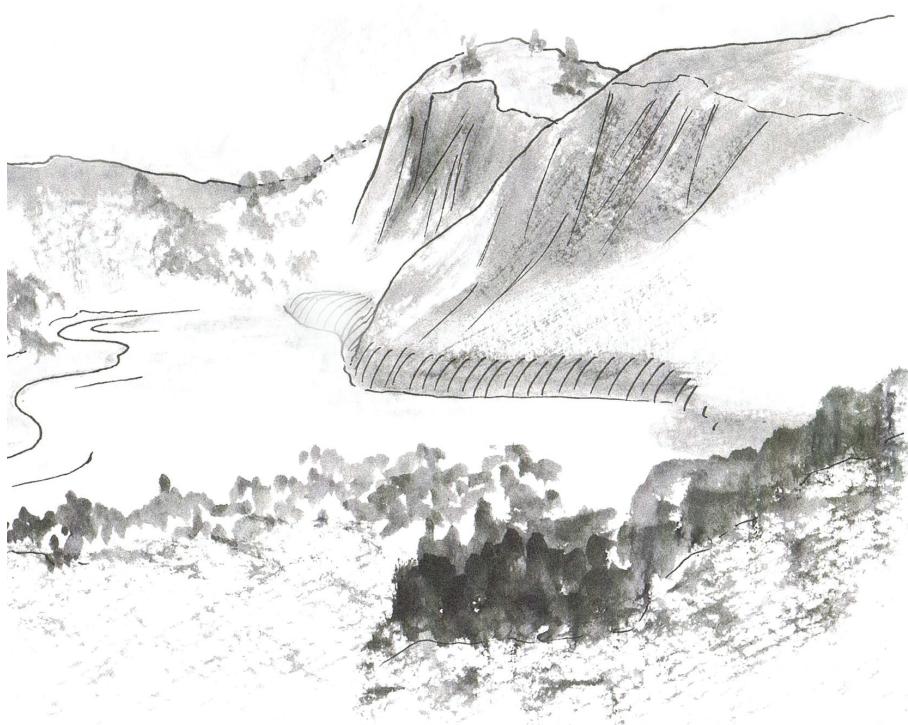




# HUMMOCKS TRAIL GUIDE

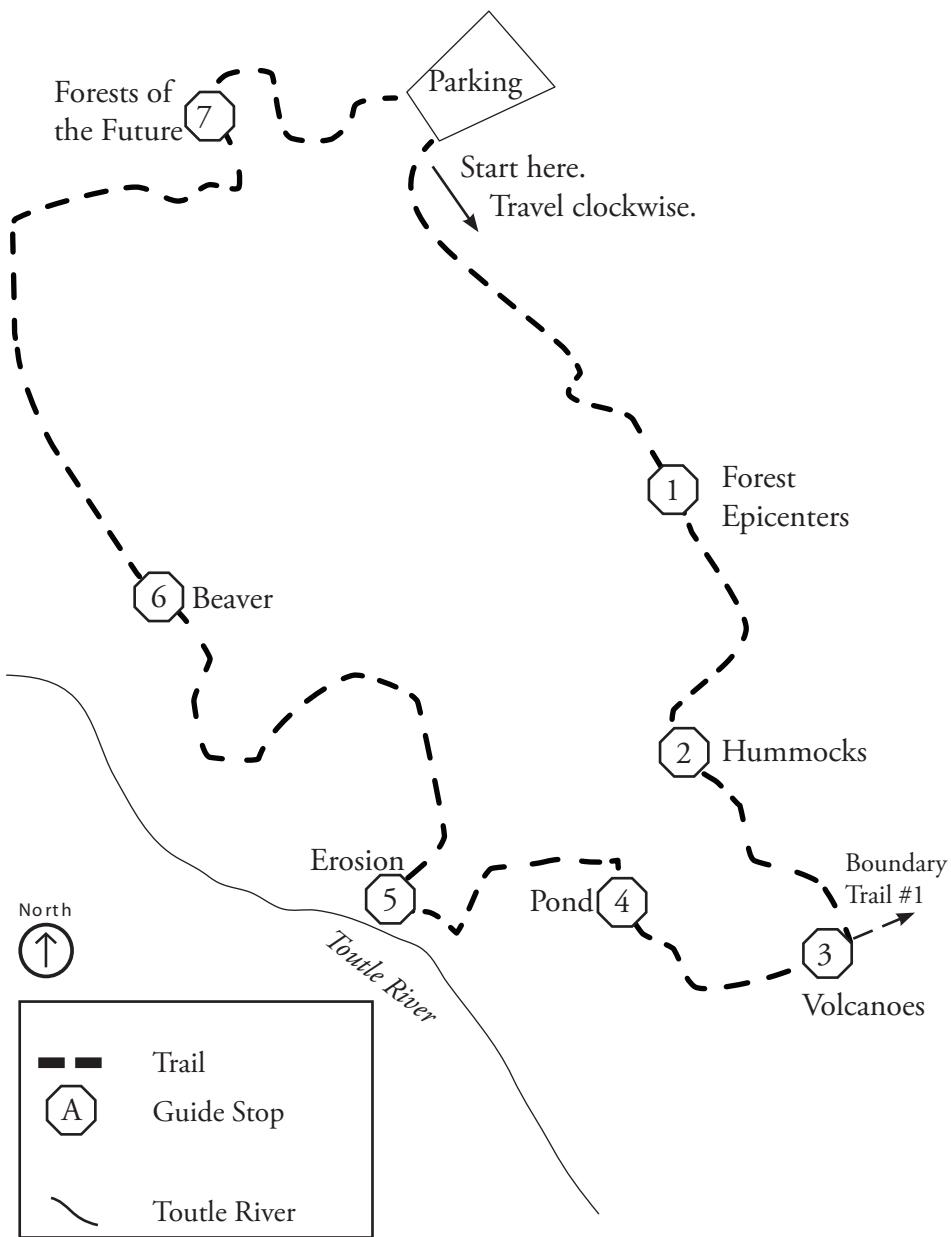


*Discover a Huge Landslide that Set in Motion  
Unimaginable Transformations.*

**gifford pinchot  
NATIONAL FOREST**



# Hummocks Trail



# Discover a Cascade of Change

A gigantic landslide from the collapse of Mount St. Helens on May 18, 1980 caused a cascade of change that still resonates in the landscape today. The colossal landslide that filled this valley set the stage for incredible erosion that continued for decades, while simultaneously creating stable oases from which life has sprung with amazing speed.

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: 2.3 mile loop

Rock and ash-covered trail with a 300-foot elevation change

Short hike option: 1 mile round-trip out to the Boundary Trail Junction and back.

**Stay on the Trail:** You are entering into an important scientific research area. Entry is permitted on-trail only. Stay on the trail and protect ongoing research studies and the beautiful wildflowers growing along the trail. Research plots are marked by stakes, plastic pipes and flagging; please do not disturb them.

## Ponder as You Wonder

Look for trees growing beside ponds that formed after the eruption. Why are the tree trunks thicker closer to the ponds and smaller in diameter further away?



1

## New Ponds Become Epicenters for Forest Re-Establishment

The small hills that fill this valley form small watersheds. Water collects at the base of hummocks, creating abundant ponds. More than 150 ponds and wetlands have formed from rainfall, snow melt and groundwater. Trees and other plants established along moist pond shorelines, spreading outward and merging into dense forests. The valley is quickly being covered by a dense alder forest.

Red alder is playing a critical role in paving the way for the eventual return of evergreen forests. Red alder has the unique ability to “fix” nitrogen. It harbors bacteria in bumpy nodules on its roots that gathers nitrogen from the air and supplies it to the tree. As a result, red alder grows fast, anywhere from three to five feet per year.

Each fall the alder drops its leaves and nitrogen is added to the landslide deposit along with carbon. Over time, the added nutrients will help develop a productive soil from what was, not too long ago, the inside of a volcano. By improving the soil and creating a cooler shady habitat, red alder helps pave the way for other plants to follow.



### Ponder as You Wander

Keep an eye open for small evergreen trees slowly growing in the understory of the alder forest, and imagine how this landscape will change in just a few years.

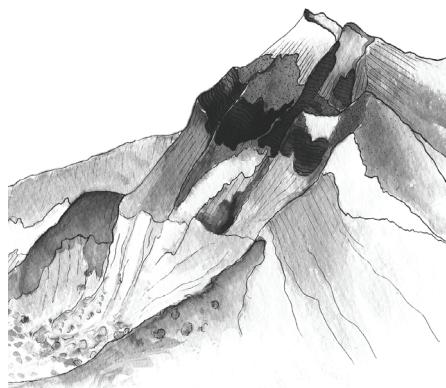
## 2

# Mount St. Helens Collapsed, Filling the Valley with Hummocks

*hum•mock n. A low mound or ridge of earth; a knoll.*

The May 18th, 1980 eruption of Mount St. Helens began with a gigantic landslide. The north side of the volcano crumbled into the valley north of the volcano. Most of the landslide slammed into Johnston Ridge and was deflected westward down the Toutle River Valley. In just 10 minutes, the landslide covered 14 miles of valley to an average depth of 150 feet.

Parts of the collapsing volcano broke into pieces that “rode” along the surface of the landslide, coming to rest as intact chunks of the mountain called hummocks. Much of the landslide tumbled and broke apart to become a jumble of volcanic rock.



As you continue along the trail, see if you can recognize any differences between the many hummocks. As time passes, erosion and a quickly growing forest are obscuring many of the hummocks.

## Ponder as You Wander

Imagine you were here before the May 18, 1980 eruption, walking through a young evergreen forest located 230 feet below your feet



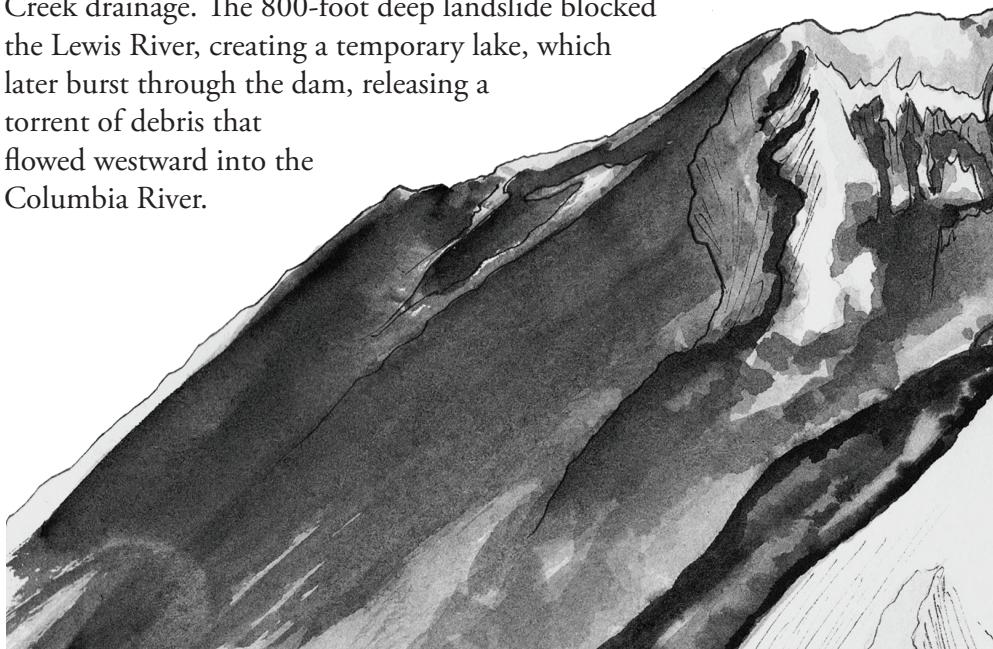
## 3

## Volcanoes Rise, Fall and

Although the May 18, 1980 eruption caused incredible change in a matter of minutes, Mount St. Helens has been erupting for nearly 300,000 years. Considered a young cascade volcano, it sits atop a much older volcanic foundation. Imagine a building whose upper floors keep collapsing and getting rebuilt, but the foundation remains the same.

2500 years ago, Mount St. Helens summit collapsed and a gigantic landslide roared down this valley. The massive landslide blocked a creek, creating Spirit Lake. Without an outlet, Spirit Lake's water level rose until it burst through the landslide dam, releasing a concrete-like slurry of mud and rock that flowed west to the Columbia River.

24,000 years ago the south flank of the volcano collapsed and a gigantic landslide roared 10½ miles south down the Swift Creek drainage. The 800-foot deep landslide blocked the Lewis River, creating a temporary lake, which later burst through the dam, releasing a torrent of debris that flowed westward into the Columbia River.



# Rise Again

During the May 18, 1980 landslide, Mount St. Helens lost about 6% of its total volume, but within 5 months new eruptions began to slowly reconstruct the volcano. Lava domes are the building blocks of Mount St. Helens.

Between October of 1980 and 1986, 17 eruptions of thick pasty lava built a 920 foot-tall lava dome inside the crater. When Mount St. Helens reawakened in 2004, it erupted thick lava onto the crater floor for 3½ years, like toothpaste squeezed from a tube, creating a new dome that is 11 football fields long and 1350 feet tall. Combined, these two new lava domes have replaced 8% of what was lost during the May 18, 1980 eruption.





4

## Ponds Become Biological Hotspots

After the eruption, water collected in low areas, and trees and other plants quickly established along the shorelines. These wetland areas are full of life: algae, insects, amphibians, birds, and mammals.

Amphibians were not expected to survive or do well in the post-eruption environment, but Pacific chorus frogs, red-legged frogs and western toads survived in nearby drainages and hopped in after the eruption to reach new habitat. For more than a decade their populations soared as the amphibians that had few predators bred in large numbers. The Monument hosts one of the largest and healthiest populations of amphibians in the Pacific Northwest.

The depth and size of each pond varies and provides unique habitat for birds. Some ponds are deep, while many others are shallow.

More than half of the ponds dry up by the end of the summer. These fluctuating water levels cause habitat conditions to change. The slope along shorelines and depth of the water in each pond determine which birds use them.



Look and listen for the birds that use the different pond habitats.

*Look for:*

Common yellowthroat and orange-crowned warbler in the willows along the shoreline.

Red-winged blackbird and marsh wren in cattails along the shoreline.

Great blue heron in shallow water.

Also look for pied-billed grebe and dabbling ducks like the cinnamon teal and mallards.

Deeper ponds attract diving ducks, such as the common merganser and Barrow's and common goldeneyes.



## Ponder as You Wander:

As you stroll to the next stop, compare the vegetation along stable pond shorelines to the barren, unstable floodplain of the North Fork of the Toutle River.



## 5

## Canyon Carving

The landslide completely buried a 14 mile stretch of the North Fork Toutle River. Erosion began before the eruption ended. Five years after the eruption, most of the canyon seen here was carved as the river formed a new channel. The average amount of sediment carried downstream in each of the first five years would cover a football field to a height of 360 miles! From 1980 to 1983, an estimated 8 million tons of ash also washed off the surrounding hillsides into the Toutle River system. After the eruption, the Toutle River was one of the most sediment-laden rivers in the world.

The terraces along each side of the river reveal stages in the canyon carving process. Notice how the river is braided, shifting from side to side, undercutting the steep slopes and banks, which then collapse adding more sediment to be carried downstream. So far, the meandering river has only eroded about 10% of the landslide deposit.

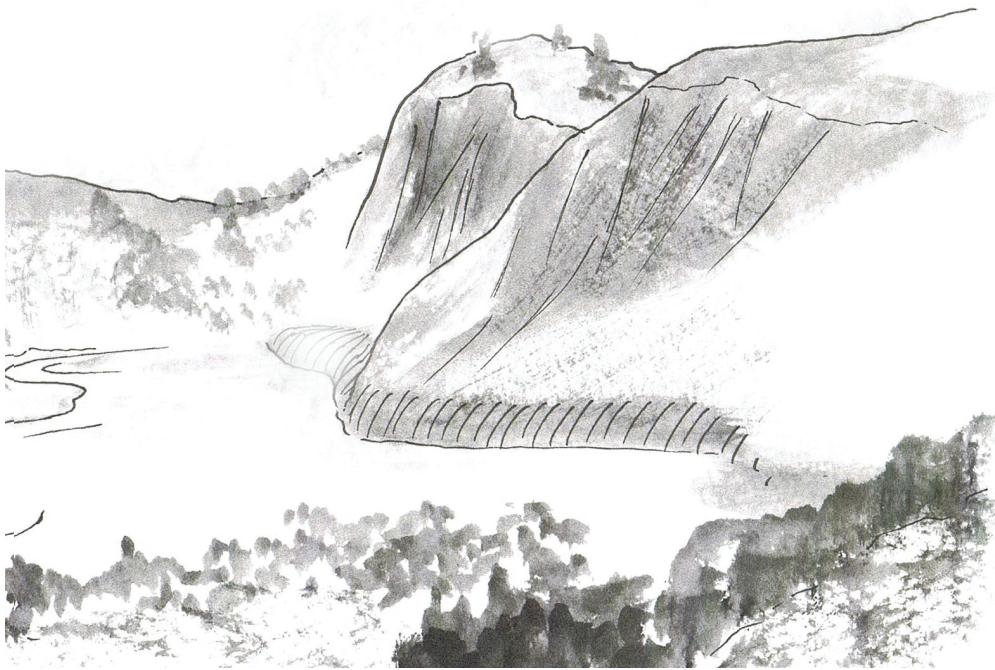


## Creates Problems

In 1987, the US Army Corp of Engineers completed a Sediment Retention Structure (SRS) on the Toutle River. The SRS was designed to slow the flow of water and collect sediment to reduce flooding and protect the downstream river channel for shipping. The structure is now 90% full and has amassed more than 100 million cubic yards of sediment. Planning for future flood protection continues as the river continues to erode and transport sediment downstream.

### Ponder as you Wander:

Take a moment to simply enjoy this dramatic and chaotic landscape and ponder how change occurs both slowly and quickly in this dynamic landscape.





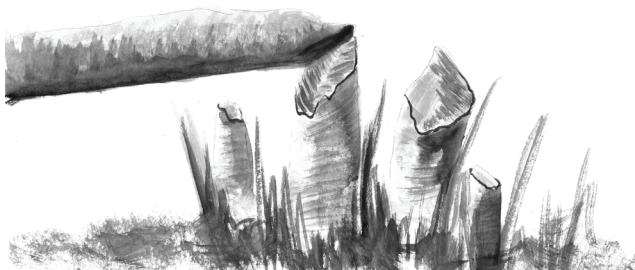
## 6

## Beaver Engineered Ecosystems

How did beaver get here? Where did they come from? Scientists believe they dispersed (walked in) from the Green River and Maratta Creek drainages to the north.

Streams and ponds in the hummocks are ideal habitat for beavers. Here, where a small stream once flowed, a beaver moved in, built a dam and created new habitat. With the sturdy beaver dam in place, the water slows, algae and rooted vegetation grows, enabling insects, amphibians and small mammals to thrive. Beaver dams can have negative impacts as well. As water rises behind the beaver dam, the flooded trees die. The birds that perch or nest on those trees often vacate the area, but are replaced by ducks and other birds that make use of the pond.

By cutting down trees and flooding the area, the beavers keep the pond open so sunlight reaches the water, increasing algae growth. The beavers eventually cut down and use all the available trees. Without trees, the beavers eventually leave, the dam deteriorates, the pond becomes a stream until the trees grow back, and eventually the beavers return to build again.



### Ponder as You Wander

Try to imagine how this spectacular pond will change, if and when, the beaver abandon the site.

## 7

# A Cascade of Change Continues

It is hard to imagine that the steep slope you just ascended was bare rock and ash just 30 years ago. The scale of change that has occurred here is evident in the soothing shade of this red alder forest. Shadows cast by the towering trees have eliminated habitat for sun-loving plants, while creating conditions for a new cast of characters. Can you spot the shade-loving sword-fern? How about the few Douglas fir trees that are hanging on beneath the dense red alder forest?

The thought of shade-loving forest ferns thriving here today would have been incomprehensible 30 years ago. Eventually the fast growing alders will succumb to snow breakage and windthrow and an evergreen forest will rise again. The idea of a lush evergreen forest eventually covering this valley somehow no longer seems to be such a farfetched idea.

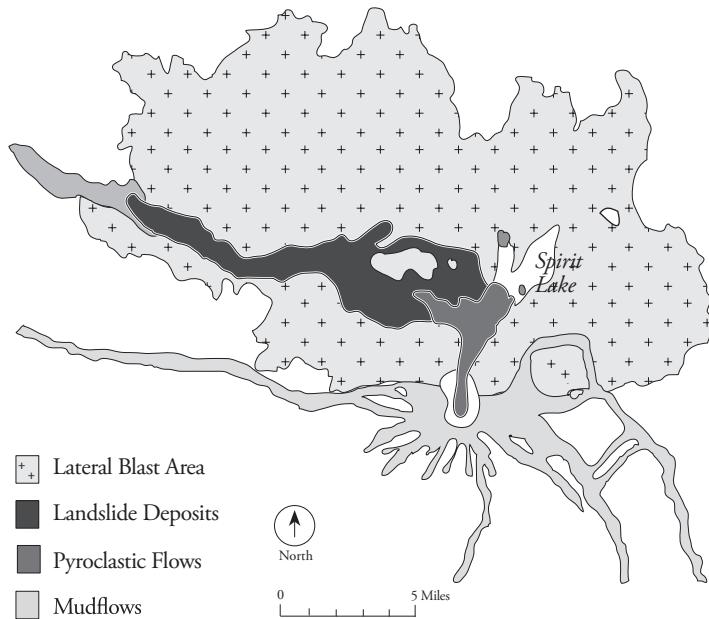
The Mount St. Helens National Volcanic Monument was preserved to change in unimaginable ways. The hummocks trail provides testament to the cascade of change that has and will continue to occur in this magical place.



# Mount St. Helens Eruption Sequence on May 18, 1980

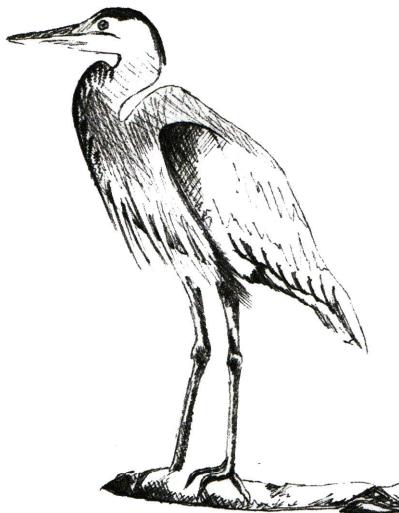
**8:32 a.m.**

- 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  
American robin  
common raven  
mountain chickadee  
marsh wren  
killdeer  
common yellowthroat



## Can you find?

- Mount St. Helens has rarely erupted fluid basalt lava. Find a red or black rock and you may have discovered a rare eruption.
- The landslide carried giant blocks of glacial ice. Find a distinct depression and you may have found where glacial ice melted.
- Elk abound in this valley and browse some of the evergreen trees so close that the trees look like bottle brush cleaners.
- Watch for red-legged and Pacific chorus frogs crossing the trail. Don't touch; it can harm them and spread disease.
- A place protected and preserved as a living laboratory-the Mount St. Helens National Volcanic Monument?



# Pondering the Plants along the Way

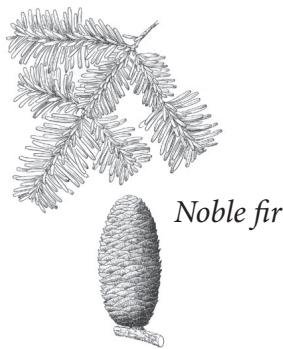
Since 1980, this debris-filled valley has undergone an amazing transformation. Virtually every plant you see has established from seed, many transported from miles away by strong winter winds. Abundant forage species like grasses and clover were carried in and deposited in the abundant droppings of elk and deer.



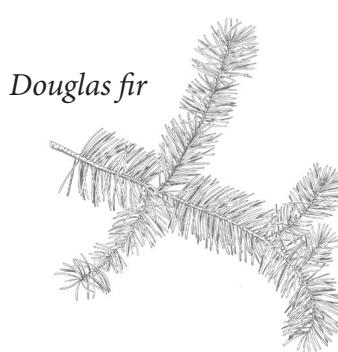
*Red Alder*

Most of the broadleaf trees you see are red alder, a pioneering tree that is rapidly reforesting the valley. This fast-growing tree is being joined by the slower growing seedlings and saplings of six evergreen tree species.

Watch for Douglas-fir and noble fir, two species that are likely to outlive the alder and, eventually form a towering old-growth forest.

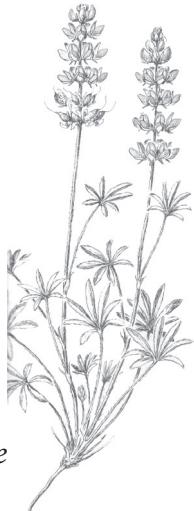


*Noble fir*



*Douglas fir*

Can you find the small, but significant prairie lupine? It is an incredibly tough subalpine plant that was one of the first plants to colonize the barren, debris-filled valley north of the volcano.

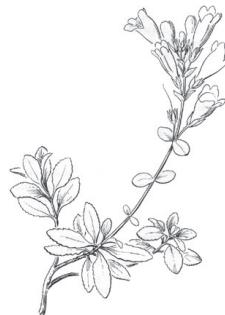


*prarie lupine*

You may also see the brilliant subalpine flowers of the common red paintbrush and purple Cardwell's penstemon.



*Common  
RedPaintbrush*



*Cardwell's penstemon*



# 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](http://mshinstitute.org) or contact us at [info@mshinstitute.org](mailto:info@mshinstitute.org)



Scotch Broom  
(*Cytisus scoparius*)



Herb Robert  
(*Geranium robertianum*)

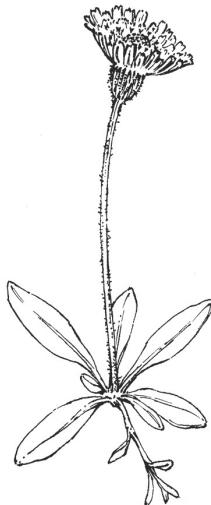
# being overrun by Noxious Weeds

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*)



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## Suggested Donation: \$2

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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](http://www.mshinstitute.org) or call (360) 449-7833.



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