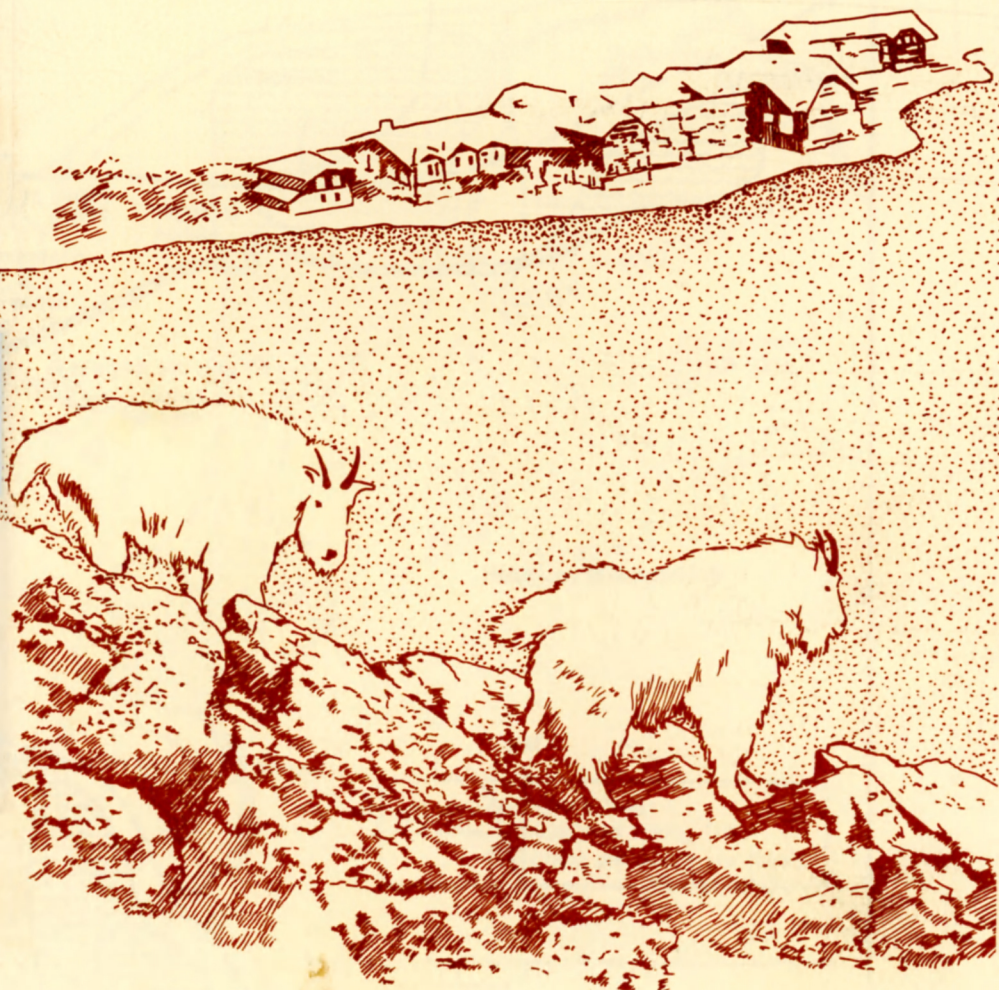
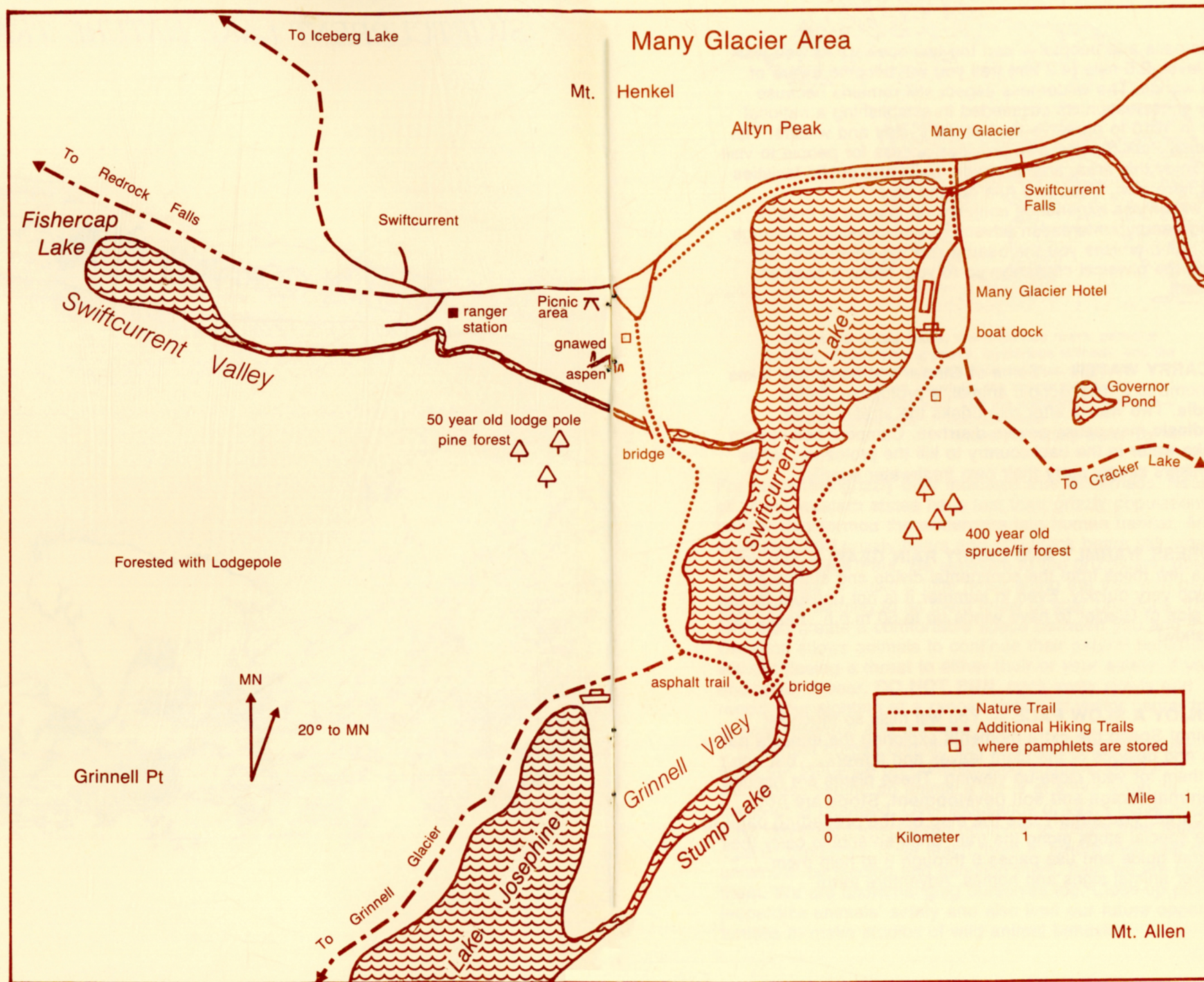


SWIFTCURRENT LAKE NATURE TRAIL





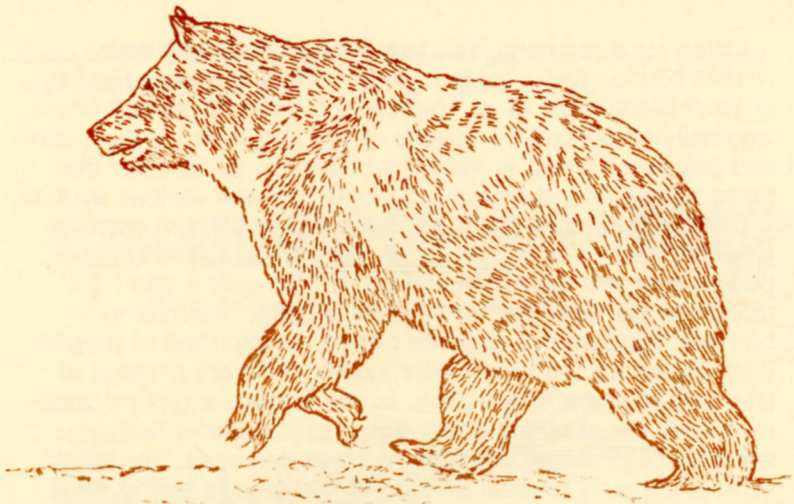
Wilderness and people — can the two coexist? As you walk this level, 2.6 mile (4.2 km) trail you will become aware of both worlds. The wilderness aspect still remains because early conservationists succeeded in establishing a national park in 1910 to preserve the natural cycles and wildlife. The National Park Service also provides access for people to visit and enjoy this area, and so roads, trails and public facilities exist here also. Does one rule out the other?

A wilderness experience conjures up images of breath-taking beauty, unforeseen adventure and physical challenge. This trail promises you the beauty and the adventure, but leaves the physical challenge up to you. Make it easy on yourself!

***CARRY WATER** — Some of Glacier's streams and lakes are home to a microscopic animal, a protozoan, called **Giardia**. Two weeks after one drinks the stream water, **Giardiasis** may cause severe diarrhea. Campers boil stream or lake water in the backcountry to kill the protozoan, while day hikers simply carry their own freshwater supply.

***DRESS WARMLY AND CARRY RAIN GEAR** — You are only a few miles from the continental divide and storms can develop very quickly. Even in summer it is not unusual for the east side of Glacier to have winds up to 50 m.p.h., heavy rain and snow!

***ENJOY A SLOW PACE** — You will miss so much by hurrying! Spend the extra moments exploring the intricate patterns and designs of the plant leaves and flowers . . . but don't pick them for your close-up viewing. These plants are needed for animal forage and soil development. Stops are not numbered. You simply use the map on the preceding page to locate special stops along the trail. Children should carry their own trail guide and use pages 6 through 8 to help them discover animal signs and homes. Adventure forth!



Where the grizzly walks, one finds free rivers, gem-like lakes, cloud-brushing peaks, mysterious stillness, and the perfection of camas petals; kaleidoscopic wildflower blankets, trackless snowfalls, the coyote's midnight serenade, cutthroat trout, and the uncommon beauty of a crest of purest blue. -Bill Schneider

Where the Grizzly Walks, pg. xii

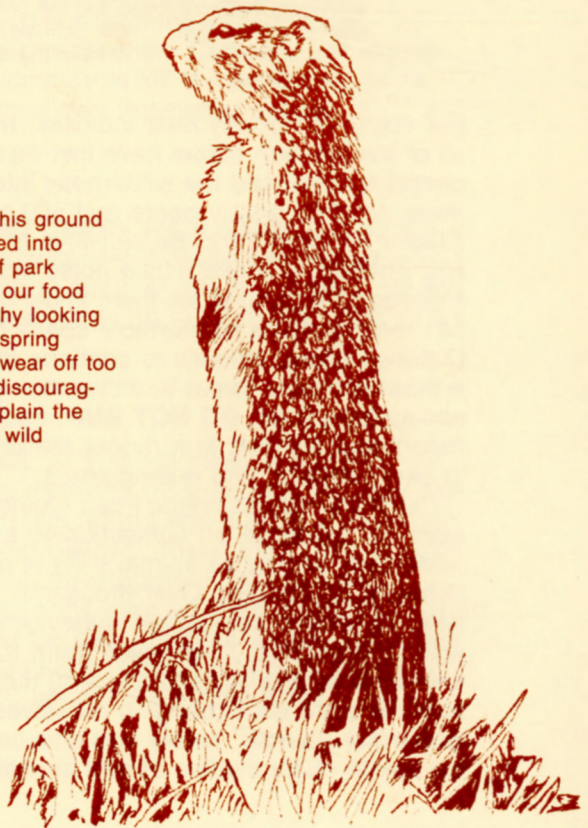
For many, the grizzly bear indicates true wilderness. Nearly all of our western states have lost their grizzly populations as people transformed the wilderness into human habitat. An estimated 200 grizzly bears and 500 black bears still inhabit Glacier National Park. Be sensitive to the grizzly and other wild animals — make a little noise along the trail with bells, whistles or singing to let them know of your presence. They can then create a comfortable space between you and them. Distance allows animals to continue their natural behavior without posing a threat to either their or your safety. If you encounter a bear, **DO NOT RUN**, back away slowly and report your sighting at a ranger station or visitor center to aid in bear research and management.

Continual human contact can change animal behavior. Consider our influence on domesticated animals. Here in a wilderness setting an animal's life is at stake when its behavior is changed. Over thousands of years these animals have developed specialized behavior to insure their safety against predators. If we teach them to ignore their fear of the unfamiliar by feeding and handling them, then we are crippling them. We are shortchanging ourselves too. Close-up pictures jeopardize animals' safety and also limit our future opportunities to make studies of wild animal behavior.

Listen for a moment. You can hear a mixture of both wildlife sounds and people sounds. Which are more familiar to you? Since most of us spend our lives in developed areas we easily recognize the sounds of the tour boat's motor, cars and people's voices. A welcome change is to discover that these noises do not drown out some new and curious sounds.

Chirp! Churp! Short and piercing are the birdlike warning cries of nearby Columbian ground squirrels. These gray-bodied squirrels appear above ground for only a short 3-4 month period. The rest of the year is spent hibernating in burrows. Nutrient rich grasses provide ample food to prepare their bodies for the long winter's sleep. The dry grasses of late August signal hibernation. In the burrow, a ground squirrel's body temperature slowly drops to just above freezing, while its heartbeat and breathing rates decrease. These actions use only a small amount of a squirrel's stored body fat. The last layers of fat wear off in May and June as the squirrel slowly awakens, crawls out from its burrow, mates and gives birth. All this occurs while the grasses remain far under hard-packed snow.

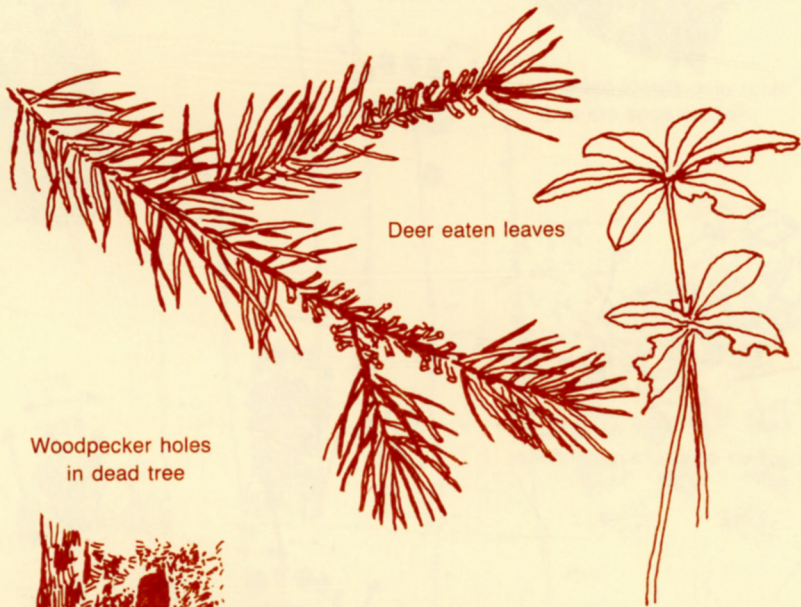
You may be tempted to feed this ground squirrel since many have turned into clever beggars at the hands of park visitors. The salt and sugar in our food harms them. Many a fat, healthy looking ground squirrel starves in the spring when its sugar-built fat layers wear off too quickly. Please help them by discouraging people who feed them. Explain the importance of preserving their wild behavior and foraging habits.



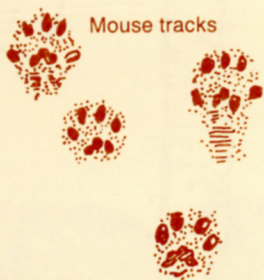
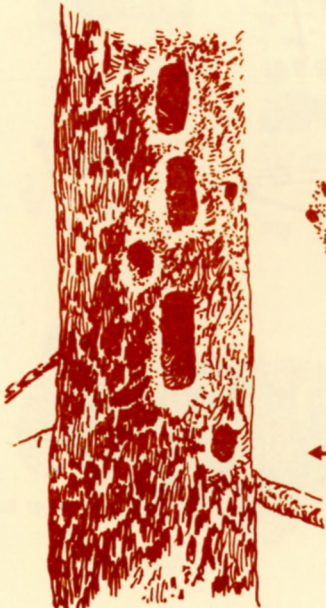
Even if the wild inhabitants are not in sight while you journey this trail you can find evidence of their existence!



White tail deer droppings. Shown at $\frac{2}{3}$ natural size .



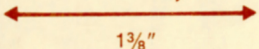
Woodpecker holes
in dead tree



Mouse tracks



Mouse droppings



$1\frac{3}{8}$ "



Mouse-nibbled mushrooms

Walking gaits of bears

Black bear



Grizzly bear



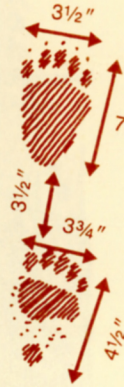
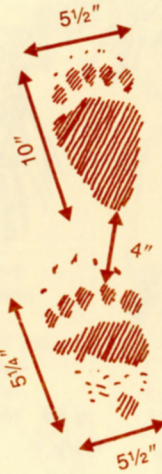
Larvae eaten path



Insect galls (where eggs are laid)



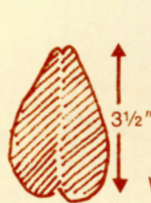
Tree squirrel's cone dinner



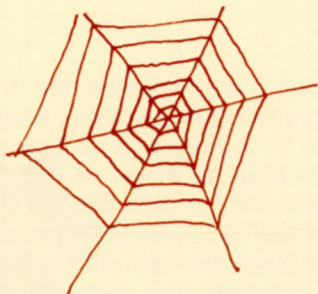
Bear tree (stripped bark)



Climbing Marks (black bear)



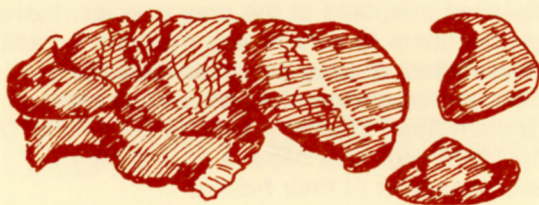
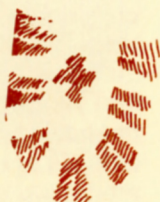
White tail deer tracks



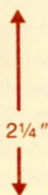
Tracks of snowshoe rabbit



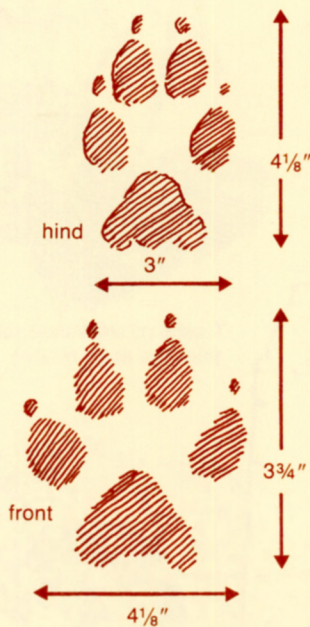
Gnawed beaver stumps



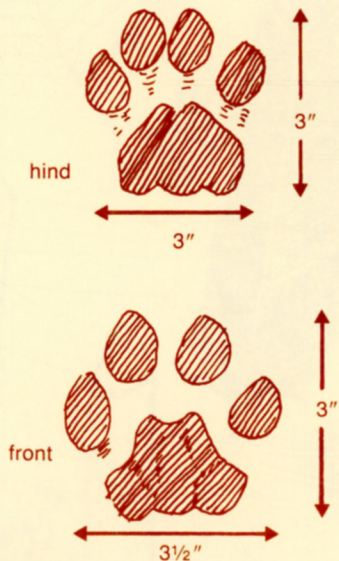
Bear droppings



2 1/4"



wolf tracks



Mountain lion tracks

Have you found any wolf or mountain lion tracks? Probably not — even though there is plenty here for them to eat — hares, deer, goats, sheep and elk. In the early 1900's people considered predators (animals adapted to kill for food) "bad animals". People feared and viewed predators as competitors for sport game animals such as deer and elk. Glacier Park's first rangers were authorized to hunt and kill wolves and mountain lions to protect the "good animals". Today no one calls an animal good or bad, as we better understand the predator/prey relationships. Predators usually kill the weakened or diseased members of the prey species, thereby allowing stronger members to survive and maintain a healthy population. If the numbers of prey go unchecked, the negative result is often starvation of many prey animals or overgrazing of a plant food. Glacier needs its predators. Their survival and population regrowth depend on our careful management and protection of their habitat.

The Swiftcurrent area remains a good habitat for beaver. Near the water's edge you will find the water-loving willow whose leaves and bark provide food and building material for the beaver. When you explore the area near the inlet of Swiftcurrent Creek you will find, not far from the bridge, an area of gnawed-off aspen. The branches are floated down the creek to its mouth where the beavers build lodges for shelter and protection from weather and predators. Notice how high from the ground the aspens are cut. Are the beavers over five feet tall?! The stumps are a result of beavers standing on snow while they gnaw the trees down, not tall beavers!

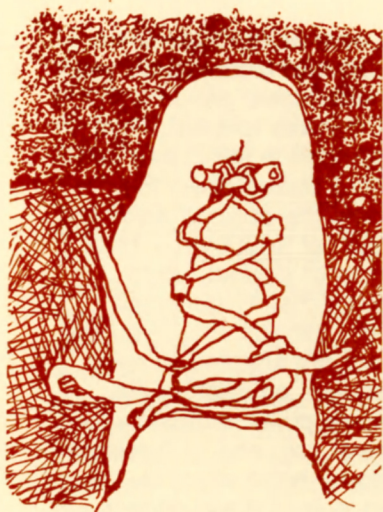


Fur companies in the early 1800's sent some of their explorers to this area to hunt and trap the beaver, whose lush, dense fur withstands cold glacier-fed lakes. A lucky switch in men's fashions from beaver skin hats to silk top hats saved the beaver from near extinction.



Anybody fishing? Many narrow paths lead from this trail down to the lake where people throw in a hook and a line. Swiftcurrent Falls, near the turnoff for the Many Glacier Hotel, produces a natural barrier to fish, preventing them from entering these lakes. If there are no fish in the lakes then why are there so many anglers on the shore and in row boats? History provides the answer. From 1900 to 1972 Kokanee salmon and eastern brook trout, as well as rainbow, lake and bull trout, were planted in lakes throughout the park. Recent research shows that in lakes with native fish populations, the planted fish are out-competing the native fish for food and spawning areas. The planted fish are also genetically changing native species through cross-breeding.

National Parks protect all life forms. Collecting, harming, or killing wildlife is strictly prohibited. . . why are fish exempted from this protection? Fish management specialists regard the fishing pressure in Glacier as minimal and are presently concentrating their efforts on documenting and improving conditions for native fish. Known critical stream habitat is therefore restricted from fishing. Anglers need to obtain non-fee fishing permits and regulations from any ranger station or visitor center to help insure the success of Glacier's fish management program.



Enjoying the cushiness of the soft ground beneath your feet? The pine needles and plant litter accumulate and form air spaces (pockets) which soften your step. When rain falls it's absorbed into the soil through these spaces and provides water for the nearby plants. A hard surface underfoot reminds you of the human presence in Glacier. Why asphalt the path between Swiftcurrent and Josephine Lakes? Rain water flows down this portion of the trail, leaving a gully instead of a path. A high use area often requires the compromise of an asphalt trail to preserve the vegetation from the feet of mud-evading people.

What may look like untouched forestland around you is actually a product of human involvement with wilderness. Are you standing in the 50 year old lodgepole pine forest in the Swiftcurrent Valley or the 400 year old Englemann spruce/subalpine fir forest in the Grinnell Valley? Step up to the closest trees and use the illustrations to identify them. Both of these forests reflect our influence with respect to fire management.



Quaking Aspen



Englemann Spruce



Subalpine Fir



Fires rejuvenate the forest soil by consuming fallen branches and leaves and releasing valuable nutrients just as your digestive system breaks down food into usable proteins. For many years this beneficial aspect of fire was ignored. Fires were suppressed to guard against damage to structures and scenery. In 1936 a lightning-caused fire blazed down the Swiftcurrent Valley and burned not only the downed wood but the entire spruce-fir forest. Suppression of fires before 1936 had resulted in excessive accumulation of downed wood which fueled a "holocaustal fire" so hot that it consumed everything from the forest crown to the mineral soil. Even the cones from lodgepole pines, which are fire-adapted to open and disperse seeds when the soil reaches an appropriate temperature, were destroyed. Lodgepole pines were slow to germinate naturally on the bare mineral soil, and so foresters had to plant lodgepole pine seedlings by hand after the '36 fire. Three million trees were planted in four years! Spruce and fir trees will naturally grow up in the shade of these pines and eventually replace them, completing another step in the fire cycle. As you walk through the 400 year old spruce-fir forest determine if there is a healthy accumulation of downed wood or an overabundance. Any evidence of a recent fire? — burned stumps or snags? Are there any human developments close by which limit our ability to allow either a natural fire or a prescribed fire to burn and rejuvenate the soil?

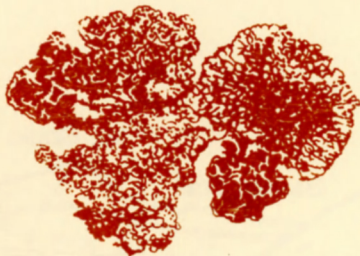
The 400 year old spruce-fir forest in the Grinnell Valley offers examples of slow decomposition and soil buildup as compared to quick decomposition through fire. Look for a moss-covered rock. Plants break rocks down into soil. The process starts with lichen, the green, orange, or gray, crusty growth you see on the rock surface.



Lodgepole Pine



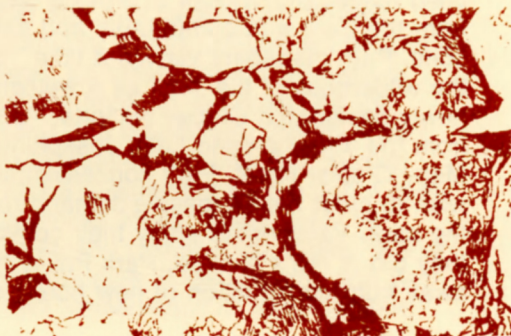
Lichen is part fungus and part alga. The blue-green alga produces food from sunlight like all green plants while the fungus provides a moist place for the water-loving alga to live. As the lichen grows, it produces a weak acid which releases minerals from the rock. Minerals collect



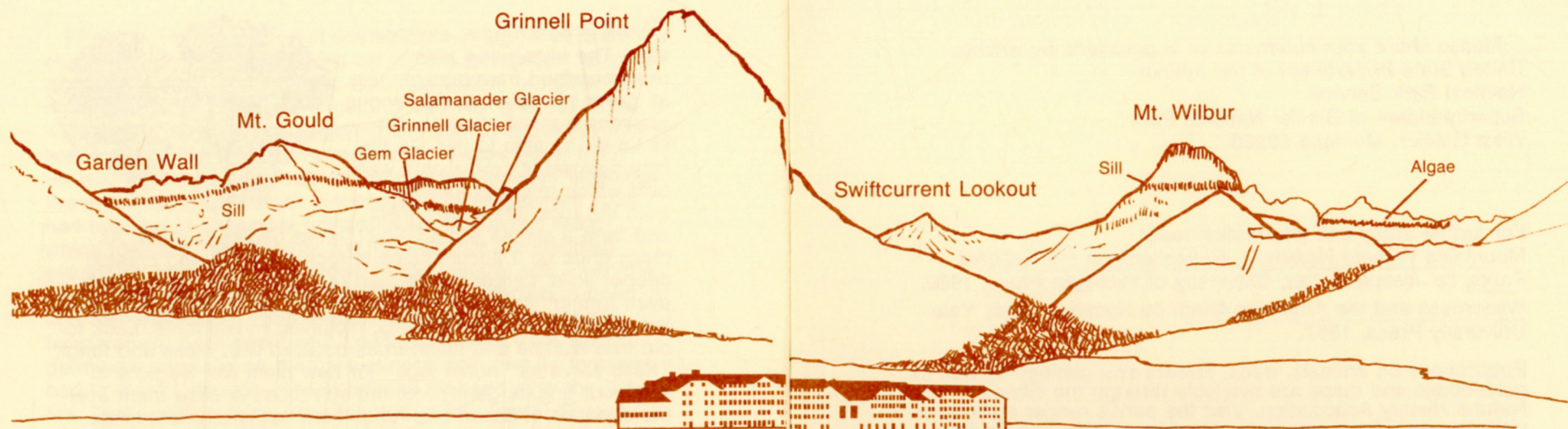
and form a simple soil on which moss begins to grow. As moss dries up it accumulates in rock fractures and creates deeper soils. Larger plants then root and break up the rock even further. Soils are enriched by the decomposition of dead leaves and branches by fungi, including mushrooms. Look for old tree stumps and fallen trees covered with moss and fungi. These serve as "nurse logs" for new plant life. Be sure to sink your fingers gently into the soft moss or slide them over the surfaces of lichen and fungi. How many different kinds can you find?

As you look from the bridge into the stream which connects Josephine with Swiftcurrent Lake, note the many colors of rocks. All of Glacier National Park was once covered by a huge inland sea whose bottom kept sinking while streams carried muds and sands into it. As the layers of muds and sands compacted they formed mudstones and sandstones — sedimentary rocks. Depending on the depth of the sea, the water chemistry changed. The red mineral, hematite (ferric oxide or "rust") formed when abundant supplies of oxygen were present while the green mineral chlorite (ferrous oxide) formed with less oxygen. The buff-colored rocks consist of limestone which precipitated out of the sea water under specific chemical conditions.

Freezing and thawing of water in rock fractures loosens rocks and starts them on their journey downslope. Pick up a rock from the stream and feel how smooth and worn the edges have become from traveling and tumbling downstream. Some rocks have been eroded into fine powder by the sandpapering effect of glacial ice embedded with rock debris. This "glacial flour" remains suspended in streams and lakes, scattering sunlight and giving the water a milky, blue-green color.



Where did the rocks in the stream come from? Look up at the mountain-sides and pick out the red, green and buff-colored layers.



The view across Swiftcurrent Lake from the Many Glacier Hotel can become a study on symmetry and beauty. Majestic Grinnell Point evenly divides the landscape into two — with Grinnell Valley to the left and the Swiftcurrent Valley to the right. Both valleys offer glimpses of glacially carved peaks and bedazzling glaciers.

The mountain's basic forms are the product of the Pleistocene Ice Age, a time three million to 10,000 years ago when glaciers up to 3,000 feet thick moved through the valleys. The glaciers eroded the mountainsides and transformed the stream-carved, V-shaped valleys into U-shaped valleys. Winter snows accumulate now on the steepened slopes and frequently avalanche creating the swaths of open areas you see between forested areas. Berry bushes and other sun-loving plants thrive in these avalanche chutes while providing important forage for birds, deer, bears and other wildlife.

James J. Hill of the Great Northern Railway was an entrepreneur in the early 1900's who knew that wilderness and spectacular scenery could attract people. Hill wanted to build hotels and chalets to provide wealthy train passengers from the East with comfortable and safe overnight accommodations. Park managers viewed a little "civilization" amongst all the wilderness of the west as a welcome contribution to the newly designated Glacier National Park. Hill's crew cut trees from the forest around Lake Josephine and constructed the Many Glacier Hotel. Park concessionaires today, like Hill, wish to meet the increasing demand for overnight lodging in the park. Vacationers enjoy their comforts today as much as they did in Hill's lifetime. Park Policy however has shifted away from construction of new hotels or motels within park

boundaries. Planned development is encouraged outside the park in areas already "civilized", thereby protecting Glacier's wildlife and wilderness habitat from further human encroachment. As our nation's wilderness shrinks, our parklands have become more precious.

After exploring you are now more familiar with the Swiftcurrent Lake area and are acquainted with some of the historical tradeoffs which allow both wildlife and human life to coexist here. In part it is a successful relationship because Glacier's winter snows force our disappearance and allow wildlife a time each year to live free of our influence. But in reality our influence is increasing and year round. Human development and pollution pose real threats to Glacier Park's wilderness. Careful wildlife management and study will help to soften and slow our impact. Current research at Glacier is helping to problem-solve on a global scale too. Out of concern for vanishing wilderness worldwide UNESCO (United Nations Educational Scientific and Cultural Organization) set up the Man and the Biosphere program. Over fifty-five countries throughout the world now have wilderness sites which have been selected for protection and ecological study of their representative plant and animal communities. All of Glacier National Park is considered an International Biosphere Reserve. This international commitment to preserving the diversity of biotic communities and monitoring human impact is crucial in protecting and evaluating the health of human ecosystems. We depend and are governed by the same complex rules of nature as wilderness areas. Study gives us opportunities to problem solve and compromise wisely. We at the park encourage you to participate in discussions and decisions about future wilderness preservation or development.

Please share your comments or suggestions by writing:
United State Department of the Interior
National Park Service
Superintendent of Glacier National Park
West Glacier, Montana 59936

For further study and information read:
Mountains Without Handrails, Reflections on the National Parks, by *Joseph L. Sax*, University of Michigan Press, 1980.
Wilderness and the American Mind, by *Roderick Nash*, Yale University Press, 1967.

Publications on animals, trees, flowers and geology as well as guidebooks and maps are available through the Glacier Natural History Association. Visit the park's ranger stations or visitor centers for a complete selection or write directly for a price list:
Glacier Natural History Assoc., Inc.
Glacier National Park
West Glacier, Montana 59936

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