

# FOCUS

# Wild Arizona

## Key Words:

**Carapace:** the top portion of a turtle shell

**Density:** the number of animals in one area

**Home range:** the entire area in which an animal moves to find food and other necessary resources

**Keratin:** a strong substance found in fingernails, hair, horns and hooves

**Scute:** a large scale or plate on a turtle shell



GEORGE ANDREIKO

Desert tortoises are amazing animals, but we don't know a lot about their life in the wild. They are difficult to study because they spend about 95 percent of their life underground. For more than 20 years, the Arizona Game and Fish Department has been studying desert tortoises, trying to learn more about them. Our research has helped us learn about the life span and survival of tortoises as well as the size of their **home range**.

But how do we study such a secretive creature? It isn't easy. It takes knowledge, a little luck and a lot of work.

First, knowledge. We know that tortoises spend most of their life hidden in a burrow. Our scientists look for tortoises during the monsoon, or summer rainy season. Why do you think they wait until the monsoon instead of searching throughout the year?

Second, luck. It just so happens that a remote part of the Tonto National Forest has a larger than normal **density** of tortoises. So, if you want to study tortoises, you are more likely to find one there than most other places.

Finally, hard work. Researchers spend days hiking through the desert, looking under rocks and in holes. Usually they find an empty, unused burrow. Sometimes, however, they find a tortoise. When they do, it is weighed, measured and identified. If it is a tortoise they have found before, they compare the new data with the old.

How can we be sure it is the same tortoise? To solve this problem, we needed a way to "mark" tortoises. For some animals, this is easy. A dot of paint or an ear tag work great. This isn't the case for tortoises. They can live more than 50 years. They scratch their shell against rocks as they move in and out of a burrow. Any mark you place on them has to be durable and long-lasting.

Can you think of a way to mark a tortoise for identification later?

---

---

---

---

---



## By Eric Proctor

Tortoise shells are made of bone. However, surrounding the bone is **keratin**, the same material your fingernails are made of. If done correctly, portions of the shell can be cut without harming the tortoise, just like you clip your nails. These notches can remain in the shell for as long as the tortoise lives. Knowing this information, scientists developed a marking method that has been used for decades.

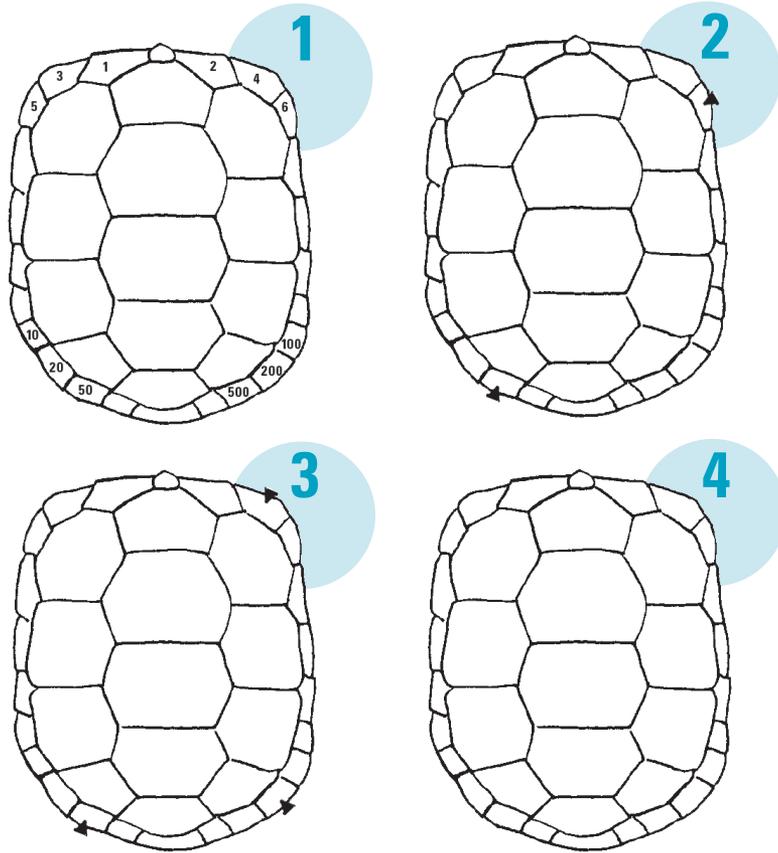
### Do the Science:

The top of a tortoise shell is called the **carapace**. The different scales or sections of the carapace are called **scutes**. Scientists assign numbers to specific scutes. Using a nail file or similar tool, they cut a small notch into some of the numbered scutes. The notched scutes provide the identifying number for the tortoise.

Let's try it. To the right is a shell with numbers on some scutes (diagram No. 1). diagram No. 2 shows which scutes have been notched. Can you identify the tortoise by its number? Hint: Add up the numbers for all the notches.

Using diagrams 1 and 2, you should have noticed that the scutes numbered 50 and 6 were both notched. So, this tortoise is identified by the number 56.

Try it again, this time by yourself.



What is the number for the tortoise whose scutes are marked in diagram No. 3?

Of course, if you were a field scientist who found an unidentified tortoise, you would need to give it a unique number. Using the same numbering system, can you place notches on the tortoise shell in diagram No. 4 to represent the number 511? What about 204? How many different ways can you make the number 106?

Great job! You are on your way to becoming a tortoise biologist. But remember, you are not one yet. As a budding scientist and nature lover, there are rules to follow. Desert tortoises are protected. They cannot be collected from the wild. If you ever do find a tortoise in the wild, do not bother it. Feel free to take a picture and enjoy the opportunity to see such a remarkable animal. But don't touch it! Simply let the tortoise live. 🐢

■ 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 Web site, [www.azgfd.gov/focuswild](http://www.azgfd.gov/focuswild), to find exciting lessons and resources.