



Ancient Times

Park News 2004



New Exhibits, New Perspectives...

This is the year for new interpretive exhibits. Soon, the visitor centers at Sunset Crater Volcano and Wupatki National Monuments will be better than new. Electrical rewiring, painting, and carpeting are needed first, followed by installation of new exhibits in both buildings. For the first time in many years, the visitor centers will present an accurate picture of these parks and their scientific and cultural importance. And the exhibits have been designed for easy updating to keep them current.

The Sunset Crater Volcano visitor center has been completed. The new exhibits were opened to the public on June 7, 2004, following a three-month closure during construction. Visitors are now enjoying a new audio-visual program, a create-your-own-earthquake jump station, a replica lava flow with models of plants and animals, oral history recordings, and other fun and educational experiences.

The Wupatki visitor center is next. The building will be closed for construction in early 2005. (Call 928-526-1157 for actual dates or check our website, www.nps.gov/wupa). All trails and other facilities will remain open, and park rangers will be on hand to answer questions. Full visitor services will be available at Sunset Crater Volcano - a perfect opportunity to explore the changes already made there.

"This is really important," says Exhibit Specialist Sue Fischer. "The old exhibits were twenty to thirty years old, and could not easily be updated as new discoveries were made. This time around, we can use computer technology, which gives us greater flexibility now and in the future. As our understanding of these areas changes over time, we can share new information quickly with park visitors, without waiting for expensive new exhibit construction. We can also rotate different materials and information into the exhibits, so that each visit is a slightly different experience." Extensive planning has gone into these new exhibits. Fischer and other park employees have consulted with American Indian tribes, scientists, educators, and other experts. Opinions of park visitors were also included, through visitor surveys conducted at both parks in recent years and through opportunities to review mockups of the planned exhibits.

Among the objectives: the new exhibits should be highly interactive, should convey a sense of the fragility of park and regional resources, and should allow visitors to experience the continuum of cultures from past to present. "These parks are not islands," says Fischer. "We want visitors to appreciate the complex relationships - then and now - between this environment and its human inhabitants. The eruption of Sunset Crater profoundly affected local



top of page: The Sunset Crater visitor center in 1968 (left), when the only exhibit was a large volcanic rock, and after installation of new exhibits in 2004 (right).
above: Exhibit Specialist, Sue Fischer explains new exhibit to park visitors.

and regional inhabitants at the time, and influenced settlement patterns for many years across a wide area, including what is now Wupatki National Monument. And human actions continue to affect this landscape."



left: clouds form over the San Francisco Peaks, looking west from Sunset Crater's Bonito Park.

Welcome

Welcome to the Flagstaff Area National Monuments! Walnut Canyon, Sunset Crater Volcano and Wupatki National Monuments are special places that reveal a part of the rich history of the American Southwest. These monuments, as units of the National Park Service, will be preserved for current as well as future generations so that their cultural and natural histories might be told.

The preservation of the monuments is a joint venture between the National Park Service and those people who visit the parks. We must all act as stewards of these irreplaceable places and resources if we are to share them with those who come after us.

The mission of the National Park Service (NPS) is "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of future generations". To meet this legislative mandate, the NPS continually evaluates the management of these lands and resources. As one of over 270 million visitors each year to the NPS system, you must also make decisions about using and caring for these pieces of America's heritage. Please begin by treating the parks gently during your visit.

We thank you for your assistance and hope that you enjoy your visit to the Flagstaff Area National Monuments!

Palma E. Wilson
Superintendent

People & Parks

Support Your Parks with WNPA Membership

Interested in supporting the educational programs of the National Park Service? Consider buying a membership to Western National Parks Association, the Flagstaff Area Monuments' nonprofit partner association. WNPA members enjoy a 15% discount on bookstore purchases, and memberships are honored throughout the National Park System. An annual individual membership costs \$25. Memberships may be purchased at park visitor centers, or call 928 526-1157, extension 226.



Are you a VIP?

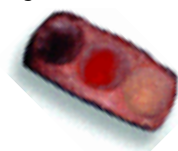
We're looking for enthusiastic, friendly people committed to assisting park employees in different areas of park management. A variety of volunteer opportunities exist year-round at the monuments. Volunteers-In-Park (VIPs) can work full-time or part-time. Housing or RV hook-ups are sometimes available. If you have a special interest or skill, chances are we could use your talents. For more information, contact:



Flagstaff Area National Monuments
Attn: Volunteer Program Coordinator
6400 N. Highway 89
Flagstaff, AZ 86004

Teachers! Make Your Science Curriculum Come Alive!

Science in Our Parks is an in-depth, science-based curriculum for 4th through 6th grade educators and their students, focusing on the natural and cultural history of the Colorado Plateau. Through classroom activities and field explorations in the Flagstaff Area National Monuments, students develop an understanding of the scientific process and park management, while gaining a sense of resource stewardship. For more information, contact the Flag Areas Education Coordinator at 928 526-3367.



House Rules

Northern Arizona is covered with archeological sites. The dry climate of this region has allowed artifacts and sites of past human activity to survive decomposition and the forces of erosion for hundreds of years.

Our decisions and actions will determine whether these priceless and nonrenewable traces of the past will exist into the future.

As a guest in these homes, please remember these basic house rules:

By Invitation Only

Visit only marked, well-known sites. These have been stabilized and reinforced and are better able to withstand visitation.

Use established, marked trails to and around sites. Walking through and around sites is one of the most damaging impacts; it rapidly undermines wall foundations and crushes fragile archeological objects and deposits.

Off-trail hiking is prohibited. Think of the cumulative impact created by judgements such as "it's just a couple of us and it's just this one time".

Keep Your Feet Off the Furniture

Sitting, leaning, walking, or climbing on walls loosens mortar which erodes easily. Walls collapse.

Minimum fine: \$50

Don't Take the Knickknacks

Parks are not the place to collect rocks, fossils, animals, or plants. Imagine the result if each of the one million visitors a year to the Flagstaff Area National Monuments took something home. The parks would be stripped bare.

Minimum fine: \$250

Don't Rearrange the Furniture

Left in place, pieces of pottery and artifacts are valuable clues; rearranged in piles they mean nothing. This behavior deprives other visitors of the thrill of discovering artifacts where they were left generations ago.

Minimum fine: \$250

Sign the Register Not the Rocks

Adding names or drawings to rock outcrops, rock art panels, or structures dishonors the timeless qualities of these special places. All visitor centers have guest registers where we invite you to leave your mark.

Minimum fine: \$250



National Park Service
U.S. Department of the Interior

Flagstaff Area National Monuments

Superintendent
Palma E. Wilson

Mailing Address
National Park Service
Flagstaff Areas
6400 N. Highway 89
Flagstaff, Arizona 86004

Park Headquarters
928 526-1157

Fax Number
928 526-4259

E-mail
FLAG_Information@nps.gov

The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

Catching Glimpses of the Past

Walnut Canyon. Sunset Crater Volcano. Wupatki. Three national monuments with very different landscapes. As we look up at Sunset Crater's cinder cone, down into Walnut Canyon, and out across the Wupatki grasslands to the Painted Desert, we wonder: how are these places connected?

NATURAL LEGACY

At all three monuments, the earth's varied geologic past lies exposed before us. These landscapes were shaped by the violence of volcanic eruptions and by the slow erosion of older rock layers, which in turn reveal evidence of ancient seas and sand dunes. Within canyon walls and in broad scenic vistas, we glimpse features from the distant past, and the diversity of plants and animals that have adapted to live here today.

GLIMPSES OF THE PAST

For thousands of years, people too have found ways to live in these places,

adapting to an arid environment and learning new skills. When Sunset Crater Volcano erupted in the 1000s, there were people here to see it; the event changed their lives, and influenced settlement at Wupatki and throughout the region. The pueblos of Wupatki and the cliff homes of Walnut Canyon contain information that fuels archeological theories and confirms the stories and traditions of present day American Indian peoples, who still have strong ties to these places. By visiting these sites, we can experience something of the lives of people here before us—their migrations, living conditions, conflicts, cooperation, ingenuity, achievements, and failings. What can we learn from them?

FOR FUTURE GENERATIONS

Some lessons of the past have not yet been discovered. By preserving and protecting these landscapes, with their variety of natural and cultural components, we are saving information for future generations.



above: Sunset Crater Volcano, Wupatki and Walnut Canyon National Monuments protect a variety of natural and cultural landscapes.

Visitor Information

In Case of an Emergency

In case of an emergency, contact a park ranger. If no ranger is available, from Walnut Canyon and Sunset Crater Volcano call 911. From Wupatki, call the Coconino County Sheriff's Office at 928 774-4523.

Dates and Hours of Operation

The Flagstaff Area National Monuments are open every day except December 25. For visitor center and park hours, please see the map on pages 6-7.

Reaching the Parks

Walnut Canyon

Take I-40 exit 204, 7.5 miles (12 km) east of Flagstaff. Drive south 3 miles (5 km) to the Walnut Canyon Visitor Center. Be advised that Walnut Canyon's parking lot has a tight turn-around for towed vehicles. Vehicles longer than 40 feet (12 m) are not recommended.

Sunset Crater Volcano

From Flagstaff, take US 89 north for 12 miles (19 km). Turn right at the sign for Sunset Crater Volcano-Wupatki National Monuments. Drive 2 miles (3 km) to the Sunset Crater Visitor Center.

Wupatki

From Flagstaff, take US 89 north for 12 miles (19 km). Turn right at the sign for Sunset Crater Volcano-Wupatki National Monuments. Drive 22 miles (35 km) to the Wupatki Visitor Center.

Entrance Fees

Entrance for adults (17 and older) is \$5.00 per person. Persons 16 and under are free. Special fees are charged for commercial tours.

Passes

The Flagstaff Area National Monuments honor National Park Passes and Golden Eagle, Golden Age, and Golden Access Passports. Passes may be purchased at park entrance stations and visitor centers.

Weather and Climate

Expect variable weather conditions throughout the parks. Short afternoon thunderstorms are common July through September. Expect high winds during March and April. At Wupatki, summer daytime temperatures can exceed 100 degrees. In winter months, heavy snowfall is not uncommon at Sunset Crater Volcano and Walnut Canyon.

Pet Policy

Pets are not allowed on trails or in buildings. Pets may be exercised in parking areas and must be leashed at all times. Do not leave pets unattended outside vehicles. Summer temperatures may be fatal to pets left in vehicles.

Contacting the Parks

Walnut Canyon Visitor Center: 928 526-3367

Sunset Crater Volcano Visitor Center: 928 526-0502

Wupatki Visitor Center: 928 679-2365

Administrative Headquarters, Flagstaff: 928 526-1157

Visit us on the web at www.nps.gov/waca, www.nps.gov/sucr, and www.nps.gov/wupa.

Getting to Know SCA



PERHAPS YOU'VE COME INTO contact with a member of the SCA during your travels through the Flagstaff Area National Monuments. You can tell you've run into an SCA by his or her smile and the yellow and purple patch that adorns the SCA uniform sleeve. These interns are some of the thousands of members of the Student Conservation Association who assist the National Park Service and other land management agencies in preserving and protecting our public lands.

SCA started as a graduate thesis proposed by a young college student named Elizabeth Titus in the late 1950s. Liz thought there should be a way to blend the energy and adventuresome spirit of young people with the pressing needs of our national parks and forests. While developing her thesis, Liz came into contact with former National Park Service Director Horace Albright, who suggested that Liz do more than simply write a thesis. Albright set up some meetings and interviews, and in 1957, 53 student volunteers served at Olympic and Grand Teton National Parks.

45 years later, the SCA has placed over 40,000 volunteers in national parks, forests, monuments, and historic sites in all 50 states. Today, SCA interns of all ages contribute over 1.2 million hours of service per year as interpreters, researchers, backcountry patrollers, foresters, and educators.

currently serve as a home base for 3 to 6 interns a year, who take part in a variety of activities, like coordinating school groups, giving educational talks, monitoring park resources, leading hikes and backpacking trips, staffing the visitor centers, even writing and editing this newspaper!

Other SCA alumni also serve here in the Flagstaff Monuments. Diana Pennington, Interpretive Ranger and Education Coordinator at Walnut Canyon, started her National Park Service career as an interpretive intern at the Grand Canyon. Originally from Indiana, Diana was directed towards SCA by an advisor after graduating from college. Her desire to see the west, and her love of the outdoors, has kept her here ever since.

In contrast to Diana, current SCA intern Emmeline Altschul came to Walnut Canyon straight out of high school in Pittsburgh. Emmeline was looking for an opportunity to explore career options and figure out what she wanted to study in college. Emmeline happened across an SCA position listing, and serendipitously came into a position she "loves".

Does an SCA internship sound like work you might also love? If you have an interest in the Student Conservation Association or working with the parks, talk to one of those friendly SCA interns, or visit the SCA for information at www.theSCA.org.

The Flagstaff Area Monuments

Traveling in Mountain Lion Country

Mountain lions live in these parks. Sightings are rare—an **attack is an extremely unlikely event**. There is far greater risk, in fact, of being struck by lightning. Lions do, however, frequent Walnut Canyon and potential exists for a hazardous encounter. To avoid danger, it is important for you to know how to behave in mountain lion country. The following advice will allow you to more safely share these parks with a truly spectacular animal.

These actions have resulted in mountain lion attacks:

- 👤 People jogging or hiking alone. It is advisable to travel in groups.
- 👤 Children running or walking unattended by parents. Keep children close and within sight at all times.

What to do if you see a mountain lion:

- 👤 Do not run. Do not approach it. Do not crouch down.
- 👤 Stop! Raise your arms and back away slowly, facing the lion. Leave the lion an escape route.
- 👤 Pick up small children. Their size and behavior make them vulnerable.
- 👤 If a lion is aggressive, wave your hands slowly, speak firmly or shout.
- 👤 If attacked, remain standing and fight back!

Exploring Northern Arizona

The Flagstaff area contains some of the most fascinating natural and cultural sites in the Southwest. From red rock canyons to Hopi's high mesas, lush green forests to rugged desert, northern Arizona has something for everyone.

Flagstaff Visitor Center	928 774-9541 800 842 7293	Lodging, dining, events and area attractions. <i>Open daily.</i>
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Area Organizations

Coconino National Forest	928 527-3600	Information on camping, hiking, fishing and other recreational activities. <i>Open weekdays.</i>
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Hopi Reservation <i>Hopi Tribal Council</i>	928 734-2411	Information on touring Hopiland. <i>Open weekdays.</i>
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Navajo Nation	928 871-6436 928 871-7371	Information on visiting the Navajo reservation. <i>Open weekdays.</i>
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Museum of Northern Arizona	928 774-5213	Center for American Indian artifacts and natural history specimens from the Colorado Plateau. <i>Open daily.</i>
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The Arboretum at Flagstaff	928 774-1442	Explore 200 acres of gardens and natural habitats with over 2,500 plant species. <i>Open daily.</i>
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Arizona Snowbowl	928 779-1951	From mid-June thru mid-October, ride the Scenic Skyride to the top of the mountain for a view of alpine tundra and desert. <i>Open daily.</i>
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For information about the Flagstaff Area National Monuments, call 928 526-1157.

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Exploring the Parks

above left: View from Sunset Crater's self-guided Lava Flow Trail.

above right: SCA intern Candace Funk and hikers enjoy a Discovery Hike near Wupatki's Citadel Pueblo.

right: Visitors on a Ledge Hike pause to look out over Walnut Canyon.



Calling All Junior Rangers

Hey, Kid ... Can you tell a mano from a metate? What does a ponderosa pine tree smell like? What would a story made from petroglyphs be about?

If you're 6 to 12 years old and think you might have an idea, then you're the kind of kid we need as a Junior Ranger. Ask at any of the three parks for a Junior Ranger workbook—it's full of activities that will help you have fun and learn about nature and people from long ago.



When you're done, bring it back to any visitor center. We'll look it over, then swear you in as a Junior Park Ranger and give you an official badge. Collect a badge at each park!

Listen! What Was That?

When was the last time you paused at an unfamiliar sound? Birds still sing, crickets chirp, the wind rushes through the trees, but - in this increasingly noisy world - we don't always hear.

Almost everyone associates the national parks with scenery. But there's another aspect to that landscape - it's called a soundscape. We experience soundscapes by hearing, in the same way that we view landscapes by seeing. Both natural and human-caused sounds (our voices, our machines, our toys, our pets, ...) are part of the total soundscape, but in many places, the human sounds drown out all others. If you live or work near a highway, railroad, airport, or other busy place, you know this daily noise too well. In places like Wupatki, Sunset Crater Volcano, and Walnut Canyon, by contrast, the silence can seem deafening.

You can experience a natural soundscape by listening, in the same way that you view a landscape by seeing. Try it. Take time to:

- Stop. Listen to what's around you.
- Close your eyes. Do you hear other sounds? Do you hear more with your eyes closed?
- Open your eyes and compare the visual landscape with the soundscape. Does the shape of the land affect the way sound travels to your ear? Are there any echoes? What is the closest sound you hear? The most distant?

It's Easy to Be Green

With over a half million visitors to the Flagstaff Area National Monuments each year, being environmentally friendly is not just a nice concept, it's a necessity. In April 1999, the National Park Service and Department of Energy formed a partnership to promote the use of technology that is both energy efficient and renewable. The success of this partnership, named "Green Energy Parks: Making the National Parks a Showcase for a Sustainable Energy Future," requires a commitment from both employees and visitors.

Our commitment to a sustainable future is demonstrated in the design of new construction projects, attention to daily maintenance practices, the purchasing of 'green' products, and recycling programs. During the summer of 2003, the bathrooms at the Wupatki Visitor Center were redesigned, incorporating such items as low-flow toilets, waterless urinals, tile made from recycled glass, motion sensor lights, and compact fluorescent light bulbs. New carpet installed in employee housing is made out of recycled plastic milk jugs and soda bottles. A policy to eliminate the use of toxic materials was implemented in 1999. Over 20 cleaning products are now nontoxic and biodegradable. In 2004, some vehicles and heavy equipment will be switched to the more environmentally sound biodiesel fuel. 'Green' items, made from postconsumer recycled content, are incorporated into the workplace as toilet paper, computer paper, notepads, and pens.

How can you, the park visitor, help us? Plastics #1 & #2, aluminum cans, tin cans, magazines and newspapers, paper, and cardboard can be recycled at the visitor centers. Rethink whether you really need a bag at the bookstore or better yet, bring in your own canvas bag. Travel with an insulated travel mug and your own water bottle. Whenever you stop for gas, check your tires to reduce your fuel usage and improve automobile efficiency. Finally, pay your entrance fee with confidence as a portion of your park fee goes to implement environmentally friendly projects.

The mission of the National Park Service is to protect and preserve resources so that future generations may enjoy them as we have. The 'Green Energy Parks' program is one way we can fulfill this. Please join us to make 'being green' part of this mission objective.

by Gloria Pavey, Visitor Use Assistant

As part of its mission to "preserve the scenery and the natural and historic objects and the wildlife therein," the National Park Service tries to preserve the symphony of natural sounds that make up the natural soundscape. You can help by walking and talking softly, and by listening carefully.

When you visit a national park, you enter a world of memorable sights. When you listen to a park, you enter a world of inspirational sounds.

To learn more about natural sound, contact:

Nature Sounds Society, 510-238-7482
<http://www.naturesounds.org>

National Park Service Natural Sounds Program, 970-267-2116 <http://www.nature.nps.gov/naturalsounds/index.htm>

Can't See the Forest for the Beetles



western pine beetle

Driving on Highway 89 between Flagstaff and Sunset Crater Volcano/Wupatki National Monuments, you will see many brown and dying trees in the stands of ponderosa pines along the side of the road. Why are these trees, as well as others in northern Arizona and around the western United States, turning brown? Some

visitors to the Flagstaff Area National Monuments might attribute the problem to the drought conditions that plagued the western U.S. in 2002. While drought has weakened trees in the region, the real culprit killing the trees is an enemy small in size. Less than an eighth of an inch long, the pine bark beetle has been making headlines all around the southwest, and some experts predict the problem these tiny creatures create may be here for some time to come.

eggs hatch into larvae and feed on the live inner bark or cambium of the tree, killing the tree. Once the larvae turn into adults, they depart for a new tree or another spot on the same tree and the cycle starts all over again.

Some bark beetles also carry spores of a specialized type of fungus in pouch-like structures in their heads. The spores dislodge and germinate as beetles chew through the bark. The fungus then blocks conductive vessels of the inner bark, causing tree leaves and needles to fade in color. After as little as a year, trees begin to turn reddish brown as a result. This is often the first evidence of bark beetle damage to a tree.

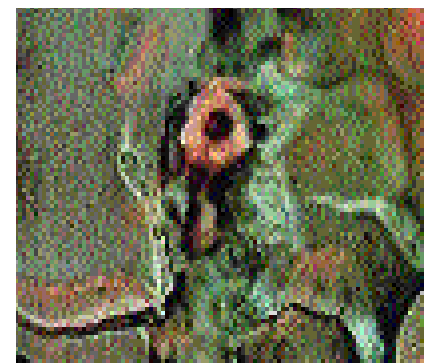
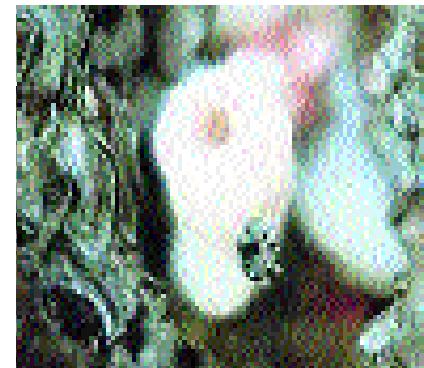
PINE ENGRAVER

The pine engraver beetle often attacks smaller trees and the tops of larger trees. While their preferred host is fresh pine debris, pine engravers will also attack and kill living trees once their populations build up in nearby debris.

In this species, it is the males who initiate the attack and send out a chemical signal to call in other beetles. Adult engravers build galleries in trees, which are excavated grooves that etch or engrave the sapwood under the bark. Pine engraver galleries are open, relative to other species. These distinctive “engraved” galleries are what give this particular beetle its name.

WESTERN PINE BEETLE

In contrast, the western pine beetle attacks living trees that are larger than six inches in diameter, often choosing large, old trees. Females carry out the initial attacks, usually at mid-trunk. Females signal an opportunity for attack by sending out pheromone signals to nearby beetles. Pitch tubes, which can be up to one inch in diameter, are clear indicators of a successful pine beetle attack. Pitch tubes are found in both bark and bark crevices. Prior to mating, the pine beetle con-



Pitch tubes made by western pine beetles. The tubes, made of resin and boring dust, are usually the first sign of infestation on a tree.

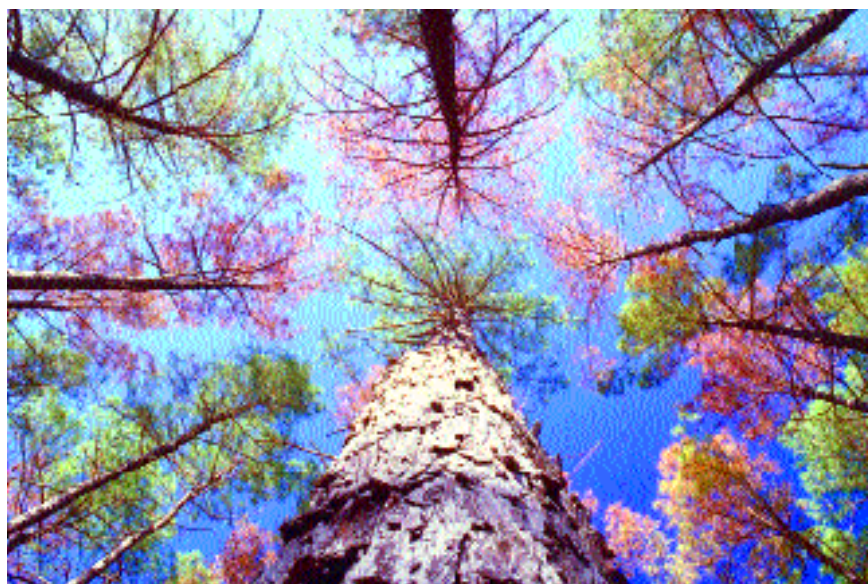
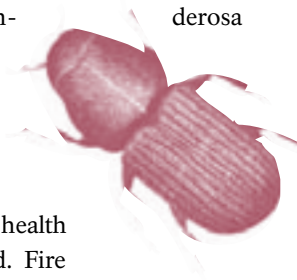
top: an unsuccessful attack by a western pine beetle. The beetle is ejected by tree resin and remains stuck to underside of pitch tube.

bottom: a successful attack. Tube is reddish brown with a clear opening. Photos courtesy USDA Forest Service Archives.

structs maze-like galleries that do not etch the wood. Unlike the engraver's open galleries, those of pine beetles are packed with boring dust.

WHY NOW?

Many local residents question why the bark beetles have suddenly become a problem. The beetles are a natural part of the northern Arizona ecosystem and have evolved with ponderosa pine for millennia. In the last century, however, overall forest health has decreased. Fire suppression has led to overcrowding in forests as well as drought. Under normal con-



Want to Learn More?

Check out these sources for further reading on bark beetles:

- 👉 **University of Arizona Cooperative Extension**
http://ag.arizona.edu/extension/fh/bark_beetle.html
- 👉 **Interior West Bark Beetle Project**
<http://www.usu.edu/beetle>
- 👉 **The Bugwood Network**
<http://www.bugwood.org>
- 👉 **Ecological Restoration Institute at Northern Arizona University**
<http://www.eri.nau.edu>
- 👉 **Flagstaff Bark Beetle Task Force**
928 774-1868

There are about a dozen beetle species that attack ponderosa pines. The two species killing most of the local trees are the pine engraver or *Ips pini* (Say), and the western pine beetle or *Dendroctonus brevicomis*. The bark beetles affect trees in several ways. Often, the pine engraver beetle attacks the top half of the tree and the western pine beetle attacks the lower half. The attack starts when an adult is successful at entering the tree through the bark. The beetle then gives off chemical signals called pheromones, causing large numbers of beetles to join the attack on the tree.

Once in the tree, adult beetles mate and lay large numbers of eggs in the cambium layer under the bark. The

by Jeanne Stevens, Interpretive Park Ranger

ditions, sap production forces bark beetles out of trees. Currently, though, trees are in a stressed state and sap production is not at normal levels. Scientists from Northern Arizona University in Flagstaff report that many trees have stopped photosynthesizing and some trees are no longer transpiring at all. To transpire means to give off watery vapor, especially from the surface of leaves or needles.

The effects of the bark beetle infestation in northern Arizona are significant. Ponderosa and piñon pine trees are the main trees affected around the region. While it is difficult to know exactly how many trees are affected, in some Flagstaff neighborhoods, there is 100% tree mortality. In addition, approximately 100,000 piñon pines east of Flagstaff are dying. The brown, dead trees can remain standing for two to fifteen years and are standing fuel—a hazard which increases the danger of lightning strikes and wildland fire.

Once a tree is infested, it cannot be saved. While in many instances, only the top half of the tree appears dead, the lower half will be killed shortly thereafter. Experts do not recommend trimming just the top of the tree in such cases. For homeowners looking to save trees, local experts say preventative measures will help the most. Foresters recommend lowering tree density through thinning. Be sure to thin trees in late summer and fall in order to allow debris to dry. This makes tree

material less attractive to bark beetles. Consult with a certified forester for appropriate thinning techniques.

At present, we are left with many more questions than answers about the effects of bark beetles on trees in northern Arizona. Historically, wildfires have naturally thinned forests in northern Arizona, leaving stands of pines and large open *parks*, or forest areas devoid of trees. We know that bark beetle attacks will ultimately destroy many large forested areas in northern Arizona and that the effects will be ecological, social, economic and more. It is diffi-

“We know that bark beetle attacks will ultimately destroy many large forested areas in northern Arizona.”

cult, however, to predict the full range of impacts from the loss of large tracts of forested areas. How do you think bark beetles will change our environment? How will the loss of forests affect our lives?



Above and below: Ponderosa pine tree mortality due to bark beetle, Walnut Canyon.

Stay Safe

For your own safety, you are responsible for knowing and obeying park rules and regulations while visiting the Flagstaff Area National Monuments. If you have any questions, please contact a park ranger. Here are a few things to remember:

Observe posted speed limits

Park roads are not designed for speed. Drive slowly, enjoy the scenery and watch for animals on the road. Be especially careful at dawn and dusk, when animals are most active.

Wear your seatbelt

Buckle up. Seat belts are required by law.

Vehicles and bicycles must remain on designated public roadways. Always use marked parking areas and *never* stop in the roadway.

Hunting and the possession of firearms are prohibited

Do not approach or feed wildlife

Within the parks, animals as diverse as javelinas, pronghorn antelope, collared lizards and mountain lions make their homes. Park wildlife is protected by federal law. Remember, this is *wildlife*—keep a safe distance.

Avoid contact with rodents

The white-footed deer mouse is a carrier of hantavirus and prairie dogs can carry plague.

Use caution and common sense around skunks, bats and other known carriers of rabies.

Hydrate!

Heat kills. In summer months, prevent dehydration by drinking lots of water. Eat salty snacks. If you will be doing strenuous hiking, take one gallon of water per person, per day.

Avoid lightning storms

Lightning storms are common to northern Arizona in summer months. Avoid danger by seeking shelter at the first indication of lightning. Avoid trees and open areas.



The Flagstaff Area National Monuments preserve both natural resources (above) and cultural resources (below).



Park News In Brief

Southern Colorado Plateau Learning Center

Imagine living laboratories where science and education combine to increase our knowledge and understanding of the world and our relationship to it. Accomplish this not by new construction, but by organizing and sharing the talents and facilities already available through national parks and their neighbors, including universities, state agencies, and community organizations. To realize this vision of the future, the National Park Service is creating a network of 32 learning centers across the nation.

The Southern Colorado Plateau Learning Center, hosted by the Flagstaff Area National Monuments and Petrified Forest National Park, will be one of these. Goals are to facilitate research and to share the resulting scientific information with the public. Stay tuned for details.



mullein

Earthscope Project

"From a distance the red cinders seem to be on fire," John Wesley Powell wrote of Sunset Crater while on a U.S. Geological Survey expedition in 1885. He named the volcano "Sunset Peak." To the Hopi, Sunset Crater is "Red Hill" or Polotsmo, home of the Kana'a katsina. Through history, Sunset Crater has been many things to many people. Now Sunset Crater Volcano National Monument is poised to take on a new role at the forefront of research in the physical sciences. The monument has been designated a pilot park to host instrumentation and interpret geophysical and geological findings of the National Earthscope Project. This multidisciplinary, multi-partner research project will investigate the structure and evolution of the North American continent and the physical processes controlling earthquakes and volcanic eruptions.

See www.earthscope.com for more details.

New on the Web



Find in-depth nature and science information on the Flagstaff Area Monuments with our new

Natural Resource Profile web pages! Search an online catalog of Walnut Canyon's exhibit collections or take a virtual volcanic field trip on Bonito Lava Flow. From the park home page, follow the *Nature & Science* link under *Park Resources*.

Western National Parks Association

The Story of WNPA

Western National Parks Association (formerly Southwest Parks and Monuments Association) was founded in 1938 to aid and promote the educational and scientific activities of the National Park Service. As a nonprofit organization authorized by Congress, WNPA operates visitor center bookstores, produces publications, and supports educational programs at more than 63 parks in 11 western states.

Introducing the Parks

Official Map and Guides

Wupatki/Sunset Crater Volcano and Walnut Canyon Park maps, safety, regulations, general orientation and introduction to the natural and cultural history of the parks. **\$.25 each.**

Sunset Crater Volcano National Monument

Rose Houk

A look at the youngest of over 600 volcanoes found in the San Francisco volcanic field. 16 pages. **\$3.95**

Wupatki National Monument

Susan Lamb

An overview of the natural and human history of Wupatki, from past to present. 16 pages. **\$3.95**

Walnut Canyon

Scott Thybony

Guide to the cultural and natural history of Walnut Canyon National Monument. 16 pages. **\$3.95**
Deutsch translation: **\$4.95**

Guide to Sunset Crater and Wupatki

Scott Thybony

An excellent road guide to the natural and cultural features of both national monuments. 48 pages. **\$5.95**

The Parks In-Depth

Wupatki and Walnut Canyon: New Perspectives on History, Prehistory, and Rock Art

David Grant Noble

Research and analysis has provided new insights presented here in a concise overview. 40 pages. **\$8.95**



Letters from Wupatki

Courtney Reeder Jones

A compilation of letters written to friends and family by the wife of Park Service caretaker Davy Jones during the 1930s. A wonderful glimpse into life at Wupatki in the days before 240,000 visitors a year. 151 pages. **\$15.95**

Bookstore Sales

Bookstore sales are WNPA's primary source of income and support the parks' interpretive programs. The following publications, available from WNPA, are recommended for making the most of your visit to the Flagstaff Area National Monuments.

For additional choices, visit the visitor center bookstores, or browse online at www.wnpa.org.

Volcanoes of Northern Arizona

Wendell Duffield

An easy-to-understand guide to northern Arizona volcanoes with beautiful graphics and color aerial photographs. Includes several self-guided road tours. 68 pages. **\$9.95**

Cultures of the Southwest

Those Who Came Before: Southwestern Archeology in the National Park System

Robert and Florence Lister

This is an excellent and comprehensive overview of southwestern archeological sites in the National Park System. 184 pages. **\$16.95**

Prehistoric Cultures of the Southwest Series

Rose Houk

Each booklet in this five-part series provides an introduction to the evolution, achievements, and lasting legacy of a distinct ancient culture. Please specify *Anasazi*, *Hohokam*, *Mogollon*, *Salado*, or *Sinagua*. 16 pages. **\$3.95 each.**

Geology

Highlights of Northern Arizona Geology

Arizona Geological Survey

A compilation of interesting articles on geologic features, side canyons of the Colorado River, petrified wood, and an aerial tour. 34 pages. **\$7.95**

A Guide to the geology of the Flagstaff Area

John V. Bezy

Descriptions and directions to fascinating geologic features along NPS and US Forest Service roads and trails. 56 pages. **\$7.95**

Roadside Geology: Wupatki and Sunset Crater Volcano National Monuments

Sarah L. Hanson

A geologic road guide for the 34-mile scenic loop road connecting the two national monuments. 32 Pages. **\$6.95**

Roadside Geology of Arizona

Halka Chronic

Explains the spectacular geology of Arizona as seen from a car at specific points along highways throughout the state. 321 pages. **\$18.00**



Maps

Guide to Indian Country Map

Covers the Four Corners area outlining Indian reservations, national parks and monuments, and geologic features. **\$3.95**

Recreational Map of Arizona

Detailed travel map with more than 400 recreational sites and 500 points of interest listed. **\$3.95**



Road Map of Navajo and Hopi Nations

Includes detailed maps of Monument Valley, Chaco Culture, and Canyon de Chelly. **\$3.95**

Hiking and Travel Guides

The Guide to National Parks of the Southwest

Nicki Leach

Authoritative interpretive guide to 52 National Park Service sites in Arizona, Utah, Colorado, New Mexico, and Texas. Color. 80 pages. **\$9.95**

The Back Roads

This Arizona Highways book outlines 20 exciting back road tours for the whole family. 137 pages. **\$12.95**

Flagstaff Hikes

Richard and Sherry Mangum

146 day hikes around Flagstaff, Arizona. 288 pages. **\$16.95**



Placing Your Order

By Phone

We encourage you to order by phone to get the publications best suited to your needs. To place an order, please call 928 526-1157, extension 226.

By Mail

Add up the total amount of your order plus shipping cost (see table at right). Include a check payable to WNPA, or credit card number and expiration date. Visa and Mastercard accepted. Send orders to: WNPA, 6400 N. Highway 89, Flagstaff, AZ 86004. Prices and availability subject to change.

Shipping Costs

Item Total	Shipping Cost
Up to \$4	\$2.00
\$4.01 - \$15	\$4.00
\$15.01 - \$25	\$5.00
\$25.01 - \$50	\$6.00
\$50.01 - \$100	\$6.50
Over \$100	Actual postage + \$1.00
International shipments, add \$1.00.	