other objects. In this process of rubbing the “velvet” is removed and the antlers become bright and shiny. These hardened antlers are formidable weapons which may be used to challenge other males of the same species, or as a protection against natural enemies. The hardened antlers are carried throughout the breeding season and on through early winter, but during late winter they become loose at the base and drop from the skull. The dropping of the antlers may occur at the same time on both sides or it may occur first on one side and then on the other. Thus, for a time animals may be seen which possess only one antler. It is only a short time after the old antlers are dropped that new ones begin to grow and in about six months are fully developed, thus repeating the cycle.
Shiras Moose
Alces alces shirasi Nelson

General Appearance:

This is the largest of our North American deer. It is a rather un­
gainly and awkward appearing animal with extremely long legs. The forelegs are longer than the hind legs and the body is higher at the shoulder than at the rump. The head is large with a broad muzzle and a heavy nose pad, giving the animal a distinct "Roman-nosed" appearance. The hair is long, coarse and brittle and the body is colored a blackish-brown blending to a whitish-tan on the belly and legs. The hair of the neck and shoulders is thicker and longer than that on the remainder of the animal and a growth of hair-covered skin called the "bell" dangles from the throat. The ears are large and the tail is small. Adult males are about 5.5 to 7.5 feet high at the shoulder and may weigh from 800 to 1200 pounds. The females are smaller than the males.

Antlers are present only on males, and on an adult bull they are extremely large, broad and heavy, spreading outward and backward from the skull, flat and broad with the edges bearing points or tines. This type of antler is referred to as a palmate antler because of its resemblance
to the palm of the hand and its accompanying fingers. The antlers of young males are much smaller and usually imperfectly palmate.

Distinguishing Characteristics:

The cloven hoofs, large size, almost uniform dark color, broad, heavy muzzle, throat bell, hump on the shoulder and the awkward appearance all serve to distinguish the moose from any other animal in the park.

Life History:

Moose are inhabitants of the park's forested areas at lower elevations. During the summer months they move into the swamplike regions adjoining lakes, ponds, beaver dams and slow moving streams, where they live an almost exclusively aquatic existence. During this period they may be seen shoulder deep in the water and at times they may completely submerge to reach aquatic plants growing on the bottom of the pool. Various species of pond weeds and water lilies are the main items of diet at this time of the year.

With the coming of cold weather in the fall and winter the moose are forced to leave this water existence behind and their feeding habits are directed toward a diet of the shoots of various broad-leaved shrubs and trees, chief among which are the many species of willow found in this area. Only the younger, more tender shoots are usually eaten, but the moose may break the larger branches. This breakage may sometimes be more harmful to the plants than the actual browsing of the tips.

Male moose are known as bulls, females as cows and the young as calves. Mating occurs in the fall, probably reaching its peak of activity in October. During this period the males are equipped with their large, shiny, hardened antlers and a mean, unpredictable disposition. At this time the call of the moose, which varies from a deep grunt to a hoarse bellow, may be heard echoing through the swamplike areas of the park. The call of the bull may be answered by that of a female or by a challenging male, for the moose challenge all comers for a female.

The calves are born the following spring and in this area one seems to be the usual number, although two is not a rarity. They are extremely awkward and unsteady at birth, but soon afterwards are able to follow the mothers into places where a human could hardly follow. They are not spotted at birth as are the young of the elk and the deer, but are uniformly light brown in color.

Although moose may appear awkward and ungainly they are actually well adapted to a life in the swamplike north country. The long legs and peculiar gait enable the animals to move with ease in mud or snow where another animal not so adapted would quickly flounder. The ungainly
appearing gait is especially deceptive, for the animals can attain phenom-
ena speeds. I have clocked moose at speeds in excess of twenty-five miles
per hour when the animals did not appear to be forced.

Park Distribution and Abundance:

Recent population estimates in the park place the number of moose
at approximately 115. Most of them are located on the west side of the
Continental Divide and the greatest concentration is along the North
Fork of the Flathead river and its various tributaries such as Camas,
Dutch, Anaconda, Logging, Quartz, Bowman, Kintla and Kishenon creeks.
Mud Lake and Howe Lake usually have one or two moose along their
shores during the visitor season. McDonald Creek normally has one to
every of the animals somewhere along its banks and occasionally one
or two are seen along the Going-to-the-Sun Highway at the swampy area
between the McDonald Hotel and Avalanche Campground. On the east
side of the park moose are sometimes seen in the St. Mary, Many Glacier,
Waterton and Belly River valleys.

Moose are active during the day and may be observed quite readily.
They do not have good eyesight and rely mostly upon their ears and
nose to detect danger. Extreme caution should be used in approaching
these animals. It is unwise to approach too closely for they are unpre-
dictable and may charge at the slightest provocation. There are several
records of moose chasing individuals up trees and holding them there for
considerable periods of time. Fortunately we have had no serious acci-
dents so far; nor do we want them. — PLEASE BE CAREFUL!
REMEMBER THESE ARE WILD ANIMALS WHICH SHOULD BE
LEFT TO THEMSELVES AND ONLY OBSERVED AND PHOTO-
GRAPHED FROM A SAFE DISTANCE!

Rocky Mountain Elk or Wapiti
Cervus canadensis nelsoni Bailey

General Appearance:

The elk is a rather large, tan-colored, deer-like mammal with a def-
inite neck mane of darker color and a short tail. The rump has a dis-
tinctly straw-colored patch, much lighter than the rest of the body,
but the head, neck and feet are dark. The fur is long and coarse although
less so than on the moose.

Only the males carry antlers, which are large, with a round main
beam extending back over the neck, and from which several prongs or
tines arise. The first of these tines is located directly forward over the
eye, thus being called the “brow-tine.” Yearling bulls may have antlers
with no tines, commonly called “spikes,” while older bulls may have 6
or even more tines on each side. Adult bulls may stand five feet or more in height at the shoulder and weigh 600 to 900 pounds, but the cows usually weigh somewhat less.

Distinguishing Characteristics:

The large size, pale-colored body, dark neck, head and legs, light rump patch and the typical antlers of the bulls should distinguish this animal from any other in the park.

Life History:

Elk normally live in the semi-open forests and mountain meadows of the park, migrating from place to place in various sized herds. During the summer months the animals are widely scattered throughout the higher, timbered valleys and are seldom seen by the park visitors. Here they graze upon the green herbaceous material or browse upon the tender shoots of the shrubs, picking their feed in a somewhat indiscriminate manner.

With the coming of fall the elk herds concentrate more, and as the snow accumulates upon the higher ridges and valleys, these herds move down onto certain exposed slopes where the snow is not so deep. Here they spend the winter grazing or browsing upon the exposed vegetation. Because of the concentration of their numbers upon these limited areas of winter range, the vegetation is often completely depleted and many of
the animals starve. For this reason the National Park Service has, in many instances, undertaken measures to reduce the rapidly increasing size of certain herds to numbers which these winter range areas will sustain. This is one of the more important wildlife management problems in areas such as Glacier, and as yet has not been completely solved.

With the coming of fall and the mating season, the calls of the bull elk may be heard in various areas of the park. The bulls are quite polygamous and may collect large numbers of cows which are guarded from rival bulls. At times the protection of these harems may require physical combat in which the antlers may be used to great advantage, or the challenge and defense may be accomplished by much noise and display with no actual contact between the contestants.

After mating season the bulls often tend to congregate in small herds, leaving the cows and sometimes the younger bulls to herd by themselves. These herds, sometimes numbering several hundred, are often dominated by one older cow who acts as leader for the group. The young are born in the following spring and, like so many of the deer family, are covered with protective spots that remain throughout the first summer. One or two calves may be born to a female each summer after her second or third year.

Park Distribution and Abundance:

The elk in Glacier are nearing the maximum population that the winter range can carry, and in some instances exceeding it. During the summer they are widely scattered where food supplies are plentiful, in the high valleys and meadows, but during the winter they must concentrate along the south slopes of the southern and western sides of the park, and on the low, windswept hillsides of the eastern front of the range. Here the animals congregate in herds up to several hundred in a place, easily seen by anyone visiting the area. The 1953 animal census placed their numbers at about 3200, most of which range during the winter along the Middle Fork of the Flathead River and along the eastern boundary on the lower ridges, but scatter into the higher back country during the summer.

Rocky Mountain Mule Deer

*Odocoileus hemionus hemionus* Rafinesque

General Appearance:

The mule deer is a rather heavily built, graceful deer with large ears and a white, rope-like tail with a black tip. The hair is long and coarse and varies in color according to the season. In the summer the oat is a tawny yellowish-tan with a white patch on the rump and tail
and white about the face. In the winter the brown hairs are replaced by gray hairs giving the animal an overall gray appearance. The under parts are white in both seasons. The face markings are distinctly contrasting, with the snout much lighter than the forehead. Only the males carry antlers. These antlers are round and project upward and forward. It is difficult to distinguish which is the main beam as some of the tines are large and divide again into two tines. Young males have either spikes, which are single unbranched antlers, or "fork-horn" antlers which branch only once and resemble the letter Y. Bucks stand about 4 feet high at the shoulder and may weigh from 150 to 400 pounds. Females in general, are smaller than the males.

Distinguishing Characteristics:

The deer-like form, small size, black-tipped, rope-like tail, and the contrasting facial markings will help distinguish this animal. The moose is much larger and darker; the elk is larger and contrastingly colored between the neck and body; the white-tailed deer has a large, bushy tail appearing flattened and distinctly white underneath, and the face is not contrastingly marked. The usual full speed gait of the mule deer consists of typical bounding jumps in which all four feet appear to strike the ground simultaneously, whereas that of the white-tailed deer is a gallop like that of a horse.
Life History:

Mule deer are dwellers of the forests and open areas of the middle and higher elevations of the park. During the summer months they are found high on the mountains and may often be seen in groups. They are primarily browsing animals subsisting on the new growth at the tips of various shrubs, but they are not averse to grazing on grass and at times may utilize great quantities of grasses and herbs.

The males are known as bucks, the females as does, and the young as fawns. Mating occurs in the fall probably reaching its peak of activity in October. During the mating season or rut, as it is called, the necks of the bucks swell to a great size and a buck in rutting season can readily be spotted by this characteristic. Usually, after mating, the animals migrate down from the higher areas, probably due to the coming of winter. Like the elk, they are forced at this time into a much restricted habitat and serious losses may occur due to over-utilization of available food supplies.

The young, numbering one or two, are born the following spring. They are covered with white spots and the spots persist throughout their first summer. Males may be capable of breeding in their first or second year, but it is quite probable that most females do not breed until they are one and one-half years of age.

Mountain lions, coyotes, bears and eagles may prey upon mule deer but it is quite likely that the young, extremely old and undernourished individuals are most often taken. It is seriously doubted that these losses, under normal conditions, can cause any appreciable drain upon the deer population.

Park Distribution and Abundance:

These are the common deer of the high elevations and the eastern slopes of the park. They are seldom seen in the western valley floors; however, several are known to live the year 'round near Apgar village, and at the West Entrance. During winter they congregate in herds along the eastern side and under protection they become exceedingly tame. It should be remembered that they are still wild animals and they should not be approached too closely. Do not feed them, as it makes them rely upon man and they may become unable to forage for themselves. They are very unpredictable in their actions and the sharp antlers and hoofs are capable of inflicting considerable damage.

The 1953 census estimated the number of mule deer in the park at approximately 800.

Mule deer are most active at night and sometimes may be seen crossing the highway where they are a constant hazard. Always obey the
speed laws in the park and be constantly on the alert for animals which may jump into the path of your vehicle.

Western White-tailed Deer
Odocoileus virginianus ochrourus Bailey

General Appearance:
This is a graceful deer with a conspicuous bushy tail, white on the under surface, which is raised and waved like a flag when the animal is alarmed or when it is running. The hair is long, coarse and brittle like that of other deer and varies in color according to the season. In the summer the general color is a reddish-brown on the body and face with pale brown legs and white under parts. In the winter the reddish coat is replaced by a more grayish one but the general pattern remains the same. The ears are not as large as those of the mule deer and the face is not as contrastingly marked. Antlers are present only on the males and those of adults have a characteristic form. There is a definite main beam which swings upward, forward and even inward at the tip. From the main beam there arises a series of erect tines which themselves do not branch. The first of these tines arises near the base of the antlers and is pointed directly up from the brow. Male fawns do not ordinarily possess antlers
during their first year. The yearlings have either spikes of Y’s and older age groups possess a variable number of points. Adult males stand about 4 feet high at the shoulder and weigh from 120 to 300 pounds. Females are smaller than the males.

**Distinguishing Characteristics:**

The deer-like form, relatively small ears, bushy tail with white under surface, loping gait and unbranched tines of the antlers of males will distinguish this animal. (See mule deer.)

**Life History:**

White-tailed deer of the park are denizens of the more brushy sections such as the bottom lands and valley floors of the western slopes. They are not as gregarious as the mule deer and are more apt to be seen singly. They are primarily browsers subsisting upon the tender shoots of various shrubs and sometimes on the young shoots of coniferous trees.

Like all members of this family they are ruminants and must stop feeding at times to rest and chew their "cud." The cud consists of food that has been partly eaten and swallowed to a storage place in the first compartment of the four-chambered stomach. The food is regurgitated in balls back into the mouth where it is re-chewed and then swallowed again to pass to another chamber of the stomach from whence it continues its way through the digestive tract. The droppings are about ½ inch long and cylindical. They may easily be found in various spots which the deer frequent.

Like the mule deer, the males are known as bucks, the females as does, and the young as fawns. October and November are the principal months of mating. Mating is perhaps less polygamous than with any of the other deer in the park. The young, usually numbering two, are born in the spring. They are covered with white spots which persist until they are about half grown, at the end of the first summer. Fawns usually stay near the mother during this first summer, but at times she may leave them in hiding places while she is feeding. One may often see the does during the summer without seeing the fawns. Occasionally people find these hidden fawns and think they are orphaned, but the mother is usually not far away and will return when the intruder leaves. Such fawns found in the woods should never be disturbed.

**Park Distribution and Abundance:**

This is the common deer of the western valleys of the park. The 1953 census estimated their numbers close to 500 animals. They appear to have been decreasing in numbers for the past several years, a fact which is probably associated with a shrinkage in the available winter food due to growth of plants above their reach in old burns. These burned areas sup-
ply excellent browse for the deer over a number of years, but as time goes by the plants become too large and are unavailable to the deer. Plant succession replaces the shrubs with trees. No recent burns of any consequence have occurred in the west side valleys, and the old burns of 1929 and 1936 are now mostly grown into stands of lodgepole pine, a species unpalatable to the deer. Precluding any large change in habitat, it is quite likely that the numbers of these deer in the park will stabilize near their present level.

White-tailed deer may often be seen at or near park headquarters, in the McDonald valley and along the North Fork of the Flathead River. They are most active at dawn, dusk and at night. It is during the early morning and evening hours that they are most often observed.

Family **BOVIDAE**: The Cattle Family

This is the family of cattle, sheep, goats and antelopes. The domestic forms belong here along with several wild species native to North America. The bison or buffalo is perhaps one of the most familiar to us, and evidence consisting of old bones and well worn trails suggests they once ranged into the eastern valleys of the park.

All members of the family possess true horns, composed of hard substance appropriately named horn. These horns are usually present on both sexes and are anchored on permanent bony outgrowths of the frontal bone of the skull, so that, unlike antlers, they are not shed but are retained throughout the life of the animal.

**Rocky Mountain Bighorn**

*Ovis canadensis canadensis* Shaw

General Appearance:

The males and females of the bighorn are distinctly different in general appearance, so must be treated separately.

Male (known as a ram)—The male is a large, stout-bodied sheep with hair rather than wool. The ears are relatively small and the tail is short. The hair is dense and smooth, the upper parts a grayish-brown with a brownish dorsal line on the back and a dark brown area on the chest, contrasting with the pale under parts and the creamy-white, round rump patch which surrounds the brown tail. The horns on an adult ram are brown in color, massive and curled. The curl swings upward and back, and then downward with the points turning up forward again in front of the eye. An adult may stand about 3.5 feet high at the shoulder and weigh from 200 to 300 pounds.

Female (known as a ewe)—The female is much smaller than the male with a more slender body, shorter, smoother hair and small, almost
spike-like horns which are directed upward and slightly backward. The color markings are usually not as contrasting as those of the ram. An adult female stands about 2.5 to 3 feet high at the shoulder and weighs between 125 and 175 pounds.

Young (known as a lamb)—The hair of the lamb is longer and more woolly than that of the adults, but by the end of its first summer the lamb may closely resemble the adult ewe.

Distinguishing Characteristics:
The grayish-brown body color contrasting with a creamy-white rump patch combined with the massive curled horns of the ram or the small, spike-like horns of the ewe will identify this animal. Deer are more slenderly built with longer legs and have antlers rather than horns. The mountain goat has a completely white coat.

Life History:
Bighorns, or mountain sheep, are grazing animals of the mountain regions. During the summer the rams are found in bands by themselves high on the slopes, but the ewes and lambs are apt to be found in their own groups down lower in the valleys. Their principal foods include a
great variety of sedges, grasses, and herbs, but under certain conditions they are known to browse on the tips of shrubs.

Bighorns are expert mountain climbers and can traverse with seeming ease and abandon, some of the steepest rocky areas. They are equipped with a keen eyesight and good senses of hearing and smell, all of which are used to detect and avoid enemies such as the mountain lion and the grizzly bear.

With the coming of fall the mating season begins and the rams move down the mountains to join the bands of ewes and half grown lambs. Mating is highly polygamous and fierce combats occur between the rams for the favor of the ewes. In these contests the opposing males square off at each other from 5 to 50 feet apart, then rush together. Just before the impact the animals raise the forefeet from the ground and bend the head downward in a final powerful lunge, then meet head on with a resounding crash of the horns. The main object of these contests seems to be the maiming or crippling of the opponent. Each contestant takes care to see that horn meets horn and that the body is not exposed to an opponent's rush, for a body blow with these massive horns might prove disastrous. Several younger rams may "gang up" on an old monarch but even under these odds the old ram is sometimes able to maintain his supremacy. During these heated combats the ewes, which are the cause of it all, may be seen grazing unconcernedly in the vicinity.

The lambs, numbering one, or occasionally two per female, are born in the spring after a gestation period of about 180 days. They are guarded closely by the ewes and after about a week may accompany them on feeding trips. In about two weeks they are able to follow the mothers over even the roughest terrain and within a month they are beginning to eat some vegetation. The lambs may remain with the ewes for as long as two years, after which the males leave to join the bands of rams which take no part in the rearing of the young.

Mountain sheep are active at all times of the year, moving down toward the valleys with the coming of winter's snow. They may be observed at almost any time of the day, but during the summer they are not very active in the middle of the day.

Park Distribution and Abundance:

Latest census figures place the number of bighorns in the park at close to 200, the largest group being found in the Many Glacier area. During the winter months they congregate down in the lower regions around the hotel, but by the time the snow has left the valley and the first visitors begin to arrive the rams have started to their summer range higher on the mountains. The bands of ewes, lambs and in rare instances, a ram,
may still be seen low on the slopes of surrounding mountains and occasion­ally in the early morning a group of them may be found near the parking area behind the hotel. The slopes of any of the surrounding peaks including Wilbur, Altyn, Grinnell, Wynn or Appekunny, if they are carefully scann­ed with a pair of glasses, may sometimes reveal a band of sheep, but it is the back-country hiker who is most apt to observe the mountain sheep at close range.

In the summer of 1953, while conducting a hike from Many Glacier Hotel to Swiftcurrent Pass, I spotted a band of eight mature rams grazing on the slopes below Swiftcurrent fire lookout. We were able to approach within approximately 100 yards of them before they took heed of us and began to amble slowly into the more inaccessible cliff areas.

Observations of mountain sheep have been made on Mt. Henry in the Two Medicine area, on Cutbank Pass and on Curly Bear Mountain in the St. Mary area. Occasionally hikers along the Highline Trail to Granite Park Chalet encounter sheep in the saddle between Haystack Butte and the Garden Wall or on the slopes above the chalet.

The bedding spots, worn trails, hoof prints and groups of dung pellets (about ½ inch long, sharp pointed on one end and flattened on the other) are all evidence of the presence of these animals in an area.

**Montana Mountain Goat**

*Oreamnos americanus missoulae* Allen

**General Appearance:**

The mountain goat is a white goat-like mammal with a long shaggy coat and a bearded chin. Both sexes possess slender, black, spike-like horns which arise from the frontal bone of the skull and have at their base a glandular, spongy cushion of skin. These horns are about 8 to 10 inches in length and terminate in sharp, shiny points which curve slightly backward over the ears. The legs are short and there is a distinct shoulder hump. Males and females resemble each other closely and except to the most experienced eye are almost indistinguishable at any distance. The horns of the males may be longer and the hair of the hind legs longer, the latter giving the animal a distinct pair of "chaps." Males are in general larger than females but the weights of either sex may overlap. Adults are about 3 to 3.5 feet high at the shoulder and weigh between 150 and 300 pounds.

**Distinguishing Characteristics:**

This is the only large white mammal found in the park and cannot be confused with any other. The white shaggy coat and the slender black horns will readily distinguish it.
Life History:

Mountain goats are inhabitants of the cliffs and rocky areas of the higher regions of the park. The peculiar hoofs with their sharp outer edges and spongy inner areas spread widely and allow the goats to cling to almost sheer surfaces while the short, powerful legs allow them to clamber with ease over intervening obstacles. These animals appear at ease in situations where others, not so well adapted, would be in serious difficulty. Even the more precipitous areas are crossed with apparent abandon and when pressed the goats may climb quickly up cliffs which have only the slightest ledges for toe holds.

The goats may occur in small groups or bands but these groups do not appear stable enough to refer to them as true herds like those of the mountain sheep. The groups may contain from 2 to 12 or more animals, both sexes and the young being represented. Goats appear to be great wanderers within a certain prescribed large home area. Their food consists of the tips of woody plants as well as alpine grasses, sedges, lichens and herbs. From a distance the ledges which they frequent may appear to be bare of vegetation but at close range small clumps of tiny mountain vegetation may be seen. Alpine willows appear to be a favorite item of diet in this area and frequently clumps of these are found which have been heavily browsed.

The goats are active in the winter as well as in the summer and may remain high on the peaks even in the severest weather. During the winter period they frequent the crests of ridges and windswept ledges where the snow is blown off exposing the dwarfed vegetation. The long shaggy coat with its dense underfur appears to be ample protection from the cold and the goats are able to use snow as a source of water. It is quite probable that during periods of extremely stormy weather they seek out sheltered ledges and crevices in the rocks as protection against icy blasts.

Mountain goats are active during the day as well as at night and may be seen wandering along the cliff faces or grazing on the rocky ledges or grassy meadows at any time of the day. During the summer the period of least activity appears to coincide with the hottest portion of the day, about noon, and during these times the goats are often seen lying under the shade of projecting rocks quietly chewing their cud. They are ex-
tremely curious animals and appear more drawn by curiosity than aroused by fear at the sight of man. They continually keep watch below them and have the peculiar habit of resting upon their haunches while surveying the world below. Seldom can one approach them closely from below for any movement toward them from this direction usually causes them to move slowly but surely higher on the mountain to keep the distance between them and the intruder about equal. On the other hand, they seldom are startled by slow approaches from above and seldom watch in this direction. One can often approach rather closely by keeping this in mind and it is not exceptional to get within several yards of the animals.

The males are known as billies, the females as nannies and the young as kids. Mating occurs in the fall months, primarily in November, and the goats appear to be monogamous at least for one season, but further study is necessary to completely substantiate this. The kids are born the following spring in April or May, and in the park one kid per female appears to be the normal number. Twins are not rare and triplets probably occur. The kids weigh about 6 or 7 pounds at birth and are quite advanced in development, soon following the mother in the most precipitous areas.

Few animals are known to prey on the mountain goats and the sources of mortality within the park population remain a mystery. Golden eagles are reported to prey upon the kids and I have seen several instances where young kids have taken shelter beneath an adult when a golden eagle was soaring above.

The shaggy coat of the goats is shed during the summer and replaced by a new one, and during the period of this molt the goats appear scraggily with patches of long, old hair intermingled with the shorter and whiter new hair. In the park this molt appears to be completed about the first or second week of August and at this time the goats are resplendent in their shiny, new coat of white. Soon however, the new coat is dirtied by scrambling over the rocks and by dust baths which are probably used as a means of getting rid of body fleas and other insect pests. Against a brown rock background the animals appear extremely white, but the dirtiness of the coat is apparent when they are outlined against patches of snow which persist throughout the summer in their high mountain home.

They are extremely fond of salt and will travel great distances to secure it. There are several places in the park where mineral licks are frequented by the goats. Even when artificially supplied with salt the goats may still visit these natural licks and it seems that other elements or compounds may be factors in the selection of the licks by the goats.

Park Distribution and Abundance:

The mountain goat is the so called “park mammal” and one of its
greatest attractions. Perhaps nowhere else in the United States can they be observed in their natural surroundings with such ease as is possible in Glacier National Park. They are present in all areas of the park in suitable habitat and latest census figures place their numbers close to 800 animals.

Goats may be observed on almost any of the peaks but certain areas are more reliable as places of observation than others. Mt. Cannon above Avalanche campground usually has a few of them grazing along its cliffs, particularly in early summer when they may readily be observed with field glasses from the campground or from the highway near the campground entrance.

The mountains surrounding Logan Pass are usually good spots to find these white animals, especially the east facing slopes of Mt. Oberlin. In the months of July and August between the hours of 9:00 a. m. and 4:00 p. m. there is a naturalist on duty at the Orientation Circle above the parking area and if the goats are in view a government owned telescope is available to observe them.

Perhaps the best place in the park for observing the goats at close hand is in the Sperry Chalet-Gunsight Pass area, the trail to which starts at the McDonald Hotel. The Sperry Chalet, a hikers' hotel, is located 6 miles from the road. Goats frequently occur in the area about the Chalet and sometimes are a cause of consternation to the lodgers because of their clattering on the steps and porches at night. From the chalet one trail leads to Sperry Glacier about 3 miles distant and another continues on past the chalet across the mountains via Lake Ellen Wilson, over Gunsight Pass and by Gunsight Lake to terminate on the Going-to-the-Sun Highway in the St. Mary valley—a total distance of 20 miles from McDonald valley to St. Mary valley. Goats may frequently be approached to within several yards at various places along the trail, especially by the shelter house located on top of Gunsight Pass.

The goats are not shy but may "spook" easily at sudden movements or loud noises so one should be careful not to unduly arouse them. If one remains motionless the curiosity of the goats will often cause them to approach rather closely. They are not inherently dangerous, but should be treated with due respect and never should be offered food.

Where U. S. Highway No. 2 enters the park, near the Walton Ranger Station, there is a roadside exhibit set up overlooking a mass of bluish earth which has been exposed by the erosive action of the Middle Fork of the Flathead River. Mountain goats frequently visit it for considerable lengths of time, coming great distances from their high mountain homes and crossing great areas of timber and the highway to reach it. The
early morning and late evening periods are perhaps the best times to find
the goats on the lick.

This is one of the few places in the world where it is possible to sit
in your car and look down on mountain goats!

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ABOUT THE AUTHOR

Mr. Lechleitner is well qualified to write on the mammals of Glacier
National Park both by education and first hand experience. His training
has been in the field of zoology, first at Montana State University where
he obtained his bachelor's degree in 1951 and his master's in 1953. He
is now completing requirements for his doctorate at the University of
California at Berkeley.

He served as a park ranger naturalist in Glacier during the seasons
of 1951, 1952, 1953 and 1954 both on the east and west sides of the park,

tence is quite familiar with the mammals that make Glacier their home.
Most of the manuscript for this publication was written by Mr. Lechleitner
on off-duty hours and after moving to Berkeley—a contribution of time
and effort for which we are truly grateful.

M. E. Beatty, Editor and
Chief Park Naturalist

July 1, 1955

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* Indicates specimen in park collection.
HYPOTHETICAL LIST

Species which have occurred in the historical past or that have been recorded in adjacent areas and may possibly be found in the park.

ANTELOPE, American Pronghorn—Antilocapra a. americana Ord
Probably entered eastern edge of the park in earlier times.

BAT, Hoary—Lasiurus cinereus Beauvois
Sight record Waterton Lake in 1917, and probably occurs in park at present time.

BISON (Buffalo)—Bison bison bison Linnaeus
Skulls found eastside valleys suggesting formerly ranged there.

CARIBOU, Mountain—Rangifer tarandus montanus Seton-Thompson
Entered park from British Columbia; last recorded in 1949.

FOX, Kit—Vulpes velox hebes Merriam
Formerly common east of mountains and may have occurred in park then; now nearly extinct.

MOUSE, Dwarf Meadow—Microtus montanus pratincola Hall & Nelson
Occurs in Flathead Valley but not yet recorded in the park.

MOUSE, House—Mus musculus domesticus Butly
Found in cities nearby but not recorded as yet from the park.

RABBIT, Cottontail—Sylvilagus nutalli grangeri Allen
Common in many areas of Montana; could possibly enter park.

* SHREW, Dusky—Sorex obscurus obscurus Merriam
Listed for park but now believed identical with Sorex vagrans.

SHREW, Pigmy—Microsorex hoyi washingtoni Jackson
One specimen taken near Hungry Horse in 1950.

* SQUIRREL, Richardson Ground—Citellus r. richardsoni Sabine
Formerly reported as common in some of the eastern valleys of park but now closest known occurrence at Babb.

WOODCHUCK, Brown—Marmota monax pretensis Howell
Known from adjacent British Columbia and Alberta but no definite park record.
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FIELD NOTES
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Glacier National Park

West Glacier, Montana 59936

Organized for the purpose of cooperating with the National Park Service by assisting the Interpretive Division of Glacier National Park in the development of a broad public understanding of the geology, plant and animal life, history, Indians, and related subjects bearing on the park region. It aids in the development of the Glacier National Park library, museums, and wayside exhibits; offers books on natural history for sale to the public; assists in the acquisition of non-federally owned lands within the park in behalf of the United States Government; and cooperates with the Government in the interest of Glacier National Park.

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