

KAUTZ MUDFLOW

Self-guiding Nature Trail



**Guide yourself. Follow the numbered posts and
match them with the statements in this booklet.**

PRICE 10¢

OR

PLEASE RETURN BOOKLET TO
DISPENSER AT END OF TRAIL.



PUBLISHED IN COOPERATION
WITH THE
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT
OF THE INTERIOR
BY
THE MOUNT RAINIER
NATURAL HISTORY ASSOCIATION

Cover: Artist's rendition of the Kautz
Mudflow area as it is today. Looking
north with Mount Rainier in background.

From drawing by Roger D. Albertson



*Artist's rendition of the Kautz Mudflow area
as it appeared shortly after the flood.
From painting by Dee Molenaar*

What you will see here: Everywhere about you in Mount Rainier National Park are examples of the powerful forces of nature at work. Along this trail you will see the remains of one of the more spectacular natural events to occur on the American continent during modern times – the Kautz Mudflow of October 2, 1947. You will walk over the mudflow and see how nature is rejuvenating the landscape.

1. From here you can look up the Kautz Creek Valley and on a clear day see the upper portions of the Kautz Glacier. The Kautz Glacier is in line with the left-hand branches on the large dead tree.

Our story takes place on October 2, 1947. (A deep forest, similar to the ones you have driven through, grew here at that time.) Torrential rains struck the southern slopes of Mount Rainier and reached cloudburst proportions when about 6 inches fell at higher elevations.

When the cloudburst hit the upper Kautz Creek drainage, the stream was already in a virtual flood stage due to the previous heavy rains. As the water came down it began to cut a narrow gorge in the glacier. The power of this rushing water was so great that the ice was cut through, exposing the rock debris beneath. This material was scooped out and a depression was formed which filled with water. The remaining ice of the glacier now began to collapse, allowing the great head of water to surge downward toward the narrow walls of the box canyon just below.

2. When the water surged downward into the box canyon in front of the glacier, the ice and boulders jammed in between the narrow walls, creating a temporary dam sufficient to partially hold back the onrushing flood. The pressure on this dam grew greater and it finally collapsed, resulting in the first of several flood surges below the box canyon. These floods gouged out a gorge through the forest below, and the original channel was left intact on the west rim of the new channel.

The surge of water, mud, trees, and boulders swept on down through

the forest, wiping out everything before it, including the road and bridge. The old road is now 50 feet under the new road.

In the meantime, the partially destroyed dam up at the box canyon became the source of what is believed to be several flood surges. The last surge destroyed the lower mile of the Kautz Glacier and swept the upper canyon clean. It cut down to bedrock below the glacier and greatly deepened the gorge below the box canyon itself. An estimated 50 million cubic yards of material was carried down during the flood. (12 million cubic yards of concrete was used in the construction of the world's largest concrete dam – Grand Coulee in Eastern Washington.)

3. Kautz Creek is flowing in front of you. It emerges from the Kautz Glacier about 5.5 miles upstream. The glacier is about one-fourth of a mile wide and over three miles long. Originating on the summit of Mount Rainier it drops over 9,000 feet in the 3 miles. This stream (which might be better called a river), like most coming off the slopes of Mount Rainier, is not clear because of the heavy load of glacier flour or powdered rock. It appears this way because the Kautz Glacier is active and moves downstream several inches a day. The glacier is continually grinding up rocks and the powder is mixed with the melting ice and snow. Most rivers on Mount Rainier originate from active glaciers and are milky in color. Rivers and streams from inactive glaciers, or from melting snow, are clear.

Kautz Creek flows into the Nisqually River about .5 mile downstream from here. When the Nisqually enters Alder Lake, about 15 miles downstream, it loses its speed and the glacier flour tends to settle out, thus gradually filling the reservoir. The water in Alder Lake, is not used for domestic purposes because of the glacier flour that never completely settles out. It is used to generate electricity for the city of Tacoma.

The trunks of trees that you see beside the river bank extend many feet into the ground. Recalling that the present road bed is about 50 feet above the pre-flood bed, you can look at the trees and estimate how far they may go down to their bases.



*The flood of boulders, mud, and trees over the old road on October 2, 1947. Today's road was constructed over the flood material.
Photo by Merlin K. Potts*

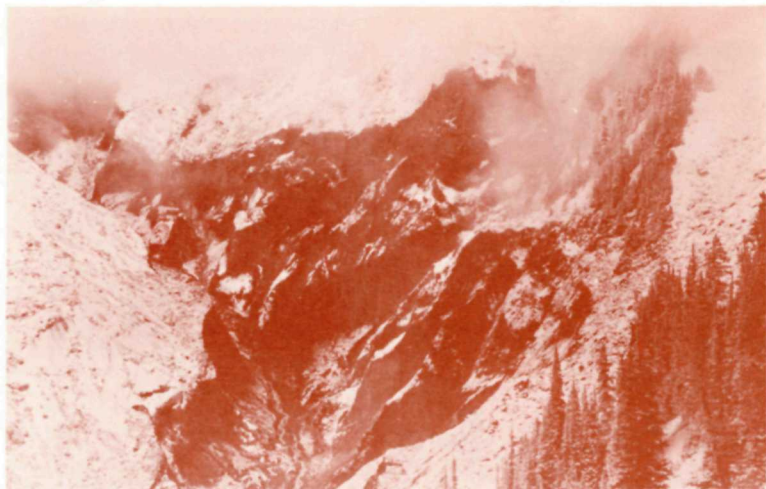


*A view of the devastation in the huge evergreen forest that grew here before the flood. The trees died from suffocation within one year.
Photo by Russell K. Grater*



A view into the Kautz Box Canyon immediately after the flood. The old creek bed may be seen high on the canyon rim to the left.

Photo by Merlin K. Potts



The dark area was occupied by the snout (front end) of the Kautz Glacier before the flood. This snout collapsed and was carried down the valley.

Photo by Russell K. Grater



The Kautz Glacier today, originating on the summit of Mount Rainier and extending down the mountain three miles. It is advancing strongly.

Photo by Austin Post

4. This stump is from a tree that once grew upstream. For most of the flood it withstood the rushing water and the beating by other logs and rocks. Note how the one side became worn away from this beating, making it almost flat. The pounding action literally beat the tree to a pulp. Finally the tree broke off above its base and the stump floated downstream to this location.

5. The Douglas-fir in front of you must have fallen into the water almost at the end of the flood as it shows little evidence of battering. It came to rest with the top end stuck between the two standing trees. The pressure of the flood water was so great that it broke the tree as if it were a match. You can see that this tree also served as a dam with logs and rocks piled behind it. Log jams, consisting of many trees, are located in other places nearby.

6. These boulders were carried down the Kautz Valley by the mudflow. People who observed the mudflow say that it was like thick concrete pouring down the valley. Boulders as large as 13 feet across were actually carried along like corks.

You can see some of the common rocks of Mount Rainier at this point. They are marked with letters:

A – Andesite. This black-colored rock is from the lava flows of Mount Rainier and makes up the major portion of the mountain. The name comes from the Andes Mountains where it was first described by geologists.

B – Breccia. The gray rock is so-called because the fragments are angular and not rounded. It may have been formed when a hot lava flow melted snow, causing a steam explosion that shattered the lava.

G – Granodiorite. This gray, salt-and-pepper like rock makes up the platform, or foundation, under Mount Rainier. It was formed by the cooling of molten rock far beneath the earth's surface.

7. Notice the young Western hemlock growing high on the top of the broken off Douglas-fir tree. How did it get there? Perhaps a squirrel or the wind may have carried the seed to this height where it began to grow in the decaying tree top. Your guess is as good as ours.
8. The surface of the ground around you is now teeming with plant life. The green moss is the pioneer plant. It appeared throughout the area during the spring following the flood adding to the organic soil layer on which trees and other plants took a foothold.

The renewal of life is amazing when you consider the death of trees and plants caused by the mudflow. Immediately after the flood, the dense forest of trees looked like they had not been hurt, but within a few months needles began to turn yellow and drop off. Roots need air if the tree is to survive. The fine-grained soil from the flood dumped over the roots of these trees, compacted into a cement-like layer and kept air out. The trees suffocated and died within a year.

9. The mountain range to the south is the Sawtooth Ridge in the Snoqualmie National Forest. High Rock is the highest point at 5,687 feet. The boundary of Mount Rainier National Park is one-half mile south from this numbered post.

You can see where some clear-cut logging was done on the sides of Sawtooth Ridge. Foresters have found that this type of cutting, followed by reseeding, is the best way to produce and harvest this kind of forest.

Here at the Kautz Mudflow area the National Park Service land management policy was followed and nature was allowed to take her course. The many dead trees in the flooded area were left, and have been slowly returning to soil.

10. The gray crust-like lichens and green mosses growing on many of the rocks are some of the oldest forms of plant life. A lichen is a combination of algae and fungi living together for mutual benefit known as "symbiosis." "The algae provides the eats, and the fungi provides the drinks." These plants are slowly digesting the boulders to form soil. This action, plus that of rainfall, freezing, and thawing is the long slow process known as "weathering."

The old dead snags (trees) that are scattered about this area have been standing since they died in 1948. They are falling over in larger numbers each year. When trees die they are soon attacked by various agents of decay. Slime molds, bacteria, fungi, and other plants help the decaying process. Without them the stock of chemicals on which life depends would remain locked in dead matter. Thus, the forces of destruction in the forest are essential to life.

11. Examples of some of the more important plants in the devastated area are found about you. Here are some tips for identifying them.

Red alder – This tree has 3-6" long leaves with saw-toothed edges.

Black cottonwood – Look for the 5-6" smooth-edged oval leaves that come to a sharp point.

Willow – This is the shrub with the small, smooth-edged leaves.

Douglas-fir – Yellow-green needles about 1" long that are flat, soft, blunt, rounded at the tip, narrow at the base and grow on all sides of the branch, identify it. Cones are 3-4" long and have three pointed bracts that stick out from between the scales, resembling the hind parts of a mouse with a short tail.

12. The Kautz Mudflow area is a scientific paradise. After the mudflow many scientists began studies of the transformation of this barren area "starting from scratch" and its eventual return to a forest. With the cooperation of the National Park Service, several

scientists from the University of Washington in Seattle set up study plots. They sought to determine what kind of plants would grow in this area, and which plants would follow each other over the years.

After the mudflow, Western hemlock seedlings sprang up, but they need shade, so most of them died off. Now such sun loving trees as red alder, black cottonwood, and Douglas-fir are growing here. This is typical of burned or cutover areas in the Northwest. Someday, Western hemlock may grow here again to become a giant mature forest. This process of one kind of plant following another kind, is called "succession."

Studies of the small mammals here have been made by Scientists from the University of Puget Sound and Pacific Lutheran University in Tacoma. They found that most are small rodents that are active at night, feeding on insects, seeds, and berries.

13. Directly beyond this numbered post, and in the midst of the dead trees about one-quarter of a mile away, stands an island of living trees. They are a remnant of the original forest that lived here before the mudflow. Flood materials deposited over the root system were later washed away by a small stream flowing through that area, and the trees survived.

14. Here at the Kautz Mudflow, as in all areas throughout Mount Rainier National Park and the National Park System, the landscape is kept in as natural a state as possible for you and future generations. National Park Service areas have traditionally served as places of research for scientists in all fields. At Mount Rainier they may study the forces and patterns of nature. The Kautz Mudflow is such a story.

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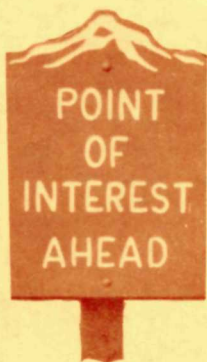
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We hope that you have enjoyed your trip. You will find other self-guiding nature trails in the park at Longmire, Paradise, Ohanapecosh, and Sunrise.

This booklet is a preliminary experimental edition. A fully illustrated and revised booklet will be published in the near future.

Your comments on the booklet and trail would be appreciated. Kindly leave them with a Park Naturalist at the Longmire Visitor Center or write:

Superintendent
Mount Rainier National Park
Longmire, Washington 98397



Watch for wayside exhibits and self-guiding nature trails throughout the park. They are announced by this sign.

The MOUNT RAINIER NATURAL HISTORY ASSOCIATION is a non-profit organization pledged to aid in the preservation and interpretation of Mount Rainier National Park. Profit from the sale of these items is used to further the interpretive program within Mount Rainier National Park and the National Park Service.

The association lists for sale many interesting and excellent publications for adults and children, as well as color slides on Mount Rainier. These items may be seen throughout the year at the Longmire Visitor Center and during the summer season at Paradise, Ohanapecosh, and Sunrise. A catalog of these items is available from the association.

Mount Rainier Natural History Association
Longmire, Washington 98397