



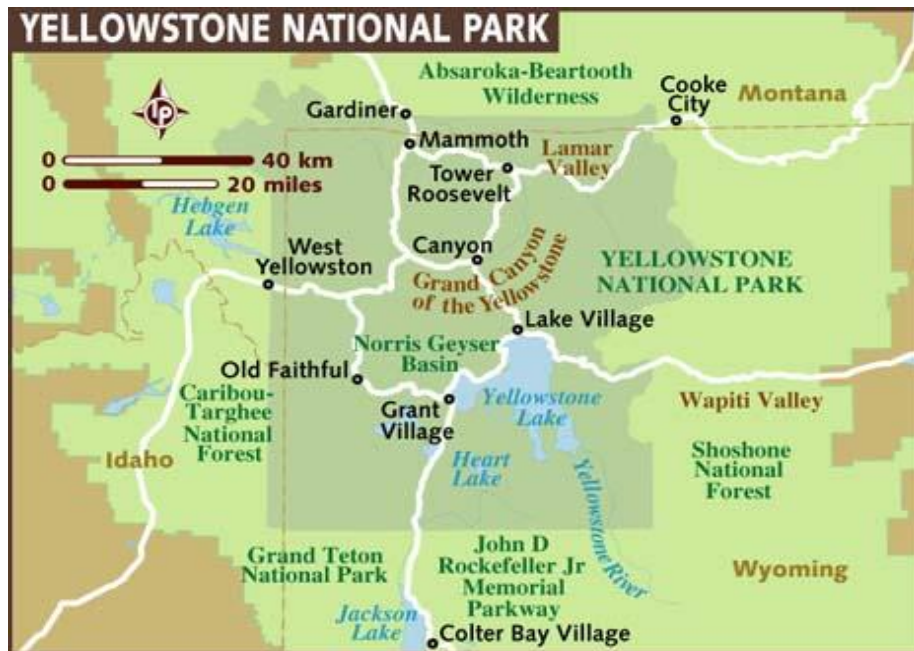
## My Drift

Title: Yellowstone

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Yellowstone National Park is a nearly 3,500 square-mile wilderness recreation area atop a volcanic hot spot. It is mostly in the northwest corner of Wyoming and extending into Montana and Idaho. It was established by the U.S. Congress and signed into law by President Ulysses S. Grant on March 1, 1872. Yellowstone was the first national park in the U.S. and is also widely held to be the first national park in the world. Yellowstone features dramatic canyons, alpine rivers, lakes, lush forests, hot springs and gushing geysers, including its most famous, Old Faithful. It's also home to hundreds of animal species, including bears, wolves, bison, elk, antelope, and other wildlife.

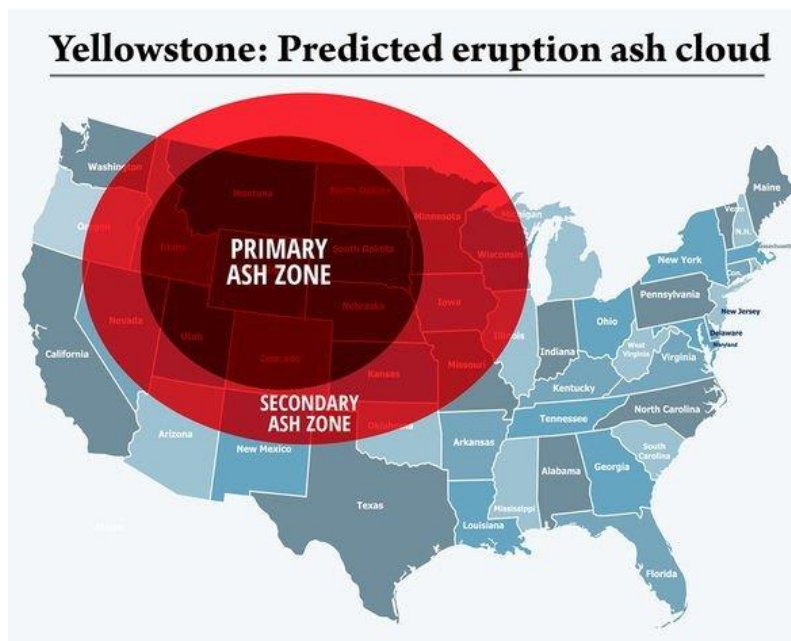
**Did you know that Yellowstone National Park sits on top of an active super-volcano?**

In Yellowstone, some 400 miles beneath the Earth's surface is a magma 'hotspot' which rises to 30 miles underground before spreading out over an area of 300 miles across. Since the most recent blast 600,000 years ago, there have been around 30 smaller eruptions, the most recent of which was about 70,000 years ago.

**Yes, the super-volcano beneath Yellowstone National Park in Wyoming has been rising at a record rate since 2004 could explode with a force a thousand times more powerful than the Mount St Helens eruption in 1980. If the Yellowstone Volcano erupts, it would spew lava far into the sky, a cloud of plant-killing ash would fan out and dump a layer 10-feet deep up to 1,000 miles away. Two-thirds of the U.S. could become uninhabitable as toxic air sweeps through it, grounding thousands of flights and forcing millions to leave their homes. This is the nightmare that scientists are predicting could happen if the world's largest super-volcano erupts.**



# Mount St Helens Eruption



## **Yellowstone Earthquakes**

During 2020, Yellowstone National Park was shaken by 4 quakes of magnitude 3.0 or above and 96 quakes between 2.0 and 3.0. There were also 172 quakes below magnitude 2.0 which people don't normally feel.

**Don't worry!!** The chances of the Yellowstone Volcano erupting anytime soon are pretty slim. After all, it has experienced only three major eruptions in the last 2 million years. That's one every 700,000 years. We should be safe for now.

## **Yellowstone Hydrothermal Features**

Yellowstone National Park's thermal features can be seen as the product of millions of years of geology at work. Much of Yellowstone sits inside an ancient volcanic caldera (the exploded crater of a volcano). Molten rock resides as little as 2 miles below the surface. Heat from the volcanic activity makes its presence known by heating ground water and creating more than 10,000 thermal features we now see. The four basic types of thermal features present in the park are geysers, hot springs, fumaroles (steam vents), and mud pots.

### **Let's learn a little more about these things:**

**Geysers** are hot springs that erupt periodically. The eruptions are the result of super-heated water below-ground becoming trapped in channels leading to the surface. The hottest temperatures are at the bottom of these channels (nearer the hot rock that heats the water) but the deep water cannot vaporize because of the weight of the water above. Instead, steam is sent upwards in bubbles, collecting in the channel's tight spots until they essentially become clogged, leading to a point where the confined bubbles actually lift the water above, causing the geyser to overflow. This causes the pressure to decrease until suddenly violent boiling occurs throughout much the length of the column, producing a tremendous volume of steam which forces the water out of the vent in a superheated mass. This is an eruption. As the eruption continues, the heat and pressure gradually decrease, and the eruption stops when the water or steam runs out.



**Steamboat Geyser**

Steamboat is the world's tallest currently active geyser. It has two vents, a northern and a southern, approximately 20 feet apart. The north vent is responsible for the tallest water columns with eruption heights up to 400 feet.

## **OLD FAITHFUL**

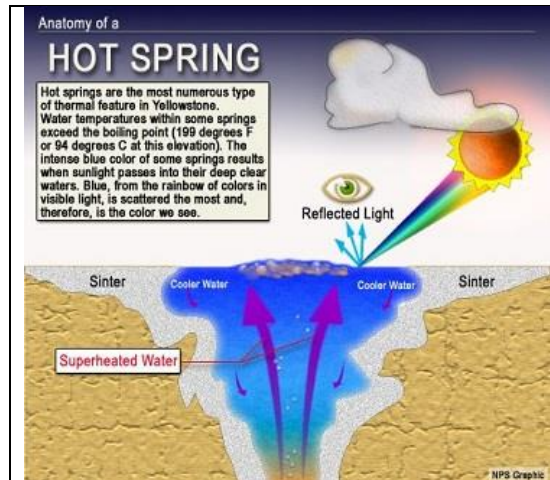


**Discovered in 1870 by the Washburn Expedition, Old Faithful geyser was named for its frequent and somewhat predictable eruptions, which number more than a million since Yellowstone became the world's first national park. Old Faithful is located in Yellowstone's Upper Geyser Basin in the southwest section of the park. The geyser height averages near 140 feet but has reached over 200 feet. Eruptions normally last about 3 minutes. The mathematical average between eruptions of Old Faithful is currently 74 minutes, but it doesn't like to act average! Intervals can range from 60-110 minutes.**

**Just in case you were wondering, there are over 1200 geysers that have erupted in Yellowstone with an average of 465 active in any given year.**

**Hot Springs** are heated by geothermal heat—heat from the Earth's interior. In volcanic areas like Yellowstone, water may come into contact with very hot rock heated by magma. Hot springs in active volcanic zones may produce superheated water, so hot that immersion can result in severe burns or death. In non-volcanic areas, the temperature of rocks within the Earth also increases with depth—this temperature increase is known as the Geothermal Gradient. If water percolates deeply enough into the crust, it comes into contact with hot rocks and can circulate to the surface to form hot springs.





**Mammoth Hot Springs**



**Hot Spring in the Winter (Yes, they are still very hot!)**

### **Some Burning Questions**

#### **Are there any hot springs in Yellowstone that humans can soak or swim in?**

Yellowstone offers very limited opportunities to swim or soak. The swimming hole in Firehole Canyon is one of two swimming areas inside Yellowstone National Park. The other area on the Boiling River has no facilities and is only open in late fall through winter because of water levels. Swimming is possible because the cold fresh river water mixes with the hot spring water.

#### **What is the most famous hot spring in Yellowstone?**



**The Grand Prismatic Hot Spring is the most photographed thermal feature in Yellowstone National Park**

#### **Has anybody died from Yellowstone hot springs?**

At least 25 people are known to have died from hot spring-related injuries in Yellowstone since 1890. Most of the deaths have been accidents, although at least two people had been trying to swim in a hot spring. Water in the hot springs can reach 160 F, which can cause severe burns or death.

#### **Yellowstone National Park remains a wild and sometimes fearsome landscape.**

That's the main reason why four million people travel to the park every year to view untrammeled vistas, glimpse untamed bears and bison, and get close to hot gushing geysers and simmering thermal springs. But for unwary visitors, the extraordinary natural features that keep Yellowstone such an alluring place can also make it perilous. While backcountry hikers may be aware that grizzlies and bison can be dangerous threats, Yellowstone visitors can get into serious trouble while wandering near the park's heavily visited geyser basins and other geothermal features.

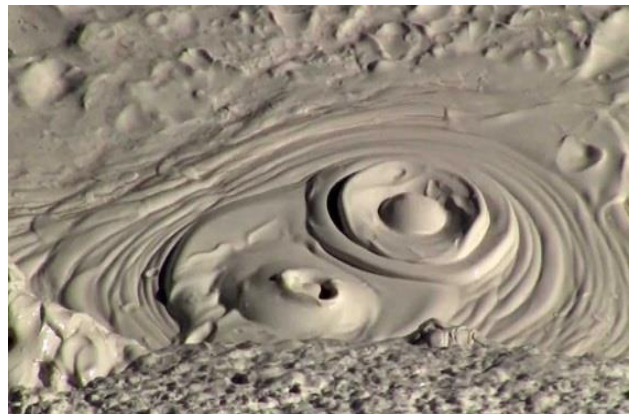


**Fumaroles**, best known as steam vents, are a familiar attraction at Yellowstone National Park. Steam vents are technically hot springs, but the small amount of water boils away before it reaches the surface causing extreme amounts of steam. Steam vents are known for their hissing sound, similar to that of a tea kettle. As the steam rises it carries volcanic gases such as hydrogen sulfide to the surface. This mixture of steam and gas is erupted from vents and fissures in the ground. Due to this chemical activity, fumaroles can be very dangerous. Associated chemical reactions can color the surrounding rocks.



**Roaring Mountain**

**A mudpot or mud pool** is a sort of acidic hot spring, or fumarole, with limited water. It usually takes the form of a pool of bubbling mud. The acid and microorganisms decompose surrounding rock into clay and mud. Today, many visitors have a fascination with these bubbling, splattering, gurgling, and—let's face it—smelly thermal features. What makes them so fun to watch is the bubbling that occurs in the mud. Bubbles form in slow motion then fracture and burst - it is mesmerizing and very calming, like watching ocean waves.



**That's enough (maybe too much) for Yellowstone's hydrothermal features. Let's look at some of the other beautiful sights in the park.**

### **Grand Canyon of the Yellowstone**



**Lower Falls and Grand Canyon of the Yellowstone may not be as big as the Grand Canyon in Arizona, but it is nonetheless breathtaking. The Lower Falls of the Grand Canyon, at 308 feet high, is one of the most photographed features in all of Yellowstone.**

### **Yellowstone Lake**



**Yellowstone Lake is the largest body of water in the Park. The lake is 7,732 feet above sea level and covers 136 square miles with 110 miles of shoreline. While the average depth of the lake is 140 feet, its greatest depth is at least 400 feet. This lake is the largest freshwater lake above 7,000 feet in North America.**



## The Grand Loop Road



The Grand Loop Road in Yellowstone is the main way to get to the attractions in the national park. This stretch from Madison Junction to the exit for the Old Faithful area is the most popular and has the most geyser basins.

## Tower Fall



Tower Fall is a waterfall on Tower Creek in the northeastern region of Yellowstone. Approximately 1,000 yards upstream from the creek's confluence with the Yellowstone River, the fall plunges 132 feet. Its name comes from the rock pinnacles at the top of the fall.

## Mount Washburn



Mount Washburn, elevation 10,243 feet, is the most prominent mountain peak in the Washburn Range in Yellowstone. The peak was named in 1870 to honor Henry D. Washburn, leader of the Washburn–Langford–Doane Expedition.

## Hayden Valley



Hayden Valley is a large, sub-alpine valley in Yellowstone National Park straddling the Yellowstone River between Yellowstone Falls and Yellowstone Lake. The valley floor along the river is an ancient lakebed from a time when Yellowstone Lake was much larger. The valley is well known as one of the best locations to view wildlife in Yellowstone.

This leads us to my favorite thing about Yellowstone National Park – **THE WILDLIFE**. Yellowstone's abundant and diverse wildlife are as famous as its geysers. There are nearly 300 species of birds, 16 species of fish, five species of amphibians, six species of reptiles, and 67 species of mammals and two bear species.



**Large Mammals (A few examples below)**



**American Bison**



**Grizzly Bear**



**Black Bear**



**Gray Wolf**



**Red Fox**



**Mountain Lion**



**Mule Deer**



**Mountain Goat**



**Moose**

Well, I learned something while researching for this article. For all of my 80 years, I thought a Buffalo and a Bison were the same animal and I always called them Buffalo. I learned that buffalo and bison are distinct animals and those animal herds in early America and currently in Yellowstone National Park are Bison – not Buffalo! That funny looking creature on the right is a Buffalo (a Water Buffalo). Darn!





**Bison** are the largest mammal in Yellowstone National Park. They are obligate herbivores, a grazer of grasslands and sedges in the meadows, the foothills, and even the high-elevation, forested plateaus of Yellowstone. Bison males, called bulls, can weigh about 1,800 pounds. Females (cows) average about 1,300 pounds. Both stand approximately six feet tall at the shoulder and can move with surprising speed to defend their young or when approached too closely by people. Bison live an average lifespan of 20–25 years in the wild. Presently, the park's bison population is estimated at about 4,000.

Oh, I learned something else while researching the animals at Yellowstone. If I asked you to name the most dangerous animal in Yellowstone Park, most people like me would say, “the Bears”. Right? Wrong! Bison have injured more people (by far) in Yellowstone than any other animal. Bison are unpredictable and can run three times faster than humans.

### **Bears**

Back in the olden days when I was a kid, our family went to Yellowstone several times and the primary thing I looked forward to was seeing and feeding the bears. We saw bears every trip back then. In fact, before 1970, bear feeding was as popular (if not more so) than geyser watching in Yellowstone National Park. In 1970, they passed a law against feeding the bears. Now days, seeing a bear at Yellowstone hardly ever happens.

Currently, the grizzly bear population within the Greater Yellowstone area is estimated to be about 720. The black bear population within the same area is estimated to be about 575.



What large animal has the biggest population at Yellowstone Park? **Elk**

More than 30,000 Elk from 8 different herds summer in Yellowstone and approximately 20,000 winter in the park. Elk are the second largest member of the deer family (moose are the largest). Adult males, or bulls, weigh about 700 pounds while females, or cows, average about 525 pounds.



**Bull Elk**

### **Small Mammals**

There are at least 50 small mammal species known to live in Yellowstone National Park, including four common species of bats: big brown bat, little brown bat, long-legged bat, and silver-haired bat. Squirrel, rabbit, skunk, raccoon, American badger, otter, mice, and shrew species are common, but many are rarely seen by visitors.



**Cotton Tail Rabbit**



**Squirrel**



**Skunk**

### **Birds (Look up once in a while – There are 300 different species in the park)**



**Bald Eagle**

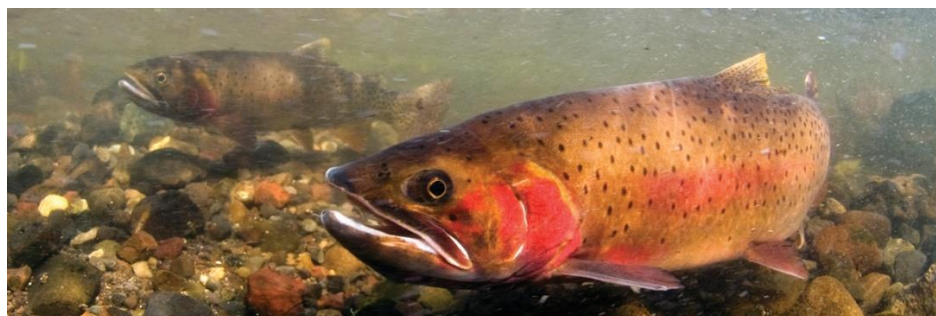


**Great Horned Owl**



**Red Tail Hawk**

### **Fish**



**Yellowstone Cutthroat Trout**

Anglers 16 years of age or older must be in possession of a valid Yellowstone National Park fishing permit to fish in the park. There are many lakes, rivers, and streams in the park and the fishing is great.



## **Amphibians**

Amphibians are an important part of Yellowstone's aquatic and terrestrial ecosystems. Many of Yellowstone's reptiles, birds, mammals, and fish prey on larval and adult amphibians, and amphibians, in turn, eat a variety of vertebrate and invertebrate species.



**Spotted Frog**



**Western Toad**

## **Reptiles (Snakes)**

Cool, dry conditions limit Yellowstone's reptiles to six species. Population numbers for these species are not known. Reptiles include prairie rattlesnake, bull snake, valley garter snake, wandering garter snake, rubber boa, sagebrush lizard.



**Prairie Rattlesnake**



**Garter Snake**

Prairie rattlesnakes are the only dangerously venomous snakes in Yellowstone.

**Best place to see the wildlife.** Without doubt, **Lamar Valley** is the best place in Yellowstone to see wildlife. Carved by glaciers and fed by the Lamar River, the grasslands that cover this valley are easily accessible on Highway 212 and attract the biggest land species in the park—buffalo, elk, moose, wolves, and bears.





**A Herd of Buffalo in Lamar Valley**

**Yes, “BUFFALO” – I’m not going to start calling these wonderful animals “Bison” now. I don’t really care what those Zoologists say!**

**YELLOWSTONE IS THE GREATEST PARK IN THE UNITED STATES**

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