National Park Service
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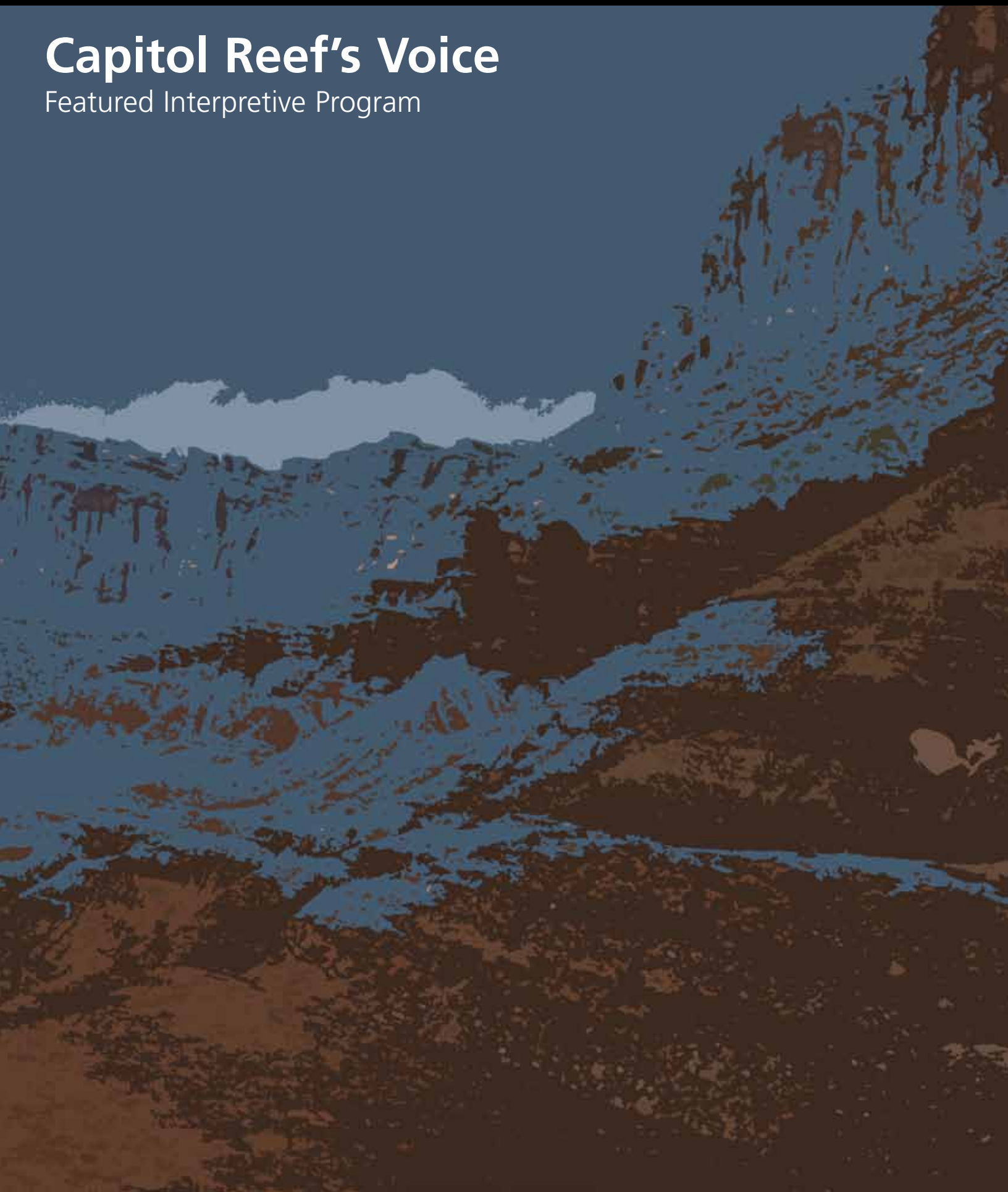
Natural Sounds & Night Skies Division

Capitol Reef's Voice

Featured Interpretive Program



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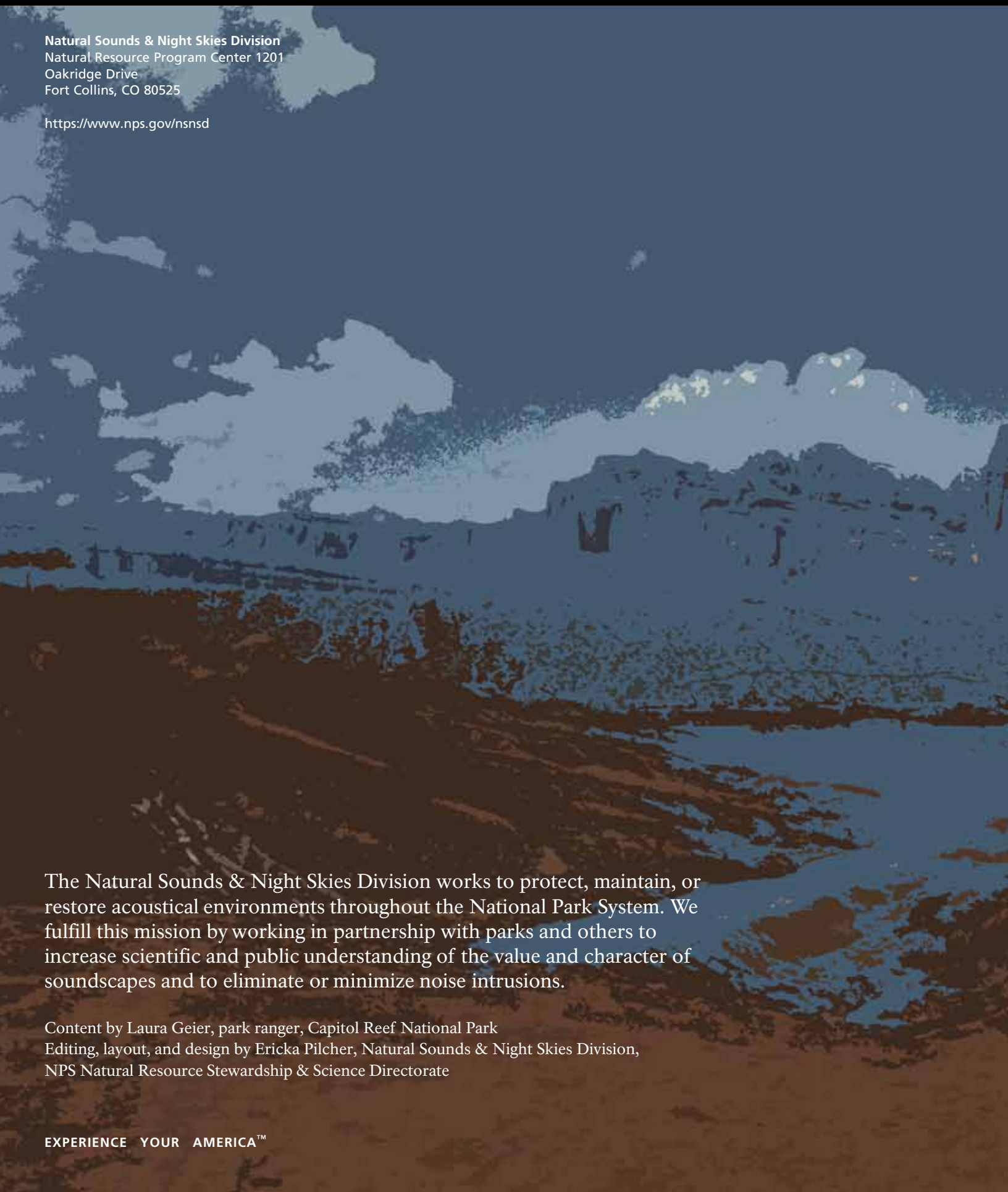

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The Natural Sounds & Night Skies Division works to protect, maintain, or restore acoustical environments throughout the National Park System. We fulfill this mission by working in partnership with parks and others to increase scientific and public understanding of the value and character of soundscapes and to eliminate or minimize noise intrusions.

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Integrating Soundscape Topics into Interpretive Programs

The following program demonstrates how soundscapes and acoustic resources can be integrated into a variety of thematic topics for interpretive programs. Laura Geier, park ranger at Capitol Reef National, developed this program to help visitors realize the impact sounds can have within a park system, and she reveals how sounds can connect visitors to special places within Capitol Reef.

Because the National Park Service works to protect and enhance both park resources and visitor experiences, the Natural Sounds & Night Skies Division differentiates between the physical sound sources and human perceptions of those sounds. The physical sound resources, regardless of audibility, at a particular location comprise what is known as the **acoustical environment**, while the human perception of that acoustical environment is defined as the **soundscape**. Examples of **acoustic resources** include sound sources such as wildlife, waterfalls, wind, rain, and historic and cultural sounds, and the quiet background in which to hear them.

In the silence of a cold winter day, the wind brushed across the land and a single snowflake fell to the ground. Goosenecks Overlook, NPS photo by Ericka Pilcher.

Gifford Barn, Fruita Rural Historic District. NPS photo.

Capitol Reef's Voice by Laura Geier

Theme
Natural soundscapes, as Capitol Reef's voice, are a vital part of the National Park Service and can enhance your experience.

Goals
Visitors will:

- realize the effect that sound has within the National Park System
- identify soundscapes as a vital part of their experience that allows them to make special connections to Capitol Reef National Park

Objectives
Visitors will:

- become aware of how natural sound enhances their experience
- learn to key in on their natural environment by listening
- understand the importance of preserving natural soundscapes
- identify ways to help reduce noise in parks

Introduction
[Prelude music: "Fanfare for the Common Man" by Aaron Copland]

Note: Depending on the natural soundscape and setting where you are doing your interpretive program, you may want to omit the background music. Often times, the natural soundscape is the best music you can provide for your visitors.

Sulphur Creek in Capitol Reef Naitonal Park. NPS photo.

Coyote. NPS photo.

[Opening quote on PowerPoint screen: "But for the time being, around my place at least, the air is untroubled, and I become aware for the first time today of the immense silence in which I am lost. Not a silence so much as a great stillness…slight noises which break the sensation of absolute silence but at the same time exaggerate my sense of the surrounding, overwhelming peace. A suspension of time, a continuous present." —Edward Abbey]

Good evening and welcome to Capitol Reef National Park. My name is Ranger Laura Geier, and this is my second season in the park.

[Announcements, weather forecast, etc.]

Body

I. Tonight, we are going on a sound safari through Capitol Reef National Park. To begin [pause]…I would like you to close your eyes for one minute and just listen.

[After one minute of listening]

What did you hear? [audience participation] These sounds are part of the natural soundscape. Natural soundscapes, as Capitol Reef's voice, are a vital part of the National Park Service and can enhance your experience. Your soundscape experience includes everything from the singing of a Western bluebird, to the chirping of crickets, to the howling of coyotes, to the rushing sounds of the nearby Fremont River.

The sounds present here at Capitol Reef will leave a strong imprint…they will draw you back to this place. As a child, I grew up going to national parks. I remember distinctly the nearby yelp of coyotes near my family's campsite at Natural Bridges National Monument. I can tell you that I will never forget what that sounded like.

Before we begin our sound adventure, let's take a closer look at the idea of soundscapes, a relatively new frontier. Until just over one hundred years ago, we had no way of preserving sound. It wasn't until the late 19th century, in 1877, that Thomas Edison invented the first audio recorder—a phonograph cylinder. Can you imagine if we had sound recordings from the time when dinosaurs walked the earth?! Today, there is an extensive knowledge of soundscapes. Scientists who study sound present within natural environments are called "bioacousticians." For exam-ple, Bernie Krause is crusader of soundscapes and has been recording soundscapes all around the world from the Pacific Ocean, to Africa, Alaska, and our national parks.

What kinds of sounds do bioacousticians like Bernie Krause record? He classifies them into two types of sounds: **Biophonic sounds** are the sounds we hear that are created by mammals, amphibians, and birds whereas **geophonic sounds** are the sounds of the natural world like the sharp clap of thunder or the rushing waters of a raging flash flood. If you take time to listen when you are here at the park…you'll discover a whole symphony of sounds.

II. And NOW…our sound adventure begins! [soundtrack to Indiana Jones and the Last Crusade plays in the background]

Where can we hear sounds in the park? [locating sounds throughout the park depending on place]

Capitol Reef encompasses a one hundred mile stretch of land where the rock layers have been folded up in the western end and tilt down towards the east. There are a variety of ecosystems (habitats) due to this unique landscape…everything from riparian environments where water is present to pinon/juniper landscapes to high cliff sandstone walls, to large basins of water known as "waterpockets" where desert amphibians make their homes.

There's more to the acoustical environment than our ears can hear. Pallid bats, like the western pipistrelles mentioned in the program, produce ultrasonic echolocation calls that humans cannot hear. These bats have been found near Fruita in Capitol Reef National Park. NPS photo.

Fruita

Let's begin right here in the orchards of Fruita where you might hear the nearby chirp of crickets, the whir of the black-chinned hummingbird, or the call of a common poorwhill, or observe the frantic flight of the western pipistrelle, one of the smallest bats in the United States.

Note: Each slide has an mp3 sound file in which I either recorded or was given permission from online sources to use in my program. A favorite resource was Jeff Rice and the Western Soundscape Archives.

Crickets: Aaah…the chirping of crickets…calming to some…annoying to others. Crickets create sound by rubbing their wings together. Their chirping is associated with mating; only the male crickets make sound to attract their female mates! They also make sound to protect their territory. Sometimes the evenings will be so blanketed by silence that the only sound you will hear is the constant whir of a cricket chorus. In China, chirping crickets signify good luck. An-other interesting fact about crickets is that they have hearing organs in their knees! Very fasci-nating. I relate this sound to calm, summer evenings out under the stars…

Black-Chinned Hummingbird: This little guy weighs about as much as a dime and one dollar. The black-chinned hummingbird, reminds me of my childhood explorations at Capitol Reef. I remember spotting many hummingbirds here in the orchards of Fruita when I was camping with my family. The sound of the black-chinned hummingbird comes primarily from the whirring of their wings that beat 50 beats per second! Hummingbirds have at least five different high-pitched chirps and ticks. You will hear their chirping sounds as they cluster together near nectar, fighting for food. Let's listen to the fast whirring of the black-chinned hummingbird. [play sound clip]

Common Poorwill: The common poorwill actually gets its name from its call, a monotonous "poor-will" given from dusk to dawn. Birds or mammals that come out just as the sun is setting are referred to as crepuscular. Remarkably, the common poorwill is the only bird known to go

"There is music in all things, if men had ears."
—Lord Byron

into torpor for extended periods (weeks to months). Torpor is a temporary state of hibernation where the body temperature and rate of metabolism are reduced. Native Americans of the Hopi tribe were likely aware of the poorwill's behavior even earlier—the Hopi word for the bird means "The Sleeping One"…and now the call of the common poorwill. [play sound clip]

Western Pipistrelle: If you watch closely this evening, you'll observe the frantic flight of the western pipistrelle. Who knew that bats are the only flying mammal and one of the greatest in terms of sound navigation? Many bats, including the western pipistrelle, use a system known as "echolocation" in which they send out sound waves to locate insect prey. The sound behaves the same way as the sound of your shout in a canyon. It travels through the air as a wave and the energy of this wave bounces off any object it comes across. Bats process this information unconsciously in less than a second and locate their prey. So, bats use sound primarily for survival so they can locate food in the dark of the night. Bats communicate at a pitch that is too high for us to hear so scientists record bat sounds with simple handheld devices called "bat detectors." [play sound clip]

Coyote: At night, as the moon rises from the horizon, or at the break of dawn you might hear maniacal laughter or the yipping of the coyote…Have you ever wondered why coyotes howl at the moon? Well, their howling serves two purposes—to call the family pack back together after individual hunting and to establish territories from other packs of coyotes. It's an attention grabbing sound and an eerie one…[play sound clip]

Mexican-Spotted Owl: If you happen to be wandering in a slot canyon late into the evening… you might hear this call…[play sound clip] of the Mexican-spotted owl. Their hoot signifies territory establishment and is also heard during mating season. Mexican-spotted owls use "intra-pair communication" in which a male owl will pair with a female owl and choose certain spatial positions relative to one another to dominate the territory.

Fremont River: Here we are on a typical day along the Fremont River, one of our perennial water sources coming from Fish Lake Mountain north of our park that runs year round… [play sound clip] Sounds from the river can be relaxing, calming, and rejuvenating. On a day where the park may have heavy rainfall in a localized area, the river could build in volume, speed, and

River ford to Cathedral Valley. NPS photo.

The sounds of a rattlesnake or a mountain lion are hard to forget. NPS photos.

power, producing a flashflood! These storms are common in late summer and early fall. Just a word of caution…never enter a wash area or slot canyon when storms are threatening because within their waters flashfloods carry debris, which includes logs, rocks, sometimes even animals. Floodwater may sound more like an approaching jet than the sound of water! [play sound clip]

Riparian (Water) Environments

As you enter Capitol Reef along Highway 24, you immediately see how water has shaped and carved an entryway through the reef. You might have also observed that water has seeped within sandstone and eroded away large basins of water called "waterpockets." Water is one of the sole culprits of the canyons you see today and continues to shape Capitol Reef.

Red-Spotted Toads: When walking in the night near standing waterpockets or where water has collected in slot canyons, you may hear the high-pitched chorus of red-spotted toads. The males are desert singers, calling the females to join them at their breeding sites. Perhaps triggered by the recent rains, these toads know that they may have only a brief opportunity to breed in these ephemeral pools.

Bighorn Sheep: If you've explored the park today, then you have probably noticed evidence of mammal track ways. Last summer, I was hiking with a friend in Cottonwood Wash slot canyon and we heard the distinctive sound of breathing as we rounded a corner. At first we were pretty frightened because we had no idea what was in the slot canyon with us. As we turned the bend we spotted a juvenile bighorn sheep, also called a lamb, that had wandered into the slot. Who is to say where mama was? At that point, we turned around and continued out the other end of the slot so we would not frighten the lamb any further. Bighorn sheep lambs bleat when scared or when calling out for their mothers. The ewes respond back with a guttural "ba." During mating season, the rams frequently snort loudly. [play sound clip]

Piñon-Juniper Landscape

While hiking many of our extraordinary slick-rock areas, you may have seen one or both of the two most common woody plants in the park—the piñon pine tree and juniper berry.

Piñon Jay: And where you find piñon pine trees…you will find this bird, the piñon jay, which can be heard cawing (cackling) loudly in groups. The piñon jay is a highly social, cooperative-breeding, seed-caching bird of the desert Southwest. Its name is taken from the piñon pine. They are in a co-evolutionary relationship, meaning that they help each other to exist. Listen close to the cawing of the piñon jay… [play sound clip]

Great Basin Rattlesnake: When you hear this cautionary sound [play clip], you know that it is time to back off and give the desert Great Basin rattlesnake some space. The rattle protects the snake from predators and is used to warn others of its presence.

Mountain Lion (Cougar): As dusk rolls in upon the desert floor, beware of this large mammal, the mountain lion (cougar), which roams the land at night. Mountain lions are rarely sighted, but they do exist here in the park. If you happen to hear a very deep, low, growl that makes your hair stand on end, never run. The mountain lion can easily outrun you. Stand tall and still and look big so that the mountain lion knows you are not an easy catch. This sound will make the hair on your arm stand on end…[play sound clip]

Just as we use sound (language) to communicate…so do mammals, amphibians, birds, and insects. Acoustical environments are important to these creatures for the following reasons:

1. Intra-species communication
2. Territory establishment—finding a desirable habitat in which to live
3. Predation and predator avoidance
4. Nurturing and protecting young
5. Courtship and mating

[Follow each with an example from the program.]

Conclusion/Preservation Message

Soundscapes are in danger due to noise pollution from machinery, humans, vehicles, and air transportation. Imagine if the bat cannot hear its sound wave reflecting off its prey due to noise from us? It is our mission (the NPS) to protect soundscapes.

What is the National Park System doing to preserve the voice of the natural world?

1. The Natural Sounds Program (NSP), a branch of the NPS, established in 2000 is working to monitor, protect, maintain, and restore acoustical environments.
2. The NSP works with the Federal Aviation Administration to develop air tour management plans.
3. The NSP collects and analyzes acoustic data in regard to natural ecosystems.

What can you do? It's very simple…

1. Speak quietly and turn off vehicle engines whenever possible.
2. Be aware of others on the trail and use a soft voice.
3. Turn off car alarms!
4. Look for mute options on electronic equipment.
5. Use alternative transportation such as shuttles when available (Zion National Park).
6. Be aware of campground quiet hours (generator hours).

How is nature's voice beneficial to you and I? Nature's voice is a vital part of YOUR experience because it provides physical and spiritual healing leading to a sense of wellbeing and reduction of stress. It provides places of tranquility, peacefulness, and a timeless haven for contemplation, reflection, and solitude. It gives us memories to take home and reminds us of this special place…Capitol Reef National Park.

[Activity: Have the audience choose a sound that they heard in the park that speaks to them and do a group imitation.]

Each of us has our voice…the coyote…the western pipistrelle…even the smallest red-spotted toad. The most important thing you can do while visiting the parks is to [pause] listen. To end, I am going to leave you with the voice that I most relate to and that is my violin. [play theme from "October Sky" to segue into night sky viewing and give people time to reflect]

Thank you. Enjoy the sounds of your evening…

[Closing quotation on PowerPoint screen: "Have you listened to the earth? Yes, the earth speaks, but only to those who can hear with their hearts. It speaks in a thousand, thousand small ways, but like our lovers and families and friends, it often sends its messages without words. For you see, the earth speaks in the language of love. Its voice is in the shape of a new leaf, the feel of a water-worn stone, the color of the evening sky, the smell of summer rain, the sound of the night wind. The earth's whispers are everywhere, but only those who have slept with it, can respond readily to its call." —Steve Van Matre, "The Earth Speaks"]

Waterpocket Fold. NPS photo.