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# ROCKY MOUNTAIN NATIONAL PARK



Natural History Handbook



UNITED STATES DEPARTMENT OF THE INTERIOR

Stewart L. Udall, *Secretary*

NATIONAL PARK SERVICE

Conrad L. Wirth, *Director*

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*NATURAL HISTORY HANDBOOK NUMBER THREE*

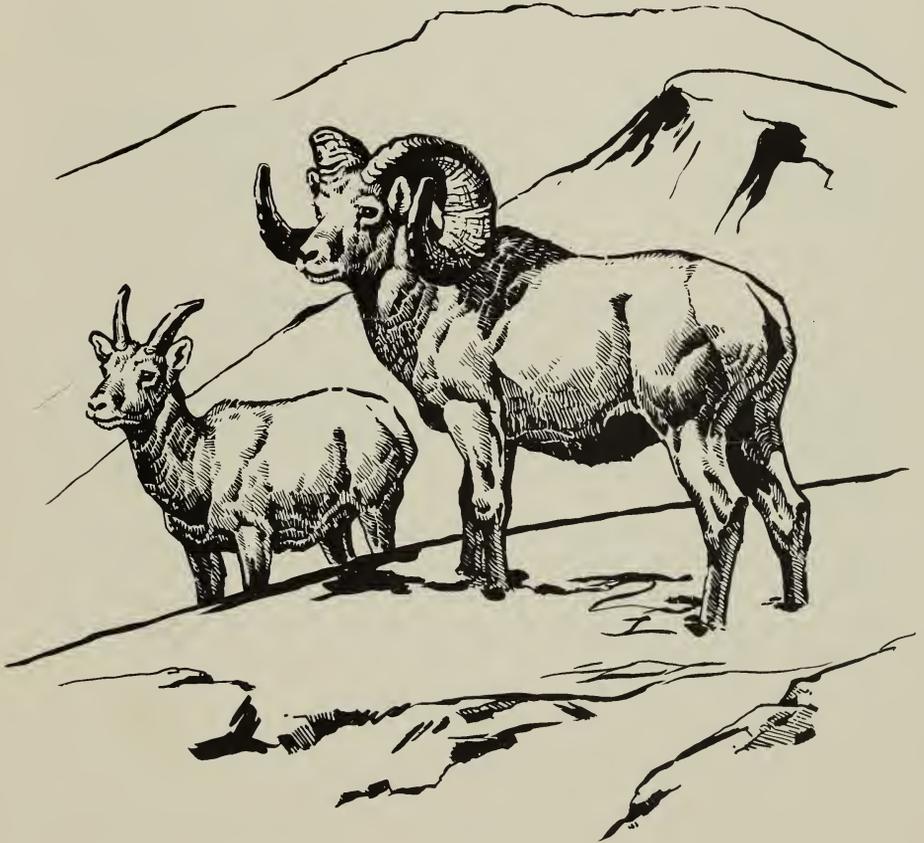
This publication is one of a series of handbooks explaining the natural history of scenic and scientific areas in the National Park System administered by the National Park Service, U.S. Department of the Interior. It is printed by the Government Printing Office and may be purchased from the Superintendent of Documents, Washington, D.C., 20402

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# ROCKY MOUNTAIN

## NATIONAL PARK • COLORADO

By Edwin C. Alberts



NATURAL HISTORY HANDBOOK SERIES NO. 3

*Washington, D.C., 1954 (Revised 1963)*

## **Administration**

Rocky Mountain National Park, established on January 26, 1915, and containing about 410 square miles, is administered by the National Park Service, U.S. Department of the Interior.

The National Park System, of which this park is a unit, is dedicated to conserving the scenic, scientific, and historic heritage of the United States for the benefit and enjoyment of its people.

A superintendent is in immediate charge of Rocky Mountain National Park, with headquarters in Estes Park village on the east side of the park. Address communications to the Superintendent, Rocky Mountain National Park, Box 1086, Estes Park, Colo.

## **America's Natural Resources**

Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

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Notchtop and Little Matterhorn from Fern Lake.

**In 1859, Colorado's historic gold rush beckoned a legion of pioneers, and led indirectly to the settlement of the verdant meadows at the foot of the Front Range in the vicinity of modern Estes Park, and eventually to a "rush" of vacationists. As the scenic splendor of this region became better known, many public-spirited citizens recognized the need for preserving portions of the area as a National Park. In 1915, Rocky Mountain National Park was dedicated in simple ceremonies, at what is now called Horseshoe Park. Since that time millions of visitors have enjoyed the natural wonders of the park, including placid mountain lakes, rushing streams, and verdant high-country meadows. Here are trout to catch, native mammals and birds to be seen and photographed, and trails to hike.**



Park rangers are often asked, "What are the main attractions of Rocky Mountain National Park?" It is hard to answer this question, for the appeal of the park, somewhat like that of a symphony, lies in the varied yet repeated experiences or melodies which may be found within its framework. The raw beauty of the rugged mountains contrasts with the calm loveliness of wildflower gardens growing nearby. Some visitors enjoy the solitude, while others appreciate the opportunity to meet people with like interests and to hike with organized groups on some of the 200 miles of trails. Many derive pleasure from quietly studying the fascinating world of nature preserved in the park. Some vigorously battle the steep slopes of the mountains; others relax in camp, soothed by the sound of the wind in the trees. Each person enjoys the park in his own way. There are regulations, but no regimentation, no compulsory activities, no "musts." The park was established for all to use, but not to abuse.

Rocky Mountain National Park comprises about 400 square miles of the Front Range. The altitude of the park is high, with cool summers the inevitable result. There are more than 65 named peaks exceeding 10,000 feet. The Continental Divide, separating slopes draining to the Pacific Ocean from those draining to the Gulf of Mexico, runs through the park.

Moraines extending into the meadows, seen from Many Parks Curve on Trail Ridge Road.



To those who study it, the park reveals stories of great natural dramas of earth forces that made its deep gorges and lofty peaks, and of once-mighty glaciers that carved its remote lakes. Its forests and wildflowers tell a story of struggle and adjustment to environments that differ with altitude and exposure. Its native populations—deer, elk, bear, beaver, birds and the myriad lesser creatures of the wild—can be seen in their natural habitats. Its streams attract the hopeful fisherman; its unmodified natural compositions enthrall the artist; its cool, green setting appeals to all summer travelers.

Enos Mills, "father" of Rocky Mountain National Park, wrote about 40 years ago:

A National Park is a fountain of life. . . . Without parks and outdoor life all that is best in civilization will be smothered. To save ourselves—to enable us to live at our best and happiest, parks are necessary. Within National Parks is room—glorious room—room in which to find ourselves, in which to think and hope, to dream and plan, to rest, and resolve.

His words are even more significant to our generation than they were to his. This booklet is an attempt to provide a concise summary of some of the park's important natural values and to arouse your appetite for further pursuit of the enjoyment they offer. The basic experience in this National Park, as in most, is to capture some of the inspiration and spiritual qualities of the landscape which Enos Mills felt so keenly.

## **THE MOUNTAINS ARE MADE**

The geological story of Rocky Mountain National Park is a long one. Most of its details are lost in the passage of hundreds of millions of years. Some of the story has been put together by scientists from bits of evidence scattered here and there. The evidence strongly indicates a certain chain of events, but no eyewitnesses are available to confirm the deductions. Few of these events can be proved to everyone's satisfaction; we can but pass on to you some determinations that geologists have made.

Most of the rocks which you see in the park are crystalline and very ancient. The gneiss and schist were, in part, once sediments formed in seas, perhaps a billion years ago, under conditions about which there is little knowledge or general agreement. These sediments were buried beneath thousands of feet of other sediments, cemented and hardened into layers of sedimentary rock and later squeezed, crushed, and elevated by slow, ceaselessly working earth forces that produced mountains even in that ancient time. During this period the sedimentary rocks were changed to harder metamorphic rocks, probably



Rocks once buried miles deep are now exposed on Longs Peak, at an altitude of more than 14,000 feet.

because of deep burial under tremendous pressure and considerable heat. Masses of molten rock welled up into these earlier deposits and hardened under the earth's surface. This later (though still very ancient) intrusive material is now exposed granite in many parts of Rocky Mountain National Park.

These ancient mountains were gradually worn away by wind, rain, and other agents of erosion, which must have attacked the surface of the earth as vigorously then as now. With the passage of millions of years, these mountains were reduced to a lowland. Another sea gradually lapped over the land where mountains had been, and once again sediments were dropped in its bottom. This new invasion of the ocean affected the park region during many millions of years in which the dinosaurs dominated the earth.

In response to little-understood rhythms of the earth's crust, which have lifted mountains ever so slowly at great intervals all over the world, the seas drained away as the crust rose again, and the rising land once more became subject to the ceaseless attack of erosion. This uplift—which began about 60 million years ago—originated the sys-

tem of mountain ranges and basins that today give Colorado its spectacular scenery and much of its climate. This great period of mountain-making is called the Laramide Revolution, from its early recognition in the Laramie Basin region of Wyoming.

The Front Range, of which this park preserves a choice sample, was buckled in the fashion of a great long wrinkle in a carpet. This "roll" of rock was about 200 miles long and some 40 miles across. In its earlier stages it was covered by the arched-up sediments, but, as time passed and erosion continued, the inner core of earlier crystalline rocks was exposed once again. Today, all traces of the former thick mantle of sedimentary beds are gone from the park. They are still present beneath the plains to the east and the basins to the west, and the cut-off ends of some of them now lie exposed in a tilted position against both east and west flanks of the mountains. The sandstones of some of the hogback ridges crossed by the approach roads from Lyons and Loveland are a part of this once continuous overburden.

Uplift continued intermittently during many millions of years. In the western section of the park, volcanic eruptions took place. Specimen Mountain is the remnant of a volcano; some of its flows are seen today as the cliffs behind Iceberg Lake, on Trail Ridge Road. Great sheets of lava and other volcanic rocks piled in layers now make up much of the Never Summer Range. Eventually, these rocks, too, will be stripped away by the relentless work of erosion; this will require millions of years.

An unusual feature of the landscape here is the rolling, sometimes flattened character of many mountain summits. Trail Ridge Road crosses several miles of one of these summits—a gently rolling upland above 11,000 feet. These mountaintops appear to be all that is left of an old land surface that once may have been continuous far eastward over the area occupied today by the Great Plains. Such surfaces, of which the mountains in the park show many good remnants, are called peneplains. Their presence atop the mountains is a part of the evidence suggesting that the range had been worn down by erosion to a fairly flat upland a few million years ago. Then renewed uplifting occurred, and streams draining the highland gradually cut canyons two or three thousand feet into the elevated surface.

## THE WORK OF GLACIERS

These canyons were filled by glaciers at intervals during the million years of the ice age. This period saw the formation of vast ice fields over much of northern North America. The causes of the ice age are complex, but its effects on our landscape are marked and convincing.

Every large high-altitude canyon in what is now Rocky Mountain



Sandstone hogbacks flank the mountains on the east. Scene near mouth of Big Thompson Canyon, west of Loveland.

Remnants of an erosion surface on peaks south of Trail Ridge Road.





High mountain lakes are set among the scars of glacier excavation. Arrowhead Lake, in Gorge Lakes Canyon.

Great forests, high peaks, and cool summers add to the appeal of Rocky Mountain National Park.



National Park became filled with snow, much of which, under pressure, turned to ice. The glaciers thus formed, moving under their own great weight—slowly, but with tremendous power—broadened, deepened, and straightened the twists and turns of the original river-cut valleys, and, bit by bit, scooped out bowls, or cirques, at the glacier sources. These glaciers quarried and removed untold millions of tons of rocks from the upper reaches. Many of the cliffs and lakes of the park are the results of excavating done by the mountain glaciers.

These glaciers were entirely local; they did not extend down to the plains in this region. At what is now an altitude of about 8,200 feet—just below present-day Moraine Park, Horseshoe Park, Wild Basin, and a few miles below Grand Lake in the Colorado River valley—the glacier fronts melted as fast as the ice advanced. It was there that most of the rock debris plucked from higher up was dropped. Piles of rock are scattered over most of the meadowlands of this general altitude. These rock deposits are called moraines—ridges and heaps, or scattered masses, of unsorted rock debris dumped where they settled from the melting ice. Classic examples of moraines may be seen in Moraine Park, named for these special features. You can learn more about them at the Moraine Park Visitor Center.

When climatic changes caused the glaciers to melt back faster than they advanced, the moraines, like modern dams, formed lakes behind them whenever stream drainage from the shrinking glaciers was checked. Several such lakes, now silted in and changed to green meadows, occupied lower regions in the park. There are good examples of these lakes in Horseshoe Park and Moraine Park.

The glaciers invaded the park valleys several times during the ice age. Usually, two distinguishable ages of moraines can be seen; the

Bierstadt Ridge, a huge glacial moraine, seen en route to Bear Lake.





Andrews Glacier, late in season. Note crevasse in upper middle of glacier.

older and more extensive one is made up of well-weathered, “rotten” boulders and finer material, while the newer ones are scarcely altered at all. It is thought that the last great glaciers retreated only some 12,000 years ago. Indians lived on the plains at that time!

It is by no means certain that the glacier age is entirely a thing of the past. Five small glaciers, or “glacierets,” of geologically recent origin—Taylor, Andrews, Tyndall, Rowe, and Sprague—exist today in the park. They are much smaller than the earlier glaciers; but they are ice masses, and they are moving (though very slowly); so they are glaciers by definition. They are accessible only by arduous foot travel, but the first three are visible from heavily traveled roads and trails of the park.

The story of the geological events, as we have seen, is long. The landscape of today, we now realize, is transient. It is the contemporary product of processes that have been working day and night throughout geologic time. These processes will certainly go on and on, and inevitably will continue to change the landscape. Each year sees some little modification here and there. These small changes are not linked in our thinking with the vast sweep of geologic time, probably because our own lives are so very short. With some reflection we seem to catch glimpses of eternity as we examine the ancient gray cliffs and mighty peaks of Rocky Mountain National Park.

## THE MOUNTAINS ARE MANTLED WITH PLANTS

Having seen that the present mountains are the result of past events, we should not be surprised to learn that the plant cover of the park is also dependent on what has occurred before. We are inclined to think of a plant community, such as a forest, as a permanent fixture; but it is a dynamic, never-stagnant population of individual living things, and in some ways resembles a community of people.

Just as human populations ebb and flow through periods of great numerical growth and dominance, followed by decline and engulfment by invading peoples, so do vegetation types go through periods of dominance and decline. When certain conditions of climate and soil prevail, those kinds of plants best adapted to such conditions will dominate the scene. As conditions change, the flora will change.

In Rocky Mountain National Park, we assume that toward the end of the ice age most of the high altitude landscape was either ice-covered or barren, like our present-day rockpiles above treeline. As the ice melted and disappeared, the bare rocks of the canyons were exposed, and lakes occupied what are now the meadows. The climate was changing, though, and the rather sparse arctic-type plantlife was superseded by another vegetation complex, except on the very tops of the mountains.

The ice-age vegetation was presumably connected with that of the regions bordering the Arctic Ocean. The present tundra of the high country in the park is an island of arctic-type vegetation, surrounded on all sides by plant communities of lower latitudes. Will it be engulfed some day and replaced by surrounding plant types? If the climate continues to moderate, the answer may be "Yes."

Most of the original sparse arctic flora has already disappeared. The bare rocks were first invaded by lichens—those plant pioneers still to be seen on rocks in the park. In the thin soil formed by their life processes, other primitive plants became established. As the climate moderated and soils formed where bare rocks formerly existed, a new vegetation complex replaced the old.

We suppose that all sorts of plants got started on this new land, but only those species which happened to be adapted for the particular conditions of their time would last long enough to become well established and to produce ample seeds for future generations. This selective elimination of plants which were not adjusted to the changing conditions results in the dominance of certain well-adjusted species. In this way, according to scientists, a climax vegetation develops for a particular situation. As long as the climate remains about the same, the climax vegetation remains relatively stable.



Rugged cliffs and mighty peaks are spectacular products of geologic forces.

Although it has been thousands of years since these plant communities first started on the glaciated bedrock, the struggle for dominance among the plants still goes on. Conditions are not yet completely static and probably never will be. The meadows, the forests, and the barrens of today may be quite different in a distant tomorrow.

## PLANT COMMUNITIES

### Below 9,000 Feet

In the lower slopes of the park, below approximately 9,000 feet altitude, usually described as the Montane zone, the climate is relatively warm and dry. This type of climate has encouraged a fairly consistent pattern of vegetation that may be considered climax. The forests in this zone are open. The trees are likely to be scattered in characteristically parklike stands and are made up mostly of ponderosa pine. On cool north slopes the stands are thicker, with Douglas-fir sprinkled in or even dominant. With the ponderosa pine on drier sites is juniper (commonly called "cedar"), and above 8,000 feet thick stands of lodgepole pine are sometimes admixed. Along the streams are the distinctive and graceful Colorado blue spruce, associated with willows, birch, and alder. Aspen groves and, in lower altitudes, cottonwoods appear here and there. Many types of shrubs, some characteristic of the foothills, grow in the Montane zone.

The most characteristic forest tree of the lower part of this zone is **PONDEROSA PINE**. It has dull-green needles from 3 to 6 inches long—longer than those of other pines in the park—which are usually in bundles of three. Although the bark on young trees is black, the mature trees have a yellow-brown bark in characteristically rectangular plates. The cones are about 3 inches long, with prickles on the tips of the cone scales. Capable of growing in warm, dry environments, it is an evergreen of south-facing slopes and is widespread as a forest tree in the southwestern United States. On the cooler, north-facing slopes, **DOUGLAS-FIR** mingles with the ponderosa pine. Douglas-fir is easily identified by its needles, which grow singly along the branch instead of in sheaths. The needles are flat, blunt, and about 1 inch long; and they have a narrow stalk at the base that pulls off with the needle. This distinguishes it from the blue spruce often found in the same vicinity. The bark is smooth and gray on young trees, but rough, brownish, and deeply furrowed on older trees. The cones are about 2 inches long, made up of broad scales each with a projecting 3-pronged bract. Here, Douglas-fir seldom attains the great size for which it is noted in the Pacific Northwest.

Another conifer growing in this zone, usually along streams or in such other wet locations, is **BLUE SPRUCE**, one of the most admired ever-

greens of the West. Its needles produce a bloom, or powder, which gives the tree a distinctive bluish or silver aspect, especially noticeable in midsummer. The cones are from 3 to 5 inches long, tan-colored, with many scales, which have narrow tips but no prickles.

In the upper parts of the Montane zone grow dense forests of LODGEPOLE PINE, so named because the Indians used it for tepee (or lodge) poles. It is characterized by tall, slender, straight trunks, with most of the foliage near the top. Its trunk is usually much smaller than the other conifers of the region—seldom exceeding 20 inches. The bark is much thinner than that of the ponderosa pine; gray scales on the bark of young trees become brown with age. The cones are about 2 inches long and are borne in clusters of two or three, tightly attached to the branch. Cones often remain on the tree for years, the seeds retaining their vitality. After a light forest fire, the undamaged cones will open, releasing the seeds. This is nature's way of reseeding a fire-swept area and explains the extremely dense stands of lodgepole pine which, for example, you will see near Many Parks Curve.

ROCKY MOUNTAIN JUNIPER can be seen on dry hills and rocky canyon walls in the park. Its scalelike leaves (not needles) are small and flattened against the innumerable branches. It has no cones, but bears little, bluish berries, which require two seasons to ripen. Usually this juniper grows in a squat and sprawling manner.

Open stands of ponderosa pine are typical of the lower areas of the park.



The most common deciduous tree in the park is **QUAKING ASPEN**. It is immediately recognized by its smooth, white bark and small, green leaves that tremble with the slightest breeze, because of the curious flattening of the petiole, or leaf stalk, at right angles to the leaf blade. Aspen grows to considerable size in beautiful groves of tall trees, where the moisture and shelter are sufficient, but is more often seen in scrubby thickets on rocky, drier slopes. In September the leaves turn to a golden color, giving early autumn travelers a matchless visual experience. **NARROW-LEAF COTTONWOOD** grows along streams in the lower altitudes of the park. Many willows also occupy streambank environments, the most common being **SCOULER WILLOW** with characteristic willow leaves and large oval catkins, which are quite conspicuous in May and early June.

**WATER BIRCH** is a thin-leaved, graceful shrub, sometimes growing to tree size, commonly seen along streams in the lower forests. It can be recognized by its graceful, almost delicate appearance. **THINLEAF ALDER**, also abundant along streams, often grows in great clumps with many stems growing from the same root. Widespread throughout the West, the alder provides habitat for many bird groups. You may also recognize, by its leaf, **ROCKY MOUNTAIN MAPLE**, which grows here and there in the park up to about 11,000 feet.

The shrubs most commonly observed by the visitor are:

**ANTELOPE BITTERBRUSH**—a low, tough, much-branched shrub, with many fragrant, pale-yellow blossoms in May and June. Its leaves are less than 1 inch long, wedge-shaped and 3-toothed at the apex. The spindle-shaped seeds are important food for chipmunks and ground squirrels, and mule deer depend on the shrub for browse. **BOULDER RASPBERRY**—a common bush with showy, 5-petaled white blossoms, up to 3 inches across. During May and June this shrub adds much beauty to the landscape. Birds eat its berries avidly. **WAX CURRANT**—a common shrub found also in the highest forests—forms rounded clumps, 1 to 3 feet high, with rigid, much-branched stems and rounded leaves. The red berries ripen in summer and are eaten by many birds and small rodents. This plant is alternate host to blister rust (a disease which may affect the limber pine in the park in the near future), and much of it has been eradicated in areas where limber pine grows. **SAGEBRUSH**—a familiar plant in much of the West—in this park grows in a dwarf form, and is common in Glacier Basin and on the southwest slopes of Deer Mountain. This woody shrub, about 1 foot high, with 3-toothed, wedge-shaped, silvery leaves, is good forage for mule deer.

Conspicuous wildflowers that grow below 9,000 feet in the park and that will attract attention in their blossoming season are:

Early in the season—as early as March—**AMERICAN PASQUEFLOWER** exhibits its large lavender blossoms as a sign of spring. As the season advances, its blossoming follows the melting snow up the mountain

slopes, where it may be seen into July. This flower (without petals—the sepals resemble petals—but with a golden center) looks somewhat like the garden crocus. It is covered with silky hairs—almost “fur-covered.” Another early-blooming flower is COMMON STARLILY, often called “sandlily”, which displays narrow grasslike leaves and white, stemless flowers in early spring. It is rare in the park, but abundant near the village of Estes Park during May.

STEMLESS TOWNSENDIA, locally called Easter-daisy, is another early bloomer—most abundant in May. The inch-wide flower heads are pale pink or white with yellow centers and are clustered on the crowns of the plant. It is one of the composite family and is easily recognized by the general similarity of the flower heads to those of the larger, taller oxeye-daisy. The arnicas have several representatives in the park region. An early-blooming variety is HEARTLEAF ARNICA which is common in the moist fields and open ponderosa pine forests in May and June. It has large, yellow composite blossoms, from 2 to 3 inches across; the heart-shaped leaves are best developed at the base of the stem. ROCKY MOUNTAIN IRIS is common in meadows of this zone, with its light-blue flower adding color to the “parks” of the region, where moist conditions permit its growth. SPREADING THERMOPSIS, or “golden banner,” carpets the open areas with yellow during June and July. This common plant is a pea, as its flowers suggest, and as the

Sagebrush is one of the shrubs heavily browsed by mule deer.





Spreading pasqueflower heralds the arrival of spring.

long, flat seed pods prove. The flowers appear in clusters along the top of the stem. PLAINS ERYSIMUM, better known locally as "western wallflower," is also yellow, common, and conspicuous during June and early July. Sometimes mistaken for golden banner by visitors who drive rapidly past the meadows, it has quite a different flower pattern, being a mustard with spikes of many small, 4-petaled flowers.

As summer advances, other flowers become abundant. Penstemons present their showy purple spikes of flowers during July. Most abundant and conspicuous is ONESIDE PENSTEMON, usually a foot or more in height, which often colors the meadows blue. All penstemons are easily recognized by their lobed, generally bell-shaped flowers. The common name beardtongue is applied to certain species which have a flattened and bearded sterile stamen on the inside of the flower tube. This fifth sterile stamen, whether smooth or bearded, is the source of the generic name *Penstemon*. LAMBERT CRAZYWEED, also known as "Colorado locoweed," is abundant through July. It can be recognized by its spike of reddish-purple blossoms and the narrow, pinnately compound leaves. Curiously enough, locoweed blooms twice during the summer, the August period of blossoming being less noticeable. FREMONT GERANIUM, or wild pink geranium, is



Gaillardia is one of the showiest composites.

a lovely plant of the open pine forests, with typical 5-petaled pink geranium blossoms. COMMON PERENNIAL GAILLARDIA is a showy composite. The flower heads are 2 to 3 inches across, with deep-maroon to brownish centers and bright-yellow rays, often with dark bases. The tips of these ray flowers have three distinct indentations, serving to help distinguish this plant from BLACK-EYED-SUSAN, which is also common in the mountain meadows.

FIREWEED, as its name suggests, commonly blooms on areas devastated by forest fire or other destructive agencies. Its silky seeds are easily carried by the wind to these areas, where it becomes dominant. It

blooms from early July into September, and the deep-pink, 4-petaled flowers are borne in long, graceful spikes. It is a common roadside plant. MINER'S CANDLE is a hairy-stemmed plant with innumerable close-set clusters of small, white flowers throughout its stout, straight stem. It also is common along roadsides.

Autumn flowers become increasingly abundant in late summer. Conspicuous are the shrubby composites, including groundsels, sunflowers, and purple asters. While the peak of the flower display comes during July for this lower zone, many attractive wildflowers can be seen until mid-September.

## The Middle Belt

Above an altitude of approximately 9,000 feet, the forests show a different aspect. This is another zone, called the Subalpine by some botanists and Canadian by others. It is characterized by forests of stately ENGELMANN SPRUCE and SUBALPINE FIR. You can tell one from the other by touching the needles. Spruce needles are 4-sided, rigid to the touch, and sharp-pointed; fir needles are flattened and softer to the touch. From your car, you can spot the firs by their erect, dark-colored cones, mostly high in the tree. This type of forest is the climax developed in this climatic belt, which receives twice as much snow and rain as the zone below. This relatively abundant moisture (much less, however, than in most of the Eastern States with their broadleaf forests) supports a luxuriant conifer cover. Wildflower gardens of rare beauty and startling luxuriance are found in natural openings within the forest. The distinctive blue COLORADO COLUMBINE, which ranges from the lowest elevations up to 13,000 feet, seems to reach its best development here.

Other plants of the open forests in this zone include WHITE GLOBE-FLOWER with its cream-colored, cup-shaped flower; COLUMBIA MONKSHOOD, with its helmeted blue or white flowers; ELKSLIP MARSH-MARIGOLD, with numerous oval white sepals often mistaken for petals; and the strikingly beautiful PARRY PRIMROSE, with clusters of brilliant purple flowers, often growing along the edge of a stream. Common shrubs include GREENES MOUNTAIN-ASH, whose large clusters of white flowers are replaced by bright red berries in autumn; BEARBERRY HONEYSUCKLE, better known in the Rockies as twinberry, a honeysuckle with large ovate leaves 3 to 5 inches long and pairs of yellow flowers; and wild AMERICAN RED RASPBERRY, with prickly stems, 5-petaled white flowers, and delicious red fruit, relished by birds and hikers alike.

In the cool, shadowed depths of the forest where light is dim, another community of plants is found, including CALYPSO, or "fairy-slipper," a dainty orchid with rose-colored blossoms formed in a curious slipper-like shape; the PYROLAS, a group of low, hardy perennial herbs with

white or pink flowers having 5 thick petals and 10 stamens; SPOTTED CORALROOT, a plant which, getting its nourishment from decaying vegetation, has no green leaves, but bears purple-spotted flowers on its brown stem; and AMERICAN TWINFLOWER, a trailing plant of the honeysuckle family, often forming dense mats with upright, forked flower stems bearing a pair of pink, bell-shaped flowers.

After fire or other catastrophe wipes out the spruce-fir forests, a cycle of natural revegetation must take place before the climax forest again becomes established. The first step in this recovery process is the appearance of fireweed and many annual herbs, among which shrubs such as CLIFF JAMESIA, or "waxflower," become established, and aspens begin to appear as succession plant types. They are replaced

Blue columbine—Colorado's State flower.



eventually by longer-lived lodgepole pines, also sunloving and tolerant of burned or denuded sites. The trees increase the wetness of the forest floor, provide the shady sites necessary for seeds to grow in, and shelter the young spruce and firs as they slowly increase and approach maturity. Eventually, the spruces and firs crowd out the pioneers which have helped them get established. This dense spruce-fir forest seems to resist competition of other species and will maintain itself indefinitely by gradual replenishment of its own kind, unless it is again fire-swept or there is a change of climate. The spruce-fir forests of the park seem to be as nearly fixed and static as forests can be; or, in the scientists' words, they are the *climax forest* for the sites they occupy.

The higher part of the Subalpine zone (10,500 to 11,500 feet) is often called Hudsonian for its biological similarity to the region around Hudson Bay. It is a sort of frontier zone where the climate is more severe. Not only is it colder, but it is much windier, and loss of water by evaporation is much greater than it is a thousand feet lower. Although spruce and fir remain the dominant species, they are usually shorter and less symmetrical in appearance. Near the upper limits of this zone the trees are twisted and grotesque, often flat and ground-hugging, sprawled behind boulders or fingering into the dwarf willow clumps so characteristic of the alpine moun-

Lodgepole pine forests along Trail Ridge Road.



taintops. Here, also, the only 5-needle pine in the park, LIMBER PINE, a rocky-soil tree of the Subalpine zone, assumes its most picturesque aspect. Limber pine at treeline is readily identified by its grotesque, twisted, ragged appearance. Several splendid specimens can be seen beside Trail Ridge Road about a half mile above Rainbow Curve. The name, limber pine, comes from the ease with which the branches can be bent without breaking. The cones are often 6 inches long, the largest of any conifer in Colorado.

The limber pine stands in the shadow of threatened extermination by blister rust. This fungus disease, which attacks, girdles, and destroys all species of 5-needled pines, has wrought havoc in many parts of the country. Like so many virulent forest diseases, it was introduced from abroad. Since no known natural checks on it exist in this country, it is almost impossible to eradicate. It spreads to pines only from its alternate hosts, wax currant and other species of *Ribes*; if these are eradicated from the vicinity, the pines can be preserved. Though such control measures are costly, without them the limber pine might be lost forever from the park. The Government has been doing this work in selected forests on the northeast slope of Longs Peak and near Estes Cone, where many splendid specimens of this tree occur.

## Above Treeline

Above the Subalpine zone, whose upper limit is treeline, lies the Alpine, or Arctic-Alpine, zone. This is the distinctive "Land of Lilliput" of the plant kingdom, the alpine tundra, where nearly all existing plant species are in dwarf form. Some of the zone is barren rock, with only algae and lichen growth. Vast expanses of it, however, are covered with a cold, wet soil mantle which, during the brief summertime, presents a myriad of low, cushionlike flower clumps. Sometimes—usually through July—the effect is that of a vast carpet of flowers. The list of plant species is great. Showiest of the alpine flowers are ALPINE BUTTERCUP, with large, yellow, poppy-like flowers, often blooming at the very edges of snowbanks; ALPINE FORGET-ME-NOT, which grows in dense, low clumps and presents thick patches of bright-blue flowers; MOSS SILENE ("moss campion"), a moss-like cushion plant with pink flowers (also found in Greenland and Alaska); GRAYLOCKS ACTINEA, sometimes called "Old Man of the Mountain," with bright-yellow flower heads, usually wind-blown and ragged, almost as broad as the plant is tall; TUFTED PHLOX, better known here as "alpine phlox," the cushion of which is sometimes entirely covered with pale-blue or white flowers; AMERICAN BISTORT, with dense spikes of tiny flowers standing like miniature bottle brushes above the tundra grasses; KINGS CROWN, a fleshy plant with dark-red blossoms,



Limber pine at treeline.

the whole plant often turning completely red in late summer; and MT. WASHINGTON DRYAD, with its curious 8-petaled, cream-colored flowers.

Tundra is characteristically composed of grasses, sedges, herbs, and a few dwarfed shrubs. Many lichens and mosses also grow in tundra. The plants are typically small, low-growing, and compact, and often have showy flowers. There seems to be an abundance of blossoms in proportion to the size and amount of foliage of the plants. Their small leaves are protected from excessive water loss by masses of hairs or waxy substances, and they frequently contain high amounts of red pigment. Most of these plants are exceedingly slow-growing; some of those you see may be a hundred to several thousand years old.

The story of the park's trees and flowers is intensely interesting, but can best be understood by more careful study than is possible in this booklet. Several excellent botanical bulletins are available, and we urge you to invest in one of them.

## ANIMAL LIFE

A National Park is a spacious natural reserve, and in it those creatures that have survived through the past are protected from harm by humans. They are not protected from each other, there being no attempt to change natural relationships of predator and prey.

Since the animals are in their natural habitats, and not in cages, you may not be able to see at close range the kinds of animals you may want to see at any time you like. Instead, you must expect to see them at their convenience, not yours. This requires careful, patient watching, but the rewards are great for the observant outdoorsman. An occasional glimpse of a bull elk grazing free in his native meadow may be more satisfying than the most detailed inspection of a confined creature in a zoological garden. Our society needs both types of experiences.

Although there are about 35 species of mammals in the park, this booklet can present brief descriptions of only a few of those likely to be of greatest interest.

### Hoofed Mammals

The largest mammal of Rocky Mountain National Park is the AMERICAN ELK, or "wapiti." It is really a big deer—distinctly larger than the local mule deer and usually with a more reddish or brownish coat.

Treeline is at about 11,500 feet altitude near Trail Ridge Road.



The true American representative of the Old World elks is the moose, not found in Rocky Mountain National Park.

American elk were almost exterminated here by ruthless hunting in prepark days. Seventy animals introduced here in 1913 and 1914 from Yellowstone National Park made possible the present population of over 600 elk in this park.

During summer, the elk are usually high in the mountains, feeding on the lush grass of the widespread tundra and the forest glades. Their food consists mostly of grass, herbs, and twigs of woody plants. The summer is a short but prosperous time for these animals. Usually by early autumn, fierce storms in the high country put an end to days of ample forage, and most of the elk move down into the small meadows at lower altitudes. In late September, as the mating season begins and the bulls fight for possession of the herds, large groups of elk can be seen in such places as Horseshoe Park and Beaver Meadows. This is when the bugling challenges of the bulls can be heard echoing across the valleys. In November, this period ends and the more prosaic struggle for survival on the limited winter range begins.

Formerly, during winter, the elk could scatter well below the present site of Estes Park village; now they are "bottled up" within the park meadows, because of the encircling human developments. Or perhaps these introduced elk and their descendants never developed a more extensive winter migration pattern, for the more venturesome individuals among them would have been killed or harried by hunters in the lower country east of the park. In any case, most of them do not move out of the park.

Times are hard for the elk until spring permits their return to the high country, where ample feed awaits them. Grave concern is felt by wildlife experts about the winter food shortages confronting this species. Without deliberate control by the park rangers, in order to keep the population at a level that can be supported by the limited and overused vegetation of the park's winter ranges, the herd itself would face mass starvation. The absence or near disappearance from this region of some of the most effective predators of the elk—cougar, wolf, and grizzly—has removed most of the aboriginal population controls.

Whether you visit the park in summer or winter, you should be able to see elk—at least with binoculars. In summer (especially in the evenings) you may see them along Trail Ridge Road, emerging from the forests below Fall River Pass or the Rock Cut area. The cirque below Fall River Pass is a good place to look for them with binoculars. From mid-September until March or April, herds of elk are normally to be seen in Beaver Meadows, Horseshoe Park, Moraine Park, and in the meadows north of Grant Lake; but patience and some keenness of observation are required.

It should be easier to find MULE DEER, a familiar sight in many areas in early morning or evening, even in midsummer. Hikers encounter them on the trails throughout the park. When startled, the mule deer takes flight, characteristically bounding from all four feet at once, making soaring leaps, and landing with such force that its feet make a drumming sound. This bouncing but graceful gait has earned it the nickname "jumping deer" in some areas. It is effective in ascending rocky slopes and traversing brush country.

The males of all deer, including the American elk, grow antlers annually. For a short period in late winter and spring they have no antlers at all, but by June the new growths begin, getting larger and larger until August, when they attain full size. Until then, the antlers are "in velvet"—with a soft, hairy covering—which dries up and peels or is rubbed off. Often the animal helps the removal of the velvet by rubbing its antlers against the trunks and branches of trees. Many "rubbing trees" can be seen along the trails. The deer enter the mating season with polished, full-sized antlers, and these majestic adornments are worn until the season of shedding. One might expect to see discarded antlers everywhere; but because they contain much salt and calcium they are eaten by porcupines

Although elk, especially the bulls, occasionally stay high in the deep-snow belt, most of them feed in lower meadows during winter.





Mule deer are common. The fawns, born in early June, are spotted when young.

Male bighorn display the horns that have made them famous.



and other rodents. Few shed antlers, therefore, are seen by visitors to the park.

In summer, mule deer are seen singly or in small groups, browsing in the higher country; like the elk, they descend into the lower meadows in autumn. They, too, find the winter difficult, because of limited range. Deer are browsing animals, eating such things as willow, aspen, antelope bitterbrush, and even pine needles. Much of their natural food has been overbrowsed, and this condition has helped to make beggars of many of them. It is not unusual to see them in the streets of Estes Park village or near the town garbage dump looking for food. June, however, brings the lush green vegetation on which they regain their strength. That month also is fawning time. The spotted fawns are usually hidden in the woods and are nursed twice a day by the mother, who stays nearby but out of sight. Sometimes well-meaning visitors report an abandoned baby deer. In most instances, the fawn has not been abandoned; the visitors simply failed to see the mother in the background. Fawns, which keep their spots until autumn, run with the mother until the next spring.

The greatest thrill for many park visitors is when a BIGHORN, or mountain sheep, comes close enough to be photographed; however, those occasions are rare. Like most large mammals of the West, the bighorn was on the verge of extinction 40 years ago, but, thanks to various conservation measures, it is now well established. Formerly, bighorn were distributed throughout the park and beyond to the foothills. Today, they are largely restricted, by man's necessary settlement of the land, to portions of the park remote from man's developments. Most visitors—when they get to see them at all—spot bighorn on Trail Ridge Road near Milner Pass (on Specimen Mountain) or in the Mummy Range. They are seen now and then near Sheep Lake (in Horseshoe Park), usually in small family groups of ewes and lambs. Successful pictures of them have been made mostly in this vicinity.

### **Predatory Mammals**

Yellowstone and Yosemite are two National Parks where visitors have ample opportunity to become acquainted with the BLACK BEAR. Many people, by foolishly feeding or petting these wild animals, have become too intimately acquainted, and have been injured in the process. Here in Rocky Mountain National Park, these opportunities seldom occur, for the bear population is low. If you are lucky enough to see one of these bulky, furry creatures lumbering along the road, do not try to fraternize with it.

Although the species present here is called the black bear, there are blonds among them, too. The brown bear and cinnamon bear are merely color phases of the black bear. Bears eat almost everything,



Brown bear are present in the park, but not in large numbers.

including roots, berries, ants, frogs, fish, carrion, and such small mammals or birds as get into their clutches. They seem to be particularly voracious in eating garbage—discarded lunches, bacon, and similar material likely to be present in a campground. The bear is a relatively solitary animal. He has poor eyesight, but good hearing and sense of smell. Bears usually hibernate in fitful sleep, living off stored-up layers of body fat. The surprisingly small, squirrel-sized young are born in February during this semihibernation. The mother gives devoted care to her cubs, and defends them vigorously.

You can't see grizzlies here, for they were extirpated from this region before the park was established.

The COUGAR has many aliases—mountain lion, catamount, painter, panther, puma—depending upon the locality. Almost 9 feet long including the 3-foot tail, the adult cougar may weigh over 200 pounds. Its coat is dull, yellowish brown; immature cougars have blackish spots. It has acute powers of sight, smell, and hearing. A sly, crafty, and tireless hunter, it is not often seen by man even where it is abundant. The cougar is part of the natural wildlife community, and is protected from hunters within park boundaries. The chances of seeing one here are remote, for many who have spent a lifetime in these mountains have never reported seeing one. A few observations of these animals, however, are usually reported in the park each year.

A much smaller cat occasionally seen in the park is the BOBCAT. It roams the forested areas of the park principally hunting small rodents and rabbits. Grouse also are taken, and on forays above treeline the bobcat may feed upon ptarmigan. It lives in dens in the rocks and sometimes in a hollow tree. Like the snowshoe rabbit upon which it preys, the bobcat has natural "snowshoes"—its feet are expanded in winter by long hairs, which help support the animal on the snow.

A close cousin to the domestic dog is the COYOTE. This exceedingly cunning animal is actually extending its range, despite man's attempts to wipe it out, and is very common in the park. Few people fail to thrill upon first hearing its song—a high, staccato yipping often heard by visitors as they leave the evening talks at Moraine Park. You can expect to see coyotes almost anywhere in the park; early morning is a good time to look for them in the grassy meadows.

Another member of the dog family, the RED FOX, is seen occasionally by visitors. It is notoriously wary and cunning, and although less fleet-footed than the jackrabbit, it is faster than the coyote. Its family life meets with our approval, for the male actually feeds the female during the lying-in period, and at the risk of its own life leads hunters away from the den and its helpless occupants. It eats almost anything; small rodents are preferred.

People often bring back tales of an unusual animal on the trail above Bear Lake. Usually, they have seen the MARTEN, the largest of our



Young martens show the curiosity typical of their kind.

remaining local weasels and an altogether interesting animal. This creature is at home in the treetops or on the forest floor. Like all weasels, it is a voracious feeder and a peril to its neighbors. It successfully hunts birds and squirrels in the trees, and preys on rats, rabbits, fish, grouse, frogs, insects, and other weasels. Its repertory of sounds includes hisses, squalls, barks, growls, and shrieks. It breeds in summer, but the young are not born until the following spring; its life span is about 18 years. It is closely related to the famous Russian sable, and has been nearly exterminated by trapping through most of its original range.

The MINK is rare in the park, but is occasionally seen on Glacier Creek. This member of the weasel family is an excellent swimmer, and catches fish with ease. Its dense and oily fur keeps it warm in cold water, but it lacks any other apparent adaptations to an aquatic life. So agile an animal has few natural enemies apart from disease; its most important predator is, oddly enough, the great horned owl. The young are born blind and helpless, and only the size of one's finger, but by summer's end they become self-sufficient.

The WEASEL is a small, sharp-eyed creature with an extremely long body, small triangular head, and furtive ways. Weasels are success-

ful hunters, searching through brush piles and rock heaps and in underground burrows for rodents of all kinds. There are two species in the park—the LONGTAIL WEASEL and the SHORRTAIL WEASEL, or ERMINE. The latter is less than half as large as the former. Like that of certain other mountain dwellers, the fur of weasels becomes white as the snows of winter approach, replacing the brown of summer.

Horseback riders crossing Moraine Park and Beaver Meadows are usually wary of the large holes that are the work of the BADGER. Although a creature of the plains rather than of the mountains, the badger lives in some of the lower meadows of the park, and there have been reports of badgers being seen near Fall River Pass. It is a meat eater, and its large front feet have long claws, which enable it speedily to dig out a ground squirrel.

### Gnawing Mammals

The YELLOWBELLY MARMOT, with its reddish underparts, grizzled back, and bushy tail, is seen by nearly all park visitors. Although it is more common in medium altitudes in the mountains, it also may be seen high along Trail Ridge Road, and a pair, reportedly, is living atop Longs Peak! These rodents live in dens, usually rock-piles, into which they pack twigs and grass to make a comfortable

Red fox.



—Drawing by Walter A. Weber.

nest. They store up a heavy layer of fat in the summer and hibernate during the cold winter. Their natural food consists of grasses, berries, and roots. Their short, sharp whistle can be heard a mile away. During the summer, hikers occasionally see rather humanlike scenes, as marmot families sun themselves on the "front porches" of their rockpile homes.

The TASSEL-EARED, or ABERT, SQUIRREL is an excellent example of the zonal specialization of mammals. It is almost entirely restricted to the ponderosa pine forest belt. Its showy ear tufts, although often absent during the summer, set it apart from other local squirrels. It feeds mostly on ponderosa pine seeds, the bark of twigs and young trees of this species, and such wild fruits and succulent vegetation as are available. The Abert squirrel builds nests in the trees and is a familiar sight to hikers in the ponderosa pine forests. It is usually gray-colored, but may be brown or even completely black.

Another small arboreal rodent, the SPRUCE SQUIRREL, chatters and scolds when a stranger enters its patch of forest. It roams both the lodgepole pine and higher spruce-fir forests with their bitter winters, yet it does not hibernate. Even after the most severe storms it will emerge to travel through the treetop world it occupies. Some bird enthusiasts have little regard for it, because of its habit of eating eggs and young birds whenever the opportunity presents itself. However, in a National Park the squirrel's desire to live is considered to be as important as is the bird's. A certain "balance" of population is the result, which is, after all, one of the desirable features in an area dedicated to preserving natural conditions.

CHIPMUNKS are particularly familiar at Trail Ridge Road parking areas. These small squirrels are reddish-brown above, with white underparts and with four white stripes running along the back. A definite stripe across the face distinguishes them from the golden-mantled ground squirrels, with which they are often found.

The GOLDEN-MANTLED GROUND SQUIRREL is often confused with the smaller chipmunks which it joins in begging for visitor handouts at parking areas below treeline on Trail Ridge Road. Its natural food is succulent plant material and seeds, but many of the gregarious little animals are becoming more or less dependent upon food offered them by humans. You can see them most conveniently at Many Parks Curve.

Another little rodent, common in the lower meadows, is the RICHARDSON GROUND SQUIRREL ("picket pin"). It lives in colonies, after the fashion of the prairie dog of the plains. It is abundant in Moraine Park.

Relatively few park visitors see the BEAVER; but all can see examples of its work. It works at night as a rule, and usually remains out of sight when humans are abroad. These industrious rodents are much



Yellowbelly marmot—seen by most visitors.

larger than the related chipmunks and marmots, and weigh as much as 90 pounds. Beaver pelts were part of the lure that led to the early exploration of the West. Almost exterminated about 50 years ago, they are now relatively abundant in Rocky Mountain National Park.

The beaver is well adapted to its water environment. The hindlegs are webbed for efficient swimming; the tail, broad and horizontally flattened, helps in underwater maneuvering. However, its swimming speed at the surface of the water is only about 2 miles per hour. Beaver can remain submerged for over 5 minutes; this ability helps in escaping enemies.



The beaver is sometimes seen by alert observers in late afternoon or early morning.

Beaver dams are abundant in the park. Many typical examples can be seen in Horseshoe Park, Moraine Park, Glacier Basin, and Hidden Valley, and along the Colorado River. Nearly all of the park trails pass beaver workings. The dams are built of various materials in this region, but most commonly of mud, parts of aspens, and debris. They are started from the upstream side—usually on shallow creeks—and as the water level rises so does the dam. The beaver uses its front paws almost as hands. The load of mud or sticks sometimes is carried by being pressed against the chest as the animal walks on its hind feet to the top of the structure it is building. The dam is made to create a stabilized water level. This is essential for protection of the beaver's island den—a lodge made of sticks and mud. The beaver house starts as a solid heap of debris, but the animal chews and digs out a couple of underwater tunnels, as well as one or more dome-shaped rooms with the floor a few inches above water level. In this dry retreat the beaver rests, sleeps, and rears its family. Few natural enemies can pursue it through the



A narrow tail distinguishes the muskrat from the beaver, which may live in the same locality.

underwater entrances. Its food is chiefly aspen bark and twigs. A winter supply is stored under water during late summer.

Because of its energy, skill, and persistence, the beaver has become a symbol of industriousness. It is also often credited with more intelligence than it probably possesses. Its apparent industry and resourcefulness are due more likely to inherited instincts than to reasoning. At any rate, this large rodent is surely one of the most interesting animals in the park.

The MUSKRAT is frequently active in daylight hours. It lives in the same environment as the beaver, but in the park has a much more limited distribution and is confined to lower elevations. It builds lodges, too; they are much smaller than those of the beaver, and are largely composed of mud and plant material. The lodge serves as a secondary food source in the winter, and many muskrat houses are practically eaten away by spring. Unlike the beaver, a strict vegetarian, the muskrat eats fish, insects, and any birds it can catch, as well as plant food. This animal has not acquired the ability to build dams, but does make rafts of sticks and twigs. When seen closely, a muskrat is easily distinguished from a beaver, for it is smaller and has a slender, vertically flattened tail, quite unlike that of the beaver.

Probably everyone recognizes the PORCUPINE. It is a large, short-legged rodent, rather clumsy of behavior, and usually seen either sleeping or leisurely chewing the bark of a tree. The porcupine survives,

despite its sluggish behavior, because of the protection afforded by some 30,000 quills in its pelage. Although it cannot "throw" these quills, they are very loosely attached, and when the tail is vigorously thrashed about it is inevitable that some of the quills become detached and fall away. The unlucky recipient of such a slap of the tail will be convinced that the quills were thrown, although the effective embedding of quills is done by direct contact.

The MOUNTAIN COTTONTAIL is often seen in the lower forests. Despite heavy predation by many natural enemies, the cottontail manages to maintain itself because of its high birth rate. One mother may produce a total of 25 young in the 4 or 5 litters born during the year. It is fairly small, grayish-brown in color, with rather short ears and a conspicuous cottony tail resembling a powder puff. It lives in underground burrows and retains the same color winter and summer.

The SNOWSHOE HARE nests on the surface of the ground. Its fur changes from grayish-brown in summer to white in winter. A denizen of the spruce-fir and lodgepole pine forests and of the tundra, it hops about the snow on its huge, furry, "snowshoe" feet, apparently finding the severe winters of the high country no great hardship. It is not common in the park, and therefore is not often seen.

#### Porcupine.





Friendly chipmunks make themselves known throughout the park.

Motorists on the highest parts of the Trail Ridge Road often see the PIKA, which looks like a small, grayish guinea pig but is really a close relative of the rabbit. It is found in the rock slides and talus piles in the high country mostly above treeline, and is seldom seen below 9,000 feet. Despite the subzero temperature of the tundra belt, it does not hibernate. Its habit of storing little bundles of mountain grasses and other alpine plants has given it the nickname of “alpine haymaker”; it is also sometimes called “cony”—a name better reserved for an unrelated Old World mammal. Look for the pika at Rock Cut on Trail Ridge Road, it seems to have favorite sunning spots from which it greets the traveler with shrill shrieks.

### **Coldblooded Vertebrates**

Many animals do not possess an adequate mechanism for maintenance of constant body heat. Some of these, taking advantage of the slowness with which water changes temperature, live mostly in an aquatic environment. Few can endure the cold winters of high altitudes.

Unlike other animals in National Parks, fish may be taken, under regulations designed to conserve the resource. As long as you have a State fishing license, you may exercise this privilege in Rocky Mountain National Park. The season and catch limits vary from year to year; you are urged to ask a park ranger about current regulations.



Coyote.

The original trout in the park is the **BLACK-SPOTTED, OR CUTTHROAT, TROUT**. Once found only in the northern Rockies, it has been transplanted widely. It has numerous subspecies and color variations, but here it is usually an olive-green on back and upper sides, shading into a yellowish cast on lower sides. The lower surface becomes red at spawning time. The body and fins are black-spotted. The red streak on each side of the lower jaw has given it the name "cutthroat." Its principal foods are insects and small aquatic animals. Spawning takes place in midsummer in the high country.

The **BROOK TROUT**, originally native east of the Mississippi, was introduced into this park, where it has thrived and maintains itself through natural reproduction in many lakes and streams. It is olive-green to gray, with a sprinkling of red and gray spots on the sides. The front borders of the lower fins and the lower borders of the tail are white. Its food includes insects, worms, small minnows, and crustaceans. It spawns in autumn; the female deposits the eggs in a depression she scoops out in the streambed. After the eggs are fertilized, she covers them with gravel and leaves them to hatch unattended.

The **RAINBOW TROUT** is another nonnative trout of the park waters. Its original range was on the Pacific slope of the Sierras and the Cascades, but it has been transplanted widely. It is bluish-olive above the lateral line, changing to silvery-green on the sides. Its name is derived from a broad, reddish stripe on the sides. It eats insects, worms, and

smaller fishes, and is a favorite of the angler for its fighting ability and tendency to break water when hooked. Spawning occurs from autumn to spring, depending on the altitude.

The most common amphibian in the park is the bright-green to tan LEOPARD FROG. Restricted to damp areas near ponds or creeks, it is most likely to be seen in spring and early summer when the gelatinous egg masses are being laid. The tadpoles develop into mature frogs in about 3 years. Until then, it lives on plant food; after maturity, it eats insects and worms. It is found in Moraine Park, Horseshoe Park, and other moist grassland valleys.

The THREE-LINED TREEFROG, our smallest amphibian—about an inch long—is often mistaken for a young leopard frog. Although it is a treefrog, possessing disks on its toes, it is seldom seen in trees; it prefers small ponds or swampy grassland. It is sometimes found under rockpiles or pieces of damp wood. Despite its small size, its loud chirps in spring and summer can be heard a half mile away. During its singing, a vocal sac beneath the lower jaw inflates to a size larger than the creature's head. It is easily recognized by the three stripes down its back. Look for this diminutive amphibian at Gem Lake.

The insectivorous MOUNTAIN TOAD, a nondescript denizen of marshy lake habitats, is common in Cub Lake Valley, Hallowell Park, and in the Ouzel Lake area in Wild Basin. In late spring, large numbers

Cutthroat trout.





View of Mount Ypsilon from near Bear Meadows approach to Trail Ridge Road.

congregate in ponds to lay strings of eggs. The small tadpoles become adults by the end of summer.

The **TIGER SALAMANDER** is one of the oddest animals of the park. Salamanders do not walk out of fires, as medieval tradition had it, but are amphibians. Unlike frogs and toads however, they retain their tails after reaching maturity. They hatch from eggs in shallow ponds, breathe by means of feathery external gills at the back of the head. Later, the gills are absorbed and the salamander begins breathing with lungs; it then leaves the water for a moist underground burrow, returning to ponds in early spring to lay eggs on plants or debris in the water near the shore. In southern latitudes, the larvae (gill-breathing forms) are able to lay eggs; these are the *axolotls* of Mexico. Our local variety of the tiger salamander is about 8 inches long, gray-brown with dark spots. It is found in Sheep Lake, around which large numbers occur during the spawning season in June, and is often seen in suitable habitats along Cub Lake Trail. It eats insects, insect larvae, worms, and small snails. It is harmless to humans.

The only reptile in the park is the MOUNTAIN GARTER SNAKE, which is found throughout the mountainous areas of Colorado. Because of its fondness for water, it is often erroneously called a "water snake." It is greenish-gray and may reach a length of over 2 feet. It feeds on frogs and worms; it is entirely harmless to man, but is capable of giving off an offensive odor when handled. The young are born alive in midsummer. These snakes may be seen near most of the marshy ponds or slow-moving streams in the park. The ponds in Cub Lake Valley and in Hallowell Park are favorite haunts of these interesting creatures.

No rattlesnakes or other poisonous reptiles have ever been found in the park. Reports of rattlesnakes near Glen Haven mark the highest known occurrences in this region—a fact that, while contributing to the visitor's peace of mind, puzzles many people. This absence, or relative scarcity, of cold-blooded animals is probably due to the climate—long, cold winters and chilly summer evenings. The lower amount of oxygen at high altitudes may also be a factor. On the tundra, many pools are free of ice for only about 6 weeks—scarcely time for frogs' eggs to hatch and for larvae to develop lungs before freeze-up. The cold nights, even in midsummer, would inhibit a large snake's movements to such a degree that it would probably starve. Thus you can hike in the park in confidence that you will encounter no poisonous snakes.

Fishing is a popular recreation made doubly attractive by the mountain setting of the park waters.



## Birds

With over 226 different species listed in the most recent publication on local birds, it is difficult to give adequate attention to the subject in the limited space of this booklet. Park birds, like our human population, can be classified as visitors and residents. Occasionally a "straggler" appears, far from its usual haunts. Birds, like humans, can be further classified by their preferences as to locale. Just as some people prefer to visit the high peaks and tundras, so some birds prefer these areas. A few people come here only to fish; so does the belted kingfisher. Like most humans, many birds can be seen throughout the park, and the greatest variety and numbers occur in summer.

A number of park birds—both resident and migratory—have specific preferences. For instance, if a bird's diet is mostly seeds from pine cones, it will usually be found in pine forests. Typical park environments and the characteristic birdlife of zones are outlined in Appendix B. Most of the birds nest in these associations.

The lower altitudes of the park—ponderosa pine forests and grassy meadows—have a large, varied population of birds in summer. Here lives the STELLER'S JAY, easily recognized by its rich-blue wings, sharp crest, and saucy manner. The BLACK-BILLED MAGPIE, like Steller's jay a member of the crow family, has a conspicuously long tail, a greenish-iridescent, black-and-white body, and a propensity for scavenging small animals killed by autos. The WILLIAMSON'S SAPSUCKER is always associated with the ponderosa pine in which it pecks its sap holes; and the "red-naped sapsucker"—a subspecies of the YELLOW-BELLIED SAPSUCKER—with bright-red throat and crown, is usually seen working on aspens. The GREEN-TAILED TOWHEE nests in the shrubs of the Montane zone during June. RED-EYED VIREOS, characterized by gray cap and black-bordered white stripe over the eye, are found in the forested valleys from June into August. The PIGMY NUTHATCH, a tiny, noisy bird with a brown head and white underparts, wanders in small, noisy flocks through the pine forests in spring and autumn but scatters during the nesting season. There is some migration of pigmy nuthatches to the plains when winter comes.

The chickadees—both the MOUNTAIN CHICKADEE, which remains in the park during the winter and has a typical black cap, broken by a white line above the eye, and the BLACK-CAPPED CHICKADEE, which becomes scarce in the winter—belong to the Montane zone. The VIOLET-GREEN SWALLOW is an abundant species in this zone. The MOUNTAIN BLUEBIRD arrives in "waves" during April, to leave scattered pairs to nest in holes in aspens or other cavities. It lacks the rufous breast, but has the characteristic azure color its name suggests. The WESTERN Tanager, the most colorful bird in the park, is mainly black

and yellow, with a red face. It is in the park from mid-May until August.

Nesting in this general zone, in rocky cliffs and canyons, are the GOLDEN EAGLE (seen every summer); the CANYON WREN (its characteristic "laughing" song is often heard during May and June); and the WHITE-THROATED SWIFT (which comes in early May to nest in crannies in the cliffs at the very east edge of the park, and leaves in June).

Some birds commonly nest in lodgepole and aspen forests, from about 8,500 feet upward. They include the WESTERN WOOD PEWEE, with a dark gray back, dull gray underparts, and two white bars on the long wings; the WARBLING VIREO, a migrant that arrives in a "wave"

The gray jay, or "camp robber," which often visits motorists during lunch stops.



late in May; the LINCOLN'S SPARROW, streaked, with a short tail, which spends only 2 months in the park; the RUBY-CROWNED KINGLET, which appears suddenly in late April and fills the forests with its song during June; the showy AUDUBON'S WARBLER, with its fire-bright yellow spots and white wing patches; and the HERMIT THRUSH, whose songs ring through the lodgepole and spruce-fir forests and along the streams in July.

In the spruce-fir forest, nesting birds you may expect to see include the PINE GROSBEAK, a large finch, the male of which has a rich rose-red head and breast; and the BROWN CREEPER, named for its habit of creeping up tree trunks. Thickets near treeline are the nesting area of the WHITE-CROWNED SPARROW, a bird with strikingly black-and-white striped crown. It is as much at home above treeline as below, usually ready to scold all hikers who invade its territory. The WILSON'S WARBLER, with yellow body and black cap, nests in the willows at this altitude, but leaves the heights in August and returns in May.

Above the forests, on the wind-swept tundra, are some of the most interesting birds of the park. Here WHITE-TAILED PTARMIGANS spend the entire year. These alpine grouse, mottled-brown in summer, become pure white in midwinter. They assemble in small flocks in September to spend the winter together, but disperse during May and June for courtship and breeding. Nesting ptarmigans have been seen close by the busy Trail Ridge Road. Depending upon their natural camouflage for protection, they seldom show alarm when closely approached.

Ornithologists travel far to see BROWN-CAPPED ROSY FINCHES, which breed only on the high mountains of Colorado and probably northern New Mexico. Nesting in cliffs above treeline in summer, they band together in autumn to descend into the ponderosa forests for the winter. A third common bird of the tundra is the WATER PIPIT, a small ground bird, whose white-bordered tail is almost constantly in wagging motion. Pipits have an interesting courtship flight, and during midsummer are seen only above treeline, where they nest. By late August they descend to lower altitudes, not to return until June.

Even the most casual visitor notices the GRAY JAY and its cousin, CLARK'S NUTCRACKER. These members of the crow family are common at Bear Lake and at Many Parks and Rainbow Curve parking areas on Trail Ridge Road, where they compete with the chipmunks for hand-outs from motorists. The GRAY JAY, sometimes known as the Rocky Mountain jay or "camp robber," has a dull-gray body, light-gray head, and short bill. It is often seen in the company of the Clark's nutcracker, about the same size, but with a longer bill, light-gray body and white patches on black wings and tail. The nutcracker tends to range both above treeline and down into the ponderosa pine belt

during summer, whereas the “camp robber” has a more restricted distribution.

The COMMON RAVEN is often observed soaring over the canyons. RED-TAILED HAWKS are fairly common—those that nest on the cliffs southeast of the visitor center are almost always to be seen in summer in Moraine Park. The robin is abundant and widely distributed in the park in summer. Flocks of robins are to be seen above treeline into October. The sleek BOHEMIAN WAXWING passes through the park in winter and early spring. Along the beaver ponds, in the willows, the showy REDWINGED BLACKBIRD may be seen from May until July.

Possibly the most unusual bird of the park is the DIPPER, or “water ouzel,”—a chunky little dark-gray bird, with a habit of bobbing up and down constantly, which is seen only near rushing mountain streams or waterfalls. It hops into rushing water and even walks submerged on the stream bottom in search of aquatic insects—a method of food-gathering that appears suicidal but actually does the dipper no harm. The mossy, dome-shaped nest is usually built where spray can keep it moist. Look for these amazing creatures at Chasm Falls, at The Pool, along Mill Creek and Glacier Creek, or in the cascades in Wild Basin.

It is hoped that this brief treatment of the birds will arouse your interest in these important members of the park’s wildlife population.

The ptarmigan’s summer coat resembles lichen-covered boulders of the high meadows where it lives.





Clark's nutcracker, familiar at parking areas, is often confused with the "camp robber," or gray jay.

Park-naturalist-conducted bird hikes are scheduled during the summer, and bird books are on sale at Moraine Park Visitor Center. Birds are an important element in the enjoyment of the park; take advantage of the opportunity to become acquainted with them.

## **MAN IN THE ROCKIES**

At least a thousand years ago many Indians passed through the park region. Evidences of their presence are few but conclusive. Arrow points, hand hammers, and even crude pottery fragments have been collected, and some are on display in the Moraine Park Visitor Center. In the past 200 years or so, the park was the haunt of the Utes (whose main territory was west of the Continental Divide) and, latterly, of the Arapahoes who ranged the plains east of the park. Many old Indian trails have been logged in the park; Trail Ridge was named for its Indian trail.

After the United States acquired the region through the Louisiana Purchase, a number of explorers and adventurers passed near the park in their travels: Stephen Long in 1820, William Ashley in 1825, Richard Dodge in 1835, Eliza Farnham in 1839, Frederick Wislizenus in 1839, Rufus Sage in 1840, John C. Fremont in 1843 and 1844, Francis

Parkman in 1846, and Frederick Ruxton in 1847. From his narrative, there is reason to think that Sage might have been in Wild Basin; if so, this would mean that he was the first explorer to set foot in what is now Rocky Mountain National Park.

On October 15, 1859, Joel Estes and his son topped Park Hill and saw what is now Estes Park. The next year, Estes settled his family in the grassy meadow—a “park” in Colorado terminology. It soon became known as Estes Park, a name in use to this day. By 1867, the Estes family claim was acquired by Griff Evans, who later transferred his rights to a British nobleman, the Earl of Dunraven.

Dunraven’s influence on the region was, perhaps, more beneficial than his antagonists would have admitted. Many enterprises that would have seriously marred the matchless landscape were kept out of his feudal regime, saving (although quite accidentally) many beauty spots for later generations. He also did much to publicize the region; one of his guests was the artist Albert Bierstadt.

During the 1880’s a mining boom occurred in what is now the west side of the park, leading to the establishment of Lulu City, Dutchtown, and Teller. Grand Lake had already been discovered, and a small but rather exciting community grew up on its shore, serving the needs of the new mining camps. You can see the crumbling cabins of Lulu City by taking a 3-mile hike up the Colorado River valley.

By 1910, many people began thinking of a National Park here, as that new invention, the automobile, was finally proving practicable as a means of travel. Although there were many supporters of the

Both Ute and Arapaho Indians hunted in these mountains.





Tassel-eared squirrel.

National Park idea throughout the land, one man—Enos Mills, naturalist, philosopher, writer—is credited with carrying the idea to a tangible result. He was rewarded for his years of hard work and innumerable frustrations when he participated in the dedication ceremonies for Rocky Mountain National Park on September 4, 1915.

## CLIMATE

The climate of any part of the world is due to many forces—but basically to the amount of energy received from the sun. In mountainous areas, such as Rocky Mountain National Park, the climate is made more variable by the different altitudes, slopes, and exposure to solar radiation. Like all midlatitude regions, too, the park experiences invasions of different air masses with their varying qualities and the storms associated with their fronts.

Few frontal storms are experienced in summer. Most of the frequent thunderstorms are produced by the elevation and cooling warm air from the Gulf of Mexico as it streams into the mountains from the southeast. This season provides the great cumulus clouds that delight the photographer. During autumn, winter, and early spring the

weather is determined by alternate invasions of cold Canadian air and cool Pacific air. The latter brings much snow to the western side of the park, but usually results in favorable weather on the eastern slope; the warm chinook winds are associated with these conditions. The Canadian air—usually heralded by blizzards on the plains below the mountains—brings snow and below-zero temperatures to the east slope. The winter weather at the village of Estes Park is often milder than in most of the plains country to the east, because of the protection afforded by the mountains from the full forces of these air movements.

In general, the weather is ideal for summer vacations, with cool, clear nights and sunny days. The frequent afternoon showers are mere refreshing interludes in an otherwise delightful season. The winter weather, although often rigorous, is relatively mild for the region's altitude, and, although the high Trail Ridge Road is snow-blocked, scarcely ever is it a problem to drive from Estes Park village to Denver or other plains communities.

It is always cool at night, even in midsummer, so bring warm clothes; western garb is always socially acceptable. The region is noted for its friendly informality. For hiking on trails and camping, old field clothes are desirable, and stout, comfortable shoes are a necessity. A slicker is important, since afternoon showers may be expected.

## **PARK SEASON**

Although the park is officially open to travel all year, summer—June through September—is the “regular” season. From October until May, high-altitude roads are blocked by snow, as are most park trails in winter. All but one of the visitor centers are closed, and naturalist hikes and other activities are not scheduled after September 15. Camping is difficult from September to May because of adverse weather and limited facilities. However, the roads to both Estes Park and Grand Lake are usually open throughout winter, and accommodations are available in both gateway towns during the off-season.

## **WHAT TO DO**

For most visitors, the park's scenic splendors are the chief attraction. There is a choice of several auto drives; and miles of trails beckon those who prefer hiking or horseback riding. A few of the principal automobile and trail trips are described below.

The park ranger-naturalist activities are popular; so is fishing, a park sport for which a State license is required. All activities within the National Park are keyed to the natural scene.

The principal winter-use area in Rocky Mountain National Park is at Hidden Valley along Trail Ridge Road, 10 miles west of Estes Park. Skiing, ice skating, snowshoeing, and platter sliding are popular here. The area is designed for family winter use, not as a typical ski resort. There are down-mountain ski runs and several practice areas so that either the expert or the novice skier will find slopes to his liking. Ski tows service popular slopes. A lodge and a warming shelter are provided at two popular locations within the area for the use of winter sports enthusiasts. Rental equipment, food service, lounge, and other facilities are available at the visitor center. Cross-country skiing may be enjoyed by the experienced skier at numerous locations on the eastern side of Rocky Mountain National Park and on the western slope in the vicinity of Grand Lake.

Here are a few photo hints: the light is intense at high altitudes; many shots are made at half the exposure needed nearer sea level. Mornings are best for pictures; afternoons are often cloudy. Use side-light for depth, and break up the foreground on long shots. Color film will not register accurately the intense light of the sky and the dark green of the forest on the same exposure. Film, filters, and other supplies are available at the gateway towns. Color slides are sold at Moraine Park Visitor Center and nearby curio shops.

### **Automobile Trips**

Mountain driving is different from ordinary automobile travel, and presents special problems. In most of the park a speed limit of 35 miles per hour is enforced (20 m.p.h. on curves). This permits leisurely sightseeing; but do not stop on the road. Stop in a parking area and walk back to a scenic spot, if necessary. Vapor lock, which often stalls cars, is caused, in part, by driving the car up steep grades in high gear; use lower gears and keep the motor cooler. Most cars stalled by vapor lock will start after cooling off for about 10 minutes. Keep your car in gear and use lower gears, if possible, on down grades, too; do not use overdrive. Drive carefully and courteously. Gateway towns have the usual auto services.

*Trail Ridge Road.* The 50-mile drive from Estes Park to Grand Lake across the Front Range in Rocky Mountain National Park is one of America's most magnificent auto trips. Trail Ridge Road, a modern, hard-surfaced road, is usually open from late May to mid-October. For sheer scenic beauty, for easy access to the fantasies of treeline and tundra, and for a variety of natural landscapes within a few miles, Trail Ridge Road has few equals anywhere in the world.

Trail Ridge proper is a massive ridge extending easterly from the Continental Divide. In the early days an Indian trail crossed the



Trail Ridge Road, altitude more than 12,000 feet, experiences winter most of the year. It is open to motor travel in summer only.

Park naturalists conduct field trips during the summer season.





From Rainbow Curve, an extensive view to the east affords glimpses of the lower levels of Trail Ridge Road.

mountains via this ridge—hence the name. The present road was built by the National Park Service in the early 1930's on a route chosen for maximum scenic possibilities and minimum snow-clearance problems.

The lofty peaks of the Colorado Rockies have been sculptured by glaciers into a bewildering network of rocky ridges, sheer cliffs, needle-like crags, and great cirques. Until roads were built, much of this breathtaking scenery was accessible only to hardy mountain climbers. Now all can see choice samples of high country from a car.

Although every mile of this road affords scenes of great interest and rare beauty, several points deserve special attention: Many Parks Curve permits close observation of the chipmunk, golden-mantled ground squirrel, and Clark's nutcracker, and excellent views of the meadows. To the north is Fall River Valley, and beyond, the towering peaks of the Mummy Range. This valley was the melting basin of a great glacier. The fine view to the south includes Longs Peak (14,256 feet), looming over the green flats of Beaver Meadows and Moraine Park. Several moraines—long, generally parallel ridges of broken rocks built up at the edges of glaciers and now heavily forested—stretch out before you, separating one park from the other.

Above Many Parks Curve, the road climbs along the north side of Trail Ridge, loops about the head of upper Hidden Valley (where skiing is in vogue during the winter), passes the 2-mile elevation sign, and reaches another parking area at Rainbow Curve, about 8 miles from Deer Ridge, and one-half mile higher in altitude. The view from Rainbow Curve is vast, open, and superb, with the Great Plains visible far to the east and forested canyons or glacial meadows nearer at hand. Many interesting geological features are pointed out on the roadside exhibit panels at this point.

Leaving Rainbow Curve, the road follows the rim of another deep canyon, passing through a ghost forest, scene of a devastating fire in the 1870's. Grotesquely formed treeline trees reflect the harsh climate at this high altitude. As the Rock Cabins are passed, a superlative view opens up to the south across Forest Canyon. For several miles the road traverses the Alpine zone tundra, carpeted during July by low-growing, colorful flowers.

Glaciated mountains south of Trail Ridge Road can be seen to best advantage from Rock Cut (altitude 12,110). Gorge Lakes, Forest Canyon, and other landscape features are indicated in roadside exhibits. If time permits, a short hike can be made over a nature trail to the nearby Roger W. Toll Memorial Peakfinder. A walk along this trail provides a rare opportunity to become acquainted with the tundra; however, the high altitude affects some people adversely, so it may not be advisable for persons with heart ailments to attempt the trip.

Winter snows lie deep at higher elevations of the park.



Iceberg Lake, which occupies a glacial cirque, was named from the presence of blocks of ice that remain on its surface even in late summer, except in extremely warm and dry years. The reddish cliffs at this point are made up of relatively recent lava, which is not common in the park. The highest point (12,183 feet, marked by a sign) is between Iceberg Lake and Fall River Pass. The pass is a popular stopping place, with restrooms, alpine exhibit room, and lunch counter.

Below Fall River Pass the road continues downhill all the way to Grand Lake. The Continental Divide is crossed at Milner Pass at an altitude of 10,758 feet, in the midst of a typical spruce-fir forest. As Far View Curve is approached, the valley of the Colorado River comes into view, and the rugged Never Summer Range looms up to the west. The road descends from this point in sharp switchback curves to reach the wide floor of the Colorado Valley. From here to Grand Lake, the route follows the valley. Deer and elk are often seen in this vicinity. The lake itself, over 250 feet deep, is one of Colorado's scenic gems. The town of Grand Lake, outside the park, is a friendly western town with the usual resort accommodations.

*Bear Lake Road.* This is a short spur road, leaving from Beaver Meadows Entrance on one of the eastern approaches to Trail Ridge through Moraine Park and Glacier Basin to Bear Lake, nestled at the foot of the high mountains. Everyone should make this trip, if time permits—an extra hour or so will do it. The road traverses glaciated meadows and moraines; it affords splendid views of Longs Peak. Great stands of aspen on Bierstadt Ridge make this a colorful drive in autumn. Bear Lake, at the end of the road—the only high lake in the park accessible by auto—is a foreground for the view up Tyndall Gorge, with the sheer cliff of Hallett Peak making a dramatic backdrop to the alpine scene. A half-mile trail encircles the lake, giving different scenic effects with every step, and nature-trail labels aid in enjoyment of the rocks, wildflowers, and trees. A short hike—a mile or so—from Bear Lake to Dream Lake gives you an opportunity to escape auto traffic and see some of the park, without undertaking too arduous a climb.

## Trail Trips

You are urged to take at least one trail trip, for only on the trails can you experience the real essence of the mountains. Everyone has his favorite trail; you can make your own selection. The first decision is whether to hike or ride a horse—or to try both methods. In any case, leave your car behind for at least 1 day of your visit.



Although Grand Lake is outside the park, an excellent view of it can be obtained from within the park.

Certain rules covering trails should be observed:

*To avoid getting lost stay on designated trails. Repeated short cuts damage the trails, necessitating repairs.*

*If you are hiking, yield right-of-way to horses by standing quietly off the trail as the riders pass.*

*Deposit trash in receptacles; keep trails free of litter.*

*If you plan to cook out, obtain a fire permit from a park ranger. This is a fire-protection regulation.*

*Leave dogs behind. Their presence on trails disturbs wildlife.*

With some 200 miles of trails in the park, beginning at a dozen different points and ending at scores of destinations, you may have difficulty planning your trail trips before you arrive. Information on the various trail trips is best obtained after you get to the park. The park rangers, the museum attendants, the naturalists, and the saddle-horse operators can help you outline trips.



A short hike from Bear Lake takes you to Dream Lake, with its matchless view up Tyndall Gorge.

A brief description of a few of the popular trips follows:

*Trails from Bear Lake.* One of the trail hubs of the park is Bear Lake. A "must" is the 1-mile hike to Dream Lake, near the foot of Hallett Peak. From Dream Lake you can take a primitive trail another mile to Emerald Lake in Tyndall Gorge or a developed trail to Lake Haiyaha in Chaos Canyon. Each trip is an excellent half-day hike. You may want to go along the big moraine to Bierstadt Lake, or to the top of Flattop Mountain from Bear Lake—a long, uphill climb, with a reward of marvelous views. The splendid all-day hike to Odessa and Fern Lakes begins here, too. This can be a loop trip, via Cub Lake, returning to Bear Lake; or, if you can arrange to be met in Moraine Park, an excellent 9-mile "through" hike with a minimum of uphill walking is possible.

*Glacier Gorge Trails.* A mile below Bear Lake is a parking area from which trails lead in several directions. Two short hikes—about

4 hours each—are possible from here to Lake Mills in Glacier Gorge (at the foot of Longs Peak) and to The Loch, a lovely mountain lake. From these lakes, dim “fishermen’s” tracks lead on to higher and more remote lakes. From The Loch a primitive path leads to Andrews Glacier. These latter tracks are not really trails and, although easily followed, usually require some local specific information. There is also a seldom-used, constructed trail from Glacier Gorge parking area up to Boulderfield near the top of Longs Peak. This makes a good horseback trip but is not popular with hikers because the destination is so much more easily reached by the shorter trail from Longs Peak Campground. A spur from this trail leads, via Storm Pass, to Tahosa Valley.

*Fern Lake Trail.* At the end of the Moraine Park Road is a picnic area. A trail begins here which follows Big Thompson River, past beaver dams and The Pool, to Fern Falls and Fern Lake. From Fern Lake the trail continues to Odessa Lake and on to Bear Lake. Many people leave Bear Lake, reaching Moraine Park by this trail. The trip is about 9 miles; 6 hours gives ample time for a leisurely pace.

*Wild Basin Trails.* Many persons consider Wild Basin the finest wilderness area in the park. Trails begin here at the road’s end and

Only by trail can you reach such high-country lakes as this.



lead up the branches of North St. Vrain Creek to many beautiful lakes. One popular hike (about 4 hours) is to Ouzel Falls, via Calypso Cascades, and return. Most of the other trips in Wild Basin are longer and make more suitable all-day hikes. Thunder Lake is one of these spots. Ouzel and Bluebird Lakes make another 1-day trip combination. There is no trail across the range here, but some fine, back-country hiking possibilities exist for the sturdy, seasoned hiker.

*Western Slope Trails.* Many people hike or ride horseback from Bear Lake over Flattop Mountain to Grand Lake via either Big Meadows or North Inlet. This takes all day as compared with 2 or 3 hours by road. However, the trail trip is through much splendid scenic country which is not seen by the highway traveler between these two points. Hikes in the Grand Lake vicinity include one to Shadow Mountain Fire Lookout, with matchless panoramic views, and the interesting "trail to nowhere," up Columbine Creek. The trail distances to major points of interest on the west slope are longer than on the east side of the park, and many people prefer to use horses. By riding, trips to Lake Verna in East Inlet and Lakes Nokoni and Nanita in North Inlet can be made in 1 day. A number of spectacular horseback trips in Never Summer Range are possible. Saddle-horse operators can help you plan such trips in this vicinity.

*Trails in the Estes Park Vicinity.* Several interesting trail trips near Estes Park village and in the lower altitudes of the park are available. These are especially pleasant early or late in the season when many of the higher trails are snow-blocked. Gem Lake is reached by a 2-mile trail (3 hours or so) which begins about 1 mile from town on the Devils Gulch Road. This trip presents interesting rock formations and fine panoramic views. Twin Sisters is a high, isolated mountain south of Estes Park, reached by a trail beginning on State Route 7. A good hike for about 7 hours takes one to the top of this mountain and back in a leisurely manner. The view of the plains from Twin Sisters is extensive, and treeline flowers add color to the trip. There are several other hiking trails in this area.

*Trails near Trail Ridge Road.* At Deer Ridge, a trail leads to the commanding summit of Deer Mountain, which is a fine, early-season hike although dry in midsummer. On the tundra, a trail leads from Rock Cut on the road to the Memorial Peakfinder. A trail also leads from Iceberg Lake to Fall River Pass. At Milner Pass a trail leaves the highway, passes through an especially beautiful forest, and reaches the top of Specimen Mountain. This hike affords matchless scenic views, particularly of the Never Summer Range, fine displays of wildflowers, and possible glimpses of bighorn. Near the spot where Trail Ridge Road begins the ascent of the western slope, a trail leads

up the Colorado River to the ghost town of Lulu City, and branches continue to Poudre Pass, Thunder Pass, and beyond.

Many of these trails—and others—can be covered by visitors on summer trips with the park ranger-naturalists. These escorted hikes help you to get your bearings in the park, as well as understand the natural features encountered along the route. If you are interested in hiking, you should join a few of these naturalist trips. In this way, you quickly realize the possibilities for your unescorted hikes, if you prefer to travel on your own. The park ranger-naturalists will help you plan other hikes and will do all they can to make your trail trips safe, interesting, and enjoyable.

This outline of trail-trip possibilities is only a beginning. There are also trips to Lawn Lake, Tyndall Glacier, Windy Gulch, the North Fork of the Thompson River, and Chasm Lake. Information on the far more difficult mountaintop trips is not included here. If you expect to ascend such mountains as Longs Peak or McHenry's Peak, be sure to consult the park ranger at the nearest ranger station or go to the chief ranger's office in Estes Park village. Routes to be followed may vary from week to week because of changes in snow conditions; ask park rangers for up-to-date information. Remember to get a fire permit if you plan to camp out on the trail.

## SUGGESTED READINGS

This booklet may help your understanding and appreciation of Rocky Mountain National Park, but in its limited pages only a superficial treatment can be given. The following publications—nearly all of them available for reference or purchase at the park museum information office or Fall River Pass exhibit room—have been found helpful sources of more detailed interpretation of the story of this park.

### *Birds*

NIEDRACH, ROBERT J., and ROBERT B. ROCKWELL, *Birds of Denver and Mountain Parks*. Denver Museum of Natural History, 1959.

PETERSON, ROGER TORY, *Field Guide to Western Birds*. Houghton Mifflin Co., Boston, 1941.

### *Plants*

CLEMENTS, EDITH S., *Flowers of Mountain and Plain*. H. W. Wilson Co., New York, 1926 (3d edition).

MORE, ROBERT W., *Colorado Evergreens*. Denver Museum of Natural History, 1949.

Guide to the conifers, with photographic illustrations.

NELSON, RUTH ASHTON, *Plants of Rocky Mountain National Park*. Government Printing Office, Washington, D.C., 1953.

The basic reference on the wildflowers of the region.

PESMAN, M. WALTER, *Meet the Natives*. Cooperative Printing Co., Denver, rev. ed., 1960.

A guide to the flora of the region, with a color-key arrangement; useful anywhere in Colorado.

PRESTON, RICHARD, *North American Trees*. Iowa State College Press, Ames, Iowa, 1948.

An illustrated guide to all species of trees of North America.

ROBERTS, HAROLD and RHODA, *Common Wildflowers of Colorado*. Museum Pictorial No. 8, Denver Museum of Natural History, 1959.

ROBERTS, RHODA, and RUTH NELSON, *Mountain Wildflowers of Colorado*. Museum Pictorial No. 13, Denver Museum of Natural History, 1957.

Fifty common mountain wildflowers described and illustrated.

### *Fishes*

BECKMAN, WILLIAM C., *Guide to the Fishes of Colorado*. Leaflet No. 11, Univ. of Colorado Museum, Boulder, 1952.

### *Geology*

PEARL, RICHARD M., *Nature as a Sculptor*. Denver Museum of Natural History, 1956.

A geological interpretation of western scenery, chiefly Colorado.

ROCKY MOUNTAIN NATURE ASSOCIATION, *Glaciers of Rocky Mountain National Park*. Published in cooperation with National Park Service, U.S. Department of the Interior, 1959.

Glacier story of Rocky Mountain National Park, past and present.

U.S. GEOLOGICAL SURVEY, *Denver Mountain Area Map*. 1955.

Covers most of Colorado's Front Range and explains its geology.

WEGEMANN, CARROLL, *A Guide to the Geology of Rocky Mountain National Park*. Government Printing Office, Washington, D.C., 1955.

Helpful road logs and the general geologic story of the park.

### *Mammals*

BURT, W. H., and R. P. GROSSENHEIDER, *Field Guide to the Mammals*. Houghton Mifflin Co., Boston, 1956.

A manual for the identification of all mammals north of Mexico.

RODECK, HUGO G., *Guide to the Mammals of Colorado*. University of Colorado, Boulder.

### *Mountain Climbing and Hiking*

HENDERSON, KENNETH, *Handbook of American Mountaineering*. Houghton Mifflin Co., Boston, 1942.

A pocket-size book, almost encyclopedic in scope, giving detailed information on mountain climbing and life on the trail.

NESBIT, PAUL, *Longs Peak, Its Story and a Climbing Guide*. Published by Paul W. Nesbit, Colorado Springs, Colo., 1959.

ORMES, ROBERT M., *Guide to the Colorado Mountains*. Sage Books, Denver, 3d revised edition, 1955.

### *Parks in General*

BUTCHER, DEVEREUX, *Exploring Our National Parks and Monuments*. Houghton Mifflin Co., Boston, 4th edition, 1954.

In cloth or paper covers; illustrated; gives succinct information on all our parks with natural-history backgrounds.

SHANKLAND, ROBERT, *Steve Mather of the National Parks*. Alfred A. Knopf, New York, 1955.

The evolution of the National Park System and the life of the first director of the National Park Service.

STORY, ISABELLE, *National Park Story in Pictures*. Government Printing Office, Washington, D.C., 1957.

TILDEN, FREEMAN, *The National Parks: What They Mean to You and Me*. Alfred A. Knopf, New York, 1955.

Factual material on the parks, their significance, origins, and characteristics.

# APPENDIX A—GUIDE TO MAMMAL OBSERVATION

## *Hoofed Mammals*

*Bighorn* (mountain sheep)—Best seen on Sheep Rock south of Poudre Lake; also at Sheep Lake, Shipler and Specimen Mountains, Hallett's Peak, Mount Alice, Never Summer Range, Mount Ida.

*Deer, Mule*—Occasional in open pine country, especially early and late in the day. Hillside above Tuxedo Park, Moraine Park, Deer Mountain, Trail Ridge, and Kawuneeche Valley.

*Elk, American*—At treeline on Trail Ridge, Upper Poudre Valley, and near Lawn Lake in summer; occasionally in Hallowell and Horseshoe Parks during bad weather. Large herds in lower meadows from October to April.

## *Predatory Mammals*

*Badger*—Occasional in Moraine Park and other open meadow areas.

*Bear, black*—Uncommon; infrequently observed along roads and trails and in wooded areas throughout the park.

*Bobcat*—Common, but in ravine country, especially at lower elevations.

*Cougar* (mountain lion)—Uncommon; occasionally seen above Loch Vale, Horseshoe Park, upper Fall River Valley; typical habitat around Gem Lake.

*Coyote*—Common, especially in Hallowell Park, lower Cub Lake Valley, Moraine Park, lower Beaver Meadows; signs on Deer and Specimen Mountains.

*Fox, red*—Fairly common at or above treeline, along the Colorado River, and in the Kawuneeche Valley.

*Marten*—Occasional at Bear Lake, Haiyaha, Fern-Odesa Trail, Lulu City; usually in spruce-fir forest.

*Mink*—Occasional along higher streams and lakes like Haiyaha.

*Weasel, longtail*—Occasionally seen above treeline on Trail Ridge at Rock Cabins and Rock Cut; and at woodpiles in lower meadows.

## *Gnawing Mammals*

*Beaver*—Workings along Glacier Creek in Glacier Basin, in Hallowell Park, Moraine Park, Lower Hidden Valley, Grand Lake Valley. Seen early or late in the day.

*Chipmunks* (Colorado and Least)—Common everywhere, especially on Trail Ridge and on Gem Lake Trail.

*Cottontail*—Only at lower elevations. Fairly common in Hallowell Park, Moraine Park, and Beaver Meadows.

*Hare, snowshoe*—Occasional in spruce-fir forests and down to about 8,500 feet. Common around Phantom Valley Ranch.

*Jackrabbit, whitetail*—Uncommon; above treeline on Trail Ridge.

- Marmot, yellowbelly*—Common everywhere in rocky country, especially on lower Cub Lake Trail.
- Mouse, deer*—Common everywhere at night; often seen running across road or heard in cabins and tents.
- Mouse, western jumping*—Uncommon; in dense vegetation along streams.
- Muskrat*—Often seen at twilight in Sheep Lake and nearby ponds; also in old beaver ponds along lower Cub Lake Trail.
- Pika*—Fairly common in rockpiles above 9,500 feet, as at Rock Cut on Trail Ridge, along trail on Flattop, above Bear Lake Lodge, and at Longs Peak Boulder Field.
- Pocket gopher, northern*—Piled diggings evident in most grassland, especially in high country.
- Porcupine*—Common in ponderosa and lodgepole forests; often encountered on Bear Lake and Grand Lake Highways at night. Dens in rocks.
- Squirrel, golden-mantled ground*—Common everywhere in rocky country, especially on Trail Ridge, at Bear Lake, and along lower Cub Lake Trail.
- Squirrel, Richardson ground*—Common everywhere in grassland at middle elevations, especially Moraine Park and Estes parkland.
- Squirrel, spruce*—Fairly common in spruce-fir forest, especially around Bierstadt Lake, Cub Lake, Brinwood to Pool, upper Hidden Valley, Wild Basin, and lower Lawn Lake Trail.
- Squirrel, tassel-eared*—Occasional in ponderosa pines at Sheep Lake, Tuxedo Park, and Gem Lake Trail.

Cougar.



# APPENDIX B—GUIDE TO BIRD OBSERVATION

*(Courtesy, Dr. R. G. Beidleman, Colorado College)*

SPECIES	AREAS (see key below)									
	1	2	3	4	5	6	7	8	9	10
Blackbird, Brewer's . . . . .	X		X							
Blackbird, red-winged . . . . .						X		X		
Bluebird, mountain . . . . .	X		X	X	X					
Chickadee, mountain . . . . .		X	X	X	X	X	X	X		
Chickadee, black-capped . . . . .		X	X	X	X	X	X			
Creepers, brown . . . . .					X	X	X			
Dipper, or water ouzel . . . . .							X		X	
Eagle, golden . . . . .		X	X							
Finch, brown-capped rosy . . . . .										X
Finch, Cassin's . . . . .	X			X						
Finch, house . . . . .	X									
Flicker, red-shafted . . . . .	X			X	X	X	X	X		
Flycatcher, olive-sided . . . . .					X	X				
Flycatcher, western . . . . .							X			
Goshawk . . . . .					X	X	X			
Grosbeak, black- headed . . . . .	X									
Grosbeak, pine . . . . .									X	
Grouse, blue . . . . .							X		X	
Hawk, red-tailed . . . . .	X	X		X	X					
Hummingbird, broad- tailed . . . . .	X	X		X	X	X	X	X	X	
Jay, gray . . . . .						X			X	
Jay, Steller's . . . . .		X		X	X	X	X			
Junco, gray-headed . . . . .		X		X	X	X		X	X	
Kingfisher, belted . . . . .	X							X		
Kinglet, golden-crowned . . . . .							X		X	
Kinglet, ruby-crowned . . . . .		X			X	X	X	X	X	
Lark, horned . . . . .										X
Magpie, black-billed . . . . .					X	X	X	X		
Mallard . . . . .					X	X		X		
Nutcracker, Clark's . . . . .	X	X		X	X	X	X	X	X	X
Nuthatch, pigmy . . . . .	X	X	X	X	X	X	X	X		
Nuthatch, white- breasted . . . . .		X		X		X	X	X		
Pewee, western wood . . . . .	X	X	X	X	X	X	X	X		
Pigeon, band-tailed . . . . .						X		X	X	
Pipit, water . . . . .										X
Ptarmigan, white- tailed . . . . .										X

SPECIES	AREAS (see key below)									
	1	2	3	4	5	6	7	8	9	10
Raven, common.....									X	X
Robin.....	X	X	X	X	X	X	X	X	X	X
Sandpiper, spotted.....						X	X	X		
Sapsucker, yellow-bellied.....	X			X	X	X	X	X		
Sapsucker, William-son's.....				X	X	X	X			
Siskin, pine.....	X	X		X	X	X	X	X	X	
Solitaire, Townsend's.....		X			X	X	X		X	
Sparrow, chipping.....			X	X	X					
Sparrow, Lincoln's.....				X	X	X				
Sparrow, song.....	X			X	X	X				
Sparrow, vesper.....			X							
Sparrow, white-crowned.....									X	X
Starling.....	X									
Swallow, tree.....					X					
Swallow, violet-green....	X	X	X	X	X	X	X	X		
Swift, white-throated....	X	X	X		X		X			
Tanager, western.....		X		X	X	X	X	X		
Thrush, hermit.....		X				X			X	
Towhee, green-tailed.....		X		X	X	X	X	X		
Vireo, red-eyed.....	X	X	X	X		X	X			
Vireo, warbling.....	X	X			X	X	X	X		
Warbler, Audubon's.....		X	X	X	X	X	X	X	X	
Warbler, Macgillivray's.....						X	X			
Warbler, Wilson's.....						X		X	X	X
Warbler, yellow.....	X									
Wren, canyon.....		X	X							
Wren, house.....		X			X	X	X	X		

1—Estes Park village area.

2—Gem Lake-Lumpy Ridge area.

3—Devil's Gulch-North Fork area.

4—Tuxedo Park-YMCA area.

5—Mill Creek Valley.

6—Cub Lake Valley.

7—Fern Lake Trail to The Pool.

8—Sheep Lake and Horseshoe Park.

9—Bear Lake district.

10—Trail Ridge above treeline.

# APPENDIX C—COMMON AND SCIENTIFIC NAMES OF PLANTS

This list of common names and their scientific (Latin) equivalents includes only those plants that are mentioned in the text. With minor exceptions, authority for the scientific names of all plants and for the common names of all plants except trees is the second edition (1942) of *Standardized Plant Names*, edited by Harlan P. Kelsey and William A. Dayton. Authority for common names of trees is *Check List of Native and Naturalized Trees of the United States (Including Alaska)*, by Elbert L. Little, Jr. (U.S. Department of Agriculture Handbook No. 41, published in 1953.)

## Trees and Shrubs

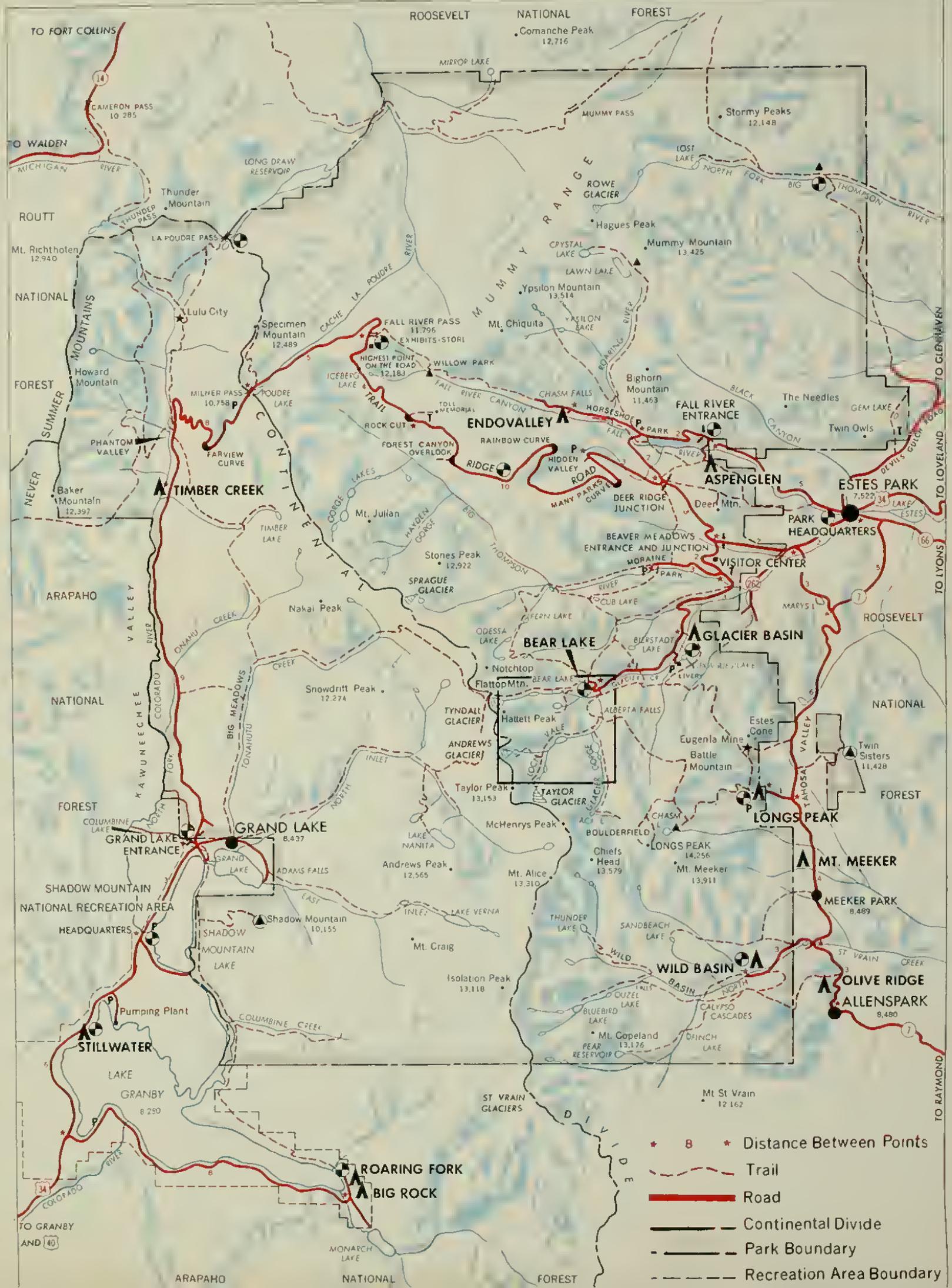
Alder, thinleaf—*Alnus tenuifolia*  
 Aspen, quaking—*Populus tremuloides*  
 Birch, water—*Betula occidentalis*  
 Bitterbrush, antelope—*Purshia tridentata*  
 Cottonwood, narrowleaf—*Populus angustifolia*  
 Currant, wax—*Ribes cereum*  
 Douglas-fir—*Pseudotsuga menziesii*  
 Fir, subalpine—*Abies lasiocarpa*  
 Honeysuckle, bearberry—*Lonicera involucrata*  
 Juniper, Rocky Mountain—*Juniperus scopulorum*  
 Maple, Rocky Mountain—*Acer glabrum glabrum*  
 Mountain-ash, Greenes—*Sorbus scopulina*  
 Pine, limber—*Pinus flexilis*  
 Pine, lodgepole—*Pinus contorta*  
 Pine, ponderosa—*Pinus ponderosa*  
 Raspberry, American red—*Rubus idaeus strigosus*  
 Raspberry, boulder—*Rubus deliciosus*  
 Sagebrush, big—*Artemisia tridentata*  
 Spruce, blue—*Picea pungens*  
 Spruce, Engelmann—*Picea engelmannii*  
 Willow, Scouler—*Salix scouleriana*

## Wildflowers

Actinea, graylocks—*Actinea grandiflora*  
 Arnica, heartleaf—*Arnica cordifolia*  
 Bistort, American—*Polygonum bistortoides*  
 Black-eyed susan—*Rudbeckia hirta*  
 Buttercup, alpine—*Ranunculus adoneus*  
 Calypso—*Calypso bulbosa*

Columbine, Colorado—*Aquilegia coerulea*  
 Coralroot, spotted—*Corallorhiza maculata*  
 Crazyweed, Lambert—*Oxytropis lamberti*  
 Dryad, Mt. Washington—*Dryas octopetala*  
 Erysimum, plains—*Erysimum asperum*  
 Fireweed—*Epilobium angustifolium*  
 Forget-me-not, alpine—*Eritrichum argenteum*  
 Gaillardia, common perennial—*Gaillardia aristata*  
 Geranium, Fremont—*Geranium fremonti*  
 Globe-flower, white—*Trollius albiflorus*  
 Iris, Rocky Mountain—*Iris missouriensis*  
 Jamesia, cliff—*Jamesia americana*  
 Kings crown—*Sedum integrifolium*  
 Marsh-marigold, elkslip—*Caltha leptosepala*  
 Miner's candle—*Cryptantha virgata*  
 Monkshood, Columbia—*Aconitum columbianum*  
 Pasqueflower, American—*Anemone ludoviciana*  
 Penstemon, oneside—*Penstemon unilateralis*  
 Phlox, tufted—*Phlox caespitosa*  
 Primrose, Parry—*Primula parryi*  
 Pyrola—*Pyrola* spp.  
 Silene, moss—*Silene acaulis*  
 Starlily, common—*Leucocrinum montanum*  
 Thermopsis, spreading—*Thermopsis divaricata*  
 Townsendia, stemless—*Townsendia exscapa*  
 Twinflower, American—*Linnaea borealis americana*





- \* 8 \* Distance Between Points
- - - Trail
- Road
- Continental Divide
- - - Park Boundary
- - - Recreation Area Boundary

FOLD OUT FOR MAP

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