

LIFE SYSTEMS:

**THE  
FOREST  
AND  
SPRINGS  
OF  
OHANAPECOSH**



**MOUNT RAINIER NATIONAL PARK**

# LIFE SYSTEMS: THE FOREST AND SPRINGS of OHANAPECOSH

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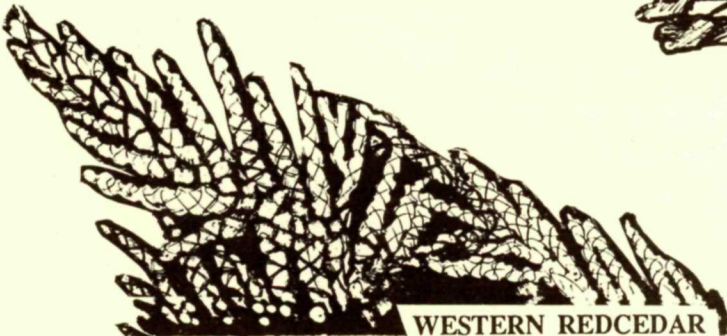
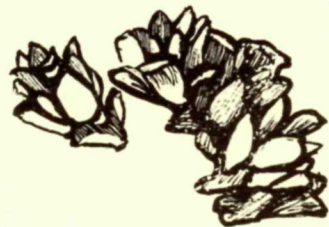


### WESTERN HEMLOCK

Welcome to the Ohanapecosh area of Mount Rainier National Park. The visitor center exhibits give you an introduction to the lowland forest of this area (the Pacific Northwest).

Now with the help of this self-guiding booklet and all your senses, we invite you to discover the forest and hot springs of Ohanapecosh.

The walk starts behind the visitor center, proceeds along a .6-mile-long trail, and ends in the campground at Loop B. The numbered paragraphs are read at the like-numbered posts.



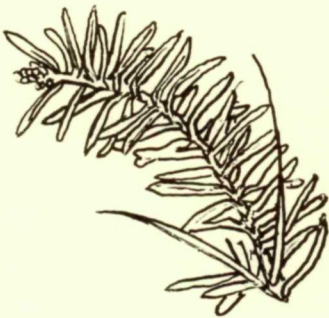
WESTERN REDCEDAR



1. The forest through which you will travel is considered a western hemlock type, since these trees dominate the area. However, three kinds of conifers, or cone-bearing trees, are abundant.

The large western redcedar behind this post is common near streams and is distinguished by its stringy, shredded bark and scale-like leaves. Near its base are several small western hemlock. Short needles and a drooping top will help you tell them from Douglas-fir seedlings which you might find along the trail. A large Douglas-fir with deeply furrowed bark stands to the right of the redcedar.

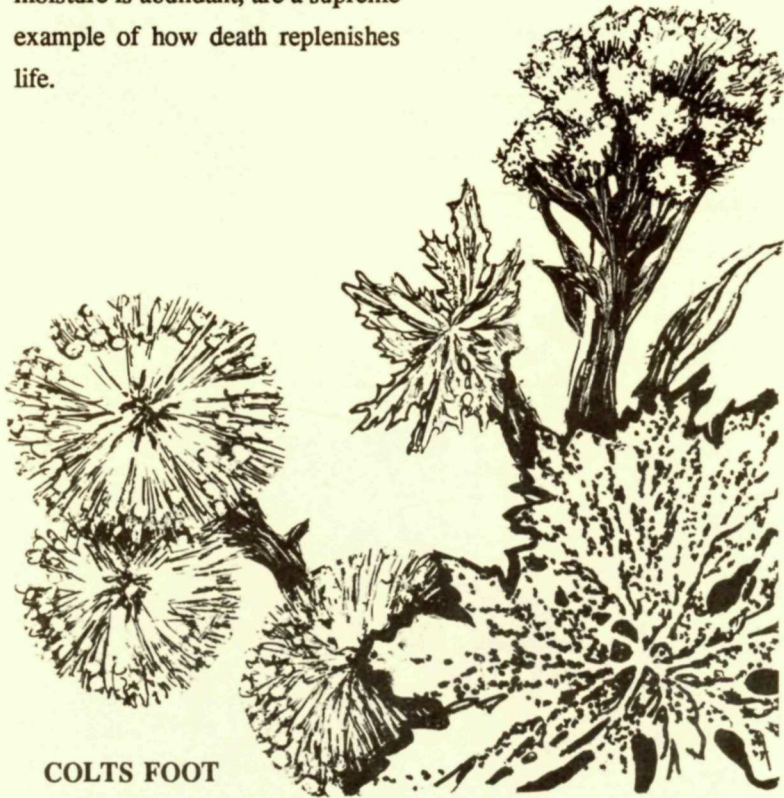
*Self-guiding trail goes to the right.*



### DOUGLAS-FIR

2. Compared to the Columbia River, the stream beside you is pretty small, but it plays a very big role in the lives of the plants around it. Just as most cities are built on or near water, and need it for life, so do the mosses on the bank and the trees towering above. Those needing the most water live the closest to it (plants like the coltsfoot, ferns and mosses) and would not survive without this source of water.

3. Life is constantly changing in the forest, ever so slowly. Life in the forest begins in many ways. Here the hemlock seedlings on this "nurse log" below the trail show new beginnings in a mature forest. Nurse logs, limited to forest where moisture is abundant, are a supreme example of how death replenishes life.



### COLTS FOOT

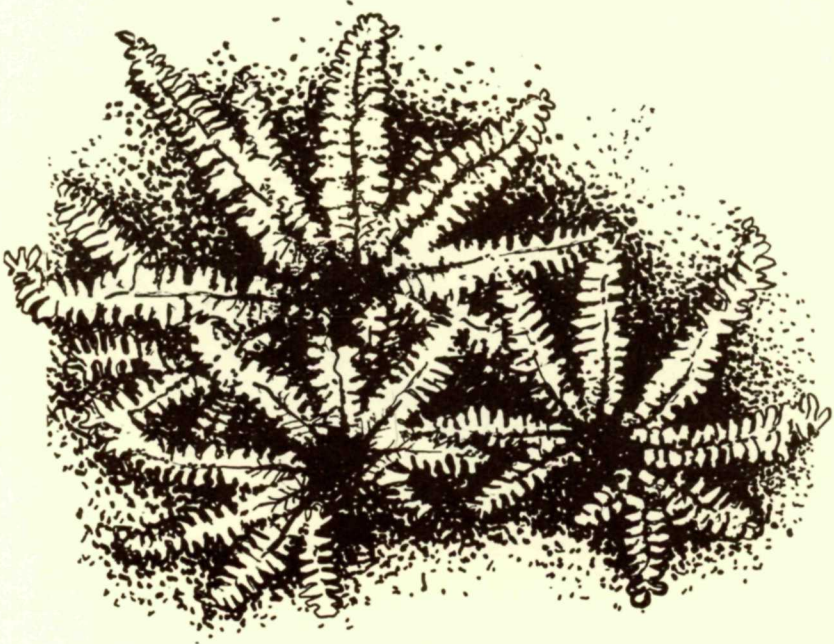
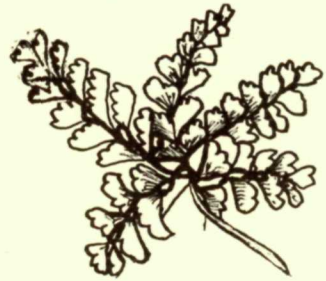
This cold water seep provides an excellent location for the large-leaved devil's club to grow. All those spines may explain where it got its name.

4. When a group of athletes run a race, only one will win. Competition is an important process in most living systems, whether it be the population of man or the western hemlock forest, because only the fittest individuals will "survive". Here you can see competition in one of its many forms. The road above you and the campground below are evidence of man's competing with the other animals and the plants for space in the forest.



5. The forest may look very much the same from one place to another, but the environmental differences, such as light, water, temperature and soil, determine which individuals will survive in a particular location.

The redcedar, like the devil's club, needs to have its "toes" wet. This western redcedar found enough water and soil to survive next to this spring. In a drier site, it would be less "fit" than the western hemlock or Douglas-fir.



#### MAIDENHAIR

6. What do the black-stem maidenhair fern and coltsfoot, living along this small stream, have in common with the western redcedar we saw earlier? Look at the place they are growing and remember the cedar's roots!

7. Remember the nurse log? It provides a growing place in the shady cool forest for the hemlock seedlings.

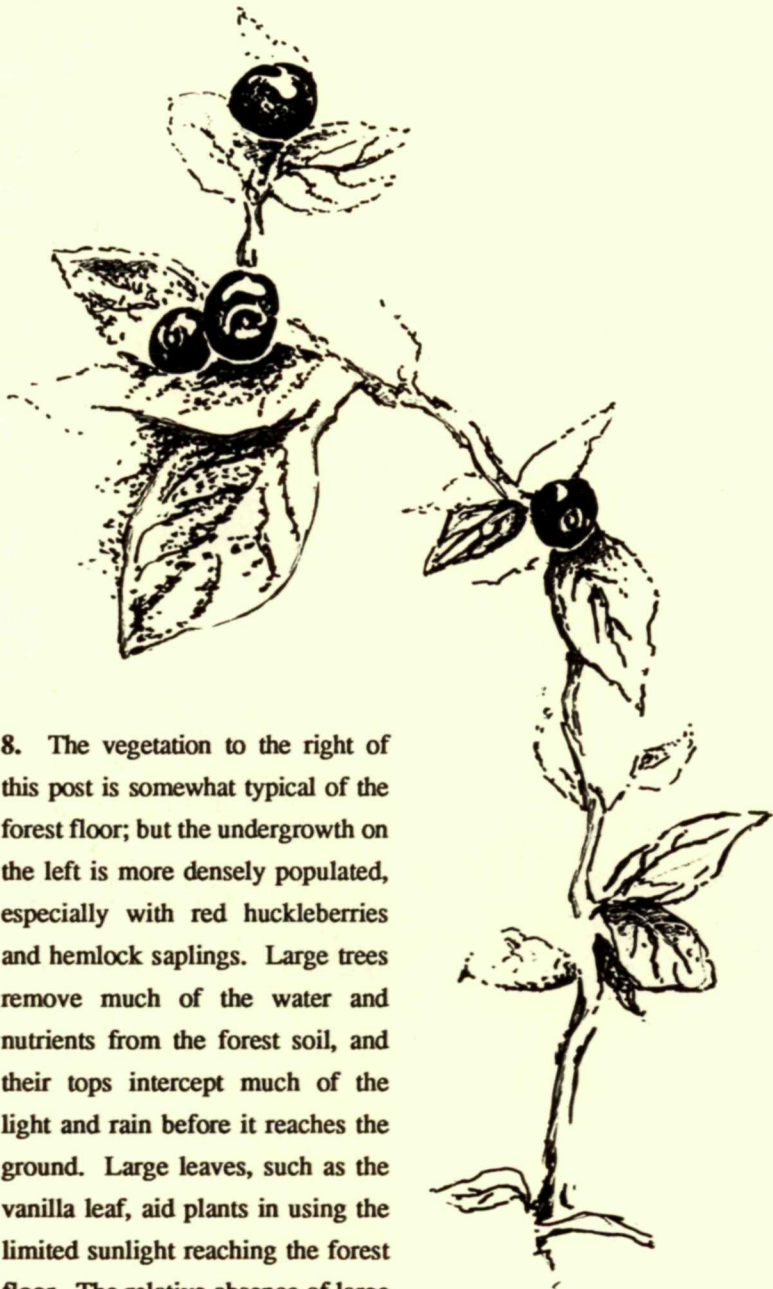
This rocky slope provides a place for other plants and animals to live. Many of the small broad-leaved trees existing here are vine maples, which are adapted to survive in many different habitats. They are pioneers of a new forest.



**VINE MAPLE**

You will find the vine maple not only in dry sites like this, but also in the more moist and shady forest along this trail.

Listen for the high-pitched "eek" and watch for the pika living in the moss-covered stone wall. This small member of the rabbit family gathers plants to dry in the sun for its winter food supply.



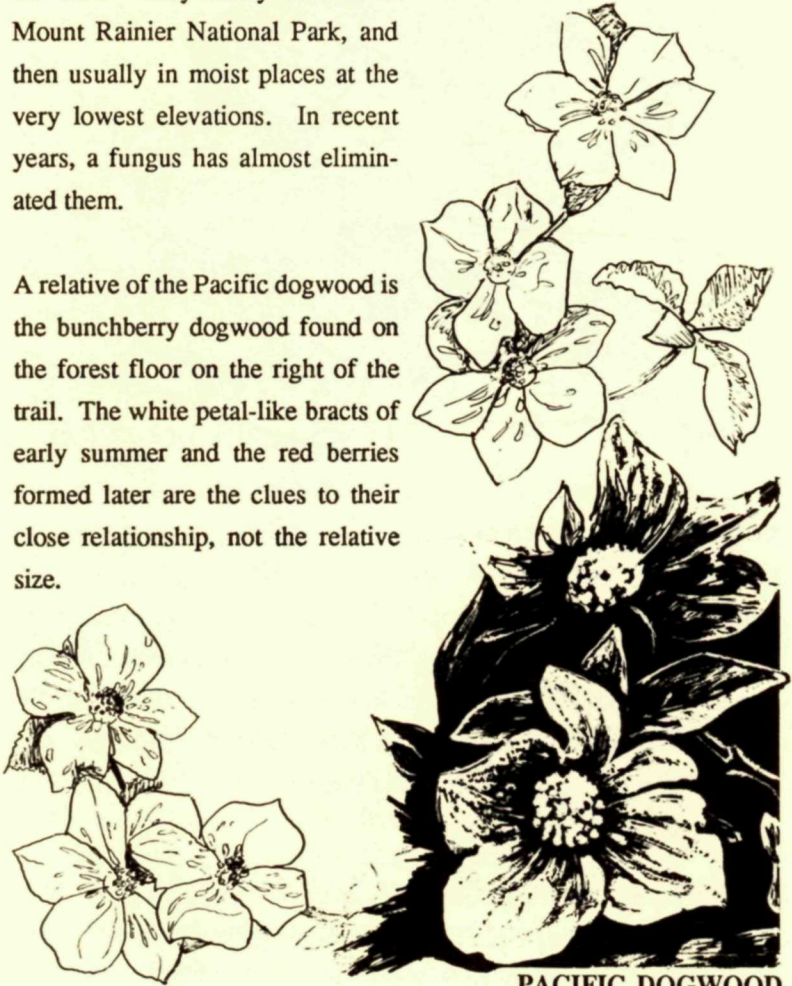
8. The vegetation to the right of this post is somewhat typical of the forest floor; but the undergrowth on the left is more densely populated, especially with red huckleberries and hemlock saplings. Large trees remove much of the water and nutrients from the forest soil, and their tops intercept much of the light and rain before it reaches the ground. Large leaves, such as the vanilla leaf, aid plants in using the limited sunlight reaching the forest floor. The relative absence of large trees on the left allows a denser undergrowth.

**HUCKLEBERRY**



9. Plants are affected by diverse conditions such as local soil moisture, light, temperature variations and elevation. Ohanapecosh is near the upper elevation limit for the Pacific dogwood tree on the left of the trail. They rarely survive in Mount Rainier National Park, and then usually in moist places at the very lowest elevations. In recent years, a fungus has almost eliminated them.

A relative of the Pacific dogwood is the bunchberry dogwood found on the forest floor on the right of the trail. The white petal-like bracts of early summer and the red berries formed later are the clues to their close relationship, not the relative size.



**PACIFIC DOGWOOD**

10. Here competition may be found in another form as it occurs among individuals of the same kind of plant. Many seeds from a western hemlock may grow into seedlings which rapidly cover a disturbed area in the forest. However, only a few of these small hemlocks will ultimately survive. Intense competition will prevent most of them from growing to maturity.



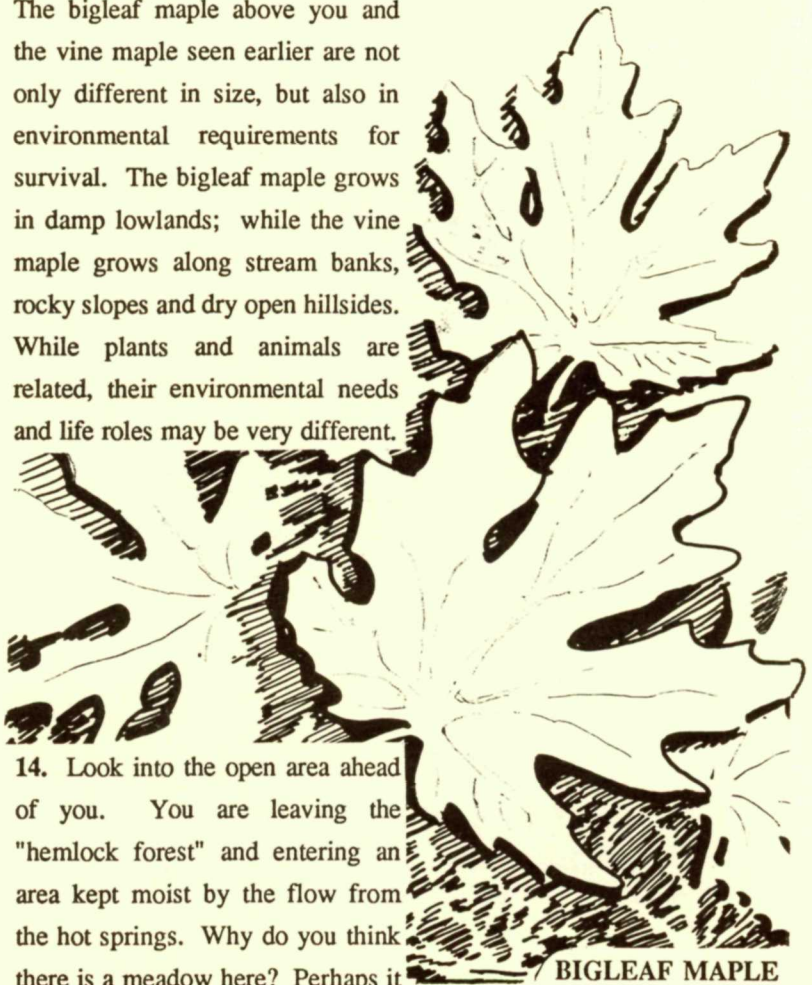
**BUNCHBERRY DOGWOOD**

11. Just as the forest covers its scars, a tree can heal many of its own wounds. Exposed wood of this hemlock is slowly being covered by new wood and bark. A small wound such as this normally will not kill a tree, but wounds which completely surround a tree will disrupt the flow of food and water up and down the stem. Such massive damage almost always kills a tree. As you look at the trees of the forest, you can also see wounds where branches have fallen off. These are often covered by a black fungus. Is it bad when a tree dies? What benefit does it provide the forest?

12. What story can this tree tell us? Look closely at the small round holes in the wood. These were made by wood-boring insects. The larger rectangular holes were made by the pileated woodpeckers in search of insects for food. In most cases, the woodpeckers help rid the tree of harmful insects; however, in this instance, the tree would not survive the heavy infestation. The decaying tree will add humus to the soil; thus, life in the forest continues, showing the inter-relationship between members of the forest community. What role does the standing stump now play?

13. Differences and similarities between plants may be the size, color, flower, or place they live, as with the Pacific and bunchberry dogwoods.

The bigleaf maple above you and the vine maple seen earlier are not only different in size, but also in environmental requirements for survival. The bigleaf maple grows in damp lowlands; while the vine maple grows along stream banks, rocky slopes and dry open hillsides. While plants and animals are related, their environmental needs and life roles may be very different.



14. Look into the open area ahead of you. You are leaving the "hemlock forest" and entering an area kept moist by the flow from the hot springs. Why do you think there is a meadow here? Perhaps it was originally a forest cleared by man. More probably it was a direct result of the springs and their mineral deposits. A large-scale change in the vegetation type reflects changes in the environment. Many natural features such as these can be fully understood only by further scientific study.

**BIGLEAF MAPLE**

To the right of the trail is one of several hot springs in the area. For a better view of the hot springs ahead, please stay on the trail.





**ELK AT SPRINGS**

15. In the mud surrounding this spring, look for evidence of the American elk (wapiti). Typical signs would be droppings or tracks. The elk gather in this area during the winter because the heat from the springs keeps it free of snow. This concentration of elk (sometimes as many as 20), with their trampling and wallowing, causes changes in the vegetation around the springs.

16. Reach down and feel the water flowing from this spring. This water is over 100°F. The water that supplies the Ohanapecosh hot springs soaks into the ground in the mountains surrounding this area. Because of the great weight of the rock layers, pressure and heat are created. The heat warms the water as it moves through the rocks below the surface, where it also picks up salts and minerals, mainly calcium carbonate ( $\text{CaCO}_3$ ). The bubbles are mostly carbon dioxide ( $\text{CO}_2$ ).

The "green scum" on the water surface is algae. The warm water of the hot spring is an ideal place for this plant to grow. As the water cools, a different color of algae will grow.



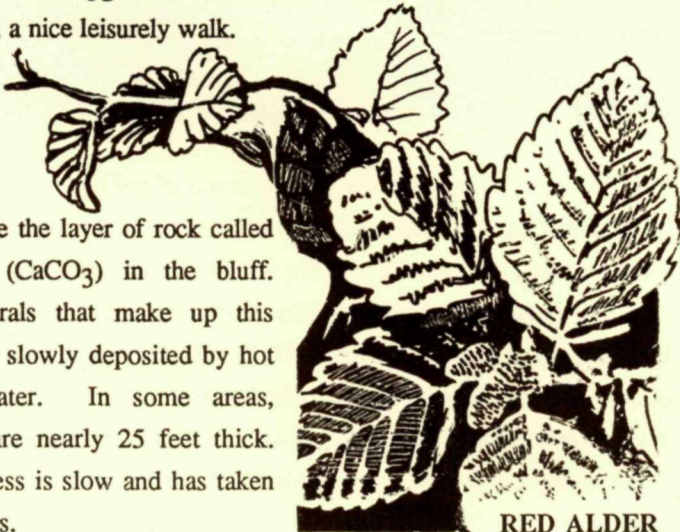
17. The early visitor, like the elk, made use of the hot springs. In the early 1920's, a health resort began to develop in this area. At first, there was only a trail from near the town of Packwood; but by 1925, a road was opened into the area. As the resort developed, a large bath house, inn, and small cabins were built. The large depression in front of you was to have been a swimming pool. Many of the earlier visitors will tell you their pains of arthritis were relieved after bathing; in the spring's water; however, according to some authorities the spring water is no more healthful than a hot bath with Epsom salts at home.

18. Looking back into the forest, can you see any additional evidence that the elk have been here? Look at the bark of the small broadleaf red alder. This bark probably was removed by a bull elk scraping his antlers against the tree to rub off the "velvet," (a covering of skin) and to polish the antlers. Elk may kill small trees by completely stripping the bark in a band around the tree.

In the fall of 1984, a new spring appeared in the middle of the trail just below this stop. No other changes in the other springs were noted.

19. The openings in the forest to your right were formerly cabin sites for the Ohanapecosh hot springs lodge. In 1961-62 the area closed for expansion and modernization of the campground. At this time, the lodge was required to update its facilities also; but was financially unable to meet the National Park Service standards and never reopened. In keeping with the policy of preserving the Park's natural features, the buildings were removed and the springs were permitted to return to natural state. Change is an ever-present part of life, here and where you live. The trail to the *left* (the continuation of the self-guiding trail) passes through the area of bath house and inn, and back to the campground; the trail to the *right* leads to Silver Falls. The walk from Ohanapecosh campground to Silver Falls and back is about 2 miles round trip, a nice leisurely walk.

20. Notice the layer of rock called travertine ( $\text{CaCO}_3$ ) in the bluff. The minerals that make up this rock were slowly deposited by hot spring water. In some areas, deposits are nearly 25 feet thick. This process is slow and has taken many years.

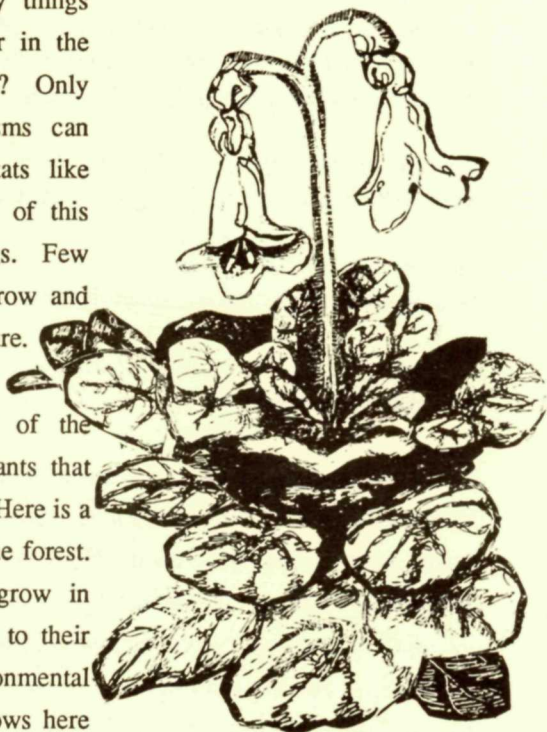


RED ALDER



21. A forest or meadow can contain many types of plants and animals. But how many things live at the South Pole or in the boiling water of a geyser? Only specially adapted organisms can survive in extreme habitats like these. The same is true of this water from the hot springs. Few plants and animals can grow and reproduce at high temperature.

The greens and oranges of the springs are algae, tiny plants that thrive in the warm water. Here is a living system much like the forest. Various types of algae grow in different places according to their ability to survive the environmental conditions. The grass grows here not only because the water is warm, but also because it is alkaline.



**TWINFLOWER**

22. The natural forest system you have explored on this trail is protected in Mount Rainier National Park for your enjoyment and that of millions of people who will visit the Park in future years. Keep in mind that how you use this resource will affect the enjoyment of others and affect the quality of the resource. The challenge is for you and the National Park Service to manage and preserve the natural systems of the parklands for the present and the future use.

The campground road to the left will lead you back to the visitor center.

### **Further Reading**

Crandell, D.R. 1969. *The Geologic Story of Mount Rainier*.  
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Aanundsen Publishing Co.

These and other publications are made available at National Parks and  
National Forests visitor centers in the States of Washington, Oregon,  
Idaho, and Montana by the Pacific Northwest National Parks and Forest  
Association, a nonprofit organization, formed to provide educational  
materials to help study and interpret the Parks and Forests of the Pacific  
Northwest. For more information, a catalog, or membership, write  
Mount Rainier Branch, Pacific Northwest National Parks and Forests  
Association, Longmire, Washington 98397.

*We hope that you have enjoyed your trip. You will find other self-  
guiding trails in the Park at Longmire, Paradise, Sunrise and Carbon  
River.*

*Your comments on this booklet and trail would be appreciated. Kindly  
leave them with a Park Naturalist at the visitor center or write:*

*Superintendent  
Mount Rainier National Park  
Tahoma Woods, Star Route  
Ashford, Washington 98304*