

# Rumblings



Lyn Topinka, USGS

Issue 1 - November / December 2013

## Another Eruption!

This eruption is of people and the opportunity to make Mount St. Helens the most studied and inspirational volcano on the planet. The Mount St. Helens Institute, encouraged by explorers, scientists, teachers, poets, and fueled by the beauty of the landscape itself, is ready to grow. You can feel the rumblings!

A homegrown private non-profit charitable organization, MSHI has now successfully modeled science field seminars for adults, stream team studies for youth, and volcano outdoor school for children. We have mentored science interns, environmental educators and landscape conservationists.

Our institute leads guided climbs to beautiful forests, the volcano rim and into the crater. We offer inspirational retreats to places of dramatic natural renewal and reassembly. We add nature's lessons to adventure and exploration on the slopes, streams and caves of the mountain. We coordinate hundreds of volunteers who jump at the chance to live their dream of building sustainable



**Toutle Lake High School students conduct ecological research side by side with scientists during their visit to Mount St. Helens**

relationships between people and the rest of nature.

We are ready, with your help, to replicate our success for the benefit of thousands of people in the Northwest and visitors from across the country and around the world. We are excited about advancing new, broad and deep understanding of earth dynamics that erupt insights about smart human action in nature and inspired life.

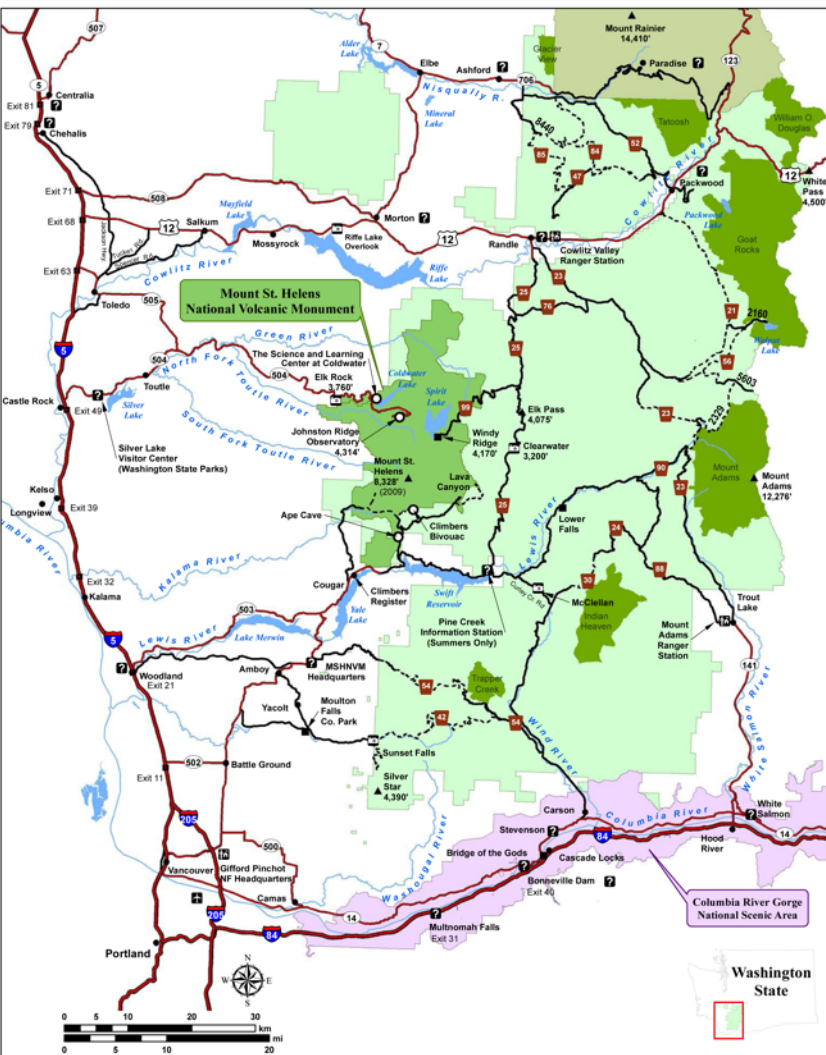
This inaugural edition of Mount St. Helens Institute's newsletter, "Rumblings," showcases our current menu of exciting programs and opportunities for exploration and

learning. Please enjoy what will be regular contributions from leading explorers, scientists and educators. Review a summary of our newly adopted three-year organization plan. Get acquainted with how MSHI advances people's understanding of the earth. Be the first to see upcoming events and opportunities around the mountain.

We kick off an ambitious Mount St. Helens Institute membership program with this newsletter. MSHI membership will connect you, your family and friends with the cool and engaging exploration, field and class activities we offer around the volcano we all share. Note the many benefits of MSHI membership on the back of this newsletter. Your membership will make you part of this explosion of understanding of the earth.

There is a relentless balance about nature – its fragility and power of destruction, its reconstruction and resilience. We at the Mount St. Helens Institute choose to advance people's understanding of our place in that balance. We welcome your support in this great cause. Be part of the great Pacific Northwest volcanic landscape.

- Tom Wolverton, Board President



For more information, visit our websites at:  
<http://www.fs.usda.gov/giffordpinchot>  
<http://www.fs.usda.gov/mountstheleens>  
 or call (360) 891-5000

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**Gifford Pinchot NF**  
 Admin. Boundary  
 Mount St. Helens NVM  
 Wilderness Area  
 Columbia River Gorge NSA

**Landmarks**  
 Locale  
 Summit  
 City, Town, Community  
 Airport  
 Information

**Transportation**  
 Interstate Hwy.  
 US, State or County Hwy.  
 Other Paved Road  
 Milepost Marker

**Hydrography**  
 Lakes and River Areas  
 Rivers

This map is intended for general reference and is approximate in general proportions. Elevations are in feet.

For Road and Recreation Conditions Report, go to this link:  
<http://www.fs.usda.gov/recreation/giffordpinchotrecreation#cond>  
 Printed June, 2012



## Mission

The Mount St. Helens Institute is a non-profit organization that advances understanding and stewardship of the earth through science, education and exploration of volcanic landscapes.

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The *Rumblings* newsletter is published bi-monthly by the Mount St. Helens Institute, a private non-profit organization. Please submit articles by the 8th of the month to Luke Wakefield - [lwakefield@mshinstitute.org](mailto:lwakefield@mshinstitute.org)

*We depend on your contributions.*

## Important Partners in Mission

Mount St. Helens Institute owes its success to ongoing partnership with the following outstanding organizations:

Gifford Pinchot National Forest -- Mount St. Helens National Volcanic Monument -- U.S. Geological Survey Cascade Volcano Observatory -- Pacific Northwest Research Station -- Discover Your Northwest -- Washington STEM -- Clark County -- Skamania County -- City of Amboy -- City of Vancouver -- City of Portland -- Washington State University -- Oregon State University -- U.S. Fish and Wildlife Service

*Other important partnerships will be highlighted in future editions of Rumblings.*





## Views and Brews - Mount St. Helens as a Traditional Cultural Property

**November 19 in Vancouver**  
**November 21 in Longview**

**Nathan Reynolds - Ecologist - Cowlitz  
Indian Tribe**

*Come and learn all about how Mount St. Helens holds such strong cultural significance to the local Cowlitz Indian Tribe. Ecologist Nathan Reynolds will explain the importance of Mount St. Helens, other than just its geologic marvel.*

**Presentation Begins: 6:30 pm**



## June Lake Snowshoe January 18

*This is one of the most popular snowshoe adventures we lead. This round-trip snowshoe takes you up to the remote and peaceful June Lake and the bleaching white snow of beauty and wonder.*

**Meeting Time:** 10 am

**Distance:** 6 miles

**Difficulty:** Moderate

**Cost:** \$30 (Snowshoe rental is available for \$15/pair)

## Old Man Pass Snowshoe January 25

*This is a peaceful and undiscovered wonder just outside of Stevenson, WA. You will snowshoe at an elevation of about 3,000' on a volcanic plateau between Mount St. Helens and Mt. Adams. Journey through this peaceful mature forest along untracked snow.*

**Meeting Time:** 10 am

**Distance:** 6 miles

**Difficulty:** Moderate

**Cost:** \$30 (Snowshoe rental is available for \$15/pair)

## Elk Pass Snowshoe February 1

*This snowshoe is for the adventurous soul. The Elk Rock area, just off State Road 504 on the west side of Mount St. Helens, has beautiful slopes and always gets fresh powder so you are able to spot the winter wildlife roaming through the forest.*

**Meeting Time:** 10 am

**Distance:** 5-7 miles

**Difficulty:** Moderate

**Cost:** \$30 (Snowshoe rental is available for \$15/pair)

## Ape Cave Snowshoe and Cave Exploration February 15

*This wonderful adventure will take you directly to Ape Cave where we will descend into the cave for a dark walk to the lava tube's terminus. We will continue above ground, weaving in and out of a forest with a rich volcanic history. This adventure is easy and relatively flat. It is perfect for both beginners and more experienced snowshoers alike.*

**Meeting Time:** 10 am

**Distance:** 3.3 miles

**Difficulty:** Easy

**Cost:** \$30 (Snowshoe rental is available for \$15/pair)

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# Dynamic Outdoor Laboratory

Mount St. Helens is a laboratory that has drawn scientists from across the globe to understand volcanic processes and ecological change. In the spirit of our mission, the Mount St. Helens Institute provides science education for learners of all ages using this dynamic outdoor laboratory. We believe that through immersion in place-based learning students gain not only understanding but appreciation. Throughout our programs, students find diverse challenges from the weather, the difficulty of a hike or the complexity of the information; it is through working in these real-world challenges that the mountain offers a unique perspective.



## Ecological Research for High School Students

During late September and early October, 150 high school students from Castle Rock High School, Toutle Lake High School, Wahluke High School, Centralia High School and iTech Preparatory School traveled to MSH to collect ecological data side-by-side with scientists. This third year program provides students with an opportunity to learn and engage with the outdoors, real data and real world problems. Scientists and professionals work with small student groups at research sites to assist with understanding the protocol and using the technology to gather data. Through this hands-on engagement with professionals, students not only better understand these



John Brugman

challenging ecological concepts but also meet individuals who passionately wish to share their career experiences with a younger generation. Back in the classroom, students share their experience with other classmates and work to develop a strong research question, enter data into a spreadsheet, analyze the data and prepare a poster which they will present at a research summit in December.

This is a grant funded program that relies on strong partnerships. In 2012 MSHI received funding from Washington STEM and in 2013 MSHI received a USFS Children's Forest grant in partnership with the Mount St. Helens National Volcanic Monument.

## STEM Projects

Using these same principals of inquiry and place-based learning, the Mount St. Helens Institute offers other youth experiences on the mountain. We host and partner with regional Science, Technology, Engineering and Mathematics (STEM) programs to bring high school and community college students into the field.

## Youth Stream Team

We bring urban and at-risk youth to stream restoration projects in the East Fork Lewis River and North Fork Lewis River to develop an understanding of watershed issues, fisheries and stream ecology.

## Internships and Volcano Outdoor School

We provide opportunities for community college and undergraduate students in

environmental education, fisheries and ecology. Volcano Outdoor School is another youth program that is run out of the Science and Learning Center -- See page 6.

## Field Seminars

For lifelong learners, field seminars offer an exploration into the landscapes of Mount St. Helens with the experts. Field seminars take participants into the crater and to the summit with professional geologists and biologists, into the hidden lives of wildlife, out onto the Pumice Plain and the boom and bust cycles that define succession, behind the lens of a camera and into the stories of people who have spent a lifetime on the mountain. Our field seminar schedule changes from year to year, so please let us know what you would like to learn about the mountain and the people who are drawn to it.

-Abigail Groskopf, Science Education Manager

## Organism Spotlight!

**Bull Trout** (*Salvelinus confluentus*) are not actually trout (despite their name), but rather a type of fish in the salmon family known as *Char*. Unlike salmon, bull trout spend their entire lives in streams and lakes, never reaching the ocean. They travel up cold, high gradient waters in the fall to spawn. Currently scientists from the Mount St. Helens Institute and other organizations are working to better understand and protect this threatened species in upper Lewis River tributaries on the south side of Mount St. Helens.

Bull Trout







Charlie Crisafulli

## Science In Action

Mount St. Helens is known for its science.

From ecology to geology, basic to applied, low-tech to high-tech, Mount St. Helens is one of the preeminent outdoor classrooms and research areas on the planet. The past 33 years of research at Mount St. Helens has resulted in a complete “makeover” of our understanding of ecological disturbances, volcanic eruptions and how people live with such a life-altering event. The Mount St. Helens Institute is proud to be an integral partner in science at Mount St. Helens.

Our field camp at **Windy Ridge** is situated among the camps of researchers from around the world. From this vantage point, we are able to learn from their findings as they come back from the field every evening. We are also able to provide local and visiting researchers with logistical support in the form of accommodations, connections with other researchers and field assistants. For instance, we were able to host twelve scientists from the Northwest Lichenologists for three days, resulting in a first-time **inventory of lichens** at Mount St. Helens. We were proud to have several of our staff contribute to this benchmark research effort.

Not all science happens at Windy Ridge, though. The south side of Mount St. Helens is the site of a \$120 million salmon restoration effort. In preparation for this **salmon restoration** effort, habitat restoration has been a priority for the U.S. Forest Service. This is where MSHI comes in: while

the Forest Service has been responsible for the habitat restoration, MSHI has spearheaded the monitoring of these habitat restoration efforts, collecting stream cross-section, long-section, photo points, and salmonoid habitat data across over 75 sites. Since 2008, urban youth have taken part in this restoration work through our **Youth Stream Team** program, helping to collect data and learn about these important ecological systems.

Salmon aren’t the only fish impacted by dams on the Lewis River. Bull trout, a threatened fish native to the Northwest, live in the reservoirs and streams of the upper Lewis River. Excitingly, 2013 has been the year of the **bull trout** for MSHI. Along with the U.S. Forest Service, U.S. Fish and Wildlife Service, the Lower Columbia Fish Recovery Board and Washington Department of Fish and Wildlife, MSHI received grant funding from Pacificorp to begin research that hopes to shed some light on the elusive Lewis River bull trout and inform potential bull trout habitat restoration efforts.

Our “**Ecological Research** Experience for High School Students” program puts students from five schools across Washington in the field with MSHI natural research professionals to collect data and conduct actual research. **Field seminars** are lead by expert scientists,

lending a whole new (point of) view on a hike. All that we do is informed by the wealth of science discoveries at Mount St. Helens.

Finally, we bring science to the masses through our myriad education programs. **Volcano Views and Brews** gives scientists a platform to discuss their discoveries over a beer with an audience of eager listeners at Loowit Brewing in Vancouver and at the Hop n’ Grape in Longview.

-Ray Yurkewycz, Science Manager

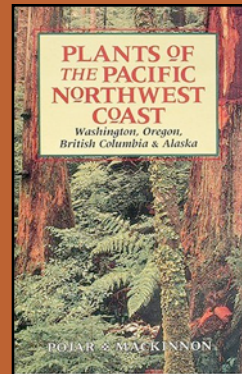
## Ray’s Book Pick

Plants of the Pacific Northwest Coast

By Jim Pojar and Andy Mackinnon

I am a field guide nerd. I asked for bird, mammal, fish, etc. field guides for many of my single-digit birthdays. The Garfield “this book protected by an attack cat” stickers are still in them. My years of field work expanded my love of field guide to dense books with extensive dichotomous keys, line drawings, and no color. Pojar and Mackinnon’s “Plants of the Pacific Northwest Coast” is the BEST FIELD GUIDE EVER. Well, in my humble opinion. This field guide makes the vast diversity of plants in the PNW accessible to the lay person while appealing to the professional scientist with a taxonomic organizational structure. This book is not dense. Rather, it contains the basic info for

identifying a particular plant while presenting oodles of interesting facts and native/ medicinal uses. In fact, this book is a great bathroom read.







## Lessons From the Volcano

Science and learning at Coldwater Lake is a **hands-on education** experience just seven miles from the crater of Mount St. Helens. There are spectacular views and unparalleled educational opportunities for learners of all ages. The Science and Learning Center has three main uses: **Volcano Outdoor School**, rentals by university groups and clubs, and weekend visitors.



Explore the volcano by day and night in a Volcano Outdoor School program, or an evening in museum-after-dark fashion with **Volcano After Dark**. Volcano Outdoor School immerses youth groups in hands-on inquiry in a volcanic world. We offer options for discovery, including a stay for multiple nights. Lessons are aligned with National Science Standards and MSHI will adapt schedules and activities to meet your goals.

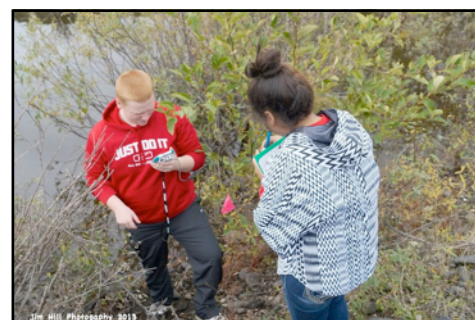
More information and options on our website: [www.mshinstitute.org](http://www.mshinstitute.org).

The Science and Learning Center at Coldwater Lake is available for **school group and club rental**. We have hosted a number of hands-on educational opportunities this past summer. The groups renting the facilities enjoy waking up at the base of the volcano, and spending more time in discovery outdoors. The center also offers indoor classrooms when the weather turns rainy. Come book your getaway at the Science and Learning Center today!

**Star Parties** are periodically hosted by local amateur astronomers who rent the facility and share their quality telescopes, knowledge and enthusiasm for the stars. Star parties are a great opportunity to explore the extraordinarily dark sky at night in the National Volcanic Monument.

We offer a variety of unique **teacher trainings** on the volcano. Our trainings

focus on National Science Education Standards, both in and out of the classroom. Trainings are hands-on and interactive. Participants spend the night at the Science and Learning Center experiencing the volcano as only a few can.



The center will be open weekends until December of 2013. Visitors are encouraged to stop in to get information, learn about education programs, purchase souvenirs and learn about the ecological recovery that is occurring at Mount St. Helens. As the snow begins to fall on the volcano, the Science and Learning Center is preparing for the change in seasons.



If you would like to explore the volcano by night and stay over in the Science and Learning Center, visit for the day or participate in a program, call me at (360) 274-2114 or email me at [gschmidt@mshinstitute.org](mailto:gschmidt@mshinstitute.org).

- Grace Schmidt, Science and Learning Center Coordinator



## MSHI's Year in Volunteering

Step, rest. Step, rest. Repeat 10,128 times. Now jump for joy – you've reached the Mount St. Helens Crater Rim! Participants in the Mount St. Helens Institute's Guided Climbs program often hear this type of encouragement and status updates from **Mountain Steward Volunteers** as they work their way up and down the mountain.

"Look in the lower left corner of the scope's field...yes, those brown things", says a **Volcano Volunteer** to a group of visitors as he shows them a herd of elk.

Clip. Clip. Clip. Hack, hack, hackety hack. Almost sounds like a new hit song. It is music to the ears of **Conservation Corps** volunteers as they chip away at overgrown vegetation on one of the hundreds of miles of trails within the Mount St. Helens National Volcanic Monument.

It's all just another day in the lives of our 283 volunteers who donated their time, talent, skills and services to the Mount St. Helens Institute this past summer. Volunteers also supported MSHI and the Forest Service behind the scenes: planning and coordinating special events, entering data, researching grants and packing gear to the backcountry.

I'd like to give very special mention of the group of Forest Service retirees who restored the **Bolt Camp Shelter**; they racked up 370 hours of service, 256 hours of drive time and another 129 hours hiking into and back from the remote location on the Lewis River. As shown in the images above, nearly the entire structure was rebuilt over a span of 19 separate trips this past summer. More than a few corny jokes



and nature references surfaced during the project, including an informal name for the group: OGWBS (Old Guys Who Build Stuff).

While most volunteer opportunities are ongoing and well-defined, numerous one-time openings popped up like lupine on the pumice-covered landscape over the summer. Researchers and scientists looking for some extra manpower often engaged MSHI volunteers in projects ranging from **stream and fisheries research** to carrying mammal traps to Spirit Lake – and everything in between, it seemed.

New volunteer opportunities are always exciting; assisting on our new Crater View Climb validated that sentiment over and over. Mountain Stewards supported and guided participants off-trail to a

brehtaking viewpoint of the crater, both lava domes and the crater glacier. Intentionally lacking a defined trail and marked route, the **Crater View Climb** afforded volunteers a unique opportunity to learn and memorize the landscape in anticipation of the route possibly becoming open to the public in the next few years.

As each volunteer experience is individual, so are the accomplishments of each to the organization. I am ecstatic to say that volunteer retention at MSHI is extremely high – I think the amazing landscape and opportunity to be a **witness to nature's recovery** and progress draws volunteers in and keeps them close for years. It is an honor to be a part of this organization and to continue to work alongside these remarkable stewards of the land.

- Amy Tanska, Volunteer and Membership Manager

## Pearly Everlasting

Taken from -- In the Blast Zone

By Gary Snyder

Walk a trail do to the lake  
mountain ash and elderberries red  
old-growth log bodies blown about,  
whacked down, tumbled in the new ash *wadis*.  
Root-mats tipped up, veiled in tall straight fireweed,  
fields of prone logs laid by blast  
in-line north-south down and silvery  
limbless barkless poles--  
clear to the alpine ridgetop all you see  
is toothpicks of dead trees  
thousands of summers  
at detritus-cycle rest  
--hard and dry in the sun--the long life of the down  
tree yet to go

bedded in bushes of pearly everlasting  
dense white flowers  
saplings of bushy vibrant silver fir  
the creek here once was "Harmony Falls"  
The pristine mountain  
just a little battered now  
the smooth dome gone  
ragged crown

the lake was shady *yin*--  
now blinding water mirror of the sky  
remembering days of fir and hemlock--  
no blame to magma or the mountain  
& sit on a clean down log at the lake's edge,  
the water dark as tea.

I had asked Mt. St. Helens for help  
the day I climbed it, so seems she did  
The trees all lying flat like, after that big party

Siddhartha went to on the night he left the  
house for good,  
crowd of young friends whipped from sexy  
dancing  
dozens crashed out on the floor

angelic boys and girls, sleeping it off.  
A palace orgy of the gods but what  
"we" see is "Blast Zone" sprinkled with  
clustered white flowers

"Do not be trickled by human-centered views,"  
says Dogen,  
And Siddhartha looks it over, slips away--for  
another forest--  
--to really get right down on life and death

If you ask for help it comes.  
But not in any way you'd ever know  
--thank you Loowit, lawilayt-lá, *Smoky Mā*  
gracias xiexie grace

# Change, Survival, and Revival: Lessons from Mount St. Helens

An essay from *In The Blast Zone: Catastrophe and Renewal on Mount St. Helens* -- Oregon State University Press

By **Charlie Crisafulli**, Ecologist, Pacific Northwest Research Station

When I arrived at Mount St. Helens shortly after the 1980 eruption, I was early in my career, a twenty-two-year-old half-trained ecologist, full of ambition and eager to learn all the volcano offered. The offerings were large, and I was set on a journey now deep into its third decade, attempting to understand the ways the eruption impacted plants, animals, and fungi and their long-term responses to this disturbance. By now I've spent over fifteen hundred days in the field sampling biological populations throughout the volcanic landscapes, and hundreds of days more hiking, photographing, camping, skiing, and snowshoeing with family and friends. This work has been intellectually and physically exhilarating, while grounded in dust, grit, fatigue, and great camaraderie.

In order to really learn what nature has to teach, we have to immerse ourselves in the natural world and see it from the perspective of individual plants and animals. We have to get to know the whole cast of characters, pay detailed attention to their activities, and unravel the tangle of factors that influence them. Through this practice, this immersion in field observation, we can begin to understand the relationships among living organisms and their environment. It's also a way to explore how we, as humans, fit into the natural world.

Disturbance equals change, and disturbances like the 1980 eruption of Mount St. Helens are impetuous and vast. The initial eruption provoked awe, as a riot of geophysical forces was unleashed: hurricane-force, stone-filled winds; churning mudflows; super-hot, turbulent flows of frothy pumice; columns of ash and pumice blown high into the atmosphere. All these events, as profound and pervasive as they were, happened in half a day, a geologic instant, but set the stage for a longer, slower eruption—an eruption of life that would play out in a series of acts and scenes lasting centuries. The newly created biophysical stage provided unrivaled conditions for plants and animals—survivors and colonizers—to exploit these changes. Likewise it gave ecologists, myself included, unprecedented opportunities for studying how organisms initially respond to a complex ensemble of volcanic disturbance processes, and how the biological communities in

forest, meadows, riparian areas, lakes, and streams are reassembled over the long term.

## Survivors

For ecologists, the first order of business in the early days after the eruption was to determine if any organisms had survived, and if so, how many, where, and how. When we first flew over the landscape, we seriously doubted that any plant or animal had survived in the hardest-hit areas, but it quickly became clear that individuals of most, if not all, plant and animal species had survived at least in a few locations, and that survival was related to many different, often unexpected, factors. We were happy to see these survivors, but we questioned whether these plants and animals could persist under the new post-eruption conditions. This was an important question, because survivors embedded within these hard-hit zones could jumpstart recolonization of the disturbed area. Islands of survivors could be local sources of plants and animals, thus reducing the importance of dispersal from distant undisturbed areas and possibly speeding the pace of biological response. As it turns out, many, perhaps most, of the survivors persisted and played numerous and diverse ecological roles over the subsequent quarter century.

## Colonists

Individual organisms that establish following a disturbance are called colonizers. At Mount St. Helens millions of individual plants and animals, representing thousands of species, have colonized since the 1980 eruption. They include all possible forms of life found in the larger landscape of the southern Washington Cascade Range: mammals, birds, amphibians, reptiles, fishes, insects and other invertebrates, fungi, plants of all sorts, and innumerable microbes. Individually and collectively they have increased the biodiversity and ecological complexity of the land and water, often at a stunning pace. Colonizers have played important roles in areas with survivors, but their presence is most noticeable where all life was obliterated by the eruption. With time many of these areas have transformed from barren rock to oases or verdant vegetation, rich with bird song, frog chorus, insect buzz, and wildflower scent.





## Biological Community Development

For terrestrial environments, the first few years after the eruption was a period of modest growth and spread of survivors, and initial colonization of species. Each of these biological processes was severely restricted by the harsh environment (summer drought, high winds, poor soil conditions, low nutrients, absence of habitat), limited source populations, and limitations on their dispersal. But species did accrue over time, as more and more players gathered in the landscape. As time past, surviving and colonizing plant populations grew, spread, and coalesced, filling gaps in the landscape. This created habitat for additional species, which in turn became further catalysts for colonization--riches begetting riches. With biological momentum increasing, species interacted in the whole array of trophic relationships: predator-prey, parasites, herbivory, seed dispersal, pollination, symbiosis!

## Tales of a Survivor and a Colonizer

Each actor, each species, has a distinctive role in an ecosystem. In sparse ecosystems, such as those in the post-eruption landscape, certain roles are conspicuous and extremely important. I am particularly intrigued by the pocket gopher and lupine--an animal and a plant with powerful influence beyond their own kind.

Northern pocket gophers are small rodents with large forelimbs adapted for digging. They thrive in meadows and forest openings throughout the Cascade range, non-forest habitats that are lush with the kinds of plants that have abundant below-ground plant parts favored by gophers. Their small eyes and ears, large incisors, and powerful forearms terminating in large claws make gophers very well suited for life below ground.

We suspected that gophers would survive the eruption because they would be protected beneath a mantle of soil. We conducted our initial surveys via low-level, bumpy, twisting helicopter flights. We flew back and forth, traversing slopes on the lookout for gopher burrows, dark mounds of organic soil against a uniform light gray pumice background. True to expectations, we discovered gophers surviving in many places, even in areas where all surface life had been wiped clean. Much like gophers, below-ground plant parts--roots, bulbs, corms, and rhizomes--had survived, continuing to provide nourishment for them. However, the long-term fate of the gophers was far from certain, because a long-term source of food was in question. Could the surviving plants send shoots up through the deep volcanic deposits in order to persist? Would new plants become established on the pumice surface quickly enough to offer a food source?

In many locations, deposits were initially too thick for plants to penetrate, but erosion removed some material, allowing plants to spring forth. In other locations, gophers facilitated the development of their own food supply. First, by their burrowing they loosened the soil and mixed it with pumice, easing the way for buried plants to send shoots

upward. Second, by mixing the nutrient-poor pumice with the deeper pre-eruption, biologically rich soil, they created an ideal medium for seed germination and plant growth. In fact, we learned that more plants grew on gopher-modified soils than on adjacent pumice areas, and these plants grew larger and produced more flowers, fruits, and seeds. In later years, gophers' impacts were sometimes reversed: by creating chronic disturbance--churning and turning the soil--they inhibited the development of complex plant communities in some locations.



Charlie Crisafulli holds a northern pocket gopher

The eruption and the changes it initiated created great opportunity for gophers. The blast-leveled forest transformed a vast landscape to "meadow," and gophers took advantage of the opportunity to spread far and wide. In doing so, they played many important ecological roles: by consuming plants or facilitating their growth, they altered the types, numbers, and distribution of plant species; they also created miles of tunnels with cool moist environments that could be used by amphibians and other animals to escape hot, dry surface conditions during the summer. Gophers reaped the benefit of the sudden transformation of the landscape for several decades, but with time, as forest cover returns, gophers will again be relegated to natural meadows and small forest openings. In the meanwhile, they reign superior.

The prairie lupine is a small, ground-hugging, short-lived (three to five years) evergreen plant of the Cascade-Sierra Nevada mountains that typically grows in poor soils on sunny, high-elevation, steep, wind-swept slopes. In this environment, with its short growing season, lupine plants "solar track," maneuvering their palmate leaves throughout the day, following the sun to efficiently harness the solar energy. They also minimize moisture loss by folding each leaflet when the air becomes too dry. Lupines have a special association, a partnership, with a bacterium on their roots--the plants provide the bacteria with simple sugars, used as a primary energy source, in exchange for nitrogen, thus enabling lupine to grow in nutrient-poor soils.



Prairie lupines lived at and above timberline high on the slopes of Mount St. Helens before the 1980 eruption. During the eruption, a series of fiery-hot pyroclastic flows surged from the crater, severely disturbing an area immediately north of the summit. Before the eruption this area had been a cool, moist forest with mosses and ferns, shaded by majestic firs--poor habitat for lupines. The volcanic processes of 1980 transformed the area to a vast, sterile expanse of steaming rock and hissing fumaroles, dubbed the Pumice Plain.

My colleagues and I were very interested in documenting the development of life on this new landscape, and in 1981 we began aerial surveys from low-level helicopter flights. In June 1982 we were stunned to find a single adult lupine, ringed with its progeny, tiny lupine seedlings. We established a research plot around these few plants and monitored plant growth over the next twenty-six years. The lupine populations underwent dramatic boom-and-bust cycles, mediated by weather and a clan of insect seed-eaters, stem-borers, and leaf miners. Nonetheless, lupines played important roles by preparing the site for scores of other plant and animal species to colonize.

This sequence of events was possible because the new pumice plain environment created after the eruption mimicked alpine conditions where prairie lupine typically grows, albeit at a much higher elevation. Chance dispersal of a seed or plant fragment led to the establishment of that first lupine plant. Once established, lupine spread rapidly in this highly suitable and unoccupied landscape and set the stage for a wave of biological change. Lupines increased the carbon and nitrogen of the soil, provided litter that increased water retention, and snared seeds blown by wind, which collectively facilitated the colonization by dozens of other plant species. In turn these plants provided food and cover for numerous animals. Ironically, the changes made by lupine that enable other species to colonize and eventually dominate sites have decreased the suitability of the habitat for lupines. Eventually, other herbs, then shrubs, and finally trees will cover the plain, and lupine will gradually be pushed back up onto the upper flanks of Mount St. Helens, where they will remain until the next eruption.

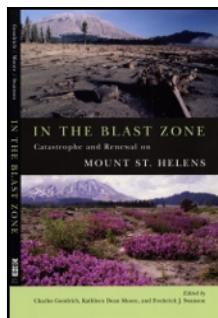
### *Change, Nature, and the Human Lot*

Dynamism is a pervasive theme in nature. The eruption caused sudden and dramatic change within a single day. Since that time characteristics of natural systems have changed as survivors grew and spread and other species colonized. Their populations waxed

and waned, went through boom-and-bust cycles, species interacted, biological complexity increased, and communities underwent shifts in dominant species. The cadence of change has been fast during the first twenty-seven years since the big eruption, but will eventually slow, becoming barely perceivable, until, that is, another sudden dramatic event resets the clock.

The 1980 eruption of Mount St. Helens set in motion a succession of change for both nature and humans. Plants and wild animals as well as humans experienced survival and death, loss of habitat and home, destruction of dispersal corridors and roads. The initial survivors and colonizers, such as gophers and lupines, play important ecological roles during the first several decades and then wane in importance, yielding to the next group of organisms that dominate the scene. Similarly, scientists who arrived early in their career at Mount St. Helens in 1980 established permanent plot networks, conducted research for several decades, and will hand off the responsibilities to the cohort of scientists.

During my twenty-seven years studying the ecology at Mount St. Helens, I have learned a great deal about how species and biological communities respond to change caused by volcanic disturbance. I have also thought hard about how we humans perceive disturbance, loss, and renewal. Long-term, committed work as a field ecologist has allowed me to become intimately familiar with a landscape and its habitants, and to better understand our relationship with nature. Ecologists like myself are colonists, of a sort. We tramp over extensive areas, set up sample plots, count organisms, and measure growth rates, while experiencing the landscape in every season and every kind of weather. What we record as scientific data is a very small sampling of a rigorous and plentiful life outdoors. And then we pass that sampling of knowledge on to other through the information web of science. Although we're just passing through, the science keeps accumulating, getting richer and more abundant, feeding more and more insights.



"This collection of poetry and essays emerges from a July 2005 camping trip and educational event at Mount St. Helens. This is a great read for volcano freaks everywhere, and anyone who's fascinated with and concerned about patterns of catastrophe and renewal in nature and culture."

-- Credit -- Foreword from *In the Blast Zone* (OSU Press) -- by Scott Slovic, University of Nevada, Reno -- Editor, ISLE



## MISSION

Mount St. Helens Institute's mission is to advance understanding and stewardship of the earth through science, education and exploration of volcanic landscapes.

*This fall, the Mount St. Helens Institute Board of Directors, staff and partners developed and adopted an ambitious five-year strategic plan. It is a six-page statement of mission, goals, priorities and objectives. Review this one-page summary. If you want to see the sixty-one MSHI objectives or steps to reach these goals, then call or email us; we are happy to share them. If you want us to accomplish these goals, then we need your help. Please see the membership contribution envelope enclosed with this edition of Rumbblings and contribute to the cause.*

GOALS	STRATEGIES / PRIORITIES - Current Priorities in Bold -
<b>Goal I: Identity</b> Build and internationally recognized science and education resource at the Mount St. Helens Volcano.	<b>A. Market Mount St. Helens as the most accessible volcano in America</b> B. Connect with schools at all levels to offer nature study experiences C. Connect with research entities to offer research opportunities D. Grow programs that offer illumination beyond Mount St. Helens
<b>Goal II: Program</b> Grow premier education, science and exploration experiences -- expand fivefold over five years.	<b>A. Pilot summer youth camps and expand volcano school success</b> B. Expand field seminars and adult camps, exploration and retreats C. Market volcano explore-learn-reflect-act experiences D. Develop a distinct guided climb program for active exploration of Volcano
<b>Goal III: Organization</b> Develop MSHI organizational capacity, support, effectiveness and reach in the Pacific Northwest and beyond.	<b>A. Build organizational capacity and record for growth</b> B. Focus planning, programs and fundraising on the mission C. Develop a membership program to broaden and deepen support D. Grow a sustainable, professional staff and board of directors
<b>Goal IV: Facility</b> Make Coldwater Science and Learning Center a primary destination for volcano studies and experience.	<b>A. Reach common vision and plan for the Coldwater Science and Learning Center</b> B. Complete facility, operation and capital campaign plans C. Raise funds to construct, operate and program the Center D. Furnish comfortable space for wide range of inquiry and inspiration
<b>Goal V: Partnership</b> Be a valuable partner to the U.S. Forest Service, universities, schools, local communities and stakeholders.	<b>A. Supply GPNF with excellent volunteers, interpretation and programs</b> B. Connect with governments, business, community groups and schools C. Offer teacher training and vocational experience in volcano setting D. Provide retreat and exploration place where people learn from nature

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## Mount St. Helens Institute *Rumblings*



Dave Anderson

### Become a MSHI Member!

You can help advance understanding and stewardship of the Earth with your membership contribution. You'll get the inside scoop about our science and education programs and adventures, field notes straight from scientists on the volcano, interesting volunteer opportunities, extra benefits and a place in history as an informed agent of change.

### Membership Levels and Benefits

- \$25 - Introductory** – A year's subscription to the MSHI newsletter, "Rumblings," and a cool sticker
- \$50 - Base Camp** – Above, PLUS 10% discount on MSHI Guided Programs and Field Seminars\* plus 15% discount at Discover Your Northwest gift shops
- \$75 - Hummocks** – Above, PLUS one year free admission to Johnston Ridge Observatory
- \$100 - Lahar** – Above, PLUS exclusive access to limited block of 2014 Climbing Permits\*\*
- \$250 - Loowit** – Above, PLUS 20% discount on MSHI Guided Programs and Field Seminars
- \$500 - Crater Rim** – Above, PLUS limited edition autographed book, *Mount St. Helens* by David Anderson
- \$750 - Glacier** – Above, PLUS MSHI logo outerwear
- \$1,000 - Summit** – Above, PLUS one "Into the Crater" hike admission

Mail the enclosed return envelope, email [membership@mshinstitute.org](mailto:membership@mshinstitute.org) or call (360) 449-7826 to join now

\* Excludes "Into the Crater" hike

\*\* Two permits available for purchase to first 250 registered Members

I hope you enjoyed this first edition of "Rumblings." Please let us know how we are doing. At the Mount St. Helens Institute, we believe that feedback is the "breakfast of champions." See you on the mountain.

-- Richard Meyer, Executive Director