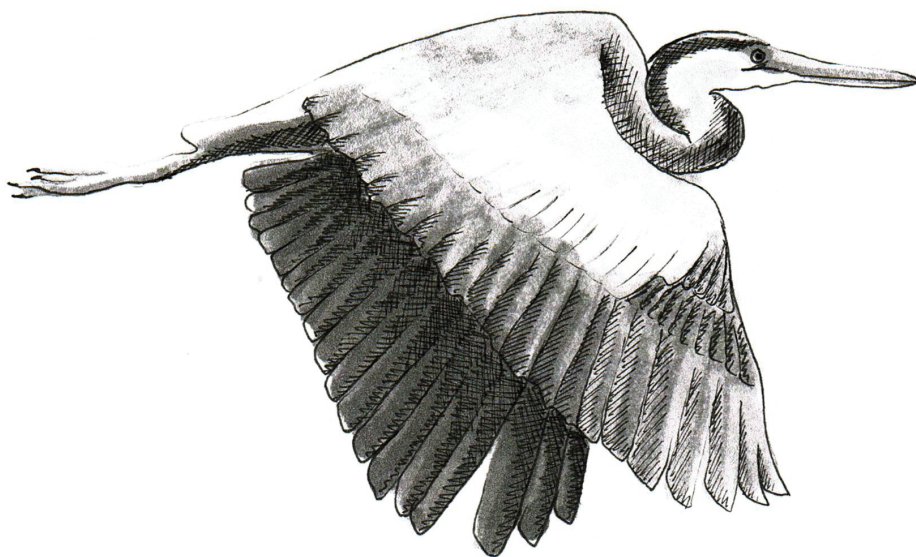




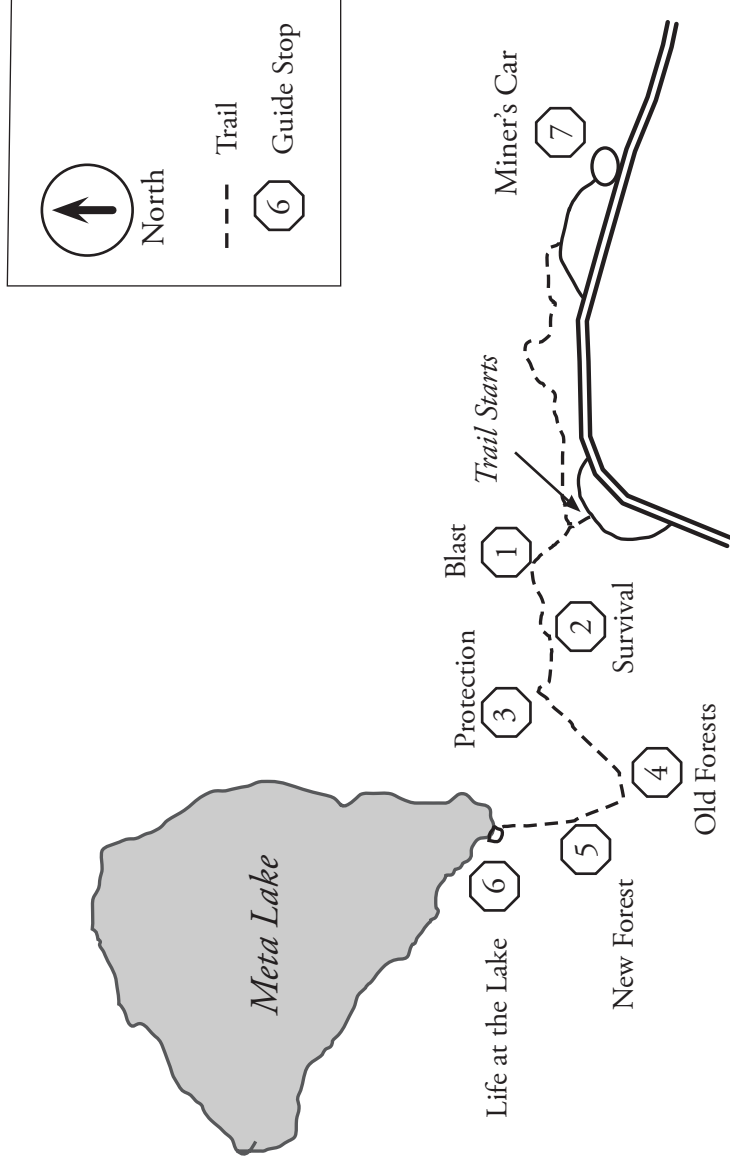
META LAKE TRAIL GUIDE



*Discover How Life Survived
the May 18, 1980 Eruption.*


gifford pinchot
NATIONAL FOREST

Meta Lake Trail



Discover How Life Survived the May 18, 1980 Blast

Welcome to the Meta Lake Trail. Use this guide as you stroll along this paved trail to discover how life survived and thrived after the 1980 eruption of Mount St. Helens.

Look for wooden posts along the trail with the corresponding number  that matches the stops in the following pages. On page 14-17 of this guide there is a list of common plants and important information on invasive plants.



Trail Information:

Length: 0.3 miles one-way on a flat paved trail. Add 0.5 miles for a side trip to visit the Miner's Car, which can be reached from here via a paved path and boardwalk.

Time: Only a few minutes to stroll. Most visitors stay about 20 minutes.

Stay on the Trail: You are entering an important scientific research area. Please stay on the trail and paved surfaces. People walking off the trail can trample plants and impact ongoing research.

Please leave frogs, toads and other natural features undisturbed. Your touch can cause them harm and spread disease.

Ponder as You Wander:

If you were here before the May 18th, 1980 eruption, you would have been walking in the shadow of a magnificent old growth forest, a forest that took root following a massive eruption of Mount St. Helens in the year 1479.



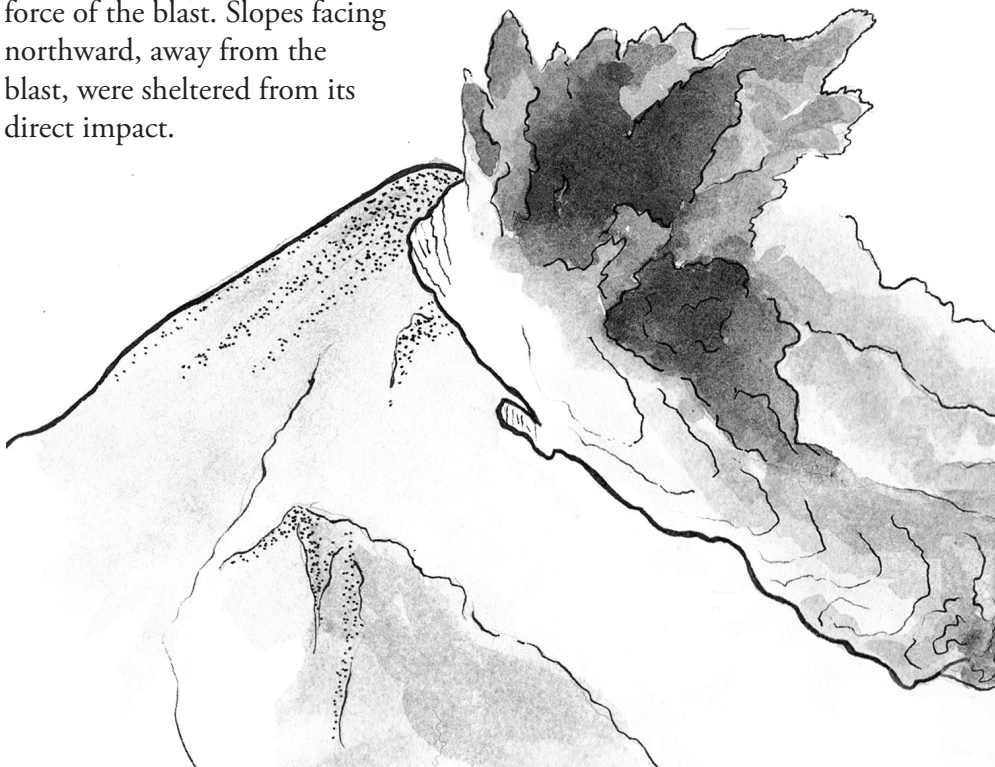
1

The Lateral Blast Swirled and

On May 18, 1980 at 8:32 a.m., pressure from rising magma caused the north face of Mount St. Helens to collapse in a massive landslide. The landslide uncorked built up pressure, deep in the volcano, releasing trapped gases and superheated water in a tremendous sideways blast.

The blast swept northward at more than 300 mph, slamming into ridges, blowing down forests, and snapping massive old- growth trees in half.

As the blast continued northward, it slowed and swirled around steep ridges. South-facing ridges that directly faced the volcano received the full force of the blast. Slopes facing northward, away from the blast, were sheltered from its direct impact.



Scorched its Way Around Meta Lake

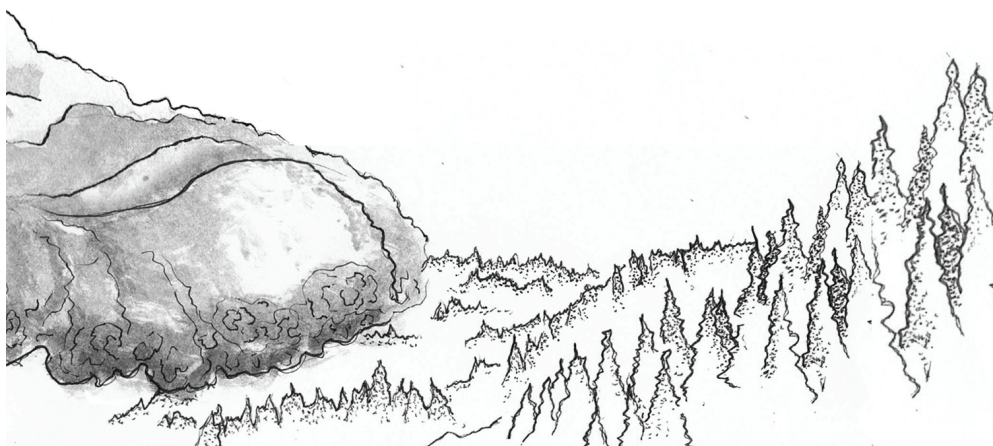
By the time the blast reached Meta Lake, seven miles from the volcano, its speed had slowed, yet the 450 degree F. temperature still scorched the trees.

Look across to the slopes to your left and right. The trees that were blown down are still partially visible and point the direction the blast traveled. Can you follow the direction of the blast as it swirled through this basin?

The north-facing ridge to your left, deflected the blast up and over the ridge. Can you see where the trees were snapped off level with the ridgeline? Like a giant roller coaster, the rock- filled blast swept down across the lake basin, slamming into the far slope across the lake and swirling across the hillside in both directions.

Ponder as You Wander:

If you were here in the early spring of May 1980, you would have been standing in a shady, old growth forest atop 8 feet of snow.



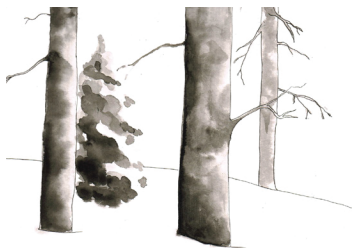


2

Surviving the Eruption was a matter of Place and Time

At 3,640 feet (1,110 m) elevation, spring comes late to the Meta Lake area. In the spring of 1980, on cool, north-facing slopes and beneath the shady forest, the deep winter snow lingered.

The snow provided protection for many plants, amphibians and small mammals. Had the eruption and lateral blast occurred later in the summer, far fewer species would have survived.



Gaze around the lake. Which hillside looks greener? The north-facing slopes behind us and to our left benefitted from being on the back side of the ridge, facing away from a direct blast hit, and were protected by a deep layer of snow. It was on these north-facing, snow-covered slopes that plant and animal survivors were found, living and growing in the aftermath of the eruption.

Surviving and Thriving:

Not all species that survived the eruption thrived in the post-blast environment. Only those species able to take advantage of the comparatively harsh, open blast zone did well. Plant survivors, like understory huckleberry, became an important food source for birds like the Oregon junco. During the decades following the eruption, these pockets of surviving life have gradually spread across the entire landscape.

Ponder as You Wander:

As you stroll think about where these evergreen trees, growing along the trail, came from? How old do you think they are?

3

Snow-Protected Understory Trees are the Foundation for an Eruption of Growth

At the time of the eruption, the small evergreen trees that grew beneath this forest ranged in age from 30 to 90 years old. These evergreen trees, mostly silver firs, survived the eruption buried in snow, beneath a towering old-growth Douglas fir and western hemlock forest.

For years, even decades, before the 1980 eruption, these small fir trees grew slowly. The large trees blocked the sunlight, depriving them of an important source of energy for plant growth. Even though they might have been only a few feet tall at the time of the eruption, many of the silver fir and hemlocks here were already decades old.

After the eruption, the larger trees that shaded the forest understory were gone. Sunlight was abundantly available and the small fir and hemlock trees erupted in growth, doubling, even tripling in height.



Ponder as You Wander:

This young, Pacific silver fir forest will become the next old growth forest, instead of the Douglas fir forest that lived here before the eruption.

However, the bones of the former forest still play an important role in shaping the next one.



4

The Bones of the Old Forest Feed the New

The 1980 eruption deposited six inches and, in some places, over one foot of volcanic ash. High in silica and poor in nutrients, the ash is a tough place for a new plant to grow. However, the decay of the blown down trees is gradually changing all of that.

Notice how the downed trees appear to be melting into and becoming part of the 1980 ash. The blown down trees are decomposing and gradually enriching the ash by adding organic material. Each year, the heavy winter snowpack crushes the decaying tree trunks further into the 1980 ash.



The blown down trees also help to trap and shelter wind blown seeds. Insects, small mammals and birds also find places to forage, nest and hide here. From out of the old dead forest grows a new younger forest and a thriving ecosystem.

Ponder as You Wonder:

Imagine what this forest will look like in 10 years, 50 years and 100 or even 200 years from now.

5

As a New Forest Grows it Turns Off the Light

Take notice of these evergreen trees—they survived an eruption and have benefitted from more than thirty years of direct sunlight. They have grown tall and stout.

Now look around underneath these trees. What don't you see? There aren't many smaller plants or shrubs growing here because the dense

evergreen overstory blocks the available sunlight, providing

little energy to support the plants below. The process

of one plant overtopping and shading out the

smaller plants below is a normal part of the

natural growth of the Pacific Northwest forests

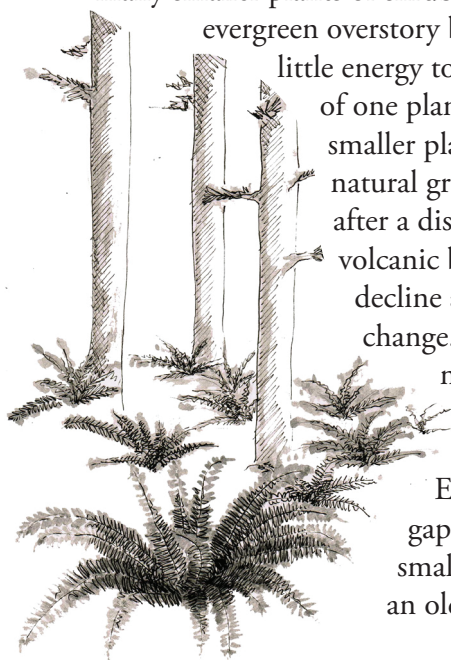
after a disturbance. As a new forest covers the

volcanic blast zone, the available sunlight will

decline and the composition of plant life will

change. Fewer sun-loving plants will grow and

more shade-loving plants will take hold.



Eventually the forest canopy will develop gaps as some trees die or succumb to the small disturbances that occur over the life of an old growth forest.

Ponder as You Wander:

On the morning of May 18th, 1980, there was 8 feet of snow on the ground. What also would have been covering the surface of Meta Lake?

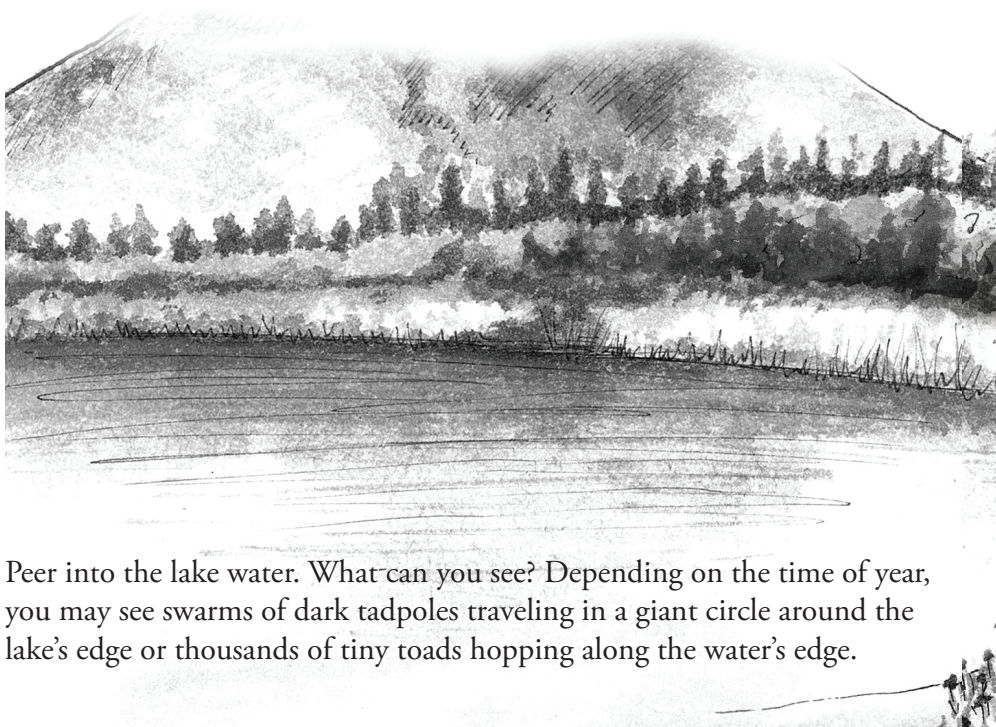


6

A Frozen Cover Shielded Meta

As you step from the forest to Meta Lake's edge, realize that, while a patchwork of snow cover provided some protection for the plants and animals on the land, the ice that covered Meta lake shielded entire aquatic communities from the eruption.

Hibernating in the mud, floating in the water beneath the ice, or waiting for spring to begin their growth—algae, insects, fish and amphibians were all present and protected from the eruption's blast and heat. Immediately following the eruption, heavy runoff and ashfall clouded the lake water and temporarily prevented the growth of algae and the development of other aquatic species. Eventually, with ample sunlight and available nutrients, the lake became a hotspot of biological activity.



Peer into the lake water. What can you see? Depending on the time of year, you may see swarms of dark tadpoles traveling in a giant circle around the lake's edge or thousands of tiny toads hopping along the water's edge.

Lake from the Powerful Eruption

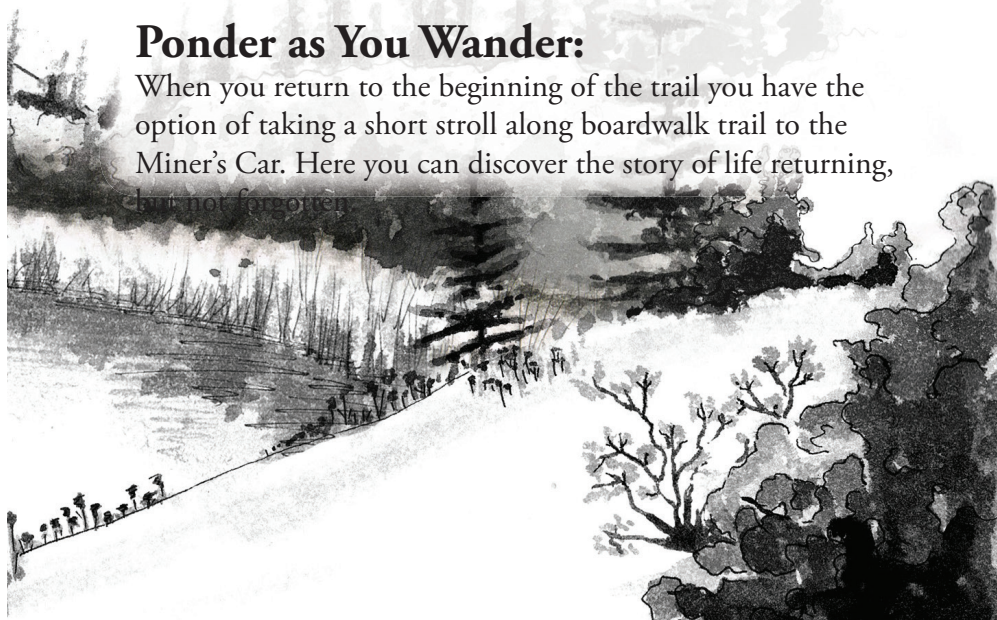
The tadpoles are evidence of one of the largest known populations of western toads. This toad population has a phenomenal breeding rate, with each female laying approximately 10,000 eggs per year resulting in the addition of 2.4 million eggs to Meta Lake each year!



Toads are flourishing along with other amphibian species because they have the advantage of being both aquatic and terrestrial. The adults survived the eruption buried in soil or hidden in logs under a cover of snow and ice. After the eruption they had few remaining predators and little competition for food, allowing them to get a reproductive head start. Eventually, numbers declined as the booming population of tadpoles and adult amphibians became the food source for predators such as great blue heron, ravens and garter snakes.

Ponder as You Wander:

When you return to the beginning of the trail you have the option of taking a short stroll along boardwalk trail to the Miner's Car. Here you can discover the story of life returning, but not forgotten.





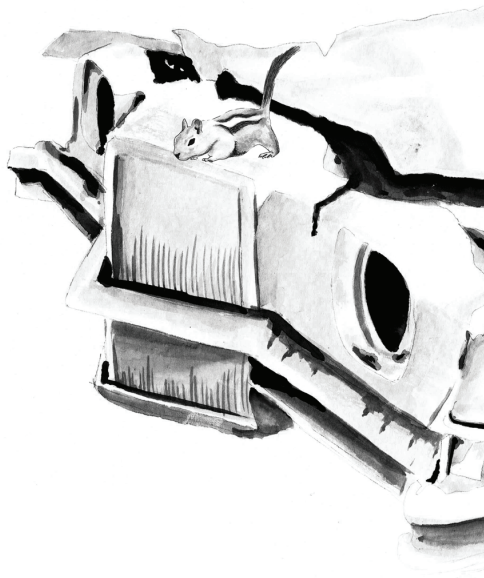
7

The Miner's Car Tells a Story of

As you read the story of the Miner's car and how geologists used the car to help better to understand the 1980 blast, we ask you to reflect on the 57 people who perished on May 18th, 1980. This shattered car reminds us of the lives impacted and yet, as time passes, this car too is fading. Like the blown down forest, it too is sinking into the ground, rusting away and, in so doing, is providing habitat for new life.

Each winter, snow and ice presses down on the car's rusting frame. Plants are seeding into the ash-filled car and have gained a foothold. Western bluebirds perch on the car's hood and golden mantled ground squirrels find a perfect place for nesting inside the car.

Nature is taking over and, as the forest fills in, this car and its story of enormous power and change will gradually disappear beneath a new story of returning life.



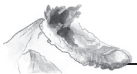
Life Returning, but Not Forgotten

Ponder as You Wander

As you return to your car, take a careful look at the forests growing on either side of the 99 Road. The area across the road from the Meta Lake parking lot (south side of the road) is located outside the boundary of the National Volcanic Monument.

The trees growing outside the monument are noble firs that were replanted in 1988 by the US Forest Service. Here on the north side of the road, inside the monument, trees that survived the eruption are growing but at nature's rate and through a natural process.

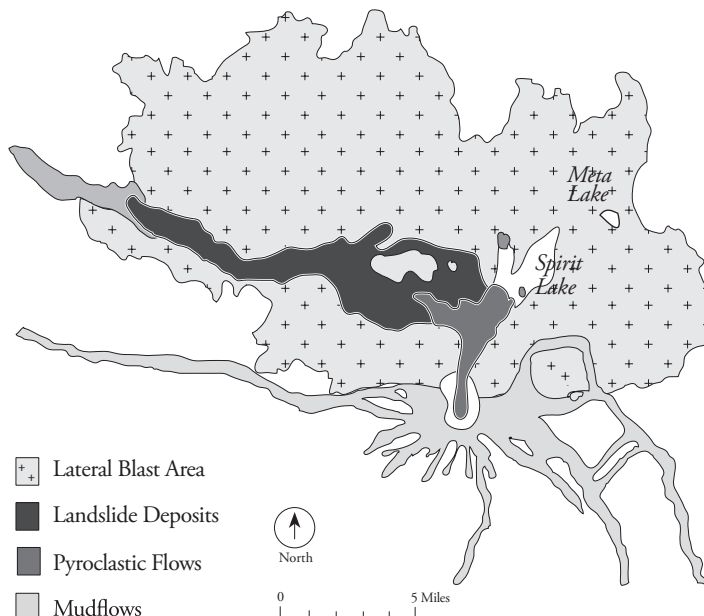
Over time these two very different forests will continue to grow inside and outside the monument. As they grow, scientists will continue to conduct research to gain knowledge and a better understanding of the complex interactions between forest ecosystems and volcanic eruptions.



Mount St. Helens Eruption Sequence on May 18, 1980

8:32 a.m.

- 5.1 earthquake marks the start of a massive landslide.
- Landslide uncorks pressurized gas and steam releasing a 300 mph lateral blast.
- Eruption column of ash reaches 15 miles high.
- Mudflows form and flow down Toutle and Muddy Rivers.
- Fiery flows of pumice and ash called pyroclastic flows, flow from the crater.



Ten birds to look and/or listen for:

great blue heron
mallard duck
rufous hummingbird
osprey
white-crowned sparrow
common raven
mountain chickadee
marsh wren
mountain bluebird
common yellowthroat



Can you find?

A tree that survived an eruption in 1479 but not 1980?

A swarm of tadpoles along the lakeshore?

Sign that beavers have been in this area?

A nest?

A golden mantled ground squirrel?

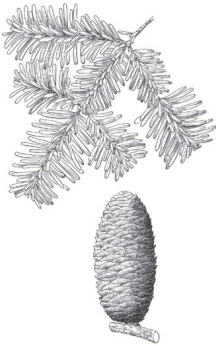
An old beaver dam along the outlet creek?

A place protected and preserved as a living laboratory-
the Mount St. Helens National Volcanic Monument?



Pondering the Plants along the Way

The Meta Lake trail is a great place to observe the amazing story of plant survival and re-establishment following the 1980 eruption. As you walk the trail, look for plants that survived the eruption and colonizing plants that have established over since 1980.



Pacific silver fir



mountain hemlock

The best example of plant survivors are the snow-protected Pacific silver fir trees that line the trail. If you look carefully, you may also see surviving mountain hemlock trees. Surviving forest understory shrubs like mountain huckleberry can also be found along the trail.



mountain huckleberry

In open areas where sunlight is abundant you will find examples of colonizing species that have established since the eruption. The best example of a colonizer is fireweed. In late summer, millions of light, cotton-covered fireweed seeds drift across the blast zone.



fireweed



pearly everlasting

Pearly everlasting another successful colonizer can also be found in sunny openings along the trail. In late summer, look for the long-lasting white flowers that give pearly everlasting its name.

Along the way, you may also encounter purple-flowered broadleaf lupines.



broadleaf lupine



Help prevent Mount St. Helens from

What is a noxious weed?

A noxious weed is defined as, “an introduced, invasive plant that is not valued where it is growing, grows vigorously and tends to outgrow or choke out more desirable native plants.”

How Can I Help Prevent the Spread of Noxious Weeds?

Don't Give 'em a Ride

Before leaving and traveling to a new area:

- *Brush your footwear and clothing clean of caked-on soil and seeds.*
- *Brush and shake seeds out of your tent, camp chairs and sleeping bags.*
- *Brush or wash your animals.*
- *Clean your car's undercarriage and tires.*



The participation of concerned hikers, campers and sportsmen is an important part of this effort. To find out how you can help, visit the Get Involved pages at mshinstitute.org or contact us at info@mshinstitute.org



Scotch Broom
(*Cytisus scoparius*)



Herb Robert
(*Geranium robertianum*)

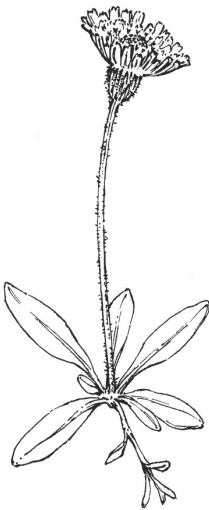
being overrun by Noxious Weeds

The US Forest Service, collaborating state and local agencies and dedicated volunteers are working hard to protect this special place. Given the size of the area and abundance of noxious weeds, we have to prioritize which weed species to control and areas to treat.

Efforts are being focused on areas closest to visitor facilities and trails and weeds that pose the greatest threat to native plants and wildlife. We're taking care to use control methods that are both effective and have the least chance of harming native plants and the surrounding environment. Treatments include hand cutting and pulling; cutting and daubing stems with herbicides; and spot-spraying.

The noxious weeds of greatest concern are capable of:

- *spreading rapidly by underground stems and abundant seed*
- *inhibiting the establishment and growth of native species*
- *reducing forage for wildlife and decreasing forest diversity*



Mouse ear hawkweed
(*Hieracium pilosella*)



Spotted Knapweed
(*Centaurea maculosa*)



Suggested Donation: \$2

Reprinting of this brochure is made possible by your generous donation.



Founded in 1996 by people passionate about Mount St. Helens, the Mount St. Helens Institute is a 501(c) (3) private, nonprofit organization devoted to helping people understand and protect the volcano.

The Institute believes that this special landscape deserves support through education, research and stewardship. The Mount St. Helens Institute is an equal opportunity employer and provider.

To find out more about Mount St. Helens and how you can get involved visit us at www.mshinstitute.org or call (360) 449-7833.



Discover Your Northwest promotes the discovery of Northwest public lands, enriches the experience of visitors, and encourages stewardship of these special places today and for generations to come. www.discovernw.org



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www.fs.usda.gov/mountsthelens

for the greatest good

Brochure by Celese Spencer; Updated 2014
Plant drawings courtesy of University of Washington Press
Illustrations by Amy Diehl
Seattle, Washington



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