



Birds and Caves at Lava Beds National Monument

Overview

Students learn how the caves at Lava Beds NM formed and the animals that use the caves.

California Science Standards

Grade 3: 3.b.c.d.-L.S.

Grade 4: 3.b.-L.S.

Grade 7: 7.c.-I&E

Oregon Science Standards

Grade 3: 3.S.2

Grade 4: 2L.1

Grade 5: 3S.2

Grade 7: 3S.3

National Standards

Content Standard A:

Science as Inquiry

Content Standard C:

Life Sciences

Materials Included

* Student Journal

* Laminated species cards

Materials Needed

* Projector

Activity Time

Preparation: 15 min.

Activity Time: 40 min.

Best Season

Spring/Summer

Vocabulary

* Troglaxene

* Troglophile

* Trolobite

Grade Level: 3rd-8th (O.S.S 3rd-5th & 7th) (C.S.S: 3rd-7th)

Learner Objectives

Student will:

- Learn how the caves at Lava Beds National Monument formed
- Investigate the different animals that use the caves as habitat
- Interpret data and practice journaling skills.

Background Information

Lava Beds National Monument sits on the northern slope of the largest (by surface area and volume) volcano in the Cascade Mountains: Medicine Lake Volcano. There are over 700 known lava tubes and caves within the monument that were formed by eruptions from Medicine Lake Volcano. As lava flows down the mountain sides, the outer layer of the flow cools rapidly forming a hard outer shell insulating the lava within it. When the eruption stops, the remaining lava drains away leaving behind hollow tubes. The cooling lava shrinks and cracks forming “skylights” and collapses create entrances to the caves where light and animals can enter.

The caves and tubes at Lava Beds National Monument provide a habitat for several different species of birds, mammals, invertebrates and plants. All of the biota (all living things found in an area) that use caves can be classified into three groups: troglobite, troglophile, and troglaxene. Troglobites “cave dwellers” are restricted to caves for the entire life cycle of the species - at Lava Beds National Monument there are 8 known invertebrate species that are troglobites. Troglophiles “cave lovers” (bats, packrats) can complete their lifecycles in the cave but they can also use other habitats. Troglaxenes “cave guests” (birds, skunks) use caves for part of their life cycles but cannot spend their entire life cycle within the cave. Transition and light zones in caves are where you find the most diversity of plant and animal life. In the damp transition zone (the entrance of a cave where daylight penetrates and gradually decreases to no light) mosses, mushrooms, and ferns cling to small cracks and footholds where soil has been deposited. Light zones (areas around a skylight or collapse where light enters) are used by birds. Common Raven, Great Horned Owl, Canyon Wrens and Mourning Doves are just a few of the species that use or nest in the light zone. Barn Owls are found in the entrance area and just beyond the light zone. Bats and packrats venture beyond the light zone and use the dark zones of the cave.

Lesson Plan

Caves are also an important water source for several different species at Lava Beds National Monument. Water will pool in caves allowing animals to access water year round, which is especially important as water at the monument is very limited as there are no streams, springs or lakes within the monument. At one of the caves with a year round water source, a wildlife imaging camera was installed to monitor the birds and mammals using the cave from May through October from 2006-2008. The camera in the cave captured the first photographs of Mountain Lion and Mountain Quail within the park. Mourning Doves were the most abundant animal photographed.

Another bird that is being monitored at Lava Beds National Monument and nests in caves, is the Purple Martin. The largest North American swallow, Purple Martins winter in the lowlands of Brazil and Bolivia and breed in North America in three regions: east of the Rocky Mountains, the west coast of the United States, and the Baja Peninsula. Purple Martins feed exclusively on flying insects and are seen hawking (capturing insects in the air) for insects at high altitudes. East of the Rocky Mountains Purple Martin nest almost exclusively in nest boxes maintained by people. Western Purple Martins still use natural cavities in snags created by woodpeckers or crevices on cliff faces. The Pacific population of Purple Martins has been declining for the past 50 years due to habitat loss in lowland areas, loss of large snags due to fire suppression, and competition of non native European Starlings and House Sparrows for nesting sites. Lava Beds National Monument is a unique area to view Purple Martins because it is the only place where Purple Martins are known to nest in caves! The resource managers at the monument have been monitoring the underground nesting populations of Purple Martins during the breeding season (May-July) since 2005. Purple Martins are found in large caves, such as Skull Cave.

Getting Ready!

1. Read background information.
2. Make copies of the *Student Journal: Birds and Caves*.
3. Acquire projector for wildlife monitoring journaling activity.

Discuss!

1. Discuss with students the geology behind Lava Beds National Monument and the formation of the caves and lava tubes.
2. On the board write out the three different types of biota (troglomite, troglophile, troglonexes) that use the caves and define each.

Fun Cave Facts:

- * *Catacombs cave is the longest cave at LABE at 8,435 ft. That's over 1.5 miles!*
- * *The deepest cave at Lava Beds is 180 feet.*
- * *The oldest lava flow in the park is over 450,000 years old.*

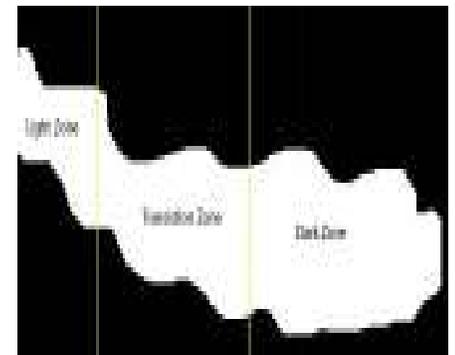


Purple Martin

Photo by NPS

Where to see Purple Martins:

Take students, journals, and binoculars to Schonchin Butte Road between April and May. Students should walk along the road and try to spot Purple Martins, practice wildlife journaling, and sketch the cave.



Lesson Plan

3. Discuss with students how caves are an important habitat and water source for the animals at Lava Beds National Monument.
4. Illustrate the transition zone, light zone and beyond light zone on the board (see right panel on previous page). Using the laminated cards again, place each animal in the proper zone: Purple Martin in transition zone; Mourning Dove in the light zone; Barn Owl and Mexican Free-tailed Bat beyond light zone.
5. Show card of the Purple Martin and discuss with students how Purple Martins use the caves at Lava Beds National Monument.
6. Introduce the concept of wildlife imaging cameras and videos and ask students what biologists can learn from them.
7. For older students pass out student journals and have them interpret the graphs.
8. Discuss results.
9. Watch video clip of migrating Sandhill Cranes or nesting Peregrine Falcons (See side Panel) in the spring or and watch a clip from *The Life of Birds* and have students complete the journaling activity.

Investigate!

1. Let students know that they will be going on a field trip to Lava Beds National Monument to investigate the caves and scout for Purple Martins
2. From May to July Purple Martins can be seen flying over head and in and out of caves at Lava Beds National Monument. Take your students to Skull Cave or Schonchin Butte Road.
3. Have students watch for Purple Martins coming in and out of the collapse, from at least 300 feet away.
4. Record any evidence of birds using the collapse and practice wildlife journaling and sketching skills.

Follow-up!

1. Ask questions from the side panel.

Cave Softly, Cave Safely!

Caves are a unique and sensitive habitat. You can help protect the caves and lava tubes at Lava Beds National Monument by making sure to:

- * Stay on trails
- * Leave no trace and pick up any trash you find in the caves
- * Do not touch the cave formations which can be permanently damaged
- * Make sure you protect your head
- * Stay with your group
- * Bring ample light sources for your group and the amount of time you will be in the cave

Wildlife Monitoring with Cameras

Biologists use video and digital technology to monitor animal behavior. Cameras can be used to avoid disturbing the animals or to monitor the animals in a remote or dangerous location. Sometimes cameras are used for education so people can experience wildlife behavior in the classroom.

Check out video of Sandhill Cranes at the Rowe Sanctuary on the Platte River in Nebraska: <http://video.nationalgeographic.com/video/cranecam/index.html>

Nesting Peregrine Falcons video from the Santa Cruz Predatory Bird Research Group: http://www2.ucsc.edu/scpbrg/peregrine_cam.htm



Cave Collapse Entrance

Photo by NPS

Follow Up Questions

How did the caves and lava tubes form?

List three types of animals that use the caves at Lava Beds National Monument.

What areas of caves do birds use?

What is one threat to the west coast population of Purple Martins?