



Turtles in Trouble



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Montezuma Well's unique habitat provides an ideal home for one of the desert's more peculiar inhabitants, the Sonora mud turtle. The constant supply of warm, fresh water and an abundance of small invertebrates and aquatic insects is all these resilient turtles need to survive and to thrive. But there is trouble in paradise.

Through the years people have released red-eared sliders, a turtle commonly sold in pet stores, into the waters of the Well. These aggressive invaders out-compete the smaller, native mud turtles and jeopardize the health of an aquatic ecosystem like no other in the world.

To address this pressing issue and help protect Montezuma Well's fragile ecosystem, the National Park Service is teaming with the USGS Southwest Biological Science Center, the Western National Parks Association, and the Arizona Game and Fish Department to conduct an ambitious project to study the negative impacts of the invasive red-eared sliders and relocate them to privately-owned habitats and public school classrooms outside the park.

Sonora Mud Turtle (*Kinosternon sonoriense*)

The only turtle native to Montezuma Well, Sonora mud turtles are easily spotted basking on logs and swimming around the water's edge. These cold-blooded reptiles depend on the environment to determine their body temperature. Once they become warm enough, they spend much of their time hunting for their favorite food: crustaceans and aquatic insects. Usually found in streams and ponds set in habitats ranging from low desert to arid woodlands, these turtles have also found a home in the unique aquatic habitat and isolation of the Well.

Members of a larger family of mud and musk turtles, when handled these turtles will often excrete a musky odor from glands located on either side of their body.

Sonora mud turtles can reach six and a half inches in length and may be identified by their smooth, elongated carapace (upper part of the shell). The shell generally has a uniform light-brown or yellowish-brown color and is often covered in algae.



This species is widespread through the Southwest, from the Verde Valley to Durango, Mexico, at elevations below 6,700 feet. However, their numbers are declining due to loss of habitat and competition from non-native species, such as the red-eared slider.

Red-eared Sliders (*Trachemys scripta*)

Also known as “dime-store turtles,” red-eared sliders are common in ponds, rivers and streams east of the Rockies. Easily identified by the wide red stripe behind the eye, the first of these invaders to inhabit the Well probably began their lives as pets, only to be released into the park when they outgrew both their aquariums and their owners’ expectations. Unfortunately, red-eared sliders are significantly larger and more aggressive than

their native cousins, making it difficult for the mud turtles to compete for both food and prime basking locations.

Although the full extent of the negative impacts of red-eared sliders on Sonora mud turtles has never been studied, similar cases elsewhere suggest that failing to remove the invasive animals may be disastrous for the continued survival of the Well’s native inhabitants.

Trapping and Relocation



Non-lethal, Baited Hoop Trap

To remove the invasive red-eared sliders from the ecosystem, an intensive trapping program is being conducted within Montezuma Well. Using non-lethal baited hoop traps (pictured above), park scientists hope to capture every red-eared slider in the well, and as many Sonora mud turtles as possible.

Sliders captured in the traps are removed from the park, while mud turtles are marked, measured and examined to evaluate trends and health in the native turtle population, and are then released back into Well.

Red-eared sliders caught in the hoop traps are “adopted” for use in public displays and school classrooms, with information provided on the biology of the turtles and why they were removed from Montezuma Well. This effort will help educate children and adults about the problems caused by releasing unwanted pets into areas where they do not naturally occur.



Sonora Mud Turtle (*Kinosternon sonoriense*)

- Medium-sized (up to 6 ½ inches long)
- Smooth, high-domed carapace (upper part of shell)
- Uniform light-brown or yellowish-brown color
- Often covered in algae



Red-eared Slider (*Trachemys scripta*)

- Twice as large as native mud turtles, they can grow to the size of a dinner plate (over 12 inches long)!
- Flat, oval-shaped carapace
- Top of shell marked with maze- or map-like stripes
- Distinctive red stripe behind eye, body heavily striped

Studying the Impacts

During this project, each mud turtle captured will be uniquely marked with notches in the margin of the shell, measured, aged using growth “rings” in the shell (similar to tree rings), and examined to determine the animal’s general health and record the presence of shelled eggs. Sliders will be measured in the same manner, except they will be removed from the park. Marking the mud turtles in this way will allow park scientists to estimate and

monitor the size of the population, and determine the extent of movement into and out of the Well.

It is hoped that the removal of red-eared sliders from Montezuma Well will aid in restoring balance to one of the most unique ecosystems in the Southwest. It will also ensure that our native Sonora mud turtles will continue to flourish in the warm waters of the Well.