California Turtle & Tortoise Club

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Female Goode's thornscrub tortoise, *Gopherus evgoodei,* photographed in habitat in southern Sonora, a state in northwest Mexico. Photo © 2011 by Mike Pingleton. Reprinted with permission from the photographer. Originally published in Mike Pingleton's blog, **Notes from the Field: A New Old Tortoise**, published 11 February 2016.

Turtle of the Month

Goode's Thornscrub Tortoise (*Gopherus evgoodei,* sp. n.)

The Sinaloan Desert Tortoise

by M. A. Cohen

The desert tortoise complex consists of three species: Agassiz's, or the Mojave desert tortoise (*Gopherus agassizii*), Morafka's, or the Sonoran desert tortoise (*G. morafkai*), and the newly recognized Goode's thornscrub, or the Sinaloan desert tortoise (*G. evgoodei*).

The southernmost species in the complex, Goode's thornscrub tortoise is found only in the Sinaloan thornscrub and the tropical deciduous broadleaf forest ecosystems in the states of Sonora, Sinaloa, and Chihuahua in northwestern Mexico.

The Desert Tortoise in Mexico

An extensive amount of research has been conducted on the desert tortoise in the United States. However, until recently, a limited amount of study has been devoted to the desert tortoise in Mexico. The following section describes some of the early research conducted with regard to the desert tortoise in Mexico.

In 1922 California herpetologist John Van Denburgh (1872-1924) provided the earliest report of desert tortoises in Mexico from sightings near Álamos in southwestern Sonora. His observations were published in an article titled "The reptiles of western North America, Vol. I, Snakes and turtles" in *Occasional Papers of the California Academy of Science*.

The next mention of the desert tortoise in Mexico in the scientific literature occurred in 1945 when Charles M. Bogert and James A. Oliver published the article "A preliminary analysis of the herpetofauna of Sonora" in the *Bulletin of the American Museum of Natural History* (Bury et al., 2002).

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Neither Van Denburgh nor Bogert and Oliver described the habitat in which the observations of the Mexican desert tortoises occurred. Bogert and Oliver were the first scientists to identify "the distinct morphology[1] of the tortoises at Álamos," but they could not "quantify it due to the small sample sizes" (Edwards et al., 2016).

Juvenile Morafka's desert tortoise, *Gopherus morafkai*, trekking past a prickly-pear cactus, *Opuntia* species. Photo by the U.S. Fish & Wildlife Service. Public domain.

In 1964 Richard Loomis and Julius Geest published the first report of desert tortoises in Sinaloa in an article in *Herpetologica* entitled "The Desert Tortoise *Gopherus agassizii* in Sinaloa, México " (Bury et al., 2002).

In 1969 biologist Walter Auffenberg furnished "the first substantial field observations" of desert tortoises in Sonora in his book *Tortoise Behavior and Survival* (Bury et al., 2002).

In 1994 Thomas Fritts and Randy Jennings coauthored a report on the distribution of the desert tortoise in Mexico for the publication *Biology of North American Tortoises*. The authors documented 74 localities within Sonora and Sinaloa at which they had observed desert tortoises.

In 2002, Kristin Berry, David Morafka and Robert Murphy coauthored an article for *Chelonian Conservation and Biology* entitled "Defining the Desert Tortoise(s): Our First Priority for a Coherent Conservation Strategy." The authors emphasized the need for systematic studies of "morphological, ecological, behavioral, and physiological distinctions among populations" of desert tortoises. The authors also suggested several possible taxonomic arrangements, one of which presents the Mojave, Sonoran and Sinaloan populations as three separate species (Berry, et al., 2002).

In 2002 Trip Lamb and Ann McLuckie coauthored a chapter published in *The Sonoran Desert Tortoise* entitled "Genetic Differences among Geographic Races of Desert Tortoises." They reported on the analysis of desert tortoise genetic data. Their research indicated that a special form of DNA (mitochondrial DNA) is "a high resolution genetic marker for assessing geographic variation" in tortoise populations based on earlier studies. Their investigation revealed distinct genetic lineages within the Mojave, Sonoran and Sinaloan desert tortoise populations (Lamb and McLuckie, 2002).

In 2011 Dr. Robert Murphy and an international team of scientists from Canada, the United States and Mexico published a paper in the online journal ***Zookeys*** presenting a description of a separate species of desert tortoise native to the Sonoran Desert, *Gopherus morafkai*, Morafka's desert tortoise. *G. morafkai* was named in honor of the late herpetologist Dr. David J. Morafka. Prior to the publication of this paper, all desert tortoises in the southwestern United States and northwestern Mexico were assigned to a single species, *Gopherus agassizii*. The ground-breaking research and DNA analysis of Dr. Murphy and his colleagues added a second species to the desert tortoise complex, the first "new" desert tortoise species in 150 years.

The Sinaloan "sister-species"

Dr. Taylor Edwards, an evolutionary biologist and conservationist from the University of Arizona, led an international team of researchers from Canada, the United States and Mexico that conducted a six-year study of the desert tortoise in the southern Sonora and northern Sinaloa in Mexico. The team took blood samples and measured as many tortoises as they could find during their fieldwork.

The study commenced in 2010

[1] form or appearance, both internal and external

and culminated in February 2016 with the publication of the new species description entitled "The desert tortoise trichotomy: Mexico hosts a third, new sister-species of tortoise in the *Gopherus morafkai–G. agassizii* group" in the online journal ***Zookeys***.

Dr. Edwards and his team utilized data management services provided by a system from the National Science Foundation called CyVerse to analyze the vast amounts of field-collected data and allowed the sharing of these data with colleagues (Littin, 2016).

Dr. Edwards proceeded to suggest a novel way to name the new tortoise species while protecting a portion of its habitat, setting up, in essence, a "trust fund" for newly-recognized desert tortoise species.

Identification

For decades prior to Dr. Edwards' study, researchers had observed striking differences in the physical characteristics of Mexico's northerly population of desert tortoises as compared with the southerly population.

The northerly population was recognized in 2011 as Morafka's desert tortoise, *G. morafkai*, which ranges from western and central Arizona in the United States south to the northern Sonoran desertscrub habitat in Mexico.

Dr. Edwards and his team developed a set of 37 variable physical characteristics in order to systematically measure the tortoises in the tropical deciduous forest and the Sinaloan thornscrub and compare those tortoises' characteristics to the other species in the desert tortoise complex, *G. agassizii* and *G. morafkai*.

All the desert tortoises share certain characteristics: 11 marginal scutes on the left and right edges of the carapace, five toenails on each forefoot, and four toenails on each hind foot. All desert tortoise species display sexual dimorphism: adult males have a somewhat longer tail, a concave plastron, a larger gular horn, and prominent chin glands (Edwards et al., 2016).

G. evgoodei has several distinctive characteristics compared to its sister-species: a noticeably flatter carapace, protruding scales ("spurs") on the upper forelimbs, a relatively bulbous snout, and rounded pads on the hind feet. Both sexes have noticeably shorter tails than the other desert tortoise species. The female's tail is miniscule at 2–8 millimeters (0.08–0.3 inch) and the male's tail is less than 13 millimeters (0.5 inch) in length (Edwards et al., 2016).

The carapace coloration of both Agassiz's desert tortoise and Morafka's desert tortoise is medium to dark brown or dark gray and the skin is brownish-gray to dark gray. The carapace coloration of Goode's thornscrub tortoise is brown to gray with subtle orange mottling or spotting, and its skin is dark tan to medium brown with an "orange cast" (Edwards et al., 2016).

Range

Goode's thornscrub tortoise is native to the thornscrub and tropical deciduous forest ecosystems of northwestern Mexico. It inhabits southern Sonora, northern Sinaloa, and western Chihuahua. See the map to the right for regions and species information.

G. evgoodei inhabits the smallest geographic range of the three species in the desert tortoise complex, an area of approximately 24,000 square kilometers (9,300 square miles) (Edwards et al., 2016). As a result, the newly-recognized tortoise species is already imperiled by the conversion of portions of its habitat to buffelgrass pasture for livestock grazing. See the section in this article titled "Threats" for more information.

Diet in the Tropical Deciduous Forest

Thomas Van Devender and a team of researchers collaborated on a project designed to study the foods consumed by desert tortoises in their various habitats. Their research findings were published in a chapter included in *The Sonoran Desert Tortoise*.

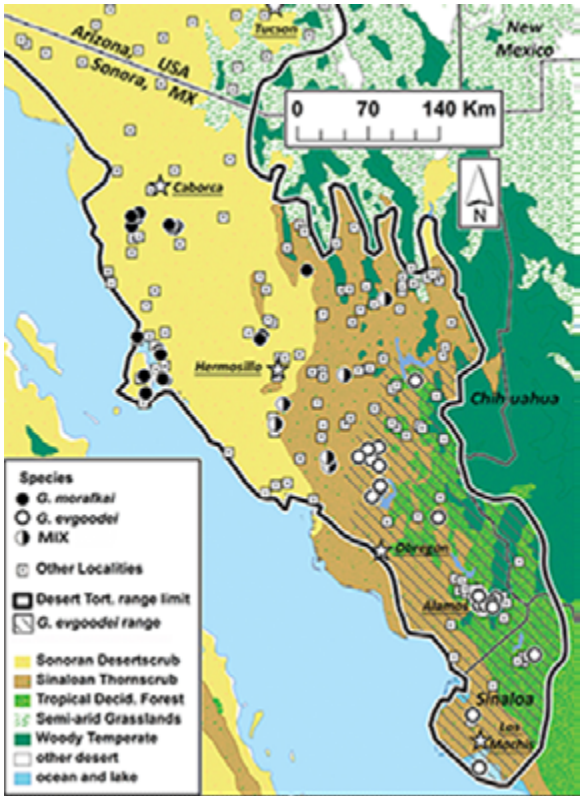
Of particular relevance to the current article is the section of that chapter titled "Diet in Tropical Deciduous Forest in Southern Sonora." The researchers collected desert tortoise scat from five burrows in Las Piedras Canyon, located three kilometers (1.9 miles) south of Álamos, Sonora. They analyzed the scat samples to determine the types of plant materials that the local tortoises were consuming" (Van Devender et al., 2002).

The researchers separated the forty-four collected fecal pellets into their component parts in order to identify the plant fragments contained in the pellets. Although some plant fragments were unidentifiable, researchers were able to recognize 25 plant species (Van Devender et al., 2002).

The combined totals for all samples were summarized by quantity consumed as follows: herbaceous perennials, 28%; trees and shrubs, 20%; grasses, 16% with 12% being annual grasses; annuals, 16%; perennial/annual herbs, 8%; a liana [ed. note: a woody climbing plant], 4%; a cactus (*Opuntia* spp.), 4%; and a subshrub, 4% (Van Devender et al., 2002).

According to the fragment analysis of the tortoise scat, the plants most commonly consumed included the following species:

• Trans-Pecos ayenia, *Ayenia filiformis*



Conservative estimate of the distribution of *G. evgoodei* in Mexico indicated by diagonal lines. Desert tortoise range limit, modified based on our field sampling, from Germano et al. (1994). Squares indicate museum and literature records of occurrence of *G.* spp. Circles are sample locations from Edwards et al. (2015) for both *G. morafkai* (black) and *G. evgoodei* (white). Localities in the Sinaloan thornscrub-Sonoran desertscrub ecotone indicated by split circles, which indicate the occurrence of both *G. evgoodei* and *G. morafkai* genotypes and/or hybrids.

Originally published in The desert tortoise trichotomy: Mexico hosts a third, new sister-species of tortoise in the *Gopherus morafkai–G. agassizii* group (Edwards et al., 2016). Reprinted under Creative Commons Attribution License (CC BY 4.0).

(a Mallow family subshrub);
- bristlegrass, *Setaria liebmannii*;
- Natal grass, *Melinus [Rhynchelytrum] repens*;
- panicgrass, *Panicum trichoides*;
- *Sida alamosana* (no common name, a Mallow family member).

A "Trust Fund" for Goode's Thornscrub Tortoise

In 2015, Dr. Edwards approached Eric V. Goode, founder and president of the **Turtle Conservancy**, with a unique proposal regarding the naming of the newly recognized species. Since 2013 Eric Goode, a restaurateur/hotelier and conservationist from New York City, has held an annual event called the Turtle Ball, a combination dinner, art auction, awards ceremony, and fundraiser to benefit the Turtle Conservancy's many projects worldwide.

Dr. Edwards proposed that the Turtle Ball auction the right to name the newly-recognized tortoise species, with the proceeds from the auction to be used solely to purchase pristine habitat to protect the "new" desert tortoise species.

Goode's thornscrub tortoise, *Gopherus evgoodei*. Photographed in Reserva La Sierrita, Sonora, Mexico. Photo © 2013 by Taylor Edwards. Reprinted with permission from the photographer.

"In an academic setting, when you're just churning out scientific papers, activism seems distant sometimes. I wanted to bridge that distance as a conservation geneticist. And I figured if we are introducing a new species to the world and we already know that it and its habitat are imperiled, why not start it out with a trust fund?" said Edwards (Littin, 2016).

Eric Goode agreed to the proposal, and the naming-rights auction occurred on 28 September 2015 at the Turtle Ball. A partnership of four entities, the Andrew Sabin Family Foundation, Global Wildlife Foundation, Rainforest Trust and the Turtle Conservancy, pooled funds and won the auction with a bid of $100,000.00. This sum will allow the purchase of approximately 40 hectares (1,000 acres) of pristine Sinaloan desert tortoise habitat in the tropical deciduous forest of southern Sonora.

According to the Turtle Conservancy's press release dated 10 February 2015, "The property targeted for this land acquisition has been identified for its excellent tortoise habitat, and for its ideal location adjoining a nature reserve, the Reserva Monte Mojino. This project will not only contribute to the survival of a unique tortoise but also the rich biodiversity associated with this ecosystem. This protected area will safeguard the globally endangered Tropical Deciduous Forest ecosystem supporting 36 families of tropical trees, 48 species of orchids, the highest diversity of birds in Sonora, 5 species of wild cats, and 79 species of amphibians and reptiles. The entire area will be owned and managed by Nature and Culture International, the organization that currently manages the Reserva Monte Mojino."

The partnership chose to honor Eric V. Goode by naming the newly recognized species after him: *G. evgoodei*. Eric Goode is a businessman who, through the Turtle Conservancy, is dedicated to protecting turtles and their habitats globally. The Turtle Conservancy currently has conservation projects in numerous turtle habitats.

Gopherus evgoodei, Goode's thornscrub tortoise, photographed in the Reserva Monte Mojino, Sonora, Mexico (in Tropical Deciduous Forest) on 24 August 2013. Photo © 2013 by Taylor Edwards. Reprinted with permission from the photographer.

Threats

In northwestern Mexico local cattle ranchers have planted invasive, nonnative buffelgrass (*Pennisetum ciliare*) in order to convert large areas of native thornscrub into pasture land for livestock forage.

Buffelgrass is a perennial bunch grass native to Africa, the Middle East, Indonesia and tropical Asia. The conversion of native thornscrub areas to buffelgrass pastures for livestock grazing poses a significant risk to the entire thornscrub ecosystem. Buffelgrass has become a problem throughout the Sonoran Desert because of its extremely invasive tendency and its ability to outcompete native flora through its prolific seed production, as well as its ability to spread by rhizomes (underground stems).

Soil temperature and soil moisture are altered when thornscrub is converted to buffelgrass pasture, according to a study by Daniel Morales-Romero and Francisco Molina-Freaner. After the wet season, soil temperature is 6° C (10.6° F) higher in buffelgrass pasture than in thornscrub. There is significantly less soil moisture in buffelgrass pasture than in thornscrub. These findings suggest that such modifications of the ecosystem will impact regeneration of the native flora (Morales-Romero and Molina-Freaner, 2016).

Buffelgrass promotes the spread of wildfires that kill off the native vegetation. There is mounting evidence that it significantly reduces soil fertility. When it dies back, buffelgrass leaves behind a "sterile wasteland," with an unknown time frame for recovery of the land and its flora (Buffelgrass, Arizona-Sonora Desert Museum).

Tropical Deciduous Forest

Tropical deciduous forests (TDFs) occur in many tropical localities worldwide, including Asia, Africa, Central and South America and northwestern Mexico. These dry forests are characterized as "regions with heavy rainfall for part of the year followed by a marked dry season" (Tropical

Deciduous Forests, 2014).

G. evgoodei is native to the TDFs in the Mexican states of Sonora and Sinaloa that experience drenching rains in summer alternating with dry winters. Most of the rainfall occurs during summer (July through September), but tropical storms and hurricanes often bring heavy rainfall in early fall (September through November). The dry season usually occurs from January to May. At elevations of 400–600 meters (1,300–2,000 feet), rainfall totals are typically 620–700 millimeters (24 to 28 inches) per year (Bury et al., 2002).

The hot, humid tropical deciduous forest in southern Sonora. Photo © 2011 by Mike Pingleton. Reprinted with permission from the photographer.

TDF ecosystems are dominated by deciduous trees, i.e., those that lose their leaves during periods of stress. Most of the trees in Mexico's TDFs lose their leaves during the winter-spring drought, so the forest canopy is closed during the wet summers and open during the dry winters. As a result, the understory plants are well-developed through exposure to sunlight during the dry cycle coupled with the abundance of moisture during the wet cycle.

About 10 days after the first heavy rainstorm, the deciduous trees in the Mexican TDFs begin to leaf out. The forest canopies then intercept most of the sunlight falling on the forest. The leafy canopy creates a shaded, hot, humid environment on the forest floor where understory plants and fungi thrive (Bury et al., 2002).

Thornscrub

Thornscrub ecosystems are found in many tropical regions, including Asia, India, South America, and northwestern Mexico. Goode's thornscrub tortoise is native to the thornscrub biomes in northwestern Mexico. Thornscrub is a transitional zone between a TDF and a desert ecosystem. The thornscrub biomes consist of small trees, shrubs, succulents, and herbaceous plants that are well-adapted to the cycles of rainfall and drought present in such localities. Grasses are largely absent in pristine thornscrub habitats.

Foothills thornscrub northeast of Ciudad Obregon, Sonora. Thornscrub looks like tropical forest during the rainy season. The emergent *etchos* [ed. note: *Pachycereus pecten-aboriginum*, the columnar cacti extending above the broadleaf trees] distinguish it from tropical deciduous forest. Organ pipe cacti are also present, but the smaller plants are nearly concealed by the foliage. Photo: Mark Dimmitt, Arizona-Sonora Desert Museum. Reprinted with permission.

Many thornscrub plants are equipped with thorns that provide some physical defense against damage by foraging herbivores and omnivores. The woody plants within the biome typically exhibit the property of drought deciduousness, meaning they shed their leaves in response to drought. Many shrubs and small trees in this biome possess green bark. This green pigmentation is due to the presence of chlorophyll, the molecule that imparts green coloration to a plant's leaves as well as its stems. Chlorophyll absorbs the energy of sunlight and enables plants to conduct life-sustaining photosynthesis even in the absence of leaves. ❒

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Conservation efforts for Florida, Pacific coast green sea turtles working, agencies say

— Those populations improving — now considered threatened, not endangered

WASHINGTON, D.C. — 5 April 2016 — Two federal agencies today issued a final rule that will revise the listing for green sea turtles under the Endangered Species Act, including reclassifying turtles originating from two breeding populations from endangered to threatened status due to successful conservation efforts.

In addition, NOAA Fisheries and the U.S. Fish and Wildlife Service will divide the turtles globally into 11 distinct population segments, allowing for tailored conservation approaches for each population. Three of the segments will be reclassified as endangered, and the rest as threatened. Green sea turtles have been listed as a threatened species, with the exception of the endangered breeding populations, since 1978.

"Successful conservation and management efforts developed in Florida and along the Pacific coast of Mexico are a roadmap for further recovery strategies of green turtle populations around the world," said Eileen Sobeck, assistant NOAA administrator for fisheries. "Identifying distinct population segments across the green sea turtle's range provides flexibility for managers to address specific challenges facing individual populations with a tailored approach. Ultimately, this will help us protect and conserve green sea turtles more efficiently and effectively, so that we can achieve our goal of recovering the species."

Years of coordinated conservation efforts, including protection of nesting beaches, reduction of bycatch in fisheries, and prohibitions on the direct harvest of sea turtles, have led to increasing numbers of turtles nesting in Florida and along the Pacific coast of Mexico. NOAA Fisheries and the Fish and Wildlife Service have reclassified the status of the two segments that include those breeding populations as threatened rather than endangered.

Green turtle, *Chelonia mydas*. Photo © Jeff Seminoff, NOAA.

"While threats remain for green sea turtles globally, the reclassification of green sea turtles in Florida and Mexico shows how ESA-inspired partnerships between the federal agencies, states, NGOs and even countries is making a real difference for some of our planet's most imperiled species," said Fish and Wildlife Service director Dan Ashe.

Threatened (light blue) and endangered (dark blue) green turtle Distinct Population Segments (DPSs):1. North Atlantic, 2. Mediterranean, 3. South Atlantic, 4. Southwest Indian, 5. North Indian, 6. East Indian-West Pacific, 7. Central West Pacific, 8. Southwest Pacific, 9. Central South Pacific, 10. Central North Pacific, and 11. East Pacific. Credit: USFWS

The agencies reviewed the green sea turtle's global status to determine the new classifications, taking into account advances in genetic studies and telemetry and tagging data, as well as more than 900 public comments on the proposal. The reclassification into distinct population segments allows managers to take a more targeted approach to the specific threats facing different populations, while maintaining federal protections for all turtles.

Significant challenges remain to conserving and restoring green sea turtle populations around the world. Primary threats to green sea turtles include fisheries bycatch, habitat alteration, harvest of turtles and eggs, and disease. Development and rising seas from climate change are also leading to the loss of critical nesting beach habitat for green sea turtles. The agencies and partners continue to study green sea turtles to ensure that conservation and management decisions are driven by the best available science. ❒

— U.S. Fish and Wildlife press release

Green sea turtle, *Chelonia mydas*. Photo © David Burdick, NOAA.

For more information on the green turtle, click on the following links.

http://animals.nationalgeographic.com/animals/reptiles/green-turtle/

http://www.worldwildlife.org/species/green-turtle

http://www.conserveturtles.org/seaturtleinformation.php?page=green

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. Click on the title link to learn more. This list is also posted at **tortoise.org/turtlenetpicks**.

Western Pond Turtles at San Francisco's Mountain Lake
Western Pond Turtles have been reintroduced to San Francisco's Mountain Lake (video).

Oldest Documented Blanding's Turtle Recaptured at Age 83
A female Blanding's turtle believed to be at least 83 years old was captured at a University of Michigan forest reserve this week.

Sliders Are Tough
Watch this news report of a slider crashing through a driver's windscreen. Despite being hit by a car and propelled into the windscreen of a following car the turtle survived!

Ontario Spiny Softshells Flourishing After Dam Failure
The busted Springbank Dam has led to more natural flows and a resurgence of the threatened spiny softshell turtle along the Thames River, southwestern Ontario.

Fewer Bolson Tortoises Being Eaten
It's rare that we see news coverage of *Gopherus flavomarginatus*, but evidently less are being eaten by the locals!

Florida Nuclear Power Plant Sucks in a Sea Turtle Every Day
Over 4,100 loggerhead or green sea turtles have been sucked into in-take pipes at St. Lucie Nuclear Power Plant on Hutchinson Island in the past ten years.

Prison Term for Sea Turtle Egg Smugglers
A Hemet couple got 6 months jail time for smuggling 800 sea turtle eggs.

Green Sea Turtles Federally Down-listed
On April 6, 2016 the FWS and NOAA revised the listing of the endangered green sea turtle. They now identify eleven distinct population segments with some endangered some threatened.

Read the ***Federal Register* notice** for more information.

Kemps Ridley Recovery Stalls
Kemps Ridley sea turtle populations are declining following 2010's Deepwater Horizon disaster.

Turtle-saving Edible Six Pack Rings
These biodegradable six-pack rings should definitely get wider use!

Recent Turtle Journals

- **Table of contents for the June 2016 issue of Chelonian Conservation and Biology.**
- **African Sea Turtle Newsletter # 5** is now available for free download.

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

CTTC Meetings and Programs

Cen-Val: No meetings (school is closed)

Chino Valley: 15 July; 19 August

Foothill: 22 July; 26 August

High Desert: 11 July; 8 August

Inland Empire: 1 July; 5 August

Kern County: 11 July; 8 August

Low Desert: 1 August

Orange County: 8 July; 12 August

Ridgecrest: 11 July; 8 August

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

Santa Clarita Branch: 16 July

Silicon Valley: 15 July; 19 August

TOOSLO (San Luis Obispo): 13 July; 10 August

TTCS (Long Beach): 15 July – Annual Luau; 19 August – Sandy Chase on Leopard and Russian Tortoises

Valley: 15 July; 19 August

Executive Board: 9 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.

Santa Barbara - Ventura Chapter Life Members

- Jim Carroll
- Tim & Louise Casey
- Jurhee Fitzgibbons
- Edward Thompson

Is Your Email Address Changing?

Please update your preferences through your MailChimp account or send your change of address to **tgdistribution@tortoise.org**

Welcome to the launch of the "green" *Tortuga Gazette*!

At its quarterly Board meeting on 9 April 2016 the CTTC Executive Board, composed of the Executive Board officers and officers of the CTTC Chapters, voted unanimously to transition to a digital *Tortuga Gazette*. This decision was based on several factors, including environmental awareness of the need to conserve resources as well as the costs of producing a printed newsletter (printing, mailing services and postage fees).

We value every CTTC member, and our policy remains one of inclusiveness. We will provide hard copies for our members who do not have access to the Internet.

We are utilizing an emailing service called MailChimp to manage our database and ensure timely delivery of your newsletter notifications. MailChimp is a reputable, professional company that will protect your privacy and will never sell your personal information.

You will notice some changes as a result of the transition from a print to a digital newsletter. For example, live links, represented by steel-blue, boldface text, will enable you to jump directly to the Internet destination or to send email messages through your email client. The formatting of the text content is optimized for readability on digital devices while being equally readable on the printed page.

When each newsletter is published, members will receive an email via MailChimp with a live link to the PDF newsletter file posted on our website **tortoise.org**.

We hope you enjoy this new format for your newsletter. If you have comments, concerns or questions, please send a **message to the Editor**. Thank you for your support! ❒

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

Jade Plant, *Crassula ovata*

Jade plant (*Crassula ovata*, formerly known as *C. argentea*) is a large succulent shrub which is native to South Africa. With its stout trunk, heavy branching structure, and jade-green leaves, the jade plant merits your attention when landscaping an enclosure for tortoises or near a pond for turtles.

C. ovata is very durable and drought-tolerant once established. It is harmless when eaten, and scars from tortoise beaks heal quickly provided the plant is healthy. The plant is pest- and disease-resistant when grown properly. Because it is virtually litter-free, jade plant is also an excellent choice for landscaping near a water feature such as a turtle or koi pond.

Trunk, branches and leaves of a mature jade plant. Photo © 2008 by Mbdortmund. Source: Creative Commons; license GFDL-1.2.

Succulent plants are equipped with sponge-like internal tissues that enable them to survive long periods when water is limited. Succulents absorb and store water in these sponge-like tissues and dispense it over time for growth and maintenance. Succulents are very tolerant of drought conditions once established in the garden or container.

Culture

No plant is drought-tolerant until it is established in the landscape. Sufficient water is necessary during the period of establishment because the plant's roots will not grow where moisture is not available. The period of establishment is usually one year for perennials and shrubs, and several years for trees.

In mild climates, *C. ovata* will thrive in full sun in the garden. It will require overhead protection and container culture in climates where hard (prolonged) freezes occur, or it will not survive the winter. Container culture with some protection is also recommended in the hottest desert areas because damaging sunburn will weaken the plant.

Because of its succulent structure, good drainage is essential in the landscape and in the container for jade plant culture. It is susceptible to root rot which will cause the death of the plant. Poor soil is well-tolerated by jade plant as long as the soil drains well.

Fertilizers are not recommended for jade plants as excessive nutrients can cause weak, abnormal growth. With normal rainfall totals, jade plant will fare well without supplementary watering once established. Its appearance is improved when the jade plant receives some additional water. For instance, placing the tortoise's water dish near the jade plant will provide a modicum of supplementary moisture as the water is changed out.

At maturity a jade can reach two to three meters (six to nine feet) in height with equal spread with free root run in the landscape. Containerized plants are likely to be smaller in all dimensions Clusters of white-to-pink flowers appear in winter in the northern hemisphere when the margins of the leaves may be tinged red.

In the Tortoise Enclosure

When planting in the tortoise enclosure, some type of barrier is needed until the plant can spread its anchor roots and take hold. Rocks, bricks, cinder blocks and the like are useful for barriers. Place barrier materials close to the main stem of the jade plant (or any other plant, for that matter) to protect it from the foraging activities of the tortoises.

The flower clusters of *C. ovata* beginning to open. Photo © 2004 by Rick Sidwell. Source: Creative Commons; license CC-BY-SA-3.0.

In time a jade plant will provide a sheltering leafy canopy under which a tortoise can retreat from the sun. The "tortoise trim" that results from a tortoise eating the leaves and small branches it can reach gives the animal a shaded spot in the heat of the day.

Propagation

Propagation of the jade plant could not be easier! Branchlets that fall from the parent plant literally root themselves. A new plant will even sprout from a single leaf. Taking cuttings from a healthy, well-watered jade plant will ensure great success and yield healthy new plants.

The most important thing to remember about propagating succulents from cuttings is that the cut ends need to callus over before placement in a soil mix. Succulents contain a viscous sap that can promote rotting of the cutting if it is planted before the callus forms. Place cuttings in the open air in a shaded location while the callus forms. This process will take varying amounts of time depending on air temperature, humidity, and the diameter of the cutting.

When the cut end is smooth and dry to the touch, the succulent cutting is ready to be placed in a container in a light-textured soil mix. Cuttings can be placed directly in garden soil, but, if your tortoise has access to the cuttings, a demolition derby will ensue. If you want to grow your cuttings in garden soil, locate them in an area to which the tortoise does not have access. When the root system is well-developed, transplant the rooted cuttings into the tortoise enclosure and protect them as described above. ❒

Portions of this article were originally published in the *Tortuga Gazette* 43(2), July/August 2007.

U.S. Finalizes Trade Protections for Four Freshwater Turtle Species on World Turtle Day — Unsustainable and illegal trade threatens the future of native turtles

(Common snapping turtle, Florida Softshell Turtle, Smooth Softshell Turtle and Spiny Softshell Turtle)

Washington, D. C. — May 23, 2016 — The U.S. Fish and Wildlife Service today celebrates World Turtle Day by addressing the growing threat of unsustainable and illegal trade in native freshwater turtles through a final rule that will bring four native freshwater turtle species under the protection of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The listing of the common snapping, Florida softshell, smooth softshell and spiny softshell turtles under CITES will require exporters to obtain a permit before shipping turtles overseas, helping the United States better control trade to ensure it is legal.

"World Turtle Day gives us the opportunity to celebrate and protect turtles and tortoises and their disappearing habitats around the world and to focus on stopping illegal trade in these species, which are threatened by unsustainable trade and wildlife trafficking. In 2013, we collaborated with international partners to adopt CITES protections for Asian freshwater turtles. Our own native species face the same global demand, so it is critical we protect them under CITES as well," said Bryan Arroyo, the Service's Assistant Director of International Affairs. "We will work closely with state wildlife agencies to protect native species and ensure trade is legal and sustainable, particularly for species at greatest risk of over-exploitation."

Freshwater turtles and tortoises are collected, traded and utilized in overwhelming numbers. The Service supports a strategic, global approach to freshwater turtle conservation, as evidence shows that when protections for freshwater turtles are strengthened in one region, demand in other regions for unprotected species may increase.

"U.S. Fish and Wildlife Service law enforcement investigations have documented illegally exported softshell turtles to markets in Asia," said Ed Grace, the Service's Deputy Chief of Law Enforcement. "Listing these species under CITES will help engage our international partners to assist our special agents and wildlife inspectors in the fight against the illegal turtle trade, including investigating the criminals who profit from it."

Trade in turtles is most common in East Asia, principally in China, with supplier countries feeding well-established legal and illegal trade networks. Turtles are used primarily as food and in traditional medicines, although a growing pet trade across the region and in other parts of the world is increasingly impacting a number of threatened species.

CITES is an international agreement signed by more than 180 governments that aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Species are listed under one of three appendices depending on the severity of the threat presented by trade. Listed species may be traded internationally only when accompanied by permits.

The Appendix-III listings of the common snapping turtle and three North American softshell turtles follow the successful sixteenth meeting of the Conference of the Parties (CoP16) to CITES, where the United States collaborated with China and Viet Nam to increase protections for a number of Asian freshwater turtles. In total, three native turtle species and 44 species of Asian freshwater turtles received increased CITES protection at CoP16. Increased protections for freshwater turtles will continue to be a priority for the Service at the upcoming CoP17, which will take place in Johannesburg, South Africa, in September 2016.

For more information on CITES and how it operates, including Appendix-III listings, visit **www.fws.gov/international/cites/how-cites-works.html**

The final rule was published in the Federal Register May 24, 2016. The listing will be effective Nov. 21, 2016. ❒

— U. S. Fish & Wildlife press release

In Memoriam
Lynda Bagley

On Thursday May 19, 2016 Lynda Bagley passed away surrounded by many friends.

Lynda joined the Orange County Chapter of the California Turtle & Tortoise Club (CTTC) in 1998. It wasn't long afterwards she became involved in the world of all reptiles. Although her first love seemed to be iguanas, turtles and tortoises fell in second place. Rescues and misfits were her favorite choices.

Lynda served in many positions throughout the CTTC over the years. She started off as treasurer of the Orange County chapter. When the adoptions position came open, she became adoption chair for Orange County as well.

She then went on to serve on the Executive Board as recording secretary and two different times as treasurer.

Lynda served as an officer at one time and as adoption chair of the Care Society, Long Beach Chapter.

Lynda was a wealth of information and knowledge. She was a mix of many emotions...from the good to the bad... from the highs and the lows. But no matter what, her generosity was enormous and she gave all she had to the reptiles she loved.

Lynda was a mentor as well as a friend to so many, young and old alike. She will be missed by many, not just the turtle and tortoise people, but across the board by many reptile lovers.

On Sunday, June 5, a celebration of Lynda's life took place at Pre-Historic Pets in Fountain Valley where Lynda volunteered. ❒

– tribute prepared by Sharon Paquette

2015-16 California Turtle & Tortoise Club Directory

CTTC Executive Board Officers

Postal mailing address: P.O. Box 7300, Van Nuys, CA 91409-7300.
Chair: **Abigail DeSesa** • Vice-chair/Adoptions: **Don Williams**
Secretary: **Robyn Kohr** • Treasurer: **Pamela Maloney**
Meeting: quarterly (January, April, July and October) at 10 AM the Los Angles County Arboretum, 301 No. Baldwin Avenue, Arcadia, CA 91007.

CTTC Cen-Val Chapter

Postal mailing address: P.O. Box 16418, Fresno, CA 93755-6418.
President/Vice president: **Robert Scott** • Treasurer: **Diana Gatti**
Meeting: Second Thursday, 7:00 PM at Fresno Unified School District, Del Mar Elementary School, 4122 N. Del Mar Avenue, Fresno, CA 93704 (no meeting in July or August, as school is closed).

CTTC Chino Valley Chapter

Postal mailing address: P. O. Box 1753, Chino, CA 91708-1753.
President: **Rachelle Buck** • Vice president: **David Bowman**
Secretary/Adoptions: **Lynda Misiak**
Meeting Third Friday, 7:30 PM at Chino Girl Scout House, 5007 Center Street, Chino, CA 91710.

CTTC Foothill Chapter

Postal mailing address: P. O. Box 51002, Pasadena, CA 91115-1002.
President: **Joanna Bolt** • Secretary: **Mardy Graves**
Treasurer/Membership: **Jeanette Lea** • Adoptions: **Linda Crawford**
Meeting: Fourth Friday, 7:30 PM at Los Angeles County Arboretum, 301 No. Baldwin Avenue, Arcadia, CA 91007.

CTTC High Desert Chapter

Postal mailing address: P. O. Box 163, Victorville, CA 92393.
President/Adoptions: **Dave Zantiny** • Secretary/Adoptions: **Mary Dutro**
Meeting: Second Monday, 7:00 PM at Sterling Inn Regency Room, 17738 Francesca Road, Victorville, CA 92395.

CTTC Inland Empire Chapter

Postal mailing address: P.O. Box 2371, San Bernardino, CA 92406-2371.
President: **Monica Dirac** • Vice president: **Richard Roosman**
Corresponding Secretary: **Vendy Martin** • Treasurer: **Robyn Kohr**
Meeting: 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 .

CTTC Kern County Chapter

Postal mailing address: P.O. Box 81772, Bakersfield, CA 93380-1772.
President: **Rita Linkswiler** • Vice president/Membership: **Javier Gonzalez**
Secretary: **Heather Ponek** • Adoptions: **Lawrence Rushing**
Meeting: 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.

CTTC Low Desert Chapter

Postal mailing address: P.O. Box 4156, Palm Desert, CA 92261.
General Information: **Tony Vaninetti** • Secretary: **Marlies Dietrich**
Adoptions: **Bill Powers**
Meeting: First Monday of every even-numbered month 7:00 PM at The Living Desert Reserve, 47-900 Portola, Palm Desert, CA 92260-6156.

CTTC Orange County Chapter

Postal mailing address: P.O. Box 11124, Santa Ana, CA 92711.
President: **Sharon Paquette** • Vice president: **Mark Szatkowski**
Secretary/Treasurer: **Traci Fields** • Adoptions: **Orange County Adoptions**
Meeting: Second Friday, 7:30 PM at Chapman University, Science Center Room 127, 346 Center Street, Orange, CA 92866.

CTTC Ridgecrest Chapter

Postal mailing address: P. O. Box 1272, Ridgecrest, CA 93555.
President: **Robert Parker** • Vice president: **Sue Parker**
Adoptions: **Montynne Yates**
Meeting: Second Monday, 7:30 PM at Grace Lutheran Church, 502 North Norma Street, Ridgecrest, CA 93555-3502.

CTTC Santa Barbara-Ventura Chapter

Postal mailing address: P.O. Box 3086, Camarillo, CA 93011-3086.
President: **Don Williams** • Adoptions: **Wes Shipway**
Meeting: Contact the Chapter for meeting information.

CTTC Santa Clarita Chapter

Postal mailing address: P.O. Box 4012, Castaic, CA 91310.
Vice President: **Don Williams** • Secretary: **Jennifer Fields**
Treasurer/Membership: **Abigail DeSesa** • Adoptions: **George Ordway**
Meeting: Third Saturday of odd-numbered months at 6:30 PM at Valencia United Methodist Church, 25718 McBean Pkwy, Valencia, California 91355.

CTTC Silicon Valley Chapter

Postal mailing address: P.O. Box 64135, Sunnyvale, CA 94088-4135.
President: **Gilbert Castro** • Vice president: **Lesa Montoya**
Secretary: **Lisa Wong** • Treasurer: **Dorothy Castro**
Meeting: Third Friday, 7:00 PM at San Jose Masonic Center, 2500 Masonic Drive, San Jose, CA. 95125.

CTTC TOOSLO (San Luis Obispo) Chapter

Postal mailing address: P.O. Box 14222, San Luis Obispo, CA 93406.
President/Membership: **Lola McAulay** • Vice president: **Brandon Froelicher**
Secretary: **Lisa Winn** • Treasurer: **Collette Griffin** • Adoptions: **Bob Thomas**
Meeting: Second Wednesday, 7:00 PM at PG&E Community Center, 6588 Ontario Road, San Luis Obispo, CA 94505.

CTTC Turtle & Tortoise Care Society Chapter

Postal mailing address: P.O. Box 15965, Long Beach, CA 90815-0965.
President: **Richard Roosman** • Vice president: **John Wong**
Secretary/Membership: **Anita De Leon** • Treasurer: **James Hong**
Meeting: Third Friday, 7:30 PM at University Baptist Church, 3434 Chatwin, Long Beach, CA 90808-2613.

CTTC Valley Chapter

Postal mailing address: P.O. Box 7364, Van Nuys, CA 91409-7364.
Vice president: **Bob Hazard** • Treasurer: **Karen Berry**
Adoptions: **Valley Chapter Adoption Team**
Meeting: Third Friday, 7:30 PM at Woodland Hills Christian Church, 5920 Shoup Avenue, Woodland Hills 91367-3327.

Orange County Chapter Show

The Orange County Chapter of the CTTC would like to cordially invite members, family and friends to our 5th Annual Live Turtle & Tortoise Show on Sunday, 28 August 2016. The show will be held in the newly remodeled La Habra Community Center in the City of La Habra, CA.

We are seeking people to join us to exhibit your shelled ones and to represent your chapters. We are inviting vendors with turtle- and tortoise-related items. We invite you come and volunteer for one of the many positions available!

It's where fun and education come together in one place! Please contact **occhaptercttc@hotmail.com** for complete information. We would love to have you. ❐

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

– www.deserttortoise.org/answeringquestions/chapter2-2.html

"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

Classified Advertisements

Classified advertisements run for one issue at $5[00] for four lines or less or $30[00] for ¼ page. They are accepted at the discretion of the Editor. Classified ads are available to members and subscribers **only**. Advertisements 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**.

CTTC Membership

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 renewal date (month/year) are printed on your address label. Mail your new or renewal membership/subscription to the Chapter of your choice.

Annual membership in the California Turtle & Tortoise Club and subscriptions to the *Tortuga Gazette* are handled through the CTTC Chapters. 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]
- Canada/Mexico...$25[00]
- Foreign...$40[00]
- Life membership...$500[00]

As a CTTC Member, you are eligible to receive an exclusive rebate of up to $1,000 when you purchase a SunPower® system for your home, or when you lease a system.[1]

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[1]SunPower lease not available in all states. Talk with your local SunPower dealer for more information.

[2]Source: Photon International, Feb. 2011, Market survey on solar modules 2011.

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the *Tortuga Gazette*
July | August 2016
Volume 52, Number 4

Turtle of the Month
Goode's Thornscrub Tortoise
Gopherus evgoodei

CTTC Online: tortoise.org
Follow CTTC on Facebook

2016 CTTC Show Schedule

28 August – Orange County Chapter show at La Habra Community Center, 101 W. La Habra Blvd., La Habra, CA 90631. 10 AM - 4 PM.

17 September – TOOSLO Chapter (San Luis Obispo) show at Veterans Memorial Building, 801 Grand Ave., San Luis Obispo, CA 93401-2641. 10 AM - 3 PM.

ICYMI [In Case You Missed It]

A Kayaker Never Expected to Find THIS, When He Notices a Creature Swimming Towards Him

Sea kayakers help a sea turtle in need.

Tortoise Burned In Fire Receives World's First 3D-Printed Shell

The Sao Paulo-based Animal Avengers are a group of pioneering surgeons who 3D print body parts for animals.

Special thanks to Dr. Fred Caporaso of the CTTC Orange County chapter for providing the links to this video and news item.

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 page and update your email address and other information. Thank you!

Goode's thornscrub tortoise, *Gopherus evgoodei*, foraging in a tropical deciduous forest in southern Sonora, Mexico. Photo © 2011 by Mike Pingleton. Reprinted with permission from the photographer.