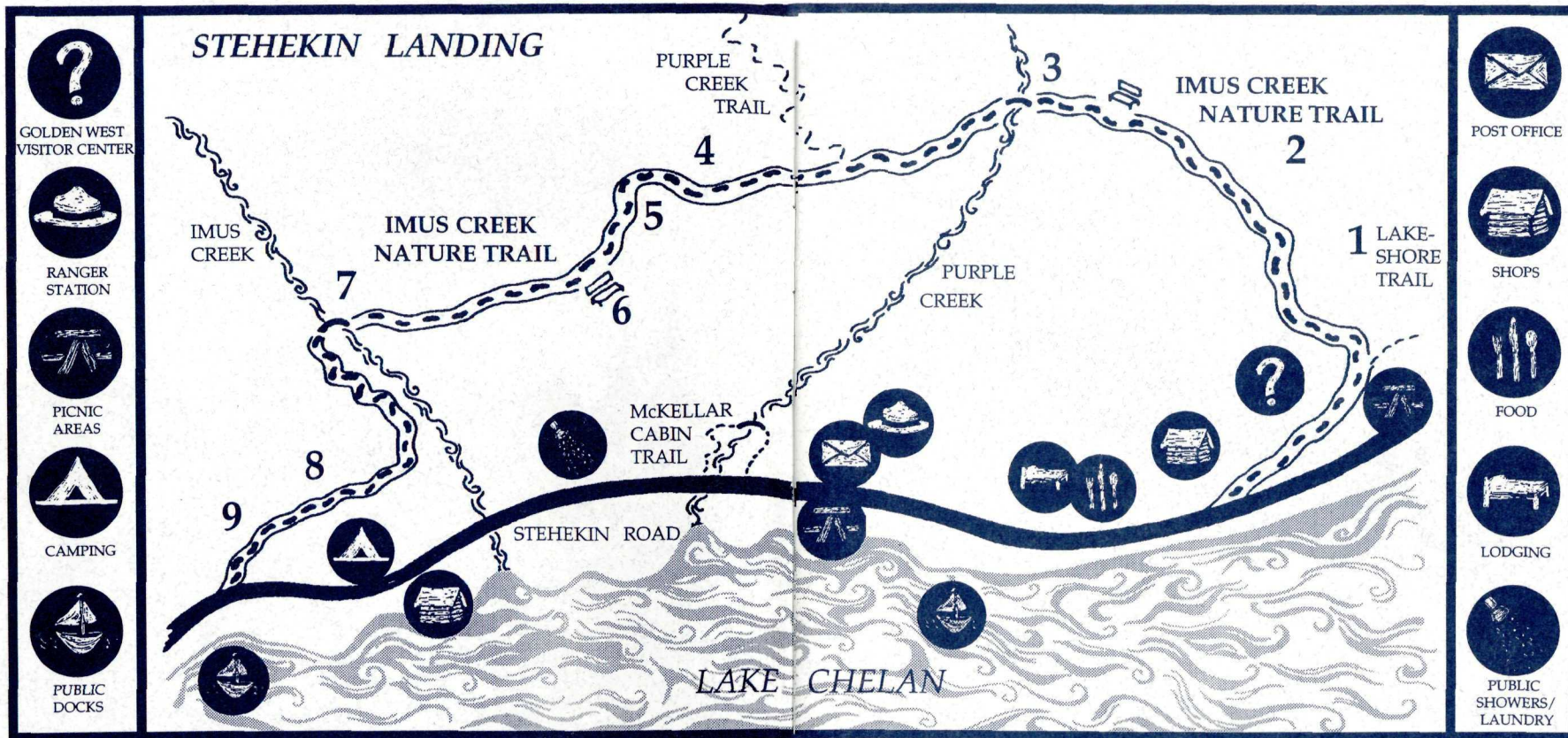


Imus Creek



Nature Trail

Lake Chelan National Recreation Area

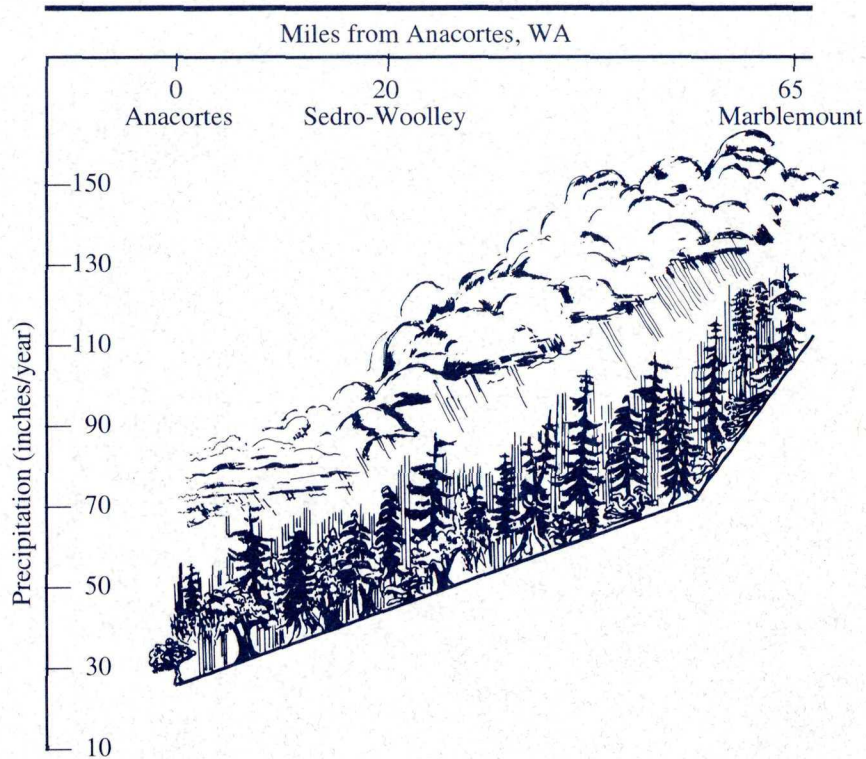


Welcome to Lake Chelan National Recreation Area, a unit of North Cascades National Park Service Complex.

Imus Creek Nature Trail climbs 200 feet, then descends to the lakeshore. The trail begins behind Golden West Visitor Center and ends adjacent to Purple Point Campground. Allow 30 to 60 minutes walking time. Two benches along the trail provide resting spots. A sign along Imus Creek Nature Trail clearly marks the junction with Purple Creek Trail. To use the guide, pause at each numbered post and read the material offered in the corresponding section.

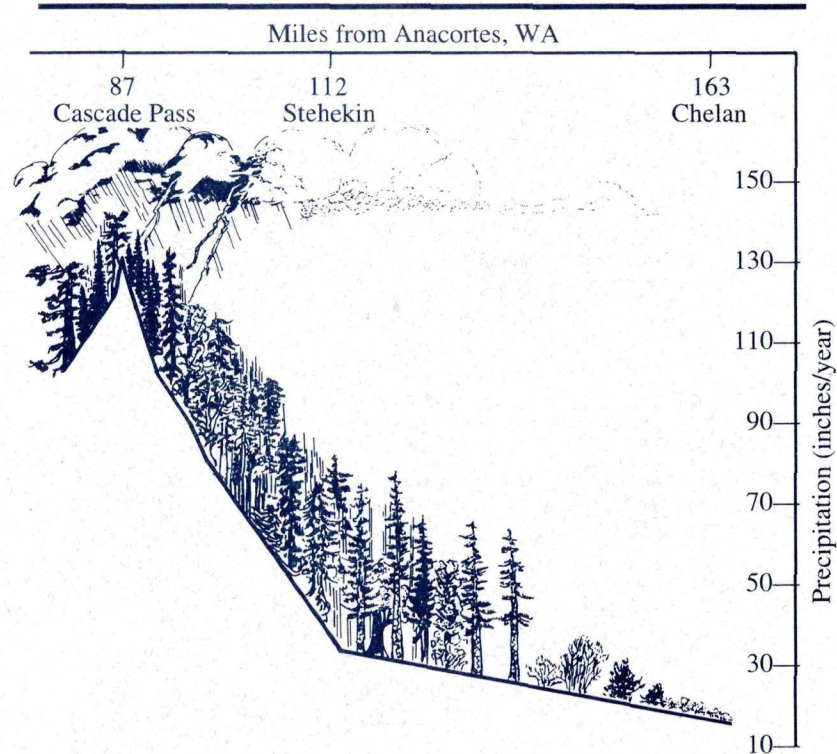
You will cross two named creeks along the trail. Purple Creek commemorates the Purple family, who operated a lodge in the early 1900s where the Golden West Visitor Center now stands. Imus Creek was named after Guy and Hazel Imus, who lived in a cabin near Imus Creek.

For a safe trip, stay on the trail. The steep slopes are dangerous; walking on them loosens the soil and kills vegetation, promoting erosion. Observe rattlesnakes from a safe distance.



1

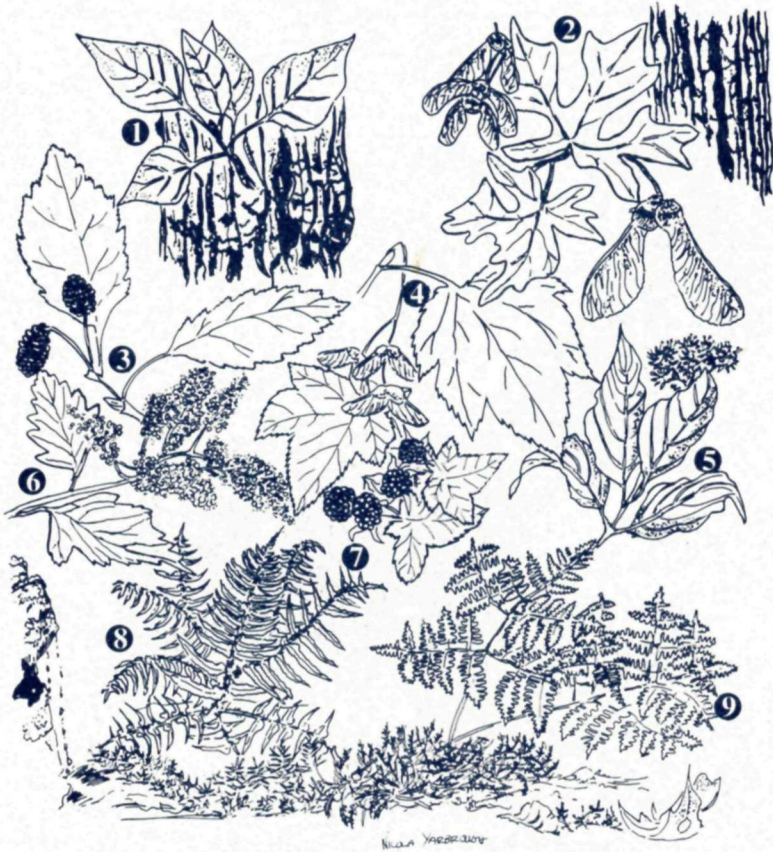
Water is the most precious substance on earth. As ice, fluid, and vapor, it sculpted the landscape around you. The lives of residents and visitors to Stehekin are affected by water in ways which we cannot control. The land, plants and animals of Stehekin Valley are also influenced strongly by water. How does this influence make the plant life in North Cascades National Park Service Complex unusual? Learn at the next stop how wind, water, and mountains interact here to affect plant life.



2

Prevailing winds drive storms east over Cascade Pass into the Stehekin Valley. Moisture rising over the Cascade crest cools and condenses, resulting in greater annual precipitation; precipitation decreases further inland (east) of the Cascade crest. The extreme precipitation gradient in this park creates a great variety of habitats.

Where yearly rain or snowfall is lower, frequency of fires is higher. The fire weather monitoring station here helps assess precipitation, fuel moisture, humidity, and other factors which define "fire danger" at Stehekin. Lightning-caused fires create patches of burned areas. These areas, in various stages of recovery from fire, are host to diverse life forms. There are more than 1,700 plant species in North Cascades National Park Service Complex.



Wet Side Plants

- 1 Northern Black Cottonwood
- 2 Bigleaf Maple
- 3 Sitka Alder
- 4 Douglas Maple

- 5 Redosier Dogwood
- 6 Ocean Spray
- 7 Thimbleberry
- 8 Sword Fern
- 9 Bracken Fern

Even in a small area, there is much variation in living conditions, resulting in microclimates. Slope, soil type, and proximity to creeks vary, producing the local plant mosaic. You will encounter an assemblage of plants along this trail, some adapted to dry surroundings and some requiring moist shady conditions. Use the drawing above to identify plants and moisture levels of microclimates along this trail.



Dry Side Plants

- 1 Douglas-fir
- 2 Ponderosa Pine
- 3 Red-flower Currant
- 4 Blue Elderberry

- 5 Serviceberry
- 6 Oregon Grape
- 7 Common Yarrow
- 8 Balsamroot
- 9 Kinnickinnick

Notice how the leaf sizes, shapes, and surfaces relate to the amount of water available to the plants.

Unlike some species which are adapted to living with limited water, humans need a constant and plentiful water supply, which is used in many ways. A reliable water source is just ahead.

3

You passed a cement cistern and redwood tank on the way to the bridge. The cistern replaced the tank as the primary water storage facility for the Stehekin Landing area. People living up the valley either have wells or pipe water from springs into holding tanks. Although Purple Creek flows year-round here, only well water is utilized at the Stehekin Landing.



Electricity in Stehekin is partially generated by a water turbine on Company Creek, 5 miles up Stehekin Valley from here. Water from Rainbow Creek is diverted into irrigation ditches to nourish Buckner Orchard. People and supplies are transported to Stehekin on the waters of Lake Chelan via boat or seaplane; cars and horses are floated to Stehekin by barge. The land which became the North Cascades drifted here across the ocean from southeast Asia as a series of microcontinents.

4

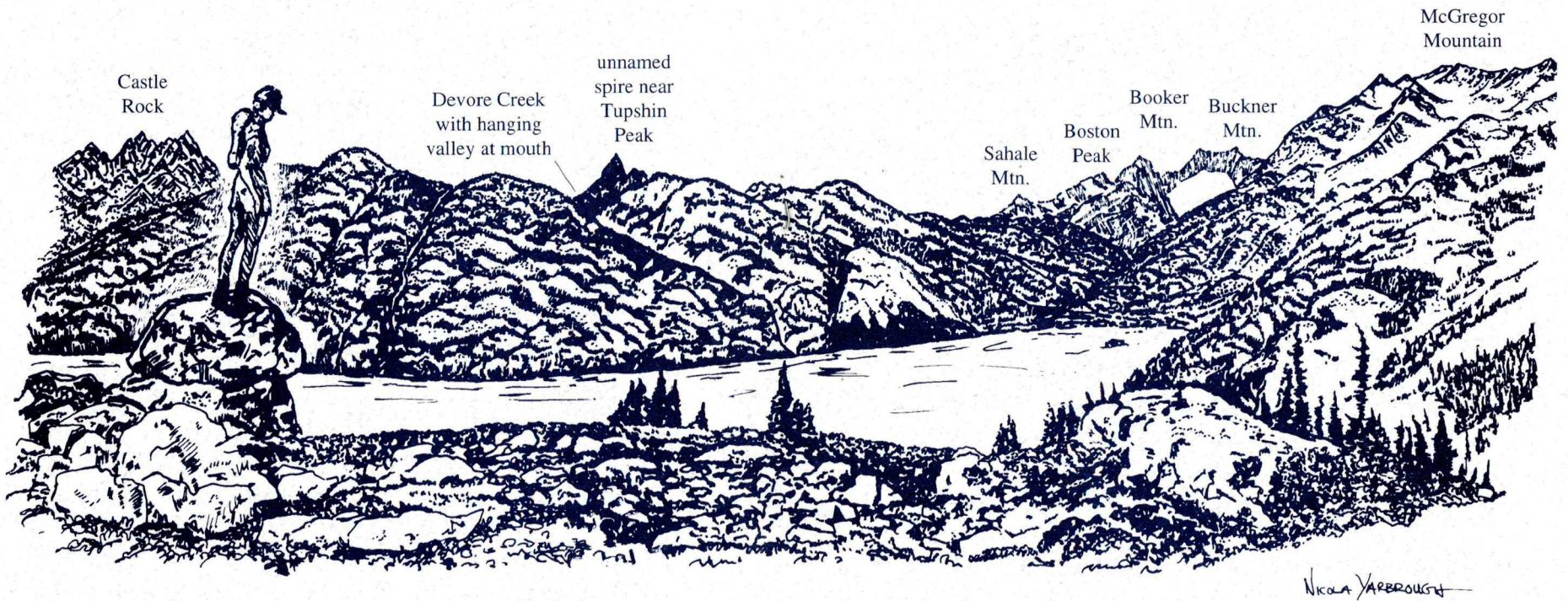
Oceanic and continental plates float around on the earth's crust somewhat like ice cubes in a glass of water. About 100 million years ago, the North Cascades micro-continents began riding on an oceanic plate like a conveyor belt from near present day southeast Asia to the Pacific Northwest. Traveling at about the speed of a growing fingernail, the floating land masses were host en route to erupting volcanoes and grazing dinosaurs.



Before these dozen or so pieces of continent collided with North America, the coastline of Washington was near the present Okanogan River, which is east of here. When the pieces rammed into "Washington," the collision pushed up the Cascade Mountain Range. The process continues to this day; you are rising very slowly as you read this brochure and as the continents continue to drift.



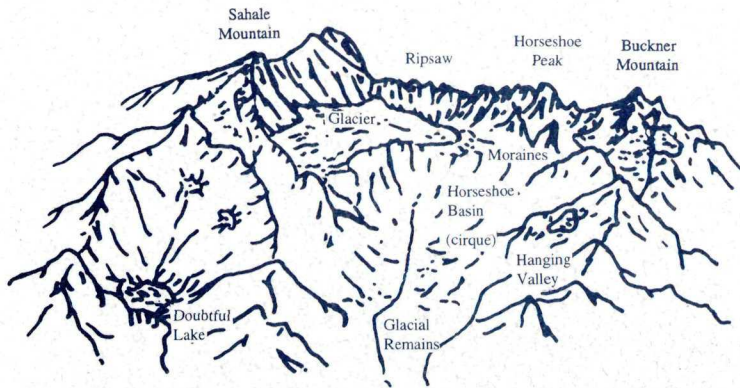
Sixty million years ago, the rocks in this exposed outcrop were sediments buried as deep as 15 miles. They became very hot and recrystallized to form a metamorphic rock known as Skagit gneiss. The mountain-building process pushed these rocks up near the surface, where gouging glaciers later uncovered them.



This is a wet microclimate. Cracks in the rocks allow ground water to seep to the surface and provide a foothold for the mosses and ferns growing here, flourishing on the occasional seeping water. The expansion and contraction of freezing and thawing water cracked these rocks during the last 10,000 years that they have been on the surface. Frozen water also was a prime sculptor of the scene you are about to see.

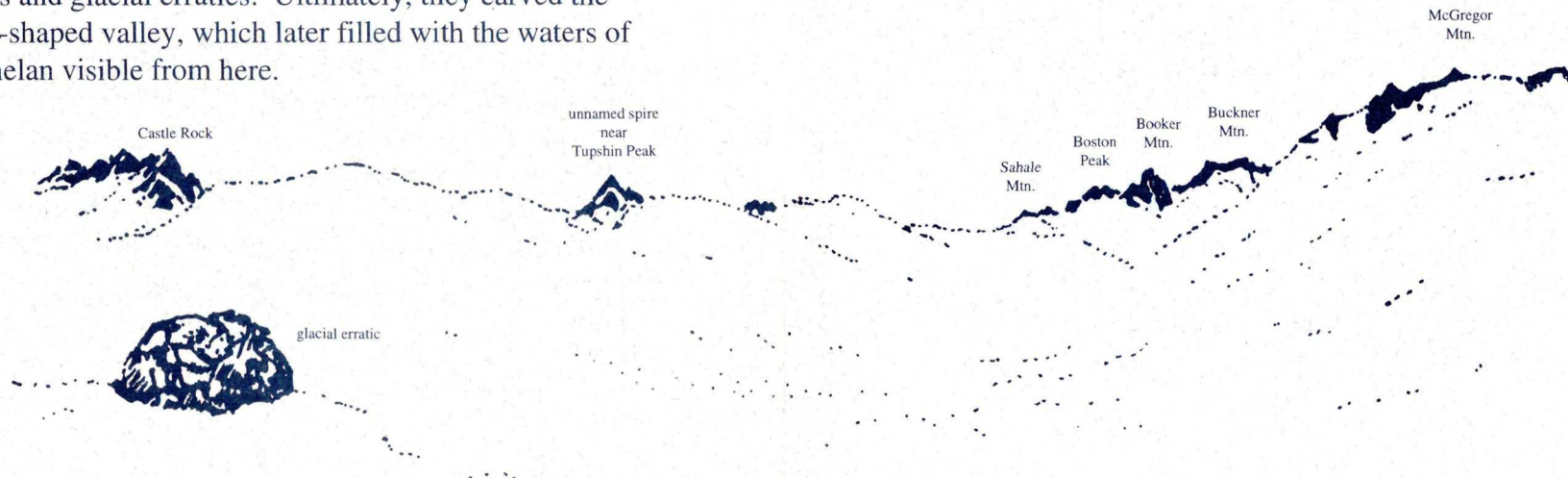
5

Survey the scene around you. Pick out the named peaks, valleys, glaciers, and Lake Chelan. The primary force responsible for forming these land features is not obvious...it comes and goes. Its presence today is unknown to many, although it significantly affects our daily lives.



6 The 318 glaciers in North Cascades National Park Service Complex provide a continuous water source which is necessary for humans as well as many species of plants and animals. Today we can see the Sahale and Boston Glaciers from here, remnants of icy times in the past.

From 2.5 million to 10,000 years ago, glaciers advanced and retreated through this craggy country several times, with each passing further sculpting the landscape. They created aretes, horns, cirques, hanging valleys, and deposits such as moraines and glacial erratics. Ultimately, they carved the broad U-shaped valley, which later filled with the waters of Lake Chelan visible from here.



During periods of continental glaciation, ice 7,000 feet thick flowed more than 100 miles up the Pasayten Valley, between Washington and Rainy Passes and down Bridge Creek through Stehekin all the way to Chelan. These glaciers may have moved as fast as one to four miles per year. The rounded ridges you see up to about the 6,000 feet elevation indicate the depth of the glaciers during this time. Glacial erratics are rocks from far away which are dropped by glaciers. Their presence up to 6,000 feet on the slopes across from you also demonstrates the depth of the continental ice sheets which passed through here. The highest craggy cliffs, such as Castle Rock, stood above the continental glaciers. These precipices were carved by mountain glaciers which flowed from the highest peaks.

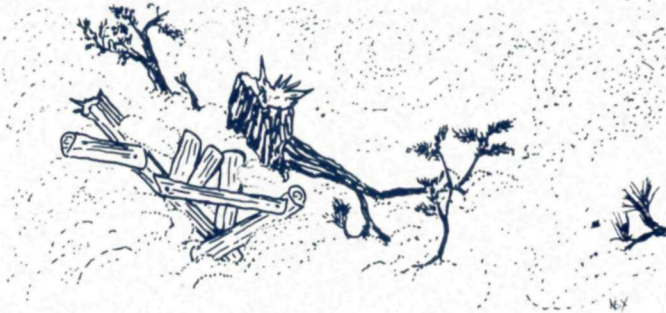
Glaciers are permanent masses of ice and snow which move; they are born or continue to grow when more snow falls than melts each season. Falling snow can quietly add to the bulk of glaciers and snowfields or in a thundering roar of an avalanche change the shape of life.

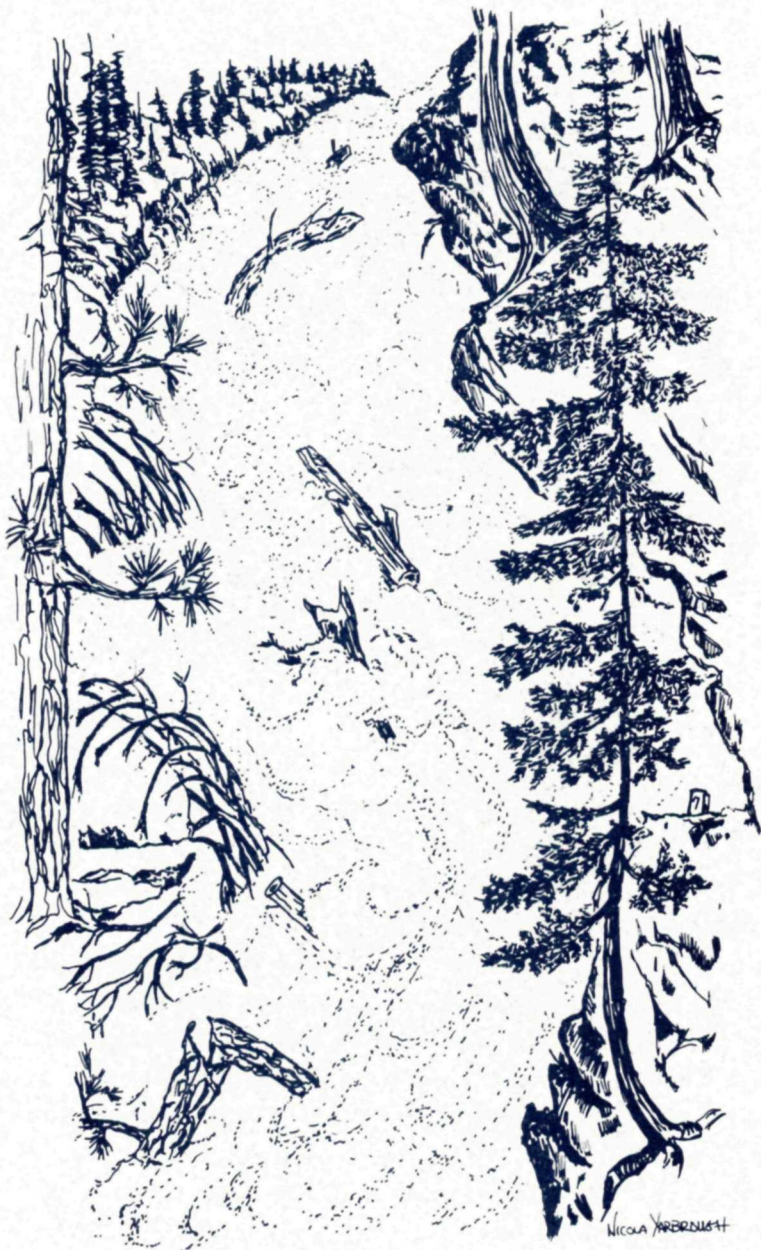
7

Snow falling on 30- to 60-degree slopes can build up, then create devastating snow avalanches. Falling snow tends to stabilize on slopes under 30 degrees and continuously slough off slopes over 60 degrees without building up to an avalanche. The slopes above you average 42 degrees, gaining 5,900 feet to Purple Mountain (7,161 feet). Vegetation, wind, and other climatic factors also shape avalanches.

Historically, a few devastating snow avalanches have roared down this gully (Imus Creek) as well as the Purple Creek gorge after periods of very heavy snowfall, wind, or rain on snow. These avalanches destroy all but the most flexible plants in their paths. Even stout trees such as Douglas-fir and ponderosa pine cannot survive in avalanche chutes. A number of broad-leaved plants are flexible and can survive being bent flat. Thus, the majority of plants you see in this gully are broad-leaved. Traveling up Stehekin Valley, avalanche paths become more numerous. Beyond road's end, vast alder thickets grow in avalanche-prone areas along the Cascade Pass Trail.

The synergism of heavy rain and the plant life as it existed here over 10,000 years ago created awesome events which formed the Stehekin Landing area. These incidents were much more destructive than snow avalanches.







8

Ten thousand years ago, this land was mostly barren. The plants and animals you see here now had not yet moved into the area so recently blanketed with glacial ice. Erosion was uninhibited by the stabilizing effect of plant roots. Snow runoff, compounded by spring rains, created tremendous avalanches of mud and rock. The entire Stehekin Landing area, from where you now stand to the Golden West Visitor Center, 1/3-mile away, is known geologically as a debris cone; it was built by these avalanches. It is difficult to imagine the destructive force of these boulders crashing for miles down Imus or Purple Creek Canyons. As impressive as these debris torrents were, they are but a drop in the bucket compared to other effects of water.



9

In just a few steps you will be at the shores of Lake Chelan again. Pause a few moments to reflect on the power of water. Water in the form of ice, fluid, and vapor exerts a mighty effect on the landscape and on the plants, animals, and humans who live here.

If all of the water on earth were likened to one gallon, then the accessible, clean, fresh water would be contained in one drop. How would a decrease in yearly rainfall of 10 or 20 inches per year affect the area where you live? Future global climate patterns and the actions of humans may significantly impact the distribution of water, and thus the lives of all living things on earth. In North Cascades National Park Service Complex, the many glaciers, rivers, and lakes comprise a vast reservoir of water. They are indeed a priceless resource.



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