

JUNIOR RANGER

ACTIVITY BOOK

INYO
National
Forest

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WELCOME

To the Inyo National Forest!

We are so excited that you have started your journey to become a Junior Ranger. What you get to see during your trip depends on what time of year you visit and how long your visit is. Don't worry, there is a lifetime's worth of places to explore here!

This booklet has activities on each page; complete as many as you can and once you are done, show it to a Forest Ranger at one of the visitor centers shown on this map to earn your badge.

The Inyo National Forest is one-of-a-kind! From Mono Lake in the north all the way to the Golden Trout Wilderness in the south, adventure awaits. This map and booklet will help you discover the many wonders of the Inyo National Forest.



NATURE NOTES

During your visit, record your special memories, nature observations, and questions you have about the Inyo National Forest. When you get your badge, ask a Forest Ranger to answer any lingering questions!

Draw a place, animal, or plant you have appreciated in the Inyo National Forest.

MONO LAKE

Mono Lake is for the birds!

Mono Lake is an important stop for millions of birds each year. Some birds, like phalaropes and grebes, come to eat brine shrimp and alkali flies to “fuel-up” for their long-distance migrations. Other birds, like California gulls, nest on the islands in Mono Lake where their eggs are safe from predators. Ospreys can be found nesting on the tufa towers, even though they must travel to nearby mountain streams to fish for their food. Mono Lake is almost three times saltier than the ocean and cannot support fish life!



Wilson's Phalarope



Eared Grebe



California Gull



Osprey

Have you seen these birds?

Check the boxes next to the birds you have seen during your visit to Mono Lake.

Why fly when you can dive?

Alkali flies are found along the shores of Mono Lake. However, these are not your typical flies. These flies spend three of their four life stages completely underwater! Adult flies have waxy body hairs that allow them to trap an air bubble and scuba dive underwater! While underwater they lay their eggs and eat algae in Mono Lake. Their bubbles hold enough air to stay underwater for up to 20 minutes!

Photo: Floris van Breugel



A few days after the eggs are laid underwater, the eggs hatch and fly larvae emerge. When the larvae find a good spot to hang on, they enter the next stage of their lives as pupae—all underwater! In their pupae, they go through metamorphosis and transform into adult flies.

The pupae of the alkali flies, also known as **kutsavi**, is a traditional food source for the Kootzaduka'a people, the original inhabitants of the Mono Basin. Kutsavi is harvested to eat and used to be traded with other tribes. In fact, Kootzaduka'a translates to “flyer eater” in their native language. The Kootzaduka'a people still call the Mono Basin home and are important protectors of this unique area.

Want to learn more? Visit the Mono Basin Scenic Area Visitor Center and ask about the free South Tufa Tours!

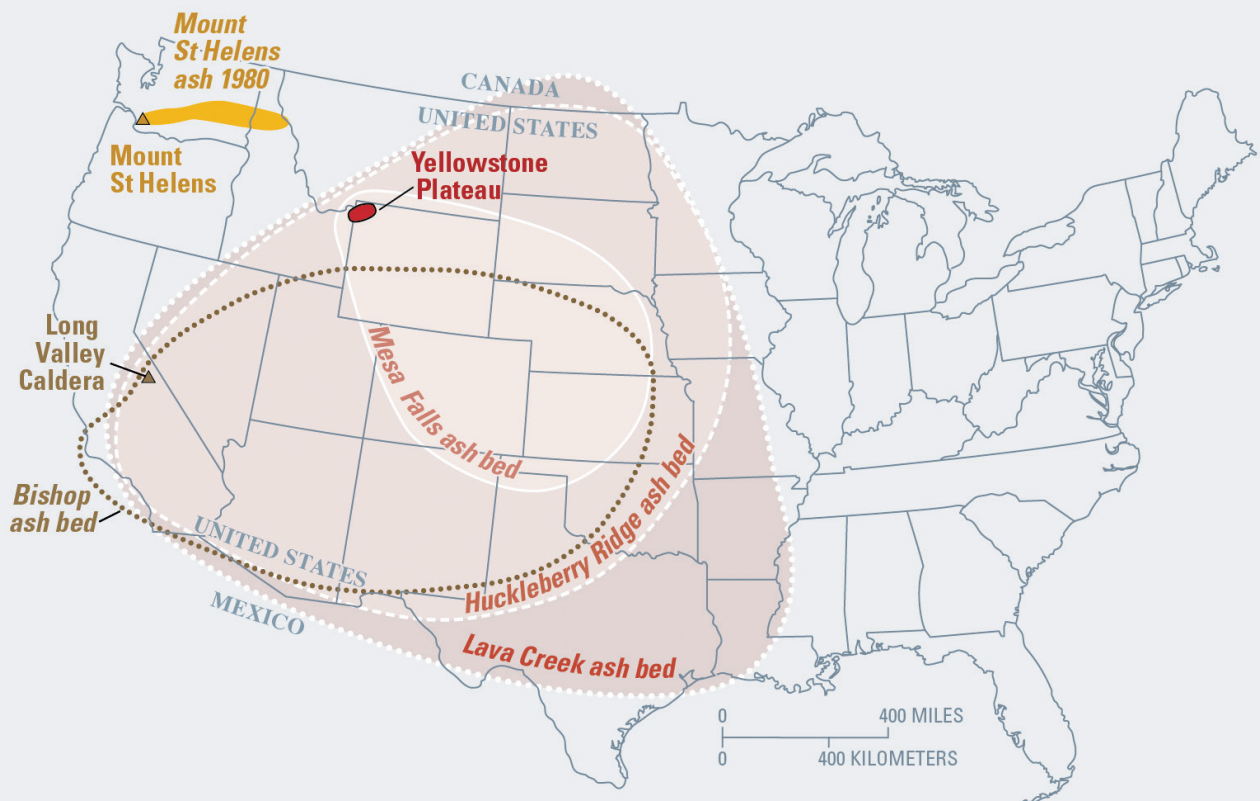
MAMMOTH VOLCANOES

You might not have noticed yet, but while in the Inyo National Forest you are surrounded by volcanoes! Eruptions, lava flows, and **magma** (underground lava) have shaped this dramatic landscape.

The town of Mammoth Lakes sits within the Long Valley Caldera, an ancient **supervolcano** (the largest eruption type!) that erupted around 760,000 years ago.

This enormous eruption caused the volcano to collapse, leaving behind a large bowl-shaped hole in the ground, called a **caldera**, that is 10 miles long and 20 miles wide! This eruption even sent ash, known as Bishop ash, all the way to Nebraska! It is shown below with the dotted brown line. There are other large eruptions shown on the map to compare.

Look at the map below: Did Bishop ash make it to where you live? _____



Volcanoes can be active, dormant, or extinct. In fact, a popular place for outdoor recreation in the Inyo National Forest is around Mammoth Mountain, an active volcano! Here you can find people skiing, hiking, mountain biking, camping, fishing, and climbing.

Which of these activities would you like to try? _____

GEOLOGY ROCKS!

Can you find these different rock types during your visit?

People come from all over the world to study the geology of the Eastern Sierra. Start thinking like a geologist by noticing the rocks around you.



Granite

My crystals grew together so tightly that there are no holes in my structure. Look for black, white, and sometimes pink speckles to recognize me.

Where to find me: *Light gray, high-mountain peaks, including Mt. Whitney.*

Where did YOU find me? _____



Pumice

I am a light gray rock with lots of holes. Pick me up to feel me; I do not weigh much and if you put me in water, I float!

Where to find me: *The Mono Craters between Mono Lake and Mammoth.*

Where did YOU find me? _____



Obsidian

I am very shiny and often black, with no air bubbles. Some call me volcanic glass and I can be sharpened to be used as tools.

Where to find me: *Obsidian Dome or Panum Crater.*

Where did YOU find me? _____



Bishop Tuff

I am a pinkish-orange rock that formed from the volcanic ash from the Long Valley supereruption 760,000 years ago. The ash was so hot that it fused together!

Where to find me: *Short cliff bands along Highway 395, south of Crowley Lake.*

Where did YOU find me? _____

What do these rocks have in common? All these rock types came from volcanoes in one way or another! Granite was magma that slowly cooled underground. Pumice, Obsidian, and Bishop Tuff were blasted out of the tops of volcanoes during eruptions and solidified quickly into rocks.

KEEP BLACK BEARS WILD

Many American black bears call the Inyo National Forest home. Bears are **omnivores**, which means they will eat just about anything. Although there is plenty of food in the forest, when given the chance to eat human food, they won't say no to a free lunch! If bears learn how to get human food and return to the same areas, it becomes unsafe for bears and people. When bears are no longer afraid of humans, we call them **habituated**. Sadly, habituated bears cause problems and are often killed to protect people. By being "bear aware" and storing your food and other scented items in bear safe containers, you can keep bears alive and wild—and keep your food!

BEAR BOX

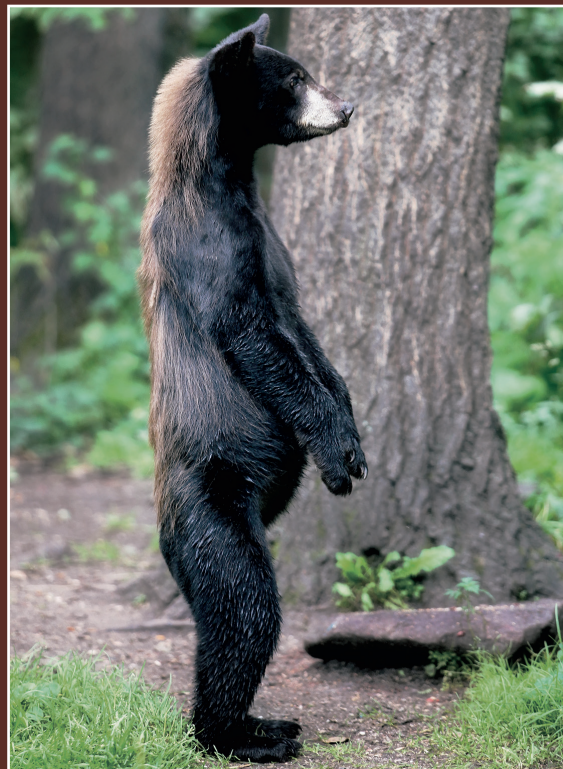
G	J	C	O	O	L	E	R	E	N
C	C	R	G	U	M	Y	L	D	V
T	R	A	S	H	W	I	K	S	K
J	R	Q	N	Y	A	C	J	K	N
J	M	W	X	D	O	F	Y	Q	E
P	R	W	O	L	Y	Z	Y	S	T
K	B	S	B	Q	Y	L	L	E	E
N	T	N	Y	B	C	M	L	G	P
W	U	O	Y	N	X	C	F	E	Q
S	T	E	A	F	O	O	D	B	T

Below is a list of items you should store in a bear safe storage container, see if you can find them all in the word search.

SODA
TRASH
FOOD

CANDY
GUM
COOLER

SUNBLOCK



Black bears are very curious and intelligent creatures. They often stand up on their hind legs to improve their sense of smell. This new perspective helps bears make decisions about food, mates, and potential threats.



Black bears are excellent tree climbers and it's one of the first things they learn how to do! Keep your eyes open: you might notice scars left on trees from a bear's sharp claws or even a bear high in the branches!

Animal Adaptations



A

Mountain Lion



B

Bighorn Sheep



C

Coyote



D

Mule Deer



E

Pika



F

Beaver

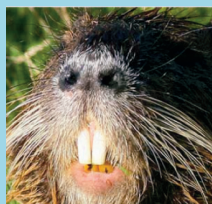
The Inyo National Forest is home to many animals, but living here is not always easy. The animals that live here have many special traits that make it easier for them to survive, known as **adaptations**. See if you can match the adaptations to the animals, by matching the letter of each animal with the correct description.



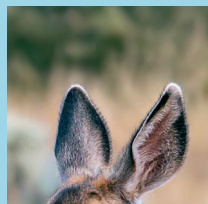
Like dogs, this animal has a very strong sense of smell to sniff out its **prey**. Their eyesight and hearing are also sharp helping make them excellent hunters.



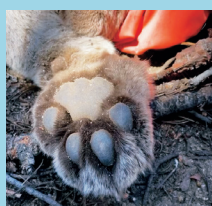
This animal's hooves are made for steep cliffs, allowing it to escape to places predators dare not go. Despite its horns, it would rather run to safety than try to fight off a **predator**.



Because this animal likes to chew on wood, its teeth have to keep growing so they don't get worn all the way down. This animal also has webbed feet to help it swim better.



This animal has large ears that keep them alert and safe from animals who eat them, known as **predators**. They can move their ears in different directions at the same time!



This animal has large, sensitive paws to help it move quietly through the forest and stalk the animals they eat, known as **prey**.



This small, alpine animal loves the cold and does not hibernate. To make it through the snowy winters, it spends all summer gathering and drying food in piles, known as haystacks.



WHERE THE WATER FLOWS

Do you know where your water comes from?

The Inyo National Forest has an abundance of clean rivers, creeks, and lakes, all of which are snow-fed. As the snow melts, gravity moves water down the mountains, and into creeks which feed into rivers and lakes. This water nourishes plants and animals and then makes its way into surrounding towns and even provides clean drinking water to millions of people in Los Angeles. While visiting the Inyo National Forest, remember the water you drink was once snow that fell high in the mountains!

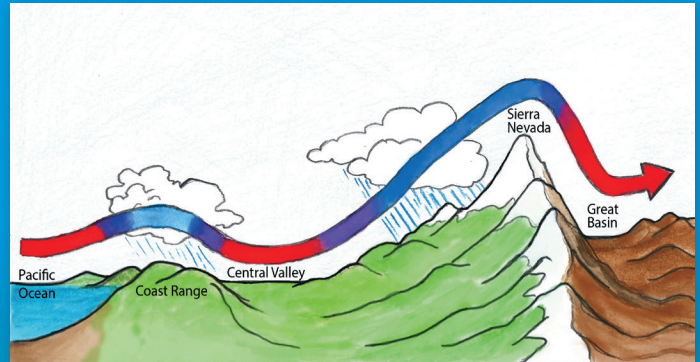


Diagram by Abby Dziegiel

Have you noticed that you are surrounded by both mountains and desert? The mountains get more rain and snow than the desert valleys to the east.

Why is this? Many of our storms come from the west. When the storms make their way over the mountains, the air cools, and rain and snow are forced to drop from the sky. By the time the storm makes it all the way to the valleys on the east side, there is not much water left; this is called the **rain shadow** effect. Death Valley, which is a short drive to the east from the snowcapped peaks of the Sierra Nevada mountains, is one of the driest places in North America. Now that's what we call a rain shadow!

Use this space to draw mountains to the west and a desert to the east. Include storm clouds with rain over the area you think would get the most rain. Include creeks, lakes, and any other plant and animal life that you have observed.



THE ROLE OF FIRE IN THE FOREST

Read the paragraph below to discover the role fire plays in our forests. Fill in the blanks with words from the word bank as you go!

_____ plays an important role in the forest, just like wind, rain and snow. Plants and animals can survive small, natural fires.

_____ fly away, _____ go underground, and bears and deer leave the area. Jeffrey pines have fire-resistant _____ that helps them survive.

In the years following wildfires, flowers and other plants thrive. Plants receive more _____ in open spaces created by fires. Wildlife is then drawn back to the new abundant food sources. The fire-blackened trees make good homes, also known as _____, for black-backed woodpeckers. Wildland _____ also use fire as a useful tool. Trained firefighters start fires, called _____, to safely reduce vegetation, recycle nutrients and improve wildlife habitat. However, not all fires are beneficial. Fires that are too hot or close to towns are often dangerous. Remember to be careful with fires while camping; fires not properly put out can get out of control.

What ways will you and your family make sure your campfire is safe?

Word Bank:

firefighters

rodents

sunlight

fire

bark

prescribed
burns

birds

habitats



A Fire Triangle, like the one pictured above, shows all the elements that are required for a fire to burn. If you remove any side of the triangle, the fire will be prevented or extinguished.

BRISTLECONE PINES



The oldest trees in the world can be found in the Ancient Bristlecone Pine Forest, which is right here in the Inyo National Forest! In 1953, Dr. Edmund Schulman (pictured left) came to the White Mountains and started to explore this bristlecone pine forest. After four years of studying these trees, Dr. Schulman dated “Methuselah,” a bristlecone pine that is more than 4,800 years old. This means that Methuselah began its life before the Great Egyptian Pyramids were built!

Rings can tell us age!

Every year that a tree lives, it adds a new ring of growth. You can find out how old a tree is by counting the number of rings inside its trunk. Bristlecone pines grow very slowly; it can take over one hundred years– 100 rings– to add just one inch of growth. Dr. Schulman had to use a microscope to count Methuselah’s 4,800 rings! For comparison, look at the tree rings from a bristlecone pine (top) and a Jeffrey pine (bottom), which grows quickly but only lives for a couple hundred years.



If you were a tree, how many rings would you have?



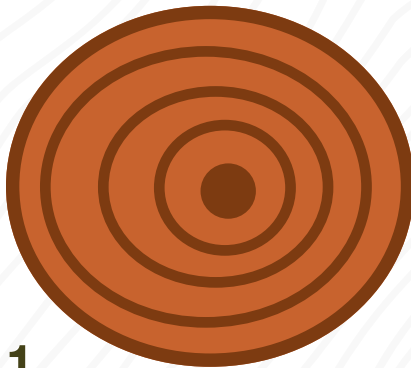
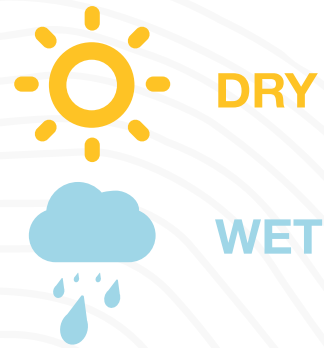
The bristlecone pine gets its name from the bristles on the outside of its cone.

Rings can tell us about climate change!

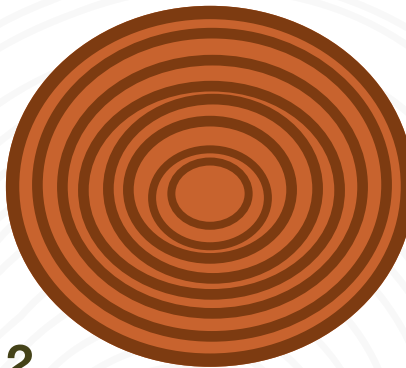
Bristlecone pines can tell us what the weather was like in the past. By looking at how wide the tree rings are, scientists can determine if it was a wet, rainy year or dry with little rain. In a wet year, trees grow faster and make a larger tree ring. In dry years, the tree rings will be smaller. If there are many rings close together it could mean that there was a period of dry weather, called a **drought**.

Do you think the bristlecone pines are growing a wide tree ring or a narrow tree ring this year?

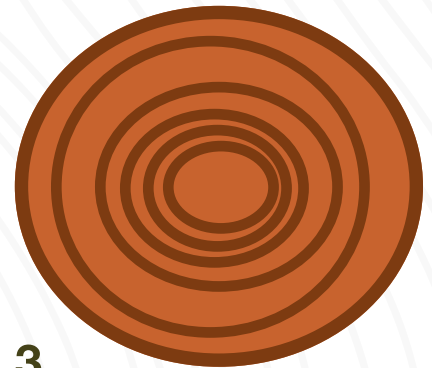
CIRCLE which weather condition made the tree ring patterns below. Circle the CLOUD for wet years or SUN for drought years. Maybe the right answer is both!



1.



2.



3.



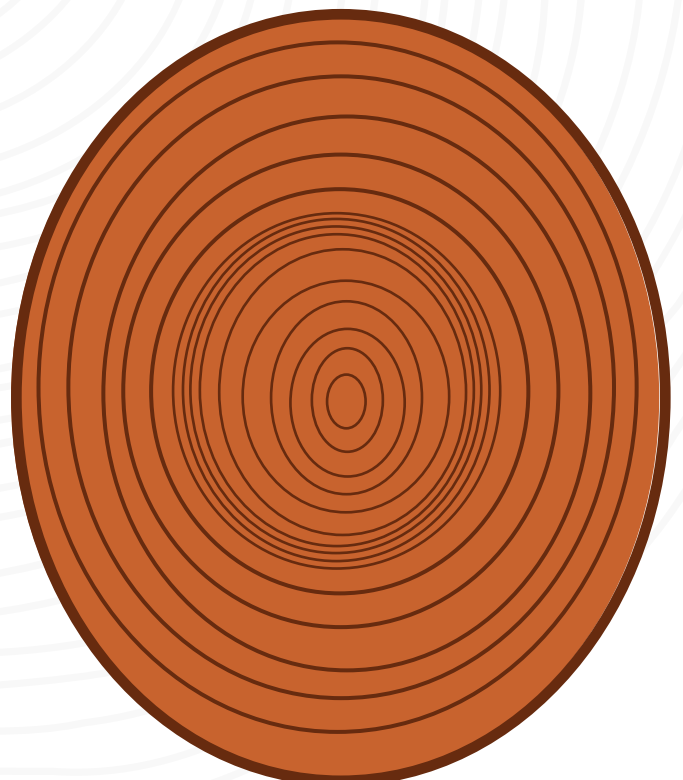
Every ring that you see represents one year of growth. In order to tell how old a tree is, start with the outermost ring and count until you hit the centermost ring. For this example, the outermost ring is from this year. Use the tree rings to answer the following questions.

How old is this tree?

Put an "X" on the first growth year of the tree.

How long ago was the drought?

How many years did the drought last?



Life Up High



Mt. Whitney

MT. WHITNEY is a sight to be seen. It stands 14,505 feet above sea level, making it the highest mountain in the contiguous United States (not including Alaska and Hawaii). That is almost three miles high! This is one of the most popular hikes in the Inyo National Forest and is considered very challenging.

What elevation do you live at? *Hint: ask your parents.* How does it compare? ft.

Are you afraid of heights?

SIERRA NEVADA BIGHORN SHEEP are at home on the steep, rocky cliffs of the highest peaks. However, this animal is a rare site. Over 100 years ago, domestic sheep were brought to high mountain meadows to graze. These sheep spread diseases that caused wild bighorn sheep numbers to plummet. Today we are still living with the consequences and continued conservation is necessary to protect this endangered species.



This plant soars above the rest!

SKY PILOT grows from 10,000 feet all the way to the tippy top of Mt Whitney. This beautiful purple flower gets its name because of its love of high alpine places. If you are visiting in the summer and get a chance to hike high enough to see a sky pilot, don't forget to stop and smell the flowers!

During your visit did you ascend to an elevation as high as sky pilot grows?

What elevation did you make it to?

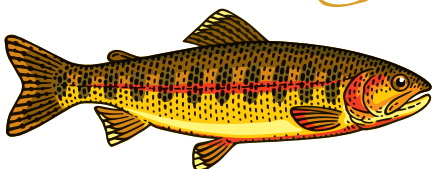
A GOLDEN TROUT

For a Golden State

Did you know the Golden Trout is California's state fish, but they are only native to the waters of the Golden Trout Wilderness, which is in the southern end of Inyo National Forest! In fact, this Wilderness area was created to protect this colorful fish from the threats of overfishing, habitat destruction, and development. When an area is protected as Wilderness, it means there are no cars, roads, and very few buildings. Wilderness designation also limits logging, mining, and grazing, which can destroy habitat for sensitive animals. These areas are a refuge for plants, animals, and hikers who are looking for a quiet place to enjoy nature.



THE GOLDEN TROUT has a bright yellow belly, a red stripe down its middle and red on the gills. Once you see one, you will never forget them.



Use the guide to add color to this golden trout- its characteristic stripes are missing!

TAKE A HIKE

Hiking is one of the most popular activities in the Inyo National Forest. When you go for a hike it is very important to take a map with you. Knowing how to read and properly use a map is a skill all hikers should know! Below you will learn how to use each of the map elements.



Use the map at right to answer the following questions:

If you hiked to the lake, which trail would be more steep?

Trail A Trail B

About how many miles is the campground away from the trailhead?

2 Miles 3 Miles 4 Miles 6 Miles

If each contour line is a change of 200 ft. in elevation, what is the approximate elevation gain from the trailhead to the peak?

2,800 ft. 3,600 ft. 4,000 ft. 5,000 ft.

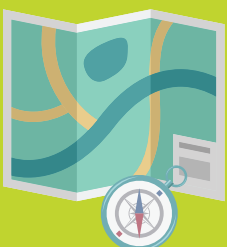
Which trail is the steepest?

Trail A Trail B Trail C Trail D

Which direction is the lake from the campground?

North East South West

When hiking, be prepared and make sure an adult is with you.
Here are a few things that you should pack!



Map and
Compass



Plenty of
Water



Layers of
Clothing

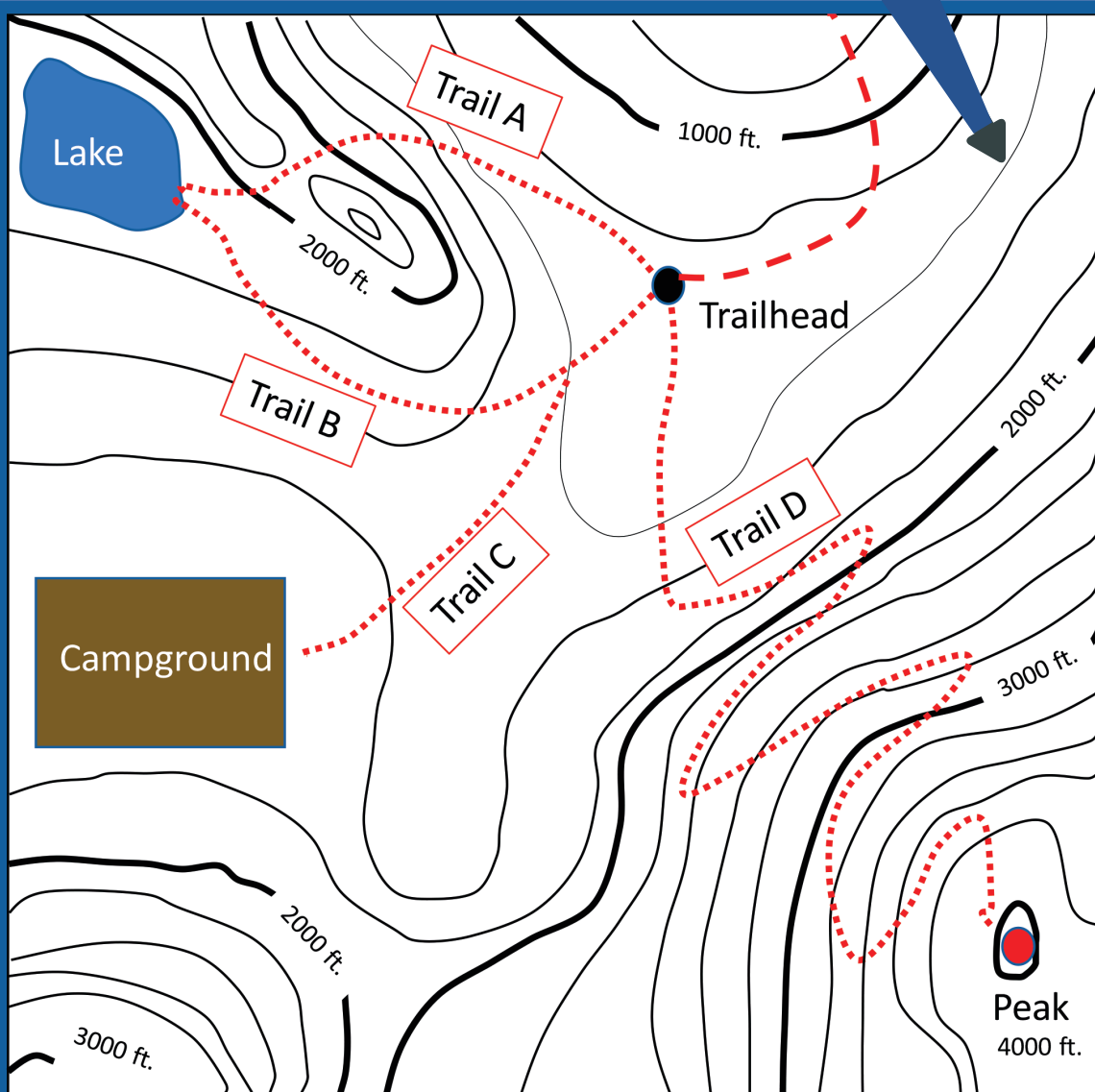


Food

HOW TO USE A MAP

CONTOUR LINES are the squiggly lines on the map. These special lines tell us the elevation or how high the ground is above sea level. Each contour line represents a specific elevation, meaning that no matter where you stand on that line, you will be at the same elevation. These lines can help you determine how steep slopes are depending on how close the lines are to each other.

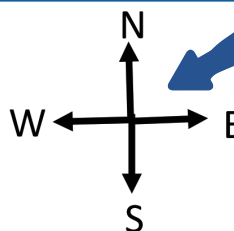
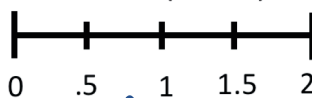
Lines that are closer together = STEEP SLOPES, Lines that are farther apart = LESS STEEP



Legend

--- Roads
... Trails

SCALE (Miles)



AN ORIENTATION ARROW

shows you where each direction is: north, east, south and west. On most maps north points to the top of the map.

A LEGEND is a guide that tells you what the different symbols and lines represent on a map.

A SCALE allows map readers to measure distance. You can use your finger to measure the scale and determine the distance of a trail. If your trail zigzags a lot, you can use a piece of string and lay it on top of trail, then you can straighten it out and measure it using the scale bar.

Follow the trail to the lake and along the way read how you can practice Leave No Trace and reduce your impact in the Inyo National Forest!

LEAVE NO TRACE

1. Know before you go

Be prepared. Pack clothes to protect you from the cold, heat or rain. Always carry a map and know how to read it.



2. Choose the right path

Stay on trails to protect the forest and yourself. If you are camping, make sure you camp on a durable surface like dirt or snow, instead of in meadows. Camp at least 200 feet from water and trails.



4. Leave what you find

Take only pictures and memories. Leave plants, rocks, and historic items where you find them.

5. Be careful with fire

If you are allowed to build a fire, only use existing fire rings. Keep your fire small and make sure it is out and cold before you leave.

7. Be kind to other visitors

Remember you share the forest with other people.

3. Trash your trash

Pack it in and pack it out. Keep the Inyo National Forest beautiful by picking up litter and disposing of it in trash cans or recycling bins.



6. Respect wildlife

Keep wildlife wild: do not feed the animals and store your food properly.



WELCOME TO THE LAKE

Three ways you have practiced Leave No Trace during your stay in the Inyo National Forest:

1. _____
2. _____
3. _____

Congratulations!

Now that you've completed the activities, you are on your way to becoming an Official Junior Ranger. Please return to any Inyo National Forest Visitor Center to receive your badge. If you left the area and need to receive your badge by mail please fill out the form below and send it to the address below.

Junior Ranger
Eastern Sierra Interpretive Association
190 E. Yaney St.
Bishop, CA 93514



Junior Ranger OFFICIAL FORM

Please scan or take a photo of the form and email admin@esiaonline.org or mail to the address listed above.



Your Name _____

Address _____

City _____ State _____ Zip _____

Email _____ Age _____

School Name _____

Parent/Family Member/Friend (Adult), please sign here:

I certify that _____ completed the activities in this book.

Signed (name of adult) _____



Junior Ranger booklet brought to you by the US Forest Service, in partnership with the Eastern Sierra Interpretive Association (ESIA). ESIA is a non-profit 501 (c)3 organization whose mission is to educate and inspire people about Sierra Nevada and Great Basin public lands through high quality interpretive products, exhibits, and programs. To learn more and support ESIA visit www.sierraforever.org. Booklet design by www.sharpenddesigns.com.