# Volcanic Vistas





**Guide to Newberry National Volcanic Monument** 



Lava Butte, depicted above, is the cinder cone volcano located to the North of Lava Lands Visitor Center. It was created during a two-phase eruption just over 7,000 years ago. The first phase sent gas-charged molten rock into the air. The material solidified in the air, trapping gas bubbles, and fell back to the earth as cinders in a pile. The grey outline above indicates the size of Lava Butte today. Lava spilled out of a side vent during the second phase and flowed for several miles to the Deschutes River. The lava cooled into a field of basaltic rock. These volcanic features, and many others, are preserved as part of Newberry National Volcanic Monument. To learn more about the Monument check out the quick facts at the bottom of each page.

# What Can I See In...

### 2 Hours:

Lava Lands Visitor Center and Lava Butte

Due to limited parking atop Lava Butte, 30 minute parking passes are issued on a first come, first served basis. Vehicles longer than 22 ft. prohibited. See page 6 for more information.

### Half-Day:

Above sites plus explore *Lava River Cave* Allow 2 hours, round trip, to see entire cave. Site gate closes at 4pm.

### Full Day:

See page 7 for more information.

Above sites plus Lava Cast Forest
Access site via gravel road, 9 miles one way. Pick up a brochure at one of the NNVM visitor centers or download a PDF from Deschutes National Forest

### **2-3 Days:**

See ALL of Newberry National Volcanic Monument!

Visit all of the above sites plus the following sites within the

### Newberry Caldera:

Paulina Visitor Center

Buy a 3-Day **Monument Pass** Big Obsidian Flow for \$10!

Paulina Falls

Paulina and East Lakes

Drive to the top of *Paulina* Peak (7,984 ft.) for one of the best views in Oregon!



# **Useful Contacts**

**Newberry National Volcanic Monument Current Information Hotline** 541-383-5700

> **EMERGENCY** 911

**Newberry National Volcanic Monument** 

www.fs.usda.gov/attmain/centraloregon/specialplaces **Lava Lands Visitor Center** 541-593-2421

**Deschutes National Forest** 541-383-5300

www.fs.usda.gov/centraloregon **Bend Fort Rock Ranger District** 541-383-4000

**Discover Your Northwest** 206-220-4140

www.discovernw.org/deschutes

**Deschutes County Sheriff** 

(Non-emergency and Animal Control):

http://sheriff.deschutes.org

Oregon Department of Fish & Wildlife 800-720-6339

www.dfw.state.or.us/

**ODOT Road Conditions 511** (toll free in Oregon) www.tripcheck.com/ **1-800-977-ODOT** (toll free in Oregon) 1-503-588-2941 (outside Oregon)

Crater Lake N.P. Information 541-594-3000



Volcanic Vistas is produced by Discover Your Northwest in partnership with the Deschutes National Forest. Published May 2013







# **Newberry News**

### Wildlife Underpasses Win Award

By Sandra Jacobson, USFS Wildlife Biologist

Nowhere else in the U.S. can a person see a wildlife passage from the perspective of an animal. At Lava Lands Visitor Center (LLVC), the wide underpass for road 9703 is actually designed for wildlife to use as well as people. It is also unusual to have an underpass landscaped with a wildlife-friendly design. The structures here are the first for large animals in Oregon. This wildlife underpass project earned the Exemplary Ecosystem Initiative Award from the Federal Highways Administration.

The 4-mile long highway project, completed in 2012, contains designs specifically for wildlife protection. Check out the underpass with its stacked logs, boulders and native plants. This earthen pathway is designed to be large enough to allow large species like deer and elk to walk through, while providing hiding places among the rocks and logs for small animals like ground squirrels and lizards. Native soils were replaced in the underpasses, and compost was added to retain moisture providing a good seedbed for native plants.

An additional wildlife crossing was constructed south of LLVC, exclusively for wildlife. Fencing to exclude small and large animals from the highway and to funnel them to the underpasses runs the entire length of the project. Novel electrified mats in the road surface at exits and merge points to the highway function as a surface 'fence.'

Always give right of way to any wildlife you see while in the underpass. Dozens of animals and numerous wildlife species already use the structures as revealed by monitoring since July, 2012.

The project was also a success from the perspective of cooperation among agencies, including the US Forest Service, Oregon Departments of Transportation and Fish and Wildlife, and Federal Highways Administration.



More details on this project can be found inside Lava Lands Visitor Center, or on the Wildlife Crossings Toolkit at

http://www.fs.fed.us/wildlifecrossings/casehistories/public-lands/LavaButteUS97.php.

Or use your smart device to scan the QR code.



Mule Deer using underpass near Lava Lands on August 13, 2012. Image captured by the motion-sensing wildlife cam.

#### New Rules of the Road

#### Travel Management in the Deschutes National Forest

The goals of travel management are to minimize resource damage from motorized vehicles, reduce conflicts between users and improve the quality of recreational experiences.

Here's what to remember:

- ·Travel only on open Forest Service Roads as indicated on the Motor Vehicle Use Map.
- · Drive no more than 300 ft. from a Forest Service Road only to reach an existing, designated or defined dispersed campsite.

(No dispersed camping in Newberry Caldera.)

· Park 30 ft. or more from any wetland, stream, river, spring or lake.

Maps are available at Lava Lands Visitor Center, Paulina Visitor Center and the Bend/Fort Rock Ranger Station 63095 Deschutes Market Rd. Bend OR 97701

### Do your part to protect the Monument

Be sure to Leave No Trace. Bigfoot's been doing it for years!



### Practice these seven principles:

- Know Before You Go
- 2. Choose The Right Path
- 3. Trash Your Trash
- 4. Leave What You Find
- 5. Be Careful With Fire
- 6. Respect Wildlife
- 7. Be Kind To Other Visitors



Scan the above QR code with your smart device to learn mor

# The Greener Good

Deschutes National Forest is a leader in innovative ways to reduce fossil fuel usage within all aspects of operations; from hybrid vehicles to 100% off-thegrid facilities, the Deschutes National Forest is leading by example. The U.S. government challenged all federal agencies to reduce fuel consumption in facilities by 65% by year 2015 with the Energy Independence and Security Act of 2007. In 2013, the Monument is improving its solar power system at Lava River Cave (LRC), piloting the use of rechargeable lanterns at LRC, using bicycles for staff travel between Monument sites, installing bike racks at Lava River Cave, printing the Vista with 80% recycled paper and soy ink, and using E-85 fuel in one of our newer vehicles.









**RECREATION PASSES ARE REQUIRED** at designated day use sites on the Deschutes National Forest including sites within Newberry National Volcanic Monument.

Recreation Passes accepted include: National Forest Recreation Day Pass (\$5), Annual Northwest Forest Pass (\$30), Interagency Annual Pass (\$80), Interagency Senior Pass (\$10), Interagency Access Pass (FREE with documentation), the NEW Interagency Military Pass and the 3-day Monument Pass\*(\$10). \*The 3-day Newberry National Volcanic Monument Pass is only sold at Monument Welcome Stations (see below) and is good only for sites within the Monument.

Passes are available at Newberry National Volcanic Monument Monument Welcome Stations (Lava Lands Visitor Center, Lava River Cave, Paulina Visitor Center and Newberry Welcome Station), Forest Service offices throughout Washington and Oregon and online at: http://www.fs.usda.gov/detail/centraloregon/passes-permits/recreation

Benefits: 95% of the revenue from Recreation Passes stays in the local area for facility maintenance, interpretive services, and ecosystem protection. These passes are your opportunity to care for our public lands and pass on your natural legacy. Thank You!





Discover Your Northwest Newberry National Volcanic Monument is managed through a partnership between the Deschutes National Forest and Discover Your Northwest

(DYNW). DYNW is a nonprofit organization dedicated to promoting the discovery of northwest public lands, enriching the experience of visitors, and building community stewardship of these special places today and for generations to come. Proceeds from DYNW retail operations are used to fund conservation education programs, publications, exhibits, guest speakers, events and other services designed to enhance your appreciation of the area.

Become a member today and receive a 15% discount at DYNW locations on public lands throughout the Northwest.

For more information: www.discovernw.org 206-220-4140

**Discover Your Northwest** 164 Jackson Street Seattle, WA 98104

# Be Bear Aware!

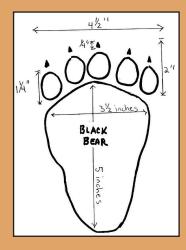
Newberry Caldera is not only part of a National Monument but is also a Wildlife Refuge. Prevent wild animals from obtaining human food and garbage. Always keep a clean camp.

- Keep all food and food-related items in a closed, hard-sided vehicle or suspended at least 10 ft. off of the ground and 4 ft. from any supporting tree or pole, except when preparing or eating food.
- · Ice chests, coolers, boxes, cans, tents and softsided campers are not bear-resistant!
- Store pet food and livestock feed the same as human food, out of reach from bears and other animals.
- · Deposit all garbage in wildlife-resistant trash containers.
- · Remove all food and garbage from campground before you leave.
- · Never approach or feed any wildlife.



Black Bear Identification

Don't be careless with food or garbage when camping. Wild animals, especially bears, may wander through at any time of day or night. Wild animals near a campground are more likely to lose their fear of humans. These animals can often become increasingly aggressive in their attempts to obtain human, pet, and livestock food.



## **Geothermal Exploration on Newberry Volcano**

By Bart Wells, USFS Geologist

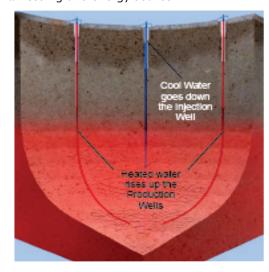
Ground-breaking progress was made last year in geothermal energy exploration on the west flank of Newberry Volcano, outside of Newberry National Volcanic Monument. AltaRock, a geothermal company based out of Seattle, successfully created multiple reservoirs in one wellhole utilizing new technology called an Enhanced Geothermal System (EGS). This is the first time ever that multiple reservoirs were completed in a single geothermal well, using a non-mechanical diverter.

This summer AltaRock plans to further test the reservoir and drill another deep well into the newly created reservoir on Newberry Volcano. During the hydroshearing process that took place from October to December of 2012, AltaRock recorded about 140 micro-seismic events from the cracking rock. The majority of events were less than Magnitude 1, which can only be detected with the most sensitive equipment.

The measured temperature of this deep 10,000-foot well is greater than 600°F. Water boils at 212°F (100°C), so there is a lot of potential heat that can be turned into energy. AltaRock created a large reservoir of micro-cracks using cold water, under

pressure. Should power generation be pursued using this system in the future, the cold water would be heated by the rock and then brought back to the surface. The hot water would flash to steam and rotate turbines to make electricity.

Geothermal energy is a renewable energy source.
This EGS demonstration project on Newberry Volcano greatly contributes to advancing the technology used in harnessing this energy source.



Injection Well Stimulation
Source: <a href="https://www.altarockenergy.com/projects.htm">www.altarockenergy.com/projects.htm</a>

### For more information on the latest Newberry geothermal project:

visit AltaRock Energy - Newberry EGS Demonstration: www.altarockenergy.com/projects.html



### Newberry's Volcanic Glass: Obsidian

What Is It?

Obsidian is a natural volcanic glass, remarkably similar to the glass in your windows. Unlike most rocks, obsidian is formed with minimum crystal growth and has a disordered internal structure similar to liquid

### Don't Be a Rock Raider!

Why Can't I Take A Piece Home?
Newberry National Volcanic Monument was established by the U.S. Congress on Nov. 5, 1990. As stated in legislation, its purpose is to "preserve and protect for present and future generations Newberry's remarkable geologic landforms." Each of us plays a vital role in caring for our National Monument.
Damaging or removing even a small sample of rock degrades the resource and it's illegal (36 CFR 261.9 a and b). Please report any violations you see to a Forest Service ranger.

How Can I See Obsidian and Learn More?
Travel to the Newberry Caldera and hike the Big
Obsidian Flow trail to observe this unique volcanic
rock. To learn more or to obtain a sample of obsidian,
visit the Paulina Visitor Center or Lava Lands Visitor



Obsidian seen on the Big Obsidian Flow trail. Photo by R. Gentry

# **NEWBERRY CALDERA**

### **Paulina Visitor Center**

OPEN 10am to 5pm Weekends **Daily** Thursday - Monday

beginning May 11 and Memorial Day June 22 - September 2 September 5 - September 30

**VISIT** the Paulina Visitor Center to get maps, information, and shop the Discover Your Northwest bookstore. Recreation passes are available for purchase when open, and the only Caldera self-service, 24-hour, day use fee station and information alcove are located in front of the visitor center.

**WALK** the Big Obsidian Flow trail, 1 mile loop trail exploring Oregon's youngest lava flow offering a panoramic view of the caldera rim from the upper overlook. An accessible paved path leads to a steep set of stairs before crossing the rocky, uneven and sharp surface of the Big Obsidian Flow. Due to the sharp obsidian surface, closed toe shoes are recommended and pets are NOT recommended.

**VIEW** Paulina Falls, a short accessible path leads to the upper overlook and picnic site to view the 80-foot cascading waterfall. Hikers may choose to walk the ¼ mile one-way switchback trail to the base of the falls for a different perspective.

**DRIVE or HIKE** to the top of Paulina Peak, the highest point on the rim of Newberry Volcano. An unpaved 3 ½ mile road takes vehicles (less than 23ft in length) to the summit for a view into the Newberry Caldera and surrounding areas. The steep 2-mile, one-way, trail begins just after the pavement ends on the Paulina Peak road. Road typically opens in late June.

**LEARN** about the Caldera at a Ranger Program! Inquire at the Visitor Center about program schedules.

### HELP PROTECT YOUR MONUMENT RESOURCES

No camping or campfires outside of developed sites in Newberry Caldera (36 CFR 261.58(e) and CFR 261.52(a)) Λ

14-night stay limit on the Deschutes National Forest & Newberry Caldera (36 CFR 261.58(a))

Do not carve, chop, nail, or otherwise damage trees or vegetation. Chainsaws in the campgrounds are prohibited. Limit firewood collection to 'dead and down' wood only and to locations outside of visual distance of developed sites.

Be 'Bear Aware.' Please store food properly and keep a clean camp.

Do not use off-highway vehicles within Newberry National Volcanic Monument. (36 CFR 261.54(e) & 36 CFR

261.55(a))

Control and clean up after pets (36 CFR 261.16(j))

Do not REMOVE or DAMAGE resources such as Obsidian.

Don't be a rock raider! (CFR 261.61(a))



Paulina Inset

### **SLEEP on a volcano!**

Camping in Newberry Caldera is managed by Hoodoo Recreation.

For reservations and information contact Hoodoo Recreation directly. www.hoodoo.com Reservations (7-days): (877) 444-6777

Information (M-F): 541-338-7869

Lodging and other amenities are available at the following businesses:

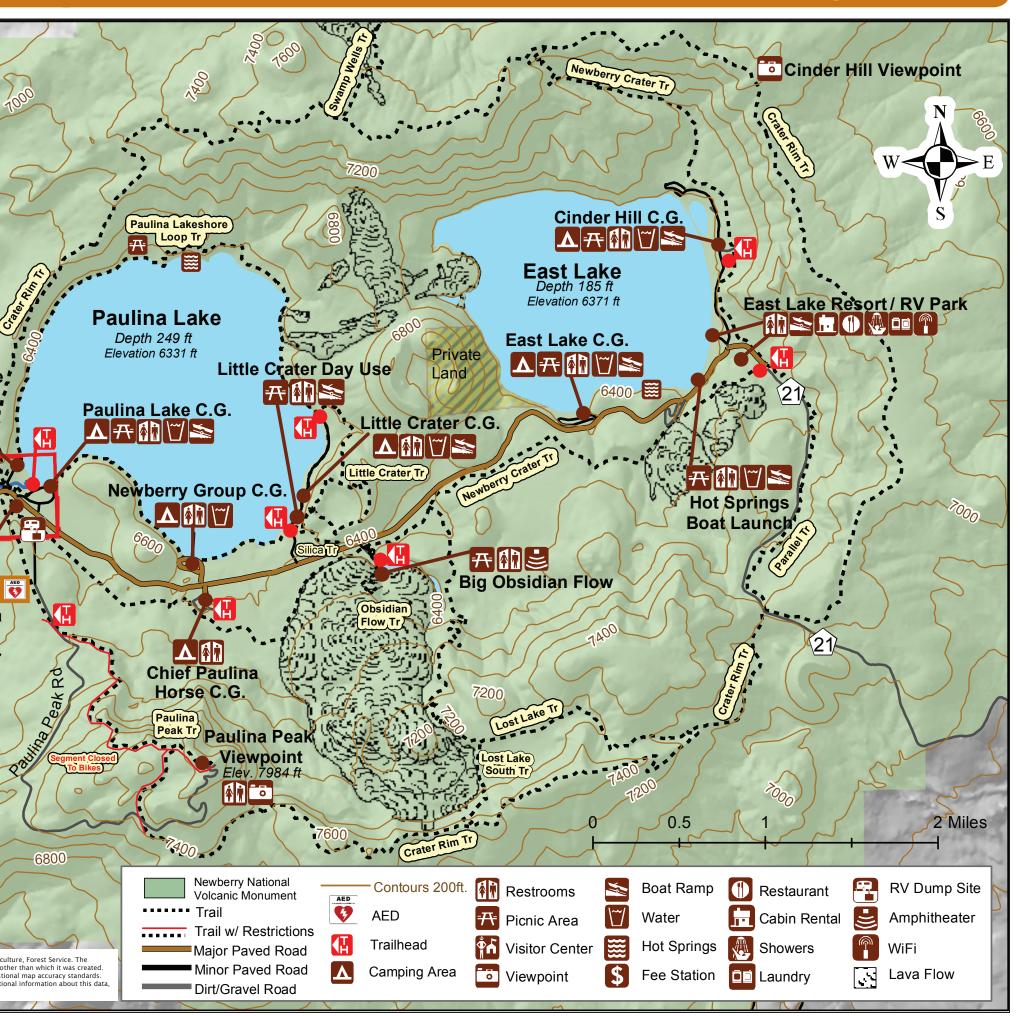
Paulina Lake Lodge 541-536-2240 www.paulinalakelodge.com

East Lake Resort 541-536-2230 www.eastlakeresort.com

Newberry Area Campgrounds	Price Per Night	Total Sites / Reservable Sites		
Prairie	\$14	17 / 0		
Ogden Group Camp	\$75	2 / 2		
McKay Crossing	\$10	10 / 0		
Paulina Lake*	\$16-18	69 / 39		
Newberry Group Camp	\$75-100	3 / 3		
Chief Paulina Horse Camp	\$14-18	14 / 14		
Little Crater	\$16	49 / 0		
East Lake*	\$16	29 / 0		
Cinder Hill	\$16	110 / 55		

<sup>\*</sup>Accessible sites may be available

# **Newberry Caldera**



Caldera Trails	Miles (One Way)	Elevation Change	Use	Difficulty
Parallel Trail #58.3	2	6450-7000 feet	hike, bike, horse	moderate
Paulina Falls Trail #57	0.5	6120-6280 feet	hike only, accessible*	easy
Paulina Lakeshore Loop #55	7.5 (round trip)	6330-6560 feet	hike only, accessible*	moderate
Paulina Peak Trail #57 (Spur trail)	0.25	7800-7980 feet	hike only	moderate
Peter Skene Ogden Trail # 56	8.6	4300-6350 feet	hike, horse, bike (uphill only)	moderate
Silica Trail # 58.5 .	0.5	6350-6365 feet	hike only	easy
Crater Rim Trail #57 (loop)	21 (round trip)	6330-7600 feet	hike,bike,horse	difficult
Obsidian Flow Trail # 58.1	0.5	6330-6850 feet	hike only	moderate
Little Crater Trail # 53 (loop)	1.5 (round trip)	6330-6850 feet	hike only	moderate
Little Crater Tie	0.6	6330-6600 feet	hike only	moderate
Lost Lake Trail #58.2/58.4	3.9 + 0.6 (Lost Lake S.)	7100-7440 feet	hike, bike, horse	difficult
Newberry Crater Trail #3958	9.2	6350-7300 feet	hike, bike, horse	moderate

\*Segment of trail is accessible

# LAVA LANDS VISITOR CENTER

# **OPEN 9am to 5pm**

Thursday - Monday May 2 - June 16

Daily June 17 - September 2

Thursday - Monday September 3 - September 30

### THINGS TO DO AT LAVA LANDS

**LEARN** about volcanoes in the Lawrence A. Chitwood Exhibit Hall and orient yourself with the 3-D topographic model of Newberry National Volcanic Monument.

**DRIVE** to the top of Lava Butte, paved road 1 3/4 miles one way. Parking is limited to 10 vehicles (less than 22' long), so please ask for a 30 minute time pass from the Ranger as you arrive. Lava Butte passes are issued on a first come, first served basis and on busy days there may be a wait.

**WALK** the Lava Butte Rim Trail, unpaved 1/4 mile loop with a panoramic view of Newberry National Volcanic Monument and surrounding area. Please stay on the trail and respect the fences.

**WALK** the Trail of the Molten Land, paved 1 mile loop. Full color interpretive signs provide for a self-guided tour. The first 1/3 mile of the trail is accessible. Other trail



Lava Butte, as viewed from its lava flow on Trail of the Molten Lands at Lava Lands Visitor Center.

segments have grades that may be challenging without assistance.

**WALK** the Trail of Whispering Pines, paved 1/3 mile loop. Follow the edge of the Lava Butte flow as it winds through the shady whispering pines. Pick up an Interpretive Botanical Guide to learn about local plants along the way.

**SHOP** in the Discover Your Northwest bookstore for books, maps and gifts.

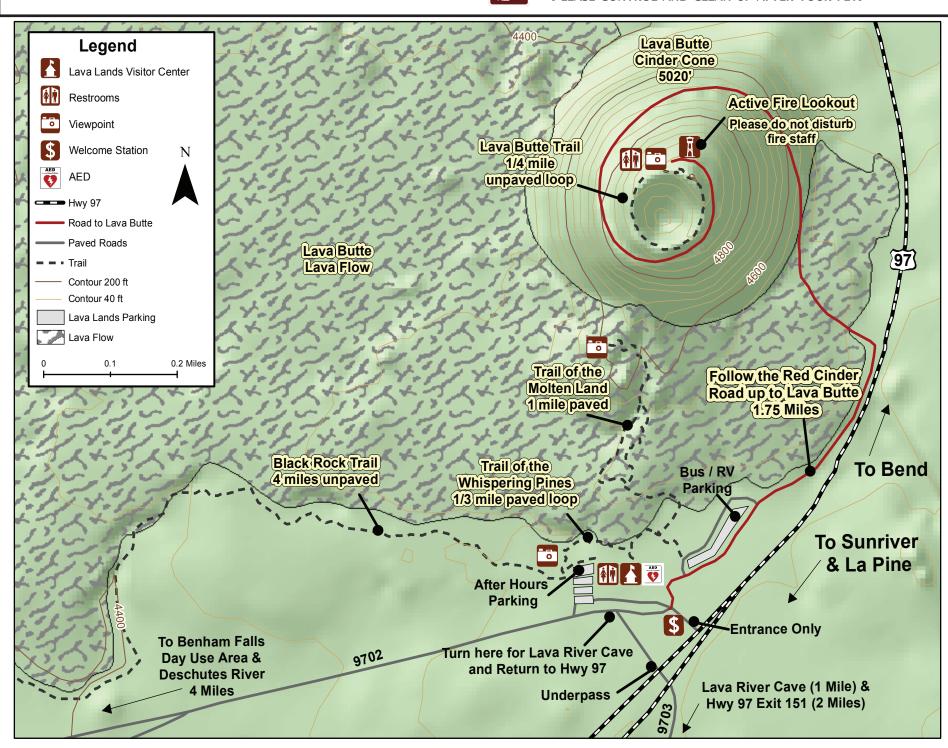
**CHECK** at the visitor center front desk for Film and Ranger Program Schedule.

#### Remember: Please don't feed the wildlife!



PETS ARE WELCOME OUTSIDE THE VISITOR CENTER, ON A LEASH.

PLEASE CONTROL AND CLEAN UP AFTER YOUR PET.



# Lava Lands and Lava River Cave

# LAVA RIVER CAVE

Discover another world below ground in Oregon's longest lava tube (almost 1 mile each way). You'll walk down over 100 stairs as you slowly descend into the darkness. Discover unique cave features formed by a massive lava flow long ago. A National Forest Day Pass or other valid Recreation Pass is required to enter. Bring your pass to the welcome station and then return it to your car.

# OPEN 9am to 5pm Site gate closes at 4pm

Thursday - Monday May 2 - June 16
Daily June 17 - Sept. 2

Thursday - Monday Sept. 3 - Sept. 30

Help Protect Lava River Cave Bats and stop the spread of White Nose Syndrome (WNS) by visiting the Bat Conservation Station at Lava River Cave. Pass the WNS screening and get your bat stamp of approval to enter the cave. See article below for more information on White Nose Syndrome.

PETS: Only certified service dogs are allowed in the cave provided a container is carried in to remove waste. Please either leave your pet at home or have a member of your party stay above ground with your pet. There is not enough shade in the parking lot to leave your pet in your vehicle safely.

Cave Conservation Tours: 3:00pm, Daily (Limited to 15 people. Reservations accepted on the day of tour.) Join a guided tour of Lave River Cave to learn more about cave geology, ecology and stewardship.

CAVE RESTRICTION: The crawl space near the end of the Cave is CLOSED to visitors to prevent the potential spread of spores that cause White Nose Syndrome.



Cave Conservation Tour participants descending into Lava River Cave.

### **VISITATION GUIDELINES:**

- ·If you have been in a cave or mine outside of Oregon or Washington, no item worn or used in that cave or mine is allowed in Lava River Cave (including clothing, boots, headlamp, cameras, backpack, etc.)
- · Carry 2 light sources with you (only propane lanterns, headlamps, or flashlights please). There is no lighting in the Cave. Propane lanterns are available for rent at the site for \$5.00.
- ·Wear warm clothing: Cave temperature averages around 40 degrees Fahrenheit.
- $\cdot$  Wear sturdy closed-toe shoes or boots. Cave access requires walking on stairs and uneven surfaces.
- · Watch your head. Child carrier backpacks are not recommended. Ceiling height in the Cave is variable with some rock outcroppings.
- · Please use the restroom before entering the Cave. There are NO bathrooms down there. The Cave is about a mile one-way, average time underground is 2 hours.

#### Protecting Bats at Lava River Cave From White Nose Syndrome

by Julie York, USFS Wildlife Biologist

White Nose Syndrome (WNS) has killed almost 6 million hibernating bats in the Eastern and Midwestern U.S. since 2006. It now occurs in 22 states and 5 Canadian provinces.

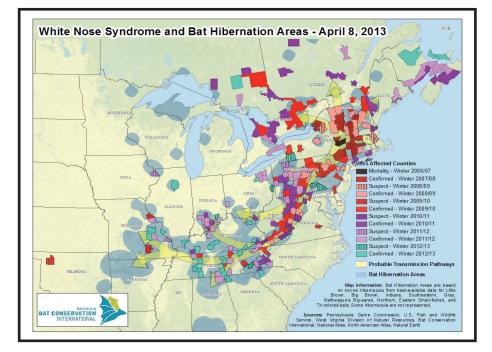
WNS is caused by a cold-loving fungus that thrives in caves and mines. Named for the white powdery appearance around bats' noses, the fungus may also occur on ears, wings, and forearms or may not be visible at all. The fungus agitates bats, awakening them during winter hibernation. Bats use up their water and fat reserves too quickly, reducing their chance for surviving winter. The fungus primarily spreads from bat-to-bat

contact but may also be spread by bringing contaminated human clothing or equipment from one cave or mine to another.

There are no known health risk to humans from WNS. However, the impacts to humans from the loss of bats may be devastating. Bats play a crucial role in the health of our ecosystem by consuming many insects including pest species. Nationally, scientists estimate economic losses in the billions of dollars annually due to an increase in insect pests as a result of the high mortality of bats from WNS and wind powered turbines.

WNS is not known to occur west of the Rocky Mountains, so help us prevent or slow its spread by doing your part to keep this disease out of caves in Oregon.

For information about other caves on the Deschutes National Forest, please go to Lava Lands Visitor Center or Paulina Visitor Center.



For more information about White Nose Syndrome, scan this QR code with your smart device

Or go to: www.whitenosesyndrome.org



# Help keep Lava River Cave bats healthy by...

...not wearing clothing, boots, or use any gear (headlamp, camera, fanny pack, etc.) in Lava River Cave that have been used in a cave or mine outside Oregon or Washington.

...wear warm clothes, sturdy boots, and needed safety items but limit other gear in the cave.

...visiting the Bat Conservation Station at Lava River Cave and complete the short screening process.

....Do Not continue past the closure into the crawl space at the end of the Cave.

...disinfecting your clothing, boots, and gear worn in Lava River Cave before going in another cave on or off the Forest.Contact a ranger for more information or read the disinfecting guidelines on the Descutes National Forest website. See link on this page.



Healthy long-eared bat. Photo: Diane Probasco, USFS

# **Newberry National Volcanic Monument**

# Current Information Hotline: 541-383-5700

