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California Turtle & Tortoise Club

The Tortuga Gazette

Volume 59, Number 1 • January/February 2023

A basking Big Bend, or Mexican Plateau slider turtle, *Trachemys gaigeae*, photographed by Steve Hillebrand, USFWS. Public domain.

featured species

Big Bend Slider, *Trachemys gaigeae* (Hartweg, 1939)

The Mexican Plateau Slider by M. A. Cohen

Indigenous to the southwestern United States (Texas and New Mexico) and northeastern Mexico, the Big Bend or Mexican Plateau slider is a freshwater species that belongs to the genus *Trachemys*, a large group of semi-aquatic turtles native to the Americas. Like all species in the *Trachemys* genus, *T. gaigeae* is a member of the family of basking turtles, the Emydidae.

Formally described by Dr. Norman Edouard "Kibe" Hartweg (1904-1964) in 1939, the species was initially called a subspecies of *Pseudemys scripta* named *P. s. gaigeae*. Dr. Hartweg was an American herpetologist specializing in turtle taxonomy and distribution. Following several taxonomic revisions, the Big Bend slider is currently considered a separate species, *Trachemys gaigeae*.

The species name *gaigeae* honors Helen Beulah Thompson Gaige (1890-1976), an American herpetologist known primarily for her study of neotropical frogs (Beolens et al., 2011).

The common names of the species refer to prominent geological features within its range. 'Big Bend' refers to the large curve in the Rio Grande river in southwest Texas. 'Mexican Plateau' pertains to the relatively flat, semi-arid region in northern Mexico with an average elevation of some 6,000 feet (1,828 meters) above sea level.

Little information exists about the "reproductive biology and population ecology" of *T. gaigeae,* the least studied of all the *Trachemys* species. Observations by biologists indicate that the Big Bend slider resembles the Central and South American *Trachemys* species more closely than the North American pond sliders like *T. scripta* (Ernst and Lovich, 2009).

A concept important to the science of conservation biology, the term 'population ecology' refers to how animal and plant populations interact with their environments and each

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other, including their abundance, density, distribution, migration, and related species dynamics.

Description

A medium-sized species, the adult Mexican Plateau slider has a smooth, oval carapace with a maximum length of 11.7 inches (298 millimeters) in females and 8.7 inches (222 millimeters) in males (Stuart and Ernst, 2004).

A Big Bend, or Mexican Plateau slider photographed while basking in Socorro County, New Mexico. Photo © 2017 by macrhybopsis

Carapace patterning at maturity varies widely, ranging from minimal patterning to colorful orange or yellow "eye spots" (known as ocelli) on an olive-brown background.

The species' plastron has distinctive, colorful markings as a juvenile in the form of roughly concentric, dark, circular shapes on an orange background near the plastral midline. The coloration on the plastron may fade somewhat as the individual matures (Stuart and Ward, 2009).

The head of the Mexican Plateau slider has yellow or orange striping and sizable orange-colored oval or teardrop-shaped spots behind its eyes. The striping continues for the length of the neck. The limbs and tail of the species are marked by orange or yellow striping similar to that on the head. The most colorful patterning occurs in the male in early adulthood, and older adult males may display either faded or melanistic (darkened) patterning.

The hatchling Mexican Plateau slider has a moderately keeled carapace that flattens as the animal matures. The carapace color is muted at hatching, generally gray or olive. Its head and limbs have subtle cream-colored striping. Females tend to retain the somewhat more muted juvenile coloration, while males typically develop more colorful patterning as they mature.

There are pronounced differences between adult males and females of the species, known to biologists as sexual dimorphism. The female is significantly larger than the male, her carapace is noticeably more domed than his, and her plastron is flat. The male has a slightly concave plastron, and his tail is longer and thicker than the tail of the female. The male lacks the elongated foreclaws common to other *Trachemys* species.

Subspecies

Two subspecies of Mexican Plateau slider are currently recognized, *Trachemys gaigeae gaigeae* and *T. g. hartwegi*. Of the two, only *T. g. gaigeae* inhabits the United States, specifically the Upper Rio Grande and Rio Conchos basin of New Mexico–Texas, USA. This subspecies also occurs in the Chihuahua–Coahuila region of Mexico. In 2011, the IUCN Red List of Endangered Species evaluated *T. g. gaigeae* as "vulnerable" to extinction with the notation that this assessment "needs updating" (van Dijk, 2011).

T. g. hartwegi occurs in the Rio Nazas basin in Durango and Coahuila in Mexico (van Dijk, 2011). The status of the subspecies in Mexico is not well-studied, but, in at least one site within its range in Coahuila, the *T. g. hartwegi* is in danger of extirpation (Stuart and Ward, 2004).

Range and Habitat

The range of the Mexican Plateau

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slider is "the Rio Grande (= Río Bravo del Norte) drainage from south-central New Mexico downstream to western Texas and northwestern Coahuila, the Río Conchos in Mexico from southern Chihuahua downstream to the confluence with the Rio Grande, and the Río Nazas closed basin of Durango and Coahuila, Mexico" (Stuart and Ward, 2009).

T. gaigeae is a riverine species inhabiting higher-order streams and pools in the Chihuahuan Desert. The term 'higher-order' stream refers to two or more tributaries that combine to form a larger stream or river.

Both adults and juveniles prefer perennial streams around 3.3 feet (1 meter) deep, although the turtles will utilize seasonal bodies of water if permanent ones are unavailable. The water in their habitats is typically turbid, meaning it is murky and filled with suspended materials such as fine grains of sand and silt (Stuart and Ward, 2009).

Foods and Feeding

Like other *Trachemys* species, the Mexican Plateau slider has an omnivorous diet. Hatchlings and juveniles are insectivorous and carnivorous for the most part, while adults tend to be herbivorous.

Adults feed on a variety of aquatic and riparian plants, including algae, common reed shoots, musk grass, and river cane. In late summer, the turtles feed on the fallen seed pods of honey mesquite shrubs growing near their aquatic habitats.

Adults will opportunistically consume carrion, crayfish, and insects when aquatic plants are unavailable (Stuart and Ward, 2009).

Carapace (ventral) view of a Mexican Plateau slider photographed in Presidio County, Texas. **Photo © 2020 by Carl J. Franklin**

Threats

Several significant threats confront *T. gaigeae* within its limited range. Habitat quality is deteriorating because of man-made changes to the riverine and riparian ecosystems that comprise its habitat. Damming rivers and pumping groundwater to support agricultural projects and municipal water needs results in the fragmentation of turtle populations and water pollution (Stuart and Ward, 2009).

Another recently identified threat to the Big Bend slider is the introduction of non-native cogeners, the biological term for species within the same genus. The species at issue here is the Red-eared slider, *Trachemys scripta elegans*. Breeding populations of red-eared sliders exist within the range of the Big Bend slider, competing for available food (Stuart and Ward, 2009).

Interbreeding between the two closely related species also threatens the unique biological traits of *T. gaigeae*. Stuart and Ward note that the native turtle may have an "adaptive advantage" over the introduced species (Stuart and Ward, 2009).

Although not well-studied, both collection of the species for the commercial pet trade and hunting for human consumption occurs.

Conservation Status

State regulations that prohibit the commercial collection of *T. gaigeae* exist in both New Mexico and Texas.

Populations in both state– and federally–managed lands receive some protection through habitat conservation measures and restrictions on commercial collection for the pet trade. These populations include those inhabiting Big Bend National Park, Big Bend Ranch State Park, Bosque del Apache National Wildlife Refuge, and Black Gap Wildlife Management Area in the United States. The populations in Cañon de Santa Elena and Maderas del Carmen protected areas benefit from governmental regulations in Mexico (Stuart and Ward, 2009).

Close-up of the head of a Big Bend slider photographed in the state of Texas. **Photo © 2021 by texasturtles**

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Diego, the famous Galápagos Giant Tortoise that saved his kind, has returned to his favorite cactus (after a century away)

by Dr. James Gibbs, Vice President of Science and Conservation, Galápagos Conservancy

Española Island, Galápagos—22 December 2022—At this holiday time, many of us are going home to family. This is the story of Diego, an old male Española saddleback tortoise, *Chelonoidis hoodensis*, who is also just returning home. In his case, he has been away from home for almost 100 years!

Diego's time away wasn't precisely on holiday… taken off his home island in the 1930s, he lived at zoos in New York and California before being transferred to the captive rearing center on Santa Cruz Island in the early 1970s. There he became well known for his ardent efforts at fathering a thousand baby tortoises. He finally returned home to Española Island in June 2020 to join his many offspring and grand-offspring released there earlier.

So how does a tortoise like Diego get re-established? He's been in captivity surrounded by concrete walls for almost a century, with regular "room service" of food and water. Now he's back where he started, a wild tortoise relying entirely on his wits to get by.

Diego's new life would be a mystery, except we attached a GPS tag to his shell upon release, nicely nestled in an out-of-the-way spot on his magnificent saddlebacked carapace. The device wakes up six times a day and sends Diego's location to us via satellite. With that, we can do a remote "wellness check" on the old tortoise without disturbing him and learn a little about how and what he's doing.

Mapping his movements day-to-day tells us he is remarkably spry for an old fellow (150 years?). While he has chosen to live in a tiny area of barely 0.6 x 0.6 mile (1×1 kilometer), he has traveled at least a total of 52 km (32 miles), likely much more when you add in all his feints and twists he has to make getting around the shrubs and bushes that make up his new home.

Liberated on June 15, 2020, Diego's first day was his longest. He completed 1.75 miles (2 kilometers) of walking around before quickly settling into a cactus tree he discovered (or maybe remembered?). He mostly stayed put for many months under that cactus tree through late 2020 as the island dried – there was little to eat aside from the occasional pad and fruit falling from the cactus tree he was under – making only a few short forays to explore his new neighborhood. Those short forays were likely to go explore "tortoise rocks" that capture water in their cracks and surfaces during brief bouts of *garúa* (mists)—tortoises can get a quick drink if they move quickly, climb onto these rocks and sip on the puddles formed while they last.

With the arrival of rains in early-mid 2021, Diego got more bold, first making a sudden if tentative foray out to the southeast of his home cactus, discovering and stopping for a few short days at a new cactus tree, then returning to his first cactus quickly. Through the end of 2021 and into early 2022, he started to repeat this commute, with extended periods under each of the two cactus trees he now calls home, and likely claims and excludes other male tortoises from, while admitting any females who wish to join him under the cactus in hopes they might mate with him.

Early 2022 ushered in a dramatic new phase of Diego's return home again. With the rains in March this year, Diego started regular, ambitious, and ever-expanding circuits of the nearby terrain, alternating stops at either of the two cacti he now calls home. For several months he ambled about grazing on the new grass growth during the short period it is green. He has dramatically expanded his home range in year two back home. Since July, he has again settled back into his two cacti and seems to have added a third cactus late in 2022, where he remains at this time, awaiting the next wet season, to snack on any lingering herbs and make short forays to drink at tortoise rocks when *garúa* falls.

Now in his second full year back home, Diego now maintains the typical tortoise life cycle on Española of staying put under a few cactus trees during the dry season, mostly resting and metabolizing his nutritional reserves, while getting highly mobile (for a tortoise) during the brief wet season to eat all he can before things dry out, and he heads home again. We have learned that, for some reason, when he turns, he often turns to the right (maybe conservative leaning in his older years?)—we have no idea why this is so, but he clearly does it.

We have mapped Diego's perambulations from his release in June 2020 to Thanksgiving 2022. His tracker is nearly at the end of its life, and he goes "off the air" next year. Then he will lead a truly solitary secret tortoise life known only to him.

We hope to still find him, by chance, on occasion during future visits to the island. We are glad to know Diego is finally home. His story has been long and tortuous, during which he forestalled his species' extinction. Now he can finish out his great life back where it started, eking out a spartan living as an older tortoise among the sparse cactus and shrubs and thousands of his children and grandchildren on Española Island, where he will likely thrive for many years to come.

— Galápagos Conservancy news release

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Join Zoo Med in supporting the TSA's conservation efforts; visit their website to learn more and how to contribute: turtlesurvival.org

TSA
turtle survival alliance

Heat-sensing drone cameras spy threats to sea turtle nests

By Liz Kimbrough, as posted on Mongabay, 17 October 2022

- Researchers used heat-detecting cameras mounted on drones to monitor sea turtle nesting on a beach in Costa Rica's Osa Peninsula.
- Using thermal infrared imagery, researchers detected 20% more turtle nesting activity than on-the-ground patrollers did. The drone imagery also revealed 39 nest predators and other animals, as well as three people, assumed to be poachers, that were not detected by patrollers.
- In Costa Rica, turtle eggs are sold locally and illegally for their alleged aphrodisiac properties. Six out of the seven species of sea turtles are threatened globally, and protecting their eggs is one of the easiest ways to ensure they endure into the future.
- The lead author says these methods are still rather expensive and aren't a replacement for patrollers but could be an extra tool that they can use to get a big improvement on night patrols, especially on nesting beaches that are dangerous and inaccessible.

Sea turtles lumber from ocean to shore to lay their eggs in the sand. In some places, this effort is protected by humans who patrol beaches on foot, warding off poachers, predators and naïve tourists. But might there be a more effective way?

Researchers used thermal infrared sensors mounted on drones to monitor sea turtle nesting on a beach in Costa Rica's Osa Peninsula. Using these heat-detecting cameras, scientists could not only see the turtles moving, but also see their tracks, differentiate the tracks of different species, detect hatchlings, and observe other wildlife and potential poachers.

This technology has been used before, but this is the first time these methods have been empirically tested for nighttime sea turtle monitoring. The results are published in the journal *Frontiers in Conservation Science*.

Nesting olive ridley turtles on the beach at Guanacaste, Costa Rica. Photo © 2022 by chloeroses

"Something that really surprised me was that the drone was able to detect tracks, because sometimes even for the patrollers is hard to differentiate them," lead author Bárbara Sellés-Ríos, a researcher with the NGO Osa Conservation, told Mongabay in a phone call. And the fact they were able to get such clear images, she said, "was amazing."

Sellés-Ríos and her team first took the drone out for test flights to find the best height and angle for the drone and mode for the camera to capture clear images while not disturbing the wildlife. At 50 meters (164 feet), they found, the drone sound was almost imperceptible over the sound of the ocean, and they didn't notice any response from the turtles.

After optimizing the gear, the team set up an experiment to compare the detection of turtle activity by human patrols versus the drone images. For seven nights in October and November 2021, patrollers walked and drones flew multiple passes over a 1.7-kilometer (1.1-mile) section of beach, looking for turtles, eggs, tracks, and other signs of life.

Using thermal infrared imagery from the drone, researchers detected 20% more turtle nesting activity than the on-the-ground patrollers did. The drone imagery also revealed 39 nest predators and other animals, as well as three people, assumed to be poachers, that were not detected by patrollers.

"We could see on the screen that the patrollers were walking 30 meters [98 feet] away from the poachers hiding in the vegetation," Sellés-Ríos said. Without the drone, they might have been missed.

Poaching remains a huge problem for sea turtles globally, especially in unprotected or unmonitored areas. In Costa Rica, many poached turtle eggs are sold locally and illegally for their alleged aphrodisiac properties.

Six out of the seven species of sea turtles are threatened globally, and protecting their eggs is one of the easiest ways to ensure they endure into the future.

"Sea turtles are slow to mature, and for some populations, it is estimated this may take up to or over 25 years," Helen Pheasey, a lecturer in conservation science at the University of Kent, U.K., who has studied the sea turtle egg trade in Costa Rica, said in a 2020 interview with Mongabay. "This is significant, as it means the damage of removing eggs today will not be seen for 25 years when the offspring of the 'poached generation' fail to arrive at their nesting beaches."

Poachers can pose risks for both turtles and human patrollers. Sea turtle conservationist Jairo Mora was killed by poachers in 2013 while patrolling

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Moín Beach on the Caribbean coast of Costa Rica. After his death, levels of egg poaching on the beach he protected expanded to nearly 100% of nests.

"The application [of the thermal imaging drones] for beaches that are dangerous to human patrollers is extremely attractive," the study authors write, "especially if carried out with local enforcement authorities to help tackle illicit activities that impact threatened species, or along those beaches where it is challenging to gather data on populations because of the safety risk to patrollers (such as illicit narco activity), even if the turtles themselves are not necessarily at risk."

"If you are a poacher and you see the drone flying above you," Sellés-Ríos said, "you may think twice about poaching the nest, right?"

Sea turtle eggs are also targeted by natural predators. On the beach in Costa Rica where the study took place, 22% of all the nests were raided in the first 10 hours after eggs were laid, mostly by coatis and raccoons.

While this technology has promising implications for monitoring turtle populations and nesting activity and perhaps deterring poachers and predators, the authors do acknowledge several limitations. First, it's expensive. The drone alone costs around $10,000, not to mention other equipment. Battery life is also a limiting factor, making larger areas more difficult to monitor.

Processing the images from the thermal infrared camera also takes a lot of time, and might not be feasible for underresourced conservation groups.

Sellés-Ríos says drones aren't a replacement for patrollers but could be an extra tool that they can use to get a big improvement on night patrols, especially on nesting beaches that are dangerous and inaccessible.

"Although it's in its infancy in turtle research, there is real potential here," Pheasey said in an email to Mongabay about this study. "This is especially valuable as it is increasingly difficult to recruit volunteers to do the ground work. I can see drone research really taking off as techniques improve and costs come down."

Citation:

Sellés-Ríos, B., Flatt, E., Ortiz-García, J., García-Colomé, J., Latour, O., & Whitworth, A. (2022). Warm beach, warmer turtles: Using drone-mounted thermal infrared sensors to monitor sea turtle nesting activity. Frontiers in Conservation Science, 3. doi:10.3389/fcosc.2022.95479

Rare Southern Bog Turtle Moves One Step Closer to Endangered Species Protection

Asheville, North Carolina—18 October 2022—The U.S. Fish and Wildlife Service announced today that it would consider protecting the southern population of the imperiled bog turtle (*Glyptemys muhlenbergii*) under the Endangered Species Act. The agency now has 12 months to decide whether to protect the turtle, which lives in Virginia, North Carolina, Tennessee and Georgia.

The Center for Biological Diversity petitioned the Service in January to protect the turtle.

"These intrepid little turtles need our help to survive, and this decision is a good first step," said Will Harlan, a senior conservation advocate and scientist at the Center. "We need to protect the wetlands where these turtles live to keep them from going extinct. I hope the Service moves quickly to give southern bog turtles the safeguards they need."

The bog turtle is North America's smallest turtle, measuring about the length of a human thumb. It is also one of the continent's most imperiled turtles: Its southern population has declined by at least 50% in the past two decades, and fewer than 2,000 individuals are left.

Southern bog turtle, *Glyptemys muhlenbergii*, photographed in Virgina. Photo © 2021 by floydcams

Habitat destruction and poaching are the primary causes of the bog turtles' steep decline. Bog turtles live in marshy wetlands that are being drained for development. Only 500 acres of mountain bog habitat remain across the turtles' entire southern range.

Bog turtles are divided into northern and southern populations. The northern population was listed as threatened under federal law in 1997, but the southern population was not, and in the past two decades, its numbers have plummeted. Only 14 viable sites remain across the turtle's entire five-state southern range.

Full protection as an endangered species would ensure that bog turtles and their remaining habitat are safeguarded. It would also require a federal recovery plan to restore bog turtle populations.

"Watching these turtles disappear forever would be heartbreaking," said Will Harlan. "We can save the southern bog turtle, but we need to act now."

—Center for Biological Diversity press release

the Turtle's Garden
planting for chelonians
by M A Cohen

Prosopis glandulosa Honey Mesquite

A mature honey mesquite in its active growth season photographed in Harris, Texas USA.
Photo © 2019 by jennformatics

Native to the arid southwest in the United States and northern Mexico, honey mesquite (Prosopis glandulosa) is a small to medium-sized, deciduous, perennial shrub or tree belonging to the Fabaceae, also known as the Leguminosae, the Pea family of flowering plants.

The range of honey mesquite is southern California, Nevada, Utah, Oklahoma, Kansas, Arizona, New Mexico, Texas, and southward into north-central Mexico.

Science currently recognizes three varieties of honey mesquite: *Prosopis glandulosa*, var. *glandulosa* (Honey Mesquite), *Prosopis glandulosa* var. *prostrata* (Honey Mesquite), and *Prosopis glandulosa* var. *torreyana* (Western Honey Mesquite) (Sturla, n.d.).

Honey mesquite generally grows in "low desert bottom-lands, grasslands, washes, mesas, alkaline soils, caliche soils, and sandy flats" below 5,000 feet (1,524 meters), according to Eugene Sturla.

Description

Honey mesquite is a fast-growing, shrub or small tree reaching 20 to 30 feet (6 to 9 meters) in height with equal or greater spread at maturity. Its sculptural, contorted branches bear varying quantities of paired, sharp thorns up to 2 inches (5 centimeters) in length on its twigs.

If planting the shrub near a high-traffic area such as a patio or a garden path, it is wise to consider purchasing a thornless variety of honey mesquite to avoid possible injuries. Some specialty nurseries sell thornless commercial cultivars named *Prosopis glandulosa* 'Maverick ®' and *P. glandulosa* 'AZT ™'.

Honey mesquite typically grows with multiple trunks, but can be trained into a standard or single-trunked form with careful and consistent pruning. Its rough-textured older bark varies in color from light brown to darker brown and may have a greenish cast. Newer bark is typically reddish-brown.

Fragrant yellow or yellow-green flowers grow on cylindrical spikes 2.75 to 3.5 inches (7 to 9 centimeters) long. Catkin is the common name for these flower spikes, and the botanical term for the flower structure is a raceme (Prosopis glandulosa, (n.d.). An abundance of flowers appears in spring, and blossoms may also form in late summer or early fall following summer rains.

The leaves of *P. glandulosa* are bright green, smooth-surfaced, and bipinnately compound, meaning that each leaf comprises 6 to 20 paired leaflets that are 2 to 3 inches (5 to 8 centimeters) long (Honey Mesquite, 2021). Each compound leaf is up to 8 inches (20 centimeters) long (Prosopis Glandulosa (Honey Mesquite), n.d.).

Honey mesquite can be invasive and difficult to control. It may sprout from lateral roots, creating thickets of shrubs. The species has naturalized on other continents where its invasive tendencies are unwelcome. Despite these facts, the species is an important food source for wildlife within its native range.

Cultivation

Honey mesquite is a rapid grower that is tolerant of many soil types. Excellent drainage is a requirement, as is full sun. The species will not grow in soggy soil or shade. It will tolerate mildly alkaline, neutral, and mildly acidic soils.

Drought tolerant once established, the plant benefits from deep, regular watering during the first year or two in the garden to develop a healthy root system. Its deep taproot may be as long as 100 feet (30 meters).

Once established, the shrub/tree requires little or no supplemental water. A little summer water will benefit the shrub/tree, particularly during an extended drought.

Honey mesquite is winter-deciduous, meaning it loses its leaves in winter

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and enters a period of dormancy. Spring begins a new growth cycle with the shrub leafing out and flowering occurring from spring through summer.

P. glandulosa modifies soil quality by nitrogen fixation (capturing nitrogen from the atmosphere), improving the soil fertility underneath the mesquite canopy. Nitrogen is one of the "Big 3" plant nutrients essential for proper growth. The shrub also adds organic matter to the soil when its catkins, leaves, and seedpods drop from the shrub.

Catkins (flower spikes known to botanists as racemes) of the honey mesquite photographed in Riviera, Texas. Photo © 2020 by Lynn Pyle

Benefits to Wildlife and Livestock

Honey mesquite bears flowers that attract various pollinators, including many species of honey bees and native bees, butterflies and moths, flies, and other insects. Many of these visitors consume the nectar produced by the flowers as food during their pollination activities.

Edible parts of the honey mesquite include the flowers, roots, seedpods, and seeds. The sweet nutritious pods of *P. glandulosa* provide forage for both wildlife and domesticated livestock.

Wildlife known to feed on the sweet pods of *P. glandulosa* includes game mammals such as deer, wild turkey, and javelina (a type of peccary). Other animals that feed on honey mesquite include coyotes, jackrabbits, cottontail rabbits, rodents, raccoons, and squirrels.

Quail, doves, and other birds feed on the flower buds, flowers, and seeds of the honey mesquite.

Domesticated animals also feed on the honey mesquite: cattle, horses, sheep, goats, mules, and burros consume large quantities of the species' seedpods (Sturla, n.d.).

Ripening seed pods of the honey mesquite. Photo © 2006 by Don A. W. Carlson

Ethnobotany

Many native American tribes in the southwestern United States used *P. glandulosa* in various ways, both culinary and medicinal. They utilized the pods of the honey mesquite for food. They prepared a meal (coarsely-ground flour) by grinding the pods and seeds that they baked into bread, cakes, and pancakes. They also cooked porridge using the meal.

Young beans were eaten raw for their sweet taste or cooked like string beans. The beans were roasted and eaten as a sweet treat.

Native Americans harvested the leaves of *P. glandulosa* as fodder for their animals.

Native Americans used the limbs of the honey mesquite for building their bows and the shafts of their arrows for hunting. They crafted the frames for the cradleboards that held their babies from its wood.

Early settlers used its thick branches for fence posts. The wood of honey mesquite is useful as firewood because it produces intense heat.

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Ripened seed pods of the honey mesquite photographed in Coahuila, Mexico. Photo © 2017 by Wynn Anderson

Mike's Turtle Net Picks by Michael J. Connor, Ph.D.

A varied selection of recent articles, stories and sites on the Web that some of you may find as interesting as I did.
This list is also posted at tortoise.org/turtlenetpicks/turtlenetpicks.html

Road Density Impacts on Desert Tortoises

The USFWS is at last suggesting setting limits for road density in desert tortoise conservation areas.

Drought Hits Female Desert Tortoises Harder

New study documents higher female compared to male mortality in desert tortoises in southeast California during the 2012-2016 drought.

Captive Bred Asian Giant Tortoise Release At India's Intanki National Park

Nagaland Forest Department, Turtle Survival Alliance and the Wildlife Conservation Society India soft released 10 captive-bred juvenile Asian Giant Tortoises, *Manouria emys phayrei*.

The Lost World of Indian Ocean Giant Tortoises

Major new study of DNA from museum specimens highlights Indian Ocean tortoise diversity before European sailors wiped them out and identifies a new extinct species from Madagascar.
The paper is open access.

Galápagos Tortoise Diets Over a 134-year Period

Stable isotope analysis of museum specimens was used to probe how Galápagos tortoise diets varied over time, using 57 tortoises collected between 1833 and 1967.

Habitat Enrichment For Tortoises

Preliminary study of the effects of habitat enrichment on the behavior of 3 tortoise species kept at the Adelaide Zoo and Monarto Safari Park in South Australia.

Studying Box Turtles in the Long Haul

Article and audio on an ongoing 100-year study of North Carolina box turtles from NPR.

New Population of Critically Endangered Black Softshell Turtles

The black softshell turtle, *Nilssonia nigricans*, was declared extinct in the wild in 2002. Fortunately, reports of its demise were exaggerated. Now a new population has been found in Nepal.

Scientists Record World's Largest Turtle Hatching

Video clip of the annual mass hatching of *Podocnemis expansa* along the Guaporé/Iténez Rivers.

Podocnemis expansa, Giant Amazon River Turtle hatchlings, photographed in the Parque Nacional do Jaú, Novo Airão, AM, Brasil in 2015. Photo by Tomas Nascimento de Melo. Public domain.

New Fossil "Horned" Painted Turtle

Chrysemys corniculata, or the horned painted turtle was unearthed at the Gray Fossil Site in eastern Tennessee. The horns are projections at the front of the carapace.

New Fossil Giant Sea Turtle From Spain

Leviathanochelys aenigmatica, a new fossil turtle found in Northeastern Spain that lived from 83.6 to 72.1 million years ago appears nearly as large as *Archelon* at 3.74 meters in length.

New Smooth Skinned Fossil Sea Turtle From Denmark

DK 807, an interesting undescribed *Eochelone* from the earliest Eocene Formation of Denmark had limbs largely covered with soft skin devoid of scales.

New Study Reports 50 Turtle Species Vocalize

I guess we were pathfinding when we set up our Turtle Calls page on CTTC's website in 1997.
And **the actual study is here**.

Trafficking Impacts America's Turtles

Update on the 2020 Collaborative to Combat the Illegal Trade in Turtles.

Distinguishing Wild and Captive Seized Turtles By Forensic Analysis

Carbon and nitrogen stable isotopes from wood turtle claw tips can be used to classify wild turtles as wild and captive turtles as captive.

Sea Turtle Postage Stamps

The latest update to <**https://seaturtlepostagestamps.com/**> lists all the stamps issued new in 2022.

CTTC's Turtle and Tortoise Listserve
To talk with other turtle and tortoise fans in a friendly atmosphere join CTTC's Turtle and Tortoise list or send an email to: **CTTC-TurtleAndTortoise-list+subscribe@groups.io**

CTTC On Facebook

For breaking news updates follow CTTC on Facebook!

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Classified advertisements run for one issue at 5^{00} for up to four lines. Ads are accepted at the discretion of the Editor. Classified ads are available to members and subscribers only and are run as a service to our members. California Turtle & Tortoise Club is not responsible for merchandise placed for sale in the *Tortuga Gazette*.

Please make your check payable to the California Turtle & Tortoise Club.

Please send ad fee to: CTTC Tortuga Gazette, attn Treasurer, P. O. Box 7300, Van Nuys, CA 91409-7300. Mail fee with ad copy to the *Tortuga Gazette* mailing address; OR, mail fee to the postal address above, and email the ad copy to the Gazette Editor.

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FOR SALE: Young Leopard tortoises for sale. Approximate age is 6 months. 75^{00} each. Contact Richard Roosman: richardinwalnutpark@msn.com

Celebration of the 50th Anniversary Desert Tortoise Research Natural Area Saturday, 25 March 2023

The Desert Tortoise Preserve Committee (DTPC) will celebrate the 50th Anniversary of the establishment of the Desert Tortoise Research Natural Area (DTRNA) on site on 25 March 2023 with an event featuring speakers, trail walks, and refreshments.

According to DTPC President Ron Berger, "... in 1973, the BLM published the boundaries of what became the DTRNA, as part of its management plan entitled, "Management of Recreational Vehicle Use" published by the U.S. Department of the Interior. This act was followed by fencing of the perimeter and posting signs to help direct OHV riders and others, including sheep grazers, to keep out of the area in order to protect the tortoise as well as the plants it needs to survive. The following year saw the establishment of your DTPC by Dr. [Kristin] Berry, Laura Stockton, and others.

DTPC is a nonprofit charitable organization established in 1974 to promote the welfare of the desert tortoise in the wild through land acquisition and management, scientific research, and educational outreach. The DTPC currently owns and manages over 29,991 acres of habitat for the desert tortoise and other sensitive species in the Mojave and Colorado deserts."

Additional details about this event will be published as they become available.

Tis the Sea Turtle Season with Spotting of First Nesting Green Sea Turtle and Newborn Olive Ridleys at Leatherback Hatchery in Naranjo Beach, Costa Rica – Turtle Island Restoration Network press release

Olema, California–15 December 2022–Under cover of night, Turtle Island Restoration Network's Naranjo Beach Leatherback Hatchery project biologist Luis Fonseca Lopez spotted the first nesting green sea turtle of the season. Earlier that day, newly hatched olive ridley sea turtles emerged from their sand-covered nests and successfully started their long and treacherous ocean journey to maturity. Turtle Island Restoration Network and Guanacaste Dry Forest Conservation Fund are working together to protect a secondary leatherback nesting beach at Playa Naranjo, Costa Rica—targeting critically endangered Pacific leatherback sea turtles.

A species most at-risk from extinction, researchers estimate that 90% of the nesting Pacific leatherback population has declined over the last three generations. Despite being located within the limits of a national park that grants protection against poachers, other land-based threats have hindered recovery efforts at this site. These land-based threats include predation on nesting females from jaguars and high temperatures affecting the incubation of eggs at Playa Naranjo. The sex of a sea turtle is determined by the temperature at which the egg is incubated, with higher temperatures producing more females. To increase the hatching rate, eggs at Playa Naranjo are relocated by the project biologist to a hatchery that provides shade and reduces the temperature of the sand.

"The simultaneous nesting and hatching of these federally threatened sea turtles is a significant year-end, holiday conservation gift to our Naranjo Beach Leatherback hatchery program," said Scott Artis, Managing Director of Turtle Island Restoration Network. "We already saw success earlier in the year as critically endangered Pacific leatherback sea turtles that had been relocated to our hatchery made their way to the Pacific Ocean."

Since 2020, Turtle Island Restoration Network provides support to the Leatherback Hatchery project at Playa Naranjo, [which] is located in Santa Rosa National Park, Guanacaste. This remote paradisiacal beach, famous among surfers, is within a five-hour drive from San Jose, the capital of Costa Rica and can only be accessed by 4×4 vehicles.

"This is a race against time and we need to make every possible effort to save Pacific leatherbacks before they completely disappear," said Artis. "We are delighted that our Playa Naranjo efforts are not only benefiting leatherbacks but threatened green and olive ridley sea turtles as well. It's a sea turtle conservation gift that keeps on giving all year round and we are eagerly awaiting our first nesting leatherback during the November through February season."

CITES Vote Grants 21 U.S. Turtle Species International Trade Protections

Native U.S. Species Gravely Threatened by Pet, Meat Trade

Panama City, Panama—23 November 2022—Countries from around the globe voted at the CITES conference today to restrict trade in 21 U.S. turtle species. The decision was made at the 19th Conference of the Parties to the Convention on International Trade in Endangered Species (CITES).

The 21 turtle species are all native to the southeastern United States and include powerful snapping turtles, beautiful map turtles, mud turtles, musk turtles and odd-looking but lovable softshell turtles. Another 32 non-U.S. turtles also received trade protections.

"If turtles could celebrate, there'd be swamp parties all over the southeastern United States tonight," said Sarah Uhlemann, international program director at the Center for Biological Diversity (CBD), who attended the conference in Panama. "Turtles around the globe are gravely threatened by the pernicious pet and meat trades, but these U.S. species just got a much better shot at survival."

Sought after as pets or for human consumption, many U.S. turtles are currently threatened by the international trade. Turtles are particularly vulnerable because they're slow to reproduce, making it difficult for populations to recover after overcollection from the wild occurs.

"Turtles are being taken out of the wild around my home in the southeastern United States at an alarming rate," said Dianne DuBois, a staff scientist at the Center who also attended the conference in Panama. "I'll rest easier tonight knowing that so many of these species have received the international protections they've desperately needed for a long time."

The turtle trade occurs in a "boom and bust" cycle. When one turtle population is depleted through collection, demand quickly shifts to a new species or population. Trade restrictions are critical because even turtle species not showing up in the trade today may still be at risk.

The Pearl River map turtle, *Graptemys pearlensis*, photographed in Louisiana. Photo © 2021 by vanremsen

More than half the world's turtles are currently threatened with extinction. Altogether, nations proposed protections for 53 turtle species at this year's CITES meeting, and all 53 received protections, representing a global acknowledgement that international trade poses a major threat to turtles.

Background

Two snapping turtle species, the alligator snapping turtle and common snapping turtle, were added to CITES Appendix II. International trade must now be sustainable and authorized through permits. Both species are traded in large quantities, primarily for meat. Alligator snapping turtles have been proposed for U.S. Endangered Species Act protections, based on a CBD petition.

Alligator snapping turtle, *Macrochelys temminckii*. Photo by Gary M. Stolz/USFWS. Public domain.

Five species of broad-headed map turtles received CITES Appendix II protections. These species are threatened by habitat loss and harvest for the pet trade. The U.S. lost 1.5 million map turtles to exports between 2005 and 2022. Map turtles have intricate designs on their shells that have contributed to their popularity in trade.

Twenty species of mud turtles received CITES Appendix II protections, and two species were listed under Appendix I, which bans commercial trade. These species are primarily threatened by habitat loss and fragmentation, and the international pet trade. Illegal trade is also a threat to mud turtles, as several species have been documented in trade without proper permits.

Four species of musk turtles received CITES Appendix II protections. Musk turtles are threatened by habitat loss and the international trade. The U.S. lost 1.49 million musk turtles to commercial trade exports from 2013 to 2019; 60% of those exports were sourced from wild populations.

Three species of softshell turtles received Appendix II protections. Softshell turtles have a distinctive tubular snout and other unique features that make them desirable in the pet trade, and they are also traded for meat.

— Center for Biological Diversity press release

2023 California Turtle & Tortoise Club Directory

Executive Board

Important: The Executive Board is strictly an administrative body for the corporate portion of CTTC and does not handle animals or adoptions.
General information:
CTTCEBOfficers@tortoise.org
Chair/Chief Executive Officer:
John Kim
Vice-chair/Vice Chief Executive Officer: **Robert Hazard**
Treasurer/Chief Financial Officer:
Virginia Doepping
Executive Secretary: **Heather Ponek**
Meeting: Quarterly hybrid meetings held via Zoom and in-person at the Los Angeles County Arboretum, 301 No. Baldwin Avenue, Arcadia, CA 91007. Next meeting: 14 January 2023.

Chino Chapter

President: Lynda Misiak
Vice president: David Bowman
Secretary: Rachelle Buck
Adoptions: Jim Misiak
Meeting: In-person meetings on the third Friday of each month, 7:30 PM, at Chino Girl Scout House, 5007 Center Street, Chino, CA 91710.

Foothill Chapter

President: Joanna Bolt
Secretary: Mardy Graves
Treasurer/Membership:
Jeanette Lea
Meeting: In-person meetings on the second Friday of the month at 7:30 PM in Ayres Hall at the Los Angeles County Arboretum, 301 North Baldwin Avenue, Arcadia, CA 91007.

High Desert Chapter

President: Regene Fonville
Vice president: Toni Clegg
Secretary: Mary Dutro
Treasurer: Jose Zamudio
Meeting: Second Monday, 6:00 PM at Sterling Inn Regency Room, 17738 Francesca Road, Victorville CA 92392

Inland Empire Chapter

President: Gerald Rezes
Vice president: Richard Roosman
Corresponding Secretary: Amy Taylor
Treasurer: Robyn Kohr
Meeting: Hybrid meetings take place virtually via Zoom and in-person on the first Friday, 7:30 PM at "The Ark" Church of the Nazarenes in the Fellowship Hall in Young Hall, 1307 East Citrus Avenue, Redlands, CA 92374.

Kern County Chapter

General information:
KernCTTC@tortoise.org
President/membership:
Heather Ponek
Vice president: Tim Brennan
Treasurer: Kathy Studer
Adoptions: Adoptions email
Meeting: In-person meetings on the second Monday, 6:30 PM at St. Philip of the Apostle Church, St. Ann's Room (East side of church), 7100 Stockdale Hwy (on the north side, between Ashe and Gosford), Bakersfield, CA 93309.

Low Desert Chapter

General Information: Tony Vaninetti
Secretary: Marlies Dietrich
Adoptions: Bill Powers
Meeting: Information to be announced.

Orange County Chapter

General Information:
orangecounty@tortoise.org
President: **John Kim**
Vice president: **Linda Grunnet**
Secretary: **Joyce Keyak**
Treasurer/membership:
Virginia Doepping
Adoptions inquiry: **Terrill Stone**
Meeting: First Friday every month at 7:30 PM at the First Christian Church of Orange, 1130 East Walnut Avenue, Orange, CA 92867.

Ridgecrest Chapter

President: Robert Parker
Vice president: Sue Parker
Adoptions: Montynne Yates
Meeting: Second Monday, 7:30 PM outdoors at Maturango Museum, 100 East Las Flores Avenue, Ridgecrest, CA 93555. There are no meetings in July or August.

Santa Barbara-Ventura Chapter

General information:
SB.Ventura@tortoise.org
President: **Sue Alvarez**
Vice president: **Christina Vanarelli**
Treasurer: **Vel Muskat**
Secretary: **Chuck Alvarez**
Meeting: Contact the Chapter for meeting information.

Santa Clarita Chapter

General Information:
Abigail DeSesa
President: **George Ordway**
Treasurer/membership/adoptions:
Abigail DeSesa
Secretary: **Jennifer Fields**
Meeting: Information to be announced.

TOOSLO (San Luis Obispo) Chapter (website is temporarily down)

Chapter Information:
TOOSLO@tortoise.org
President: Brandon Froelicher
Vice president: Brian Kusko
Treasurer: Diane O'Leary
Meeting: Information to be announced.

Turtle & Tortoise Care Society Chapter

President: John Kim
Vice president: **Casey Quinn**
Secretary/Treasurer: **Yolanda Keh**
Adoptions Inquiries
Meeting: Third Saturday, 7:30 PM at St. Gregory's Episcopal Church, 6201 East Willow Street, Long Beach, CA 90815.

Valley Chapter

President: Bob Hazard
Treasurer: Karen Berry
Adoptions: Valley Adoption Team
Meeting: In-person or virtual meetings via Zoom are held on the third Friday of every month at 7:30 PM depending on scheduling. In-person meetings take place at Woodland Hills Christian Church, 5920 Shoup Avenue, Woodland Hills 91367-3327.

California Turtle & Tortoise Club

Meeting Schedule: January/February 2023

Click on your Chapter's website link for the latest program information which is posted as it becomes available.

Chino Valley
20 January; 17 February

Foothill
13 January; 10 February

High Desert
9 January; 13 February

Inland Empire
6 January; 3 February

Kern County
9 January; 13 February

Low Desert
Meeting information to be announced.

Orange County
6 January; 3 February

Ridgecrest
9 January; 13 February

Santa Barbara-Ventura
Meeting information to be announced.

Santa Clarita
Meeting information to be announced.

TOOSLO (San Luis Obispo)
Contact the chapter for meeting information.

TTCS (Long Beach)
21 January; 18 February

Valley
20 January; 17 February

California Turtle & Tortoise Club : a Society Dedicated to Turtle & Tortoise Preservation, Conservation and Education since 1964. Promoting and Facilitating the Care, Rehoming, and Adoption of Native and Nonnative Turtles and Tortoises.

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Membership in the CTTC and subscriptions to the *Tortuga Gazette* are handled through the CTTC Chapters. The Chapters also manage membership renewals (see postal addresses to the right).

Many members choose to join a nearby Chapter to participate in Chapter meetings and other activities. Print membership forms from the CTTC website.

Your Chapter and your renewal date (month/year) are displayed on your newsletter notification. Mail your new or renewal membership/subscription to the Chapter of your choice.

Membership fees

- Student membership $15.00
- Individual membership $25.00
- Family membership $35.00
- Life membership $500.00

CTTC Mailing Addresses

Chino Valley Chapter: P.O. Box 1753, Chino, CA 91708-1753

Foothill Chapter: P.O. Box 51002, Pasadena, CA 91115-1002

High Desert Chapter: P.O. Box 163, Victorville, CA 92393

Inland Empire Chapter: P.O. Box 7205, Redlands, CA 92375

Kern County Chapter: P.O. Box 81772, Bakersfield, CA 93380-1772

Low Desert Chapter: P.O. Box 4156, Palm Desert, CA 92261

Orange County Chapter: P.O. Box 11124, Santa Ana, CA 92711

Ridgecrest Chapter: P.O. Box 1272, Ridgecrest, CA 93555

Santa Barbara-Ventura Chapter: P.O. Box 3086, Camarillo, CA 93011-3086

Santa Clarita Chapter: P.O. Box 4012, Castaic, CA 91310

TOOSLO Chapter: P.O. Box 763, Grover Beach, CA 93483

Turtle & Tortoise Care Society Chapter: PO Box 15952, Long Beach, CA 90815

Valley Chapter: P.O. Box 7364, Van Nuys, CA 91409-7364

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