

# FOCUS

# Wild Arizona

## Key Words:

**Biotic community:** a group of animals and plants that live in the same area and interact with each other

**Diverse:** having a variety of different animals and plants

**Tundra:** a treeless area where the subsoil is permanently frozen

When you think of Arizona, which of the following comes to mind?

Pine forest   Desert   **Tundra**

For many of us, the answer was probably “desert.” After all, Arizona is known for being hot and dry. Many of our state symbols — those animals and plants we have chosen to represent the state — have ties to the desert, including the saguaro cactus blossom, cactus wren and paloverde tree. But is that a complete picture of Arizona?

Your answer may depend on where you live. If you are from the northern or eastern parts of Arizona, (Flagstaff or Show Low, for example), you may have associated pine trees with Arizona. And, believe it or not, at the very top of some of our tallest mountains, you can even find alpine tundra.

These three habitats are considered **biotic communities**. There are many more, including grasslands and fir forests. While people define biotic

communities differently, these usually are determined by the plants.

Arizona is quite **diverse**. It has many different plants and, therefore, many biotic communities. Lots of diversity among our plants means our state also has lots of different species of wildlife.

Although the concept of biotic communities has changed over the years, Arizona played an important role in the initial development of this idea.

Clinton Hart Merriam was not your typical scientist. He loved art, culture and cars. He disliked religion and politics. He was fascinated with paper. He was even one of the founders of the National Geographic Society. Yet, his true love was biology. Growing up in New York in the 1850s and 1860s, he spent his time collecting bird skins. This expanded to other animals later in life.

Eventually, Merriam helped develop the most complete and accurate animal collection in the world. Over his career, most of which was spent as a leading biologist for the American government, he wrote nearly 500 scientific publications and discovered more than 650 new mammals. But it was a trip to the San Francisco Peaks in northern Arizona that provided Merriam with his most important contribution to biology.

Merriam wanted to know if different animals and plants only occur in specific areas or at certain elevations. So, he and a friend spent August and

September 1889 exploring the mountains near Flagstaff and studying the birds, mammals, reptiles and plants. In his results, published a year later, he announced an important discovery: As you move up a mountain, you encounter different biotic communities. These communities, which are sometimes referred to as “life zones,” are created largely because of changes in temperature and precipitation.

## Understanding the Picture:

The image on the right was included in Merriam’s report and shows his original ideas.

The different colors represent different biotic communities from desert (brown) all the way up to alpine tundra (white). The sides show the elevation in feet above sea level. Humphrey’s Peak, the tallest mountain in Arizona, is more than 12,600 feet above sea level.

According to Merriam, what biotic community would you be in at the following elevations:

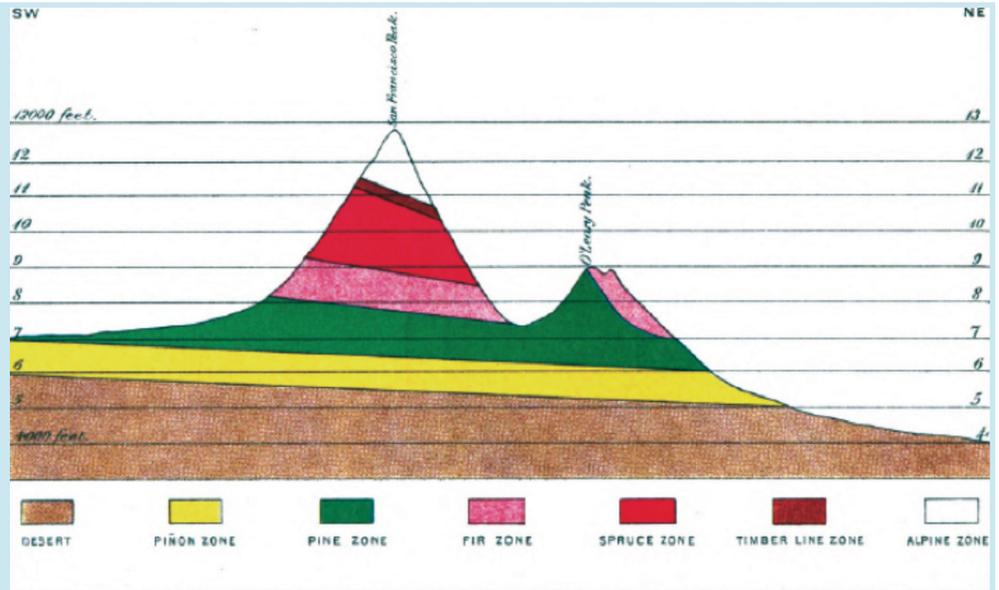
- 4,000 feet?
- 10,000 feet?
- 12,000 feet?

Did you notice that the communities are not flat? The left side of the picture represents the southwest side of the mountains. The right side is the northeast side. The communities slope down. On the southern side, you have to be at a higher elevation before you reach the next habitat type. But why?



## By Eric Proctor

As you move up a mountain, you encounter different biotic communities. These communities, which are sometimes referred to as "life zones," are created largely because of changes in temperature and precipitation.



### Do the Science:

With the help of a parent or teacher, find a hill or building (such as your school or house) and identify the north and south sides. Use a thermometer to measure the temperature at both of these sides. Try different times of the day. What do you notice?

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In general, was the south side warmer than the north side? The sun tends to hit eastern and northern sides early. As the day progresses, the heat builds. As the sun moves across the sky, this warmer air hits the southern and western sides. Because these sides are warmer, you have to get to a higher elevation before the air is cool enough to be suitable for a new biotic community. 🦋

■ This feature is part of the Arizona Game and Fish Department's Focus Wild Arizona program, a free

educational program for teachers, parents, students or anyone interested in learning about wildlife and

habitat. Visit our website, [www.azgfd.gov/focuswild](http://www.azgfd.gov/focuswild), to find exciting lessons and resources.