California Turtle & Tortoise Club

the Tortuga Gazette

May | June 2017
Volume 53, Number 3

California Turtle & Tortoise Club founded in 1964 and dedicated to Turtle & Tortoise Preservation, Conservation and Education

Ornate box turtle, *Terrapene ornata ornata*, photographed in Harris County, Texas. Photo © 2008 by Patrick Feller. Source: Creative Commons; license CC-BY-SA 2.0.

Turtle of the Month

Ornate Box Turtle, *Terrapene ornata* (Agassiz, 1857)

The Western Box Turtle by M. A. Cohen

Ranging from the Rocky Mountains eastward to the Mississippi River, the ornate box turtle, *Terrapene ornata,* is the western counterpart of the common, or eastern box turtle, a group of species and subspecies known collectively by the scientific name *Terrapene carolina.*

Formally described by Swiss-American biologist Louis Agassiz (1807–1873) in 1857, the North American *T. ornata* is native to the Great Plains of the United States as well as two states in northwestern Mexico. Nearly a full century after the initial description, researchers validated the existence of two subspecies within the genus *T. ornata*. The original ornate box turtle described by Agassiz in 1857 became the first subspecies, *T. ornata ornata.* American herpetologist H. M. Smith and a colleague named Ramsey formally described the second species, *T. ornata luteola,* the desert box turtle, in 1952. See the section titled "Subspecies" for a more detailed discussion of the two subspecies.

While the genus name *Terrapene* derives from an Algonquin Indian word for 'turtle,' the species name *ornata* means 'ornate' or 'decorated' and refers to the intricate patterning on the species' carapace and plastron (Ernst and Lovich, 2009).

Identification

The ornate box turtle is a small, primarily terrestrial chelonian species with a round or oval, distinctively patterned carapace and a hinged, patterned plastron.

"The coloration and markings present on the carapace, plastron, head, and limbs can be highly variable from one population to the next," according to the website Texas Turtles, using the phrase "polymorphic species" to describe *Terrapene ornata* (Terrapene_Ornata, n.d.). The term polymorphic derives from two Greek root words meaning 'many' (poly-) and 'forms' (-morphic). Having stated this, generalizations about appearance follow.

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Peggy Nichols Mini-Show
Turtle & Tortoise Care Society (Long Beach)
@ El Dorado Nature Center
7550 E. Spring St., Long Beach CA 90815
see page 14 of this issue for driving directions

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

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Hatchling ornate box turtle, *Terrapene ornata ornata*, photographed at the South Plains Wildlife Rehabilitation Center in Lubbock, Texas. Photo © 2011 by Onebiglie. Source: Creative Commons, license CC-BY-SA 3.0.

As a rule, the carapace of *T. ornata* is highly domed, slightly flattened at the top, and often has a broad yellow stripe, either continuous or dashed, running lengthwise down the center. Scutes, the keratinized plates that cover the turtle's bony carapace, display a pattern of wide yellow stripes on a darker background radiating outward from the center of each scute on the carapace.

Ordinarily the background color of the carapace, which is usually keel-less, ranges from an olive-brown to a reddish-brown while the pattering is yellowish, creamy yellow or white. The species' plastron may have a background color of creamy-yellow with brown or black radiating lines. Conversely, the plastron may be brown to black with creamy-yellow pattern lines (Terrapene_ornata, n.d.).

The species' plastron has scutes that bear similar markings to those of the carapace. Between the pectoral and the abdominal plastral scutes, the species' plastron features a flexible hinge that divides the plastron into two lobes. The plastral hinge, at hatching, is not fully developed, and does not become fully functional until about four years of age. Thus, the hatchlings and juveniles are relatively defenseless as compared to subadults and adults, and, as such, suffer greater levels of mortality (Ornate box turtle, n.d.).

The combination of a relatively long, hinged plastron and a high-domed carapace enables the ornate box turtle to completely withdraw into its shell, thereby "boxing" itself inside and protecting the soft tissues of its head, limbs and tail quite effectively against attacks by predators.

Both male and female ornate box turtles reach an adult straight-line carapace length (SCL) of ±6 inches (±15.4 centimeters). Because of the relatively high dome of its carapace, scientists sometimes describe the length of *T. ornata* in terms of its plastron rather than its SCL, as in the following paragraph.

While males reach breeding age at a plastral length of 4 to 4.3 inches (10 to 11 centimeters) or 8 to 9 years of age, females generally mature at a plastral length of 4.3 to 5 inches (11 to 13 centimeters) or 10 to 11 years old (van Dijk & Hammerson, 2011).

Sexual dimorphism, i.e., differences in the appearance of the male and female of a given species, exists in ornate box turtles. Typically, adult males are somewhat smaller in overall size than females, and the rear lobe of their plastrons is concave The males' eyes have a red iris while their heads may have a greenish coloration. In addition, males have longer, thicker tails than females. In contrast, females are slightly larger overall than males, the rear lobe of their plastrons is flat or slightly convex, and the females' eyes have a yellowish-brown iris (Terrapene ornata, n.d.).

The coloration of the ornate box turtle's head, limbs and tail is generally brown to black, and the species' skin may display a pattern of yellow markings. Furthermore, the tail of the species often has a yellow stripe on its upper (dorsal) surface.

Subspecies

Terrapene ornata ornata (Agassiz, 1857)

The prairie subspecies of *T. ornata*, known by the common name of ornate box turtle, inhabits open, treeless, sandy plains, gently rolling hills and grasslands with sparse scrub-brush vegetation. Sometimes entering oak-walnut woodland areas along streams, ornate box turtles will seek water to quench thirst, avoid dehydration, and thermoregulate in hot weather (Ornate box turtle, n.d.).

Especially in the northern reaches of its range, *T. o. ornata* digs a shallow hibernaculum in which it survives

winter, entering brumation beginning in September in the coldest areas. The species may utilize kangaroo rat burrows and hollows in limestone shelves as shelters; it also resides in black-tailed prairie-dog towns in the Great Plains (Ernst & Lovich, 2009). Therefore, the turtle selects habitat locations within its range that offer suitable burrowing opportunities as well as water sources.

When spring arrives, all ornate box turtles in a given area emerge from their hibernacula within one to two weeks of each other, at which time the courtship-and-mating season begins (Ornate box turtle, n.d.).

As a rule, *T. o. ornata* has a darker background color on its carapace than *T. o. luteola*, as well as having fewer yellow markings on each of its scutes and on its skin. See the photograph on this page for a comparison of the carapacial markings of the two subspecies.

Terrapene ornata luteola (Smith & Ramsey, 1952)

The arid-region subspecies of *T. ornata,* commonly known as the desert box turtle, adapts to drier ecosystems than the ornate box turtle. The term *luteola* derives from a Latin root word meaning 'yellowish.' Referring to the overall lighter appearance of the desert subspecies as compared to the darker ornate subspecies, *luteola* may also allude to the relative abundance of yellow patterning on the carapace and plastron of the desert box turtle.

The species Inhabits semidesert and desert grasslands and prairies with comparatively low humidity levels, low soil temperatures, and high air temperatures in the southwestern United States and in northwestern Mexico. For example, in southwestern Arizona, *T. o. luteola* is commonly active during the summer monsoon (July through September) when humidity levels are relatively high as compared with other times of the year (Ornate box turtle, n.d.; Ernst & Lovich, 2009).

While the eyes of the female desert box turtle have a yellowish to brown iris, the iris of the male is red, and the male's tail is longer and thicker than that of the female.

Habitat

According to a technical conservation assessment by Redder, et al., ornate box turtles, regardless of subspecies, require three types of microhabitat within a habitable ecosystem, including feeding areas having access to free water, nesting sites that may also serve as hibernacula, and resting/thermoregulatory sites with soft soil or leaf litter that is used to avoid extreme temperatures and to maintain water balance (Redder, Dodd, Jr., Ph.D., Keinath, Mcdonald, & Ise, 2006).

Side-by-side comparison of the markings on the carapaces of the two subspecies: the ornate box turtle, *T. o. ornata* (left), and the desert box turtle, *T. o. luteola* (right). Photo © 2006 by LA Dawson. Source: Creative Commons; license: CC BY-SA 2.5.

Range

Native to North America, *T. ornata* inhabits the central and southwestern United States and northwestern Mexico from the Rocky Mountains in the west to the Mississippi River in the east. Generally speaking, the northernmost reaches of its range include South Dakota and Wisconsin, and the southernmost boundary of its range occurs in northwestern Mexico (Terrapene ornata, n.d.).

Found at elevations from sea level to approximately 21,000 feet (6,500 meters), with the average being approximately 5,000 feet (1,500 meters) of elevation, the species prefers a year-round temperature span of 77 to 86° F (25 to 30° C) (Terrapene ornata, n.d.).

While the two subspecies share an overlapping range in the Great Plains of the United States, *T. o. ornata* occurs primarily in the central United States in the states of Kansas, Nebraska, Oklahoma and Texas. On the other hand, *T. o. luteola* occupies Arizona, New Mexico and western Texas up to the fringes of the desert in the southwestern United States as well as the states of Chihuahua and Sonora in northwestern Mexico (Terrapene ornata, n.d.).

Foods and Feeding

Theoretically omnivorous in its feeding practices, *T. ornata* will use the senses of sight and smell to detect food sources. Wild ornate box turtles tend to be carnivorous, with the majority of prey items being insect species. Researchers document the following as food items: earthworms, snails millipedes, sowbugs, crayfish and insects such as ants, beetles, cicadas, caterpillars, crickets, grasshoppers, stick insects, robber flies, and harvestmen, and spiders (Ernst & Lovich, 2009). The species, both wild and captive individuals, will also consume a variety of fruits and vegetables, including cantaloupe, blackberries, mulberries, persimmons, strawberries, green pea pods, dandelion, prickly-pear cactus, and tomatoes. Researchers have also observed *T. ornata* consuming amphibian, bird, fish, and mammal carrion (Terrapene_ornata, n.d.).

Reproduction

Reproductive maturity in *T. ornata* more closely corresponds to size than to age. Although the courtship-and-mating ritual sometimes takes place in summer or fall, it usually occurs in spring following the turtles' emergence from brumation (Ernst & Lovich, 2009). Thus, the activity period, including the mating season, for *T. ornata* extends from March–April to October–November.

While most nesting occurs in June, the nesting season usually extends from mid-May to mid-July, with one to two clutches laid per season. Clutch size ranges from one to eight eggs, four to five eggs being the average, with smaller clutches tending to consist of larger eggs. Nesting sites in open areas that feature relatively soft soil and good drainage are the most desirable to ornate box turtle species. Incubation generally occurs for a period of ±70 days.

In the nest, incubation temperature during a specific period in the development of the embryos of most turtle species determines the gender of the hatchlings, a mechanism known as

Ornate box turtle, *Terrapene ornata ornata,* photographed in Gainesville, Cooke County, Texas. Cooke County is on the Texas-Oklahoma border. Based on its coloration, i.e., red iris, red legs and green head, this appears to be a male ornate box turtle. Photo © 2005 Clinton and Charles Robertson. Source: Creative Commons; license CC-BY-SA-2.0.

temperature-dependent sex determination. Research conducted on *T. o. ornata* indicates that temperatures of 72.5 to 77°F (22.5 to 25°C) yield male hatchlings; temperatures of 78.8 to 84.2 (26 to 29°C) a mixture of males and female hatch out; at temperatures above 84.2°F (29°C) all hatchlings are female (Reis, Schumaker, & Kenney, 2017).

Predators and Threats

Although predators exploit the ornate box turtle at all stages of its life, the eggs and juveniles of the species are at significantly greater risk than the adult turtles. Documented predators include flesh flies, bullfrogs, several snake species, crows and ravens, vultures, hawks, golden eagles, moles, voles, opossums, armadillos, raccoons, badgers, skunks, domestic dogs, coyotes, foxes, and domestic cats (Ernst & Lovich, 2009).

In contrast to the eggs and juveniles, more adult ornate box turtles are killed by vehicles (automobiles, farm machinery, and lawn mowers) than by all types of predators combined (Ernst & Lovich, 2009).

Threats to the species include agricultural and residential development of prairies resulting in habitat degradation, destruction, fragmentation and loss, and, historically, collection for the domestic and international pet trade. Climate change poses a significant threat to any species in which temperature-dependent sex determination dictates the ratios of males to females in a given population.

Conservation

Following a recent evaluation by several leading chelonian scientists, the International Union for the Conservation of Nature designated *T. ornata* as "near threatened" on its Red List of Threatened Species, based on a combination of factors, including "gradual habitat degradation and loss, and roadkill and other human-caused accidental mortality, combined with the species' slow growth and very limited reproductive capacity" (van Dijk & Hammerson, 2011).

Based on current population data, *T. ornata* is listed on the Convention in International Trade in Endangered Species as CITES II, a listing that entitles the species to some legal protection from unrestricted collection for international trade in food and traditional medicine in foreign countries.

In 1986 the state of Kansas officially designated *T. o. ornata* as the state reptile. **Ω**

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Thousands in Ohio Ask State to Ban Unlimited Wild Turtle Trapping

Commercial Traders Now Sell as Many Turtles as They Can Catch

Columbus, Ohio—10 April 2017—The Center for Biological Diversity and Sierra Club Ohio have sent more than 3,800 letters asking the Ohio Department of Natural Resources to end unchecked commercial collection of the state's wild turtles.

Turtle traders in Ohio can now legally collect unlimited numbers of common snapping and softshell turtles to process and sell domestically or export for Asian food and medicinal markets. The letters support a petition seeking a ban on for-profit turtle trading filed by the Center for Biological Diversity and several Ohio-based conservation organizations in January.

"For-profit turtle traders should not be allowed to put the state's turtles at risk," said Collette Adkins, a Center biologist and senior attorney who authored the January petition. "Ohio desperately needs limits on the number of snapping and softshell turtles trappers can take from the wild. Selling so many turtles for meat is bad for the turtles, of course, but also for all of us who care about the health of the state's waterways and wetlands."

Under current regulations in Ohio, anyone with an annual fishing license may trap and sell unlimited numbers of common snappers, spiny softshells and smooth softshells. Although Ohio law prohibits live export of turtles, traders can sell live turtles within the state or process the animals to sell across state lines or overseas for meat and medicinal markets. Also, because turtles bioaccumulate toxins from prey and burrow in contaminated sediment, turtle meat is often laced with mercury, PCBs and pesticides, posing a health risk. Adult turtles are also taken from the wild to breed hatchlings for the international pet trade.

"All of our neighboring states ban or limit for-profit turtle trapping, and Ohio should too," said Aaron Acus-Souders, a clean water advocate from the Ohio Chapter of the Sierra Club.

None of the states that share a border with Ohio allow unlimited commercial collection of turtles. Kentucky, Michigan, Indiana and West Virginia prohibit all commercial collection of turtles, and Pennsylvania enforces strict bag limits. **Ω**

— Center for Biological Diversity press release

Why Do Bootleggers Make Good Conservationists? by Whit Gibbons

We watched the tiny TV screen, no bigger than a deck of playing cards. Everyone was silent as we peered at the eerie light and saw the walls of the tunnel go by. The image on the screen showed a turn in the tunnel and beyond that a long, straight stretch. At the far end a dark form came into view.

Someone said in a soft voice, "What's that? Up ahead, at the end of the tunnel."

No one spoke for a moment as the form began to enlarge on the TV screen and then someone else said, "It's a tortoise! Look, it's moving."

A cheer went up from beneath the blue plastic tarpaulin we had used to shield the equipment from the sunlight. All ten of us spoke at once pointing to the image on the screen. The burrow camera had worked. We had found a gopher tortoise in its underground tunnel. They are impressive in their ability to dig their own burrows.

A burrow camera is a simple device in terms of modern technology, but its value for studying the secret lairs of animals which live beneath the ground is immeasurable. The device itself consists of 30 feet of fiber optics cable about the size of a garden hose with a camera on one end and a monitor for viewing on the other. The camera is equipped with tiny infrared light sources so that the natural darkness in a deep tunnel appears fully illuminated, but only to the eye of the camera.

Many animals cannot see infrared light and may be unaware that their privacy has been invaded. Humans cannot see infrared either, but the camera can. The reflected light is converted into a picture visible to us in the form of images appearing on a TV monitor. A dark-as-a-cave burrow can look like a brightly-lit room. We found the tortoise in the fourth burrow we examined with the camera at an active gopher tortoise colony.

The imposing tortoises are officially protected in most regions of the southeast where they still occur. Gopher tortoises are known as a keystone species, a plant or animal that controls the character of an ecological system. Keystone species can dramatically alter the structure and dynamics of a habitat in direct and indirect ways. Gopher tortoises do so by modifying the landscape in the sandy soil habitats where their burrows serve as refuges not only for themselves but for many other animals.

A burrow may be more than thirty feet long and as wide and high as a full-grown gopher tortoise. The domed shells of big ones are over fourteen inches long, and their hind feet look like they should belong to a miniature elephant. Gopher tortoises are the most terrestrial of the eastern turtles, living a peaceful life grazing on grasses and other vegetation, and spending the off hours of darkness or cold weather underground.

Gopher tortoise, *Gopherus polyphemus*, photographed in Florida. Photo © 2008 by Craig O'Neal. Source: Creative Commons; license CC BY-SA 2.0.

Our excitement at seeing the gopher tortoise went beyond the thrill of using a piece of military-like technology that allows one to see in the dark. We were jubilant because this was the first confirmed sighting of a live tortoise at the recently discovered longleaf pine-wiregrass habitat, a rarity in itself. So unusual, in fact, is the habitat and its colony of tortoises that arrangements have been made by a conservation organization to purchase the land and preserve the system.

The colony was special to us because it represented the northernmost one known to exist for this fast disappearing species. But perhaps the greatest thrill of all, from an environmental standpoint, was that the newfound colony differed in another way from others reported in past decades. Almost without exception, a report about a gopher tortoise colony has been one of disruption or local extinction from such causes as development, agriculture, highway construction, and capture of individuals for pets or food. Despite official protection, colonies are still giving way to the expanding human populations, especially in Florida.

How could such a discovery even be made in today's world? How could a colony of animals the size of volleyballs go unseen by passersby or a longleaf pine-wiregrass habitat go untampered with? I like the answer. The land had been owned, and protected from outsiders for several generations by bootleggers.

Their short-term impacts on people were special, but their long-term impact on environmental preservation was even more so. **Ω**

Originally published in the Georgia Herpetological Society's *Georgia HerpNotes*. Reprinted from the *Tortuga Gazette* 32(5) May 1996.

Scientific literacy is an intellectual vaccine against the claims of charlatans who would exploit ignorance

— Neil deGrasse Tyson (b. 1956) , American astrophysicist

The California Turtle & Tortoise Club
CHINO VALLEY CHAPTER

IS HAVING A

TURTLE AND TORTOISE SHOW IN "CHINO"

SATURDAY, MAY 20, 2017
10:00am to 3:00pm

ADMISSION $2.00

** LIVE EXHIBITS - EDUCATIONAL MATERIAL & DISPLAYS**
ADOPTION INFORMATION
TURTLE BOUTIQUE

CHINO GIRL SCOUT HOUSE
5007 Center Street, Chino, CA 91710

From the 60 freeway exit Central Ave. and go south to Riverside Drive then go right. Take Riverside Drive to Third Street (1st signal) and turn right. The Girl Scout House in on the corner of "Third" and "Center" Streets

E-MAIL: jlcalif2@aol.com OR CALL LYNDA AT 909/627-0424 FOR MORE SHOW INFORMATION

California Turtle & Tortoise Club

CTTC Valley Chapter
Turtle & Tortoise Show

Saturday, May 20, 2017
11:00 AM ~ 4:00 PM
Woodland Hills Christian Church
5920 Shoup Avenue
Woodland Hills, CA 91367

- Live turtles and tortoises
- Information on care, adoptions and conservation
- Tortuga Gift Shop
- Raffle
- Silent Auction
- "Ask the Vet" booth

Admission
Adults $3.00
Seniors 60+ $2.00
Children 6+ $2.00
Children under 5 ..... FREE

For more information, contact:
Show Chair: Karen Berry
theflyingturtle1953@yahoo.com
Co-Chair: Cristina Perovich
cribetti@gmail.com

Sponsored by CTTC Valley Chapter: http://www.tortoise.org/valley, P.O. Box 7364, Van Nuys, CA 91409-7364.
The Valley Chapter of California Turtle & Tortoise Club is a not-for-profit 501(c)(3) organization.

California Turtle and Tortoise Club
Inland Empire Chapter
A Non-Profit Organization

is having their

Annual Turtle & Tortoise Show

Saturday, June 17, 2017
10:00am – 3:00pm
Admission: FREE

*Live Exhibits *Adoption Information
*Educational Displays *Fund Raising Table
*Raffle *Baked Goods & Soft Drinks

Redlands Senior Citizen Center
111 W. Lugonia Avenue
Redlands, CA

COME JOIN THE FUN!!!

For show information
Check out: www.tortoise.org

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Updating your Contact information

Every CTTC member on this mailing list has a MailChimp account that s/he can update as needed. When you receive your newsletter notification, there is a link at the bottom of the page titled "update your preferences." Simply click on this link to jump to your account and update your email address and other information. Thank you!

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.**

Marines Displace 1,100 Tortoises
With the compliance of the wildlife agencies, some 1,100 threatened desert tortoises are being forcibly removed from their habitat as Twentynine Palms Marine Base expands.

Desert Tortoise Natural Area
Story with video on the 25,000 acre Desert Tortoise Natural Area north of California City in Kern County.

Tommy Lost and Found
Lost and found tortoise stories are common. But little Tommy's travels taught me something. Who knew the Salvation Army runs an animal sanctuary?

- **Tommy Lost**
- **Tommy Found**

Giant Tortoise Evolution and Dispersal
The evidence that giant tortoises spread to islands without human intervention.

Fossil Giant Softshell From Wyoming
This brief story has a wonderful photograph of a reconstructed fossil soft shell turtle with its finders providing scale.

California Drought and Western Pond Turtles
Scientific paper from Jeff Lovich and his team on the impacts of California's protracted drought on the western pond turtles at Elizabeth Lake.

Western Painted Turtles
Short radio broadcast and video on western painted turtles from Missouri Department of Conservation.

Murray River Turtle Restoration To Mitigate Aussie *Carpageddon*?
The Australian government is considering releasing large numbers of rare, head-started Murray River turtles and a fish-herpes virus to remove invasive exotic carp from the Murray River.

Two Burmese Roofed Turtle Clutches Found
Batagur trivittata is a rare turtle and pictures of it are scarcer than hen's eggs. This short article has a couple.

Deepwater Horizon
Sea turtles and the long-lived effects of the 2010 Deepwater Horizon oil spill.

Loggerheadlines
The latest issue from the South Carolina Department of Natural Resources Marine Turtle Conservation Program.

Cyborg Turtles
One day you will be able to control your turtle's movement just by thinking about it. (This would make an unlikely turnaround from Hannibal, my 30 year sulcata, controlling me.)

CTTC on Facebook
For breaking news updates, visit and "like" us on Facebook!

Valley Chapter Life Members

- **Bay Area Amphibian & Reptile Society**
- **Rebecca Anderson**
- **B. & M. A. Cohen**
- **Marc & Linda Colen**
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- **Mr. & Mrs. Robert Gordon**
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- **Deborah Levy**
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- **Adam Maron**
- **Guy B. McInerny**
- **Diego Munoz-Flores**
- **Cathy Norman**
- **David A. Ortega**
- **Jean Phelan**
- **Herbert C. Ruderman**
- **SW Geographic Science Team**
- **Amy Beth Worrell, DVM**

CTTC Meetings and Programs

Cen-Val: 11 May; 15 June

Chino Valley: 19 May; 16 June

Foothill: 26 May; 23 June

High Desert: 8 May; 23 June

Inland Empire: 5 May; 2 June

Kern County: 8 May; 12 June

Low Desert: 5 June

Orange County: Contact the chapter for meeting information.

Ridgecrest: 8 May; 12 June

Santa Barbara-Ventura: Contact the chapter for meeting information.

Santa Clarita: 20 May – Dr. Michael Tuma on "What I Learned About the Evolution of Fighting in Tortoises: A Slideshow of Fossils, Horns and Big Brawny Males"

Silicon Valley: 19 May; 16 June

TOOSLO (San Luis Obispo): 10 May; 14 June

TTCS (Long Beach): 19 May; 16 June - Annual Plant Sale

Valley: ~~19 May~~ - no regular meeting; 16 June

Executive Board: 8 July. Meetings are held at the Los Angeles County Arboretum, Arcadia, CA.

Check your Chapter web site for the latest program information. Programs may be scheduled after the newsletter is published.

"... the current position of the California Department of Fish and Wildlife is that it is illegal to breed captive [desert] tortoises."

[The Desert Tortoise Council's *Answering Questions* e-publication is currently offline in revision.]

"CTTC will not place desert tortoises (*Gopherus agassizii*) in situations where captive breeding may occur. CTTC works with California Department of Fish and Wildlife (CDFW) to place desert tortoises. Both CDFW and CTTC discourage the captive breeding of desert tortoises."

– tortoise.org/cttc/adoption.html

Gerald McQuade
Tortoise Keeper and Mosaic Artist

When Gerald McQuade, who prefers to be called "Mac," finished his service in the Unites States Navy, he returned home to Los Angeles, California to become a driller with the Los Angeles County Flood Control District. In the course of his work, he traveled all over the county and worked in some of its most pristine areas. This experience gave him a deep appreciation of nature and inspired his work as a mosaic artist.

When he retired from his Flood Control District position in 2000, he undertook a home remodeling project. During the process of remodelling his kitchen, he began to see the leftover pieces of tile for their potential as mosaic elements. In his back yard there was an ideal "canvas" for the mosaic that was developing in his mind's eye: the blank wall of his garage that faced into his back yard.

He began the mosaic by using whole tiles and random pieces of tile from his kitchen remodel, but ultimately purchased a tile saw to cut the precise shapes he envisioned for his creation. The rest is history. Two views of his finished mosaic are present on this page.

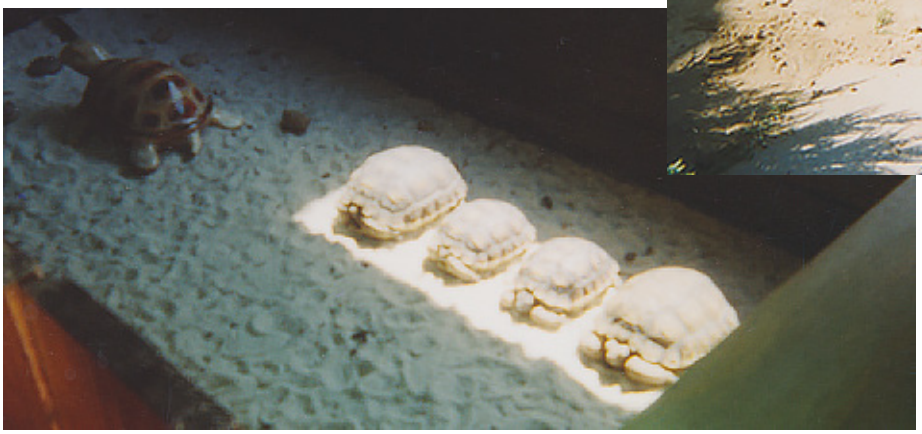
▲ A close-up of one section of the mosaic on the wall of the garage. Mac, who is a member of CTTC's Foothill Chapter, is seated on the wall of a tortoise enclosure he built in front of his mosaic .

▼ A wide shot of the mosaic and desert tortoise enclosure wall. Big Red, a boxer-Labrador mix, and Xeno the sulcata tortoise peacefully share the yard.

▲ Xeno the sulcata tortoise. He was found wandering near a homeless encampment adjacent to Glendora by a friend of Mac. In 2008 the 50-pound tortoise came to live with Mac, who initially thought it was a female, and named "her" Xena, after the Warrior Princess. Later, after determining the tortoise's true gender, he changed the sulcata's name to Xeno. The same year Mac joined the Foothill Chapter of the California Turtle & Tortoise Club specifically to learn more about properly caring for the sulcata.

Xeno's pyramiding, the dip at the rear of his shell, and the partial paralysis of his hind legs are due to malnutrition earlier in life, according to an acquaintance. Now, at over 100 pounds, Xeno is robust and rules the lawn area of the back yard.

▶ The desert tortoises that are currently living in the raised tortoise enclosure, basking on a sunny day. Several of Mac's original tortoises have found new homes with his fellow CTTC members.



◀ The indoor enclosure for hatchling and juvenile desert tortoises. The youngest animals live outside during the day when the weather is warm and sunny, and, at night and in inclement weather, the young tortoises live in their indoor enclosure.

▲ Xeno in 2008 when he came to live with Mac. Xeno weighed about 50 pounds at that time, and has since doubled in size. The sulcata and Bella, a little terrier mix who gets along well with Xeno, are basking in the yard.

▶ The protected, raised enclosure housing desert tortoises photographed in 2010. In this photograph, the tortoises are enjoying their meals. Note the reinforcing boulders inside the wall that were put in place to shore up the enclosure wall. When Xeno the sulcata sees the desert tortoises getting their meals, he attempts to knock over the 60-pound blocks that comprise the wall to get at the desert tortoises' food. Because Xeno can actually move the blocks, it was necessary to fortify the wall to keep Xeno at bay. **Ω**

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

Tortoise Berry
Nylandtia spinosa

Tortoise berry, *Nylandtia spinosa*, photographed in bloom in Cape Town, South Africa by S Molteno. Public domain.

Bearing edible red berries relished by tortoises, *Nylandtia spinosa* is a colorful, exotic shrub native to South Africa. While tortoise berry is not yet widely cultivated in the United States, according to the US Department of Agriculture's Plant Hardiness Zone map, the species is likely to thrive in Southern California and elsewhere in regions where the coldest seasonal temperatures remain above or near freezing.

With a genus name that honors the 17th-century Dutch botanist Pierre Nylandt, the species name *spinosa* derives from a Latin root word meaning "spiny," and refers to the spiky projections on the branches of the shrub. The common name, tortoise berry, derives from the fondness of local tortoises, as well as local birds, for the ripe fruits of the shrub. While the name *N. spinosa* is far more common, the literature also utilizes the botanical name *Muraltia spinosa* as a synonym for *N. spinosa*.

Afrikaans, a West Germanic language brought to southern Africa by early Dutch settlers, gives the shrub the name *skilpadbessie*, a term derived from the words *skilpad*, meaning 'turtle,' and *bessie*, meaning 'berry.' Moreover, the term *mmaba* is the name of the shrub in the language of the Tswana, a native people who use the plant medicinally (Nylandtia spinosa).

As a member of the Polygalaceae, the milkwort or butterfly bush family, tortoise berry belongs to a large plant family with over 950 members worldwide native to temperate and tropical climates. While still rare outside South Africa, drought tolerance once established, deer resistance, and edible/medicinal properties are some of the qualities that recommend the inclusion of tortoise berry in many gardens in suitable regions worldwide.

Identification

Reaching a height of 24 to 36 inches (60 to 90 centimeters) with equal spread, *N. spinosa* fits well into a small- to medium-sized garden (Tortoise Berry, Skilpadbessie, Mmaba). Having a growth habit described as stiff and upright with numerous arching branches, the shrub has considerable potential for providing color, texture, and structure in water-wise gardens.

While often described as being best suited for coastal areas, tortoise berry is adaptable to a variety of environments, temperature ranges, and rainfall patterns. For instance, a specimen of the species grows well in the Huntington Botanical Garden in San Marino, California, located inland some 35 miles northeast of the Pacific coastline.

Clothed in small, narrow leaves that are deciduous in South Africa (Nylandtia spinosa) and evergreen in North America, the branches of *N. spinosa* are spinescent, meaning they terminate in spines (Tortoise Berry, Skilpadbessie, Mmaba). Therefore, the gardener must exercise caution during maintenance of the shrub.

Described as resembling miniscule orchids or miniature sweet peas, tortoise berry flowers appear in profusion in late winter and spring in an array of colors ranging from white through pink to magenta and purple. The flowers also attract pollinators such as bees and butterflies

When ripened, the small, fleshy berries are bright red, and provide a feast for tortoises and birds. Subsequently, these animals disperse the seed of *N. spinosa* in their droppings, thus contributing to the distribution of the plant species throughout the ecosystem.

Culture

Full sun, excellent drainage, and moderate irrigation provide the optimal conditions for successful cultivation. Although pruning is unnecessary, occasional light pruning helps maintain compact growth. To benefit the overall health of the shrub, improve the soil quality and provide readily available nutrients by applying a top dressing of compost each season.

Edibility and Medicinal Uses

Containing an abundance of moisture and vitamin C, tortoise berries are edible, nutritious, and thirst-quenching. The common name attests to the fact that tortoises readily consume the berries in habitat, as do birds and, no doubt, other wildlife.

Available in southern Africa, jams and jellies incorporating tortoise berry fruit, as well as dried and processed products have economic importance locally (Wyk, B. V., 2011). Continuing laboratory research into the species' medicinal properties shows promise.

Chewing fermented leaves of *N. spinosa* in small amounts is an antidote to sleeplessness, according to native traditional medicine. Tea brewed from the shrub's leaves and stems counteracts digestive pain and tuberculosis in the traditional-medicine formulary. Combinations of *N. spinosa* and other local plants treat colds, flu and bronchitis (Nylandtia spinosa).

Indigenous people such as the Tswana utilize the roots of the tortoise berry medicinally in a compound for treating malaria (Nylandtia spinosa). **Ω**

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Iowa Reins in Exploitative Turtle Trapping

New Regulations Curb Killing, But More Protections Needed

— Center for Biological Diversity press release

Des Moines, Iowa—24 March 2017— In response to advocacy by the Center for Biological Diversity and other conservation groups, new regulations restricting collection and killing of four species of wild turtles in Iowa went into effect this week.

The new regulations impose closed seasons, daily bag limits and possession limits for common snapping turtles, painted turtles, spiny softshells and smooth softshells.

"It's great that Iowa is finally clamping down on exploitation of its turtles," said Collette Adkins, a senior attorney at the Center, which in 2009 sought a ban on commercial turtle collecting in Iowa. "The new regulations are a welcome step, but a complete ban on commercial trapping is needed to fully protect turtles."

Before these new regulations went into effect, Iowa allowed year-round commercial collection of four turtle species without any daily bag or possession limits. The new regulations protect the four turtles during their peak mating season by prohibiting commercial collection from May 15 to July 15. But year-round recreational collection of common snappers is still allowed.

The state's new regulations also set daily bag limits of four common snapping turtles, one spiny or smooth softshell and one painted turtle. Commercial turtle harvesters can possess 20 common snapping turtles, five spiny softshell or smooth softshell turtles and five painted turtles. Collection of wild turtle eggs is prohibited.

"We're so glad that states across the country are now restricting turtle slaughter," said Adkins. "Turtle trappers in the United States are catching and exporting millions of wild freshwater turtles every year, devastating populations that are already suffering from a lot of other threats, like habitat loss, water pollution and road mortality."

Just as Iowa finalized its new regulations, turtle trappers in Iowa began pushing a new bill (S.F. 460) that would replace them with revised rules more favorable to for-profit turtle trappers. Yet many surrounding Midwest states — North Dakota, South Dakota, Nebraska, Kansas, Illinois and Indiana — have determined their turtle populations can only be sustainably managed by banning all commercial collection.

Background

More than 2 million wild-caught, live turtles are exported from the United States each year to supply food and medicinal markets in Asia, where native turtle populations have already been depleted by soaring consumption. Adult turtles are also taken from the wild to breed hatchlings for the international pet trade. Large adults, females in particular, are the most valuable and therefore a primary target of commercial trappers. Yet such trapping can cause population declines even in some of the most common freshwater turtles.

As part of a campaign to protect turtles from overexploitation, the Center in 2008 and 2009 petitioned Iowa and other states with unrestricted commercial turtle collection to improve harvest regulations. In 2009 Florida responded by banning almost all commercial collection of freshwater turtles from public and private waters; in 2012 Georgia approved state rules regulating the commercial collection of turtles; and Alabama completely banned commercial collection. In October 2016 the Missouri Department of Conservation announced — in response to a 2016 Center petition — that it will consider ending unlimited commercial collection of the state's wild freshwater turtles.

In response to a 2011 Center petition, the U.S. Fish and Wildlife Service in May added four turtles — including common snapping turtles, smooth softshell turtles and spiny softshell turtles that are found in Iowa — to a list called "CITES Appendix III." Trade in Appendix III species requires an export permit and documentation that the animal was caught or acquired in compliance with the law, allowing the United States to closely monitor trade. The animals must also be shipped using methods designed to prevent cruel treatment. **Ω**

Foothill Chapter Health Clinic Meeting

On Friday, June 23rd the Foothill chapter will have their health clinic meeting offering deworming & microchipping and answers to turtle/tortoise health questions under the direction of Dennis Fees, DVM from the Arcadia Animal Hospital. Deworming cost is $10 and microchipping cost is $20 per turtle or tortoise. During the meeting there will be a silent auction which will include different gift & restaurant cards, turtle related items, baked goods, gift baskets, and individual donations. Free parking, snacks and beverages are available. The meeting will be held 7:00 PM at the LA County Arboretum in Arcadia, California.

What is an *arribada*?

The noun *arribada* translates from the Spanish as 'arrival' or 'arrived.' The meaning of the term has evolved to mean a significant mass-nesting event occurring in several species of turtle, including the olive ridley sea turtle (*Lepdochelys olivacea*) and the Kemp's ridley sea turtle (*Lepidochelys kempii*). Moreover, the phenomenon occurs in South America's Giant Amazon River Turtle (*Podocnemis expansa*).

During such events, which take place throughout the nesting season of each species, tens, hundreds, and even thousands of female turtles come ashore simultaneously to nest, each female typically laying 80 to 100 eggs.

Scientists theorize that the *arribada* phenomenon is part of a species survival tactic termed "predator swamping." This strategy involves the production of many more eggs and hatchlings than predators can consume, thereby increasing the odds that some hatchlings will successfully emerge from the nest and make their way to the sea, living to reach adulthood and producing the next generation of the species.

Chicago Herpetological Society: Herpetology 2017

Abstracts of recently published herpetological papers prepared by the editorial staff of the CHS

Olive Ridley Sea Turtle Nesting

S. Honavar et al. [2016, Herpetologica 72(4):303-308] note that Playa La Flor in Nicaragua is one of the few remaining beaches where olive ridley sea turtles (*Lepidochelys olivacea*) nest in *arribadas*. This study presents data on the status of the nesting population of *L. olivacea* on Playa La Flor from 1998 to 2006. In 2004 six plots (6 meters x 6 meters [20 feet x 20 feet]) were established on a 400-meter (1,312-foot) section of the nesting beach to measure the levels of illegal egg take, clutch hatching success, and hatchling production. The total number of turtles nesting at Playa La Flor increased from 1998 to 2006 where *arribadas* ranged in size from 167 to 60,816 turtle encounters. In August 2004, 45% of the clutches laid during the *arribada* were taken illegally from the study plots, whereas these levels were lower during the *arribadas* occurring from September to November. In 2004, clutch hatching success and hatchling production were higher in plots located high on the beach compared with plots that were closer to or below the high-tide line. Clutch hatching success and hatchling production were higher in the September *arribada* than during other *arribadas* within the same year. The lower hatching success and hatchling production of nests laid during the later *arribadas* might be explained by increased nest density, and overlapping clutches in the study plots could lead to an increase in microbial overload, 0_2 demand, and $C0_2$ production. If manipulating clutches is warranted on Playa La Flor, managers should target clutches that are at the highest risk of drowning, are in areas of high nest density, and are deposited during the larger *arribadas* that occur later in the nesting season. The location of clutches to be moved/removed might change between years, even on the same beach.

[Ed. note: see page 12 for more detail about the *arribada* phenomenon.]

§ § §

Sonoran Desert Tortoise Spatial Ecology

B. K. Sullivan et al. [2016, Journal of Herpetology 50(4):5089-219] note that the behavioral ecology of Sonoran Desert tortoises (*Gopherus morafkai*) remains relatively unstudied. In general Sonoran Desert Tortoises (STDs) differentially use incised washed and rocky slopes and avoid open flats and intermountain valleys, except during apparent emigration events. Relatively little is known about the temporal pattern of space use of STDs and even less about such use in relation to sex. The authors observed activity of adult and juvenile SDTs via radiotelemetry, and hatchling activity incidentally, over a 3-year period in central Arizona. The SDTs were most active in the fall (August–October) but exhibited a second peak of activity in spring (April). On average, males moved longer distances than did females in every month of the year when SDTs were active. Distances moved by females in the fall were apparent but not statistically significant. Activity of adults was detected in virtually every month of the year except January; at least one hatchling was observed active in every month of the year. The authors conclude that adult SDTs home range areas 1) are consistent in size and placement across multiple years and, for females especially, may include a "migratory" pattern to north slopes following summer rains, where they encounter a higher diversity and abundance of food plants; 2) are highly overlapping in females but less so in males; and 3) contain a few refuges in relatively lower elevation washes that are used consistently, especially during the hot, dry summer (May and June), and that are selected over many other available caliche refuges.

§ § §

Pacific Pond Turtles In The Desert

D. J. Germano [2016, Copeia 104(3):663-676] notes that the western pond turtles (*Actinemys marmorata*), the only native freshwater turtle in California, occurs in a variety of habitats from sea level to about 6,693 feet (2,040 meters) elevation, from mesic forests to deserts. The San Joaquin Desert in California once supported large populations of the species in lakes, sloughs, and marshes fed by water from the mountains of the Sierra Nevada. Because of damming in the mountains and agriculture on the desert floor, much of the aquatic habitat is gone. Although some biologists proffered that only non-viable populations of western pond turtles occurred in the San Joaquin Valley south of the delta, the author found a surprisingly robust population of this species at Goose Lake, an ephemeral freshwater lake on the desert floor in northwestern Kern County. From 1995 to 2006, 737 individuals were marked. Growth rates and reproduction were fairly high compared to other populations of western pond turtles in ponded waters. The average yearly population estimate was 597.4 turtles with annual survivorship estimates of 0.81 for adult males, 0.73 for adult females, 0.84 for juveniles 80–119 millimeters (3–4.7 inches) carapace length (CL) and 0.73 for juveniles for juveniles <80 millimeters (3 inches) (CL). The estimate of λ [ed. note: Greek small letter lambda] denoted a stable population. Although the population occurs in a habitat controlled by an agricultural water district, permanent water is always available and the site is secure from poaching. Despite severe decreases in the number of turtles in the San Joaquin Desert over the past 100 years, based on this study and other recent studies, there are several populations of western pond turtles in the area that appear to be large and stable. **Ω**

Originally published in the *Bulletin of the Chicago Herpetological Society* 52(1):12-13, 2017. Reprinted with permission from the Editor of the *Bulletin*.

Western (Pacific) pond turtle, *Actinemys marmorata*. Photo by Chris Brown, US Geological Survey. Public domain.

the *Tortuga Gazette*
May | June 2017
Volume 53, Number 3

Turtle of the Month

Ornate Box Turtle
Terrapene ornata

CTTC Online: tortoise.org
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The California Turtle & Tortoise Club is a non-profit 501(c)(3) corporation. Contributions are tax deductible to the full extent of the law. Please pay by USA funds only (US bank check, money order, or International Postal Order. Your Chapter and your renewal date (month/year) are printed on your newsletter notification. Mail your new or renewal membership/subscription to the Chapter of your choice.

Membership in the California Turtle & Tortoise Club and subscriptions to the *Tortuga Gazette* are handled through the CTTC Chapters. The Chapters also manage membership renewals.

Members are free to join any Chapter. Many members in California choose to join a nearby Chapter to participate in Chapter meetings and other activities. Print membership forms from the **CTTC website** and mail to the Chapter of your choice.

Membership fees

- Individual/family...$25^{00}
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- Foreign...$40^{00}
- Life membership...$500^{00}

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Postal mailing address: P.O. Box 7364, Van Nuys, CA 91409-7364.

Wild desert box turtle, *Terrapene ornata luteola*, photographed in habitat near Blue Haven Road, Patagonia, Santa Cruz County in southeastern Arizona. Photo © 2011 by Alan Schmierer. Source: Creative Commons; license: Creative Commons CC0 1.0 Universal Public Domain Dedication.

Turtle & Tortoise Care Society (Long Beach)
Peggy Nichols Mini-Show

When: Saturday, May 6, 2017 from 10:00 a.m. to 3:00 p.m.

Where: El Dorado Nature Center, 7550 E. Spring St., Long Beach CA 90815

Driving directions

From the 605 Southbound: Exit Spring Street. Turn left at first light into Nature Center entrance.

From the 605 Northbound: Exit at Willow/Katella. Take Willow Westbound. Turn right on Studebaker Road, turn right on Spring Street. Turn right at Nature Center entrance.

From the 405 Northbound: Exit Palo Verde Avenue, turn right. Turn right on Spring Street. Turn right at Nature Center entrance.

From the 405 Southbound: Exit Studebaker (North), turn left. Turn right on Spring Street. Turn right at Nature Center entrance.