Turtles Project 2013 Year in Review

Arizona Game and Fish Department, 5000 W. Carefree Highway, Phoenix, AZ 85086

The year 2013 was another exciting and event-filled year for the Arizona Game and Fish Department's Turtles Project (Cristina Jones and Audrey Owens, and interns Justin Sullivan and Allen Bartoli). Our long-term projects were our main focus, including the juvenile desert tortoise radio-telemetry study at our long-term study site northeast of Phoenix.

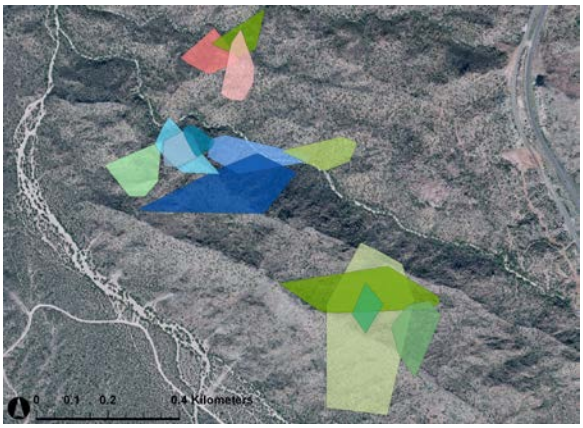
Juvenile Desert Tortoise Telemetry

This was our third year radio-tracking juvenile Sonoran desert tortoises at our long-term study site northeast of Phoenix. This site has been the focus of Department tortoise research for nearly 20 years, and through this research we have learned about the survival, movement, shelter use, and reproductive ecology of adult tortoises. This research has been critical in our understanding of the species in Arizona.

Juvenile Sonoran desert tortoises have not been studied here, or anywhere, because the relatively dense vegetation and steep rocky terrain make looking for juvenile tortoises like looking for a needle in a haystack. With the help of our dedicated volunteers, we have found 15 juvenile tortoises (2 new ones this year!) to which we have attached transmitters.

Volunteers collect data on a transmittered juvenile tortoise.

This study has allowed us to gain insight into the activity and habitat use of juvenile tortoises, which is important for understanding the conservation needs of the species as a whole.



Aerial photo of the study site, with home ranges of 13 of our juvenile tortoises (represented by colored polygons).

Juvenile tortoises move frequently, but do not move very far (on average, they move about 30 meters from one day of tracking to the next). However, remarkably, 3 of the 15 juveniles have made long-distance movements to new areas within the study site, where they have set up new home ranges. We do not know why they moved, but they were all about 130mm in length when they began their journey; we had previously hypothesized that emigration events (like these may be) would happen when the tortoises were reaching maturity, not when they were still so small.

Tortoise 975 moved over a mile during Aug – Sept 2012. It now has a new home range north of its original home range (old and new home ranges are in green).

The juvenile tortoises' peak activity is during the monsoon, when they move longer distances and their home ranges increase in size. Most wildlife species decrease their movements when their food is plentiful.

Tortoises are different because, as reptiles, they can slow their metabolism when food is scarce, thus conserving their energy. During the monsoon, when there is plenty of food, tortoises are less constrained by their environment, and take advantage of all the food by moving longer distances as they forage.

The juveniles do not interact with other tortoises much, but when they do, it is often with other juvenile tortoises. It may be that they avoid competing with adult tortoises (which is a competition they would likely lose) by using different kinds of shelters.

Two juvenile tortoises fighting over a shelter.

We have observed no mortality in the 15 juveniles, which suggests that the juveniles might actually have fairly high survival. Based on their size, these tortoises are between 10 – 15 years old. At this size, it is possible they compensate for their vulnerability to predation by remaining less active than adults, which have relatively high annual survival at this site. It may be that juveniles have equally high survival because they spend much of their time underground. We observed rapid growth rate in most of the juveniles, averaging just over 1cm per year.

Tortoise 900, the first juvenile tortoise to which we attached a transmitter in 2010, foraging on grass. Photo by Mike Barker.

Over the next year, we will continue to radio-track and present our findings at scientific conferences, and we anticipate publishing the results of this one-of-a-kind study (which wouldn't be possible without all of our fabulous volunteers, the dedication of our summer interns, and sponsorship from donors) upon completion of the project. Even though the tortoises have now entered hibernation, tracking the juveniles will continue through the winter (albeit with much fewer visits, since they won't be moving much!).

Long-term Desert Tortoise Monitoring

Regular surveys to our study site allow us to collect data on the entire tortoise population, so that we can keep tabs on adult tortoises marked years ago, or mark tortoises that are new to the population, such as hatchlings or new or previously undetected adults. During the monsoon, we surveyed the site 4 times, with the help of dozens of volunteers. We encountered 25 tortoises, including 2 that were previously unmarked. The tortoise population at this site is indeed healthy and stable.

A hatchling encountered during a radio-telemetry excursion (next to a Gatorade cap for scale).

Because of our frequent telemetry outings to the site, we have had the opportunity to make some very interesting natural history observations on tortoises and the other wildlife that inhabit the area. Many of these observations occur in the washes, which are centers of activity for wildlife.

During the monsoon, tortoises spend time at the banks of the wash for "calcium mining." Calcium mining is when animals consume calcium-rich objects, such as rocks and minerals, to compensate for a lack of nutrients in their diet. We have observed tortoises of all different sizes, from hatchlings to adults, consuming rocks, bone, and carnivore scat.


Consumption of rocks during the monsoon by tortoises results in "mud scat" – scat that is composed of rocks and sediment, as seen here.


Tortoise 900 eating carnivore scat.

The wash is also used by many other species. We know that mountain lions – at least 2 individuals – frequent the area based on tracks.


Adult male mountain lion track.

The Department's Wildlife Contracts Branch was able to capture a photo of mountain lion this summer using a motion-sensor camera located in the main wash at the site.


Adult mountain lion photographed as it uses a culvert at the study site's wash. Mountain lions are one of adult tortoises' few predators.


Javelina often use the wash, especially in the spring when water is flowing.


Gila monsters are often seen crossing the wash during the monsoon.

Once again this year we collaborated on a project studying the health of Sonoran desert tortoises. This health study (performed by a student at University of Nevada, Reno) will help biologists better understand disease prevalence in Sonoran and Mojave desert tortoises.


Collecting blood from an adult tortoise for disease testing.

We are very fortunate to have hundreds of volunteers who are eager to assist with our surveys and radio-telemetry. Their participation allows us to cover a wider area, find tortoises, and collect data. Since 1996, when the Department adopted this study site, volunteers have been an integral part of Sonoran desert tortoise research at this site. The tortoise research and our volunteers were the subject of an Arizona Wildlife Views television segment filmed this summer. While it will air during the 2014 season, it can be previewed at: www.youtube.com/watch?v=EjD-5E3aDvg

Turtle Trapping at the Phoenix Zoo


Photo of pond sliders basking at the zoo by Scott Sprague.

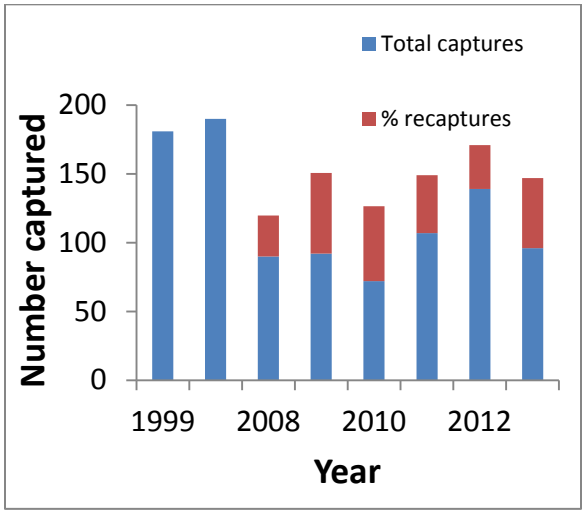
The Turtle Trapping at the Phoenix Zoo remains one of our biggest outreach efforts. As you may know, the pond in front of the zoo is, unfortunately, a popular spot for people to release their unwanted pet turtles. This year's turtle trapping was May 17-19, which was the weekend before World Turtle Day (May 23). What better way to celebrate turtle conservation than by helping prevent the spread of nonnative turtles into the wild?

The purpose of the trapping is to remove female nonnative turtles (to slow the breeding and potential spread of turtles outside the zoo pond) and provide outreach to zoo visitors on the threats posed to our native turtles by released pet turtles. The female turtles are brought to our partners at the Phoenix Herpetological Society (PHS),

where they can be adopted, and the males are released so they can be enjoyed by zoo patrons.

Razorback musk turtle.

With the help of 125 volunteers, we captured 100 turtles, representing 5 species, this year. Among the species were 2 never-before-captured species – the common musk turtle (1) and the razorback musk turtle (1). Others captured include the river cooter (1), eastern painted turtle (1), and, of course, the pond slider (96). Of the sliders, 27 were females, all of which we removed from the pond and brought to PHS. The total number of sliders captured has been decreasing each year, and the percentage of recaptures increased – we hope these are good signs that indicate there is a smaller breeding population, possibly as a result of the trapping and outreach efforts.



Number of pond sliders captured during the turtle trapping each year (in blue) and percentage of recaptures of male sliders each year (in red).

Since 1999, we have captured 825 individual turtles (not including recaptured turtles), representing 17 species. Of these, 523 have been permanently removed.

As always, one of our biggest success stories is that our outreach volunteers talked to most of the 8000 zoo visitors that weekend, and the story was picked up by several local media stations. Our outreach volunteers did a fabulous job talking to people about responsible pet ownership, nonnative species, and options for people that can no longer care for their pet aquatic turtles. Hopefully our messages will be remembered when people consider buying a baby aquatic turtle as a pet, or as they wonder what to do with their turtle that has outgrown its tank!

A young volunteer weighs a pond slider.

Ornate Box Turtles

The ornate box turtle is a fossorial species, spending much of its time in burrows in southeastern Arizona, where it inhabits grasslands. Box turtles in Arizona emerge during the monsoon, especially just after a rain. Because of its natural history, the species is difficult to study. Nonetheless, the Turtles Project spent several days surveying southeastern Arizona for ornate box turtles this July. We found 13 box turtles, including several juveniles, suggesting at least one of the sites we visited contains a thriving box turtle population.


Ornate box turtle walking after a rain.

Surveys may not be the most efficient way to gather data on ornate box turtles given their secretive life style. Because of concern that the ornate box turtle is in decline, we decided that instead, we could ask the public for assistance. So, in 2009 we started the Ornate Box Turtle Watch, a program that asks people to submit their observations of box turtles to us so that we can accumulate a database of locality data. We continue to advertise the program to folks who spend time in the outdoors, through presentations and articles in naturalist magazines. As of this year we have received over 200 observations, and several of these observations are from localities at which we did not know box turtles still existed, such as western Santa Cruz County! Remember the Ornate Box Turtle Watch the next time you travel to southeastern Arizona! For more information on the Watch, and to download observation forms, visit www.azgfd.gov/boxturtlewatch.


Box turtle habitat in southeastern Arizona is grassy, with few trees.


A Texas horned lizard, another species found in Arizona's grasslands.

Turtles Project Website

Next time you or a friend have a question about Arizona's turtles, remember the Turtles' Project website. We have loads of information on Arizona's native and nonnative turtles and tortoises, and desert tortoise adoption. You can also learn to identify turtles or tortoises you come across while hiking in the desert or walking in your neighborhood with our fun and helpful Turtle ID key.

www.azgfd.gov/turtle

Thank you!

The thousands of hours our volunteers have contributed, and the thousands of dollars our Sponsor-A-Turtle participants have donated made all our turtle conservation efforts possible. Your generosity and dedication has directly supported the collection of the data needed to make management decisions which will be used to implement future conservation efforts. For this, we thank you!