California Turtle & Tortoise Club

the Tortuga Gazette

November | December 2016
Volume 52, Number 6

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

Young Asian leaf turtle, *Cyclemys dentata*, with a carapace length of 14 centimeters (5.5 inches), from Banten, West Java, Indonesia. Photo © 2010 by Wibowo Djatmiko. Source: Creative Commons; license CC-BY-SA-3.0,2.5,2.0,1.0.

Turtle of the Month

Asian Leaf Turtle, *Cyclemys dentata* (Gray, 1831)

The Circle Turtle by M. A. Cohen

Collectively known as "leaf turtles," the species names in the following list demonstrate one of the weaknesses of common names. In both appearance and range, these species are diverse even as they are all native to Asia:

1. *Cyclemys dentata* (Asian leaf turtle, aka Brown stream terrapin);
2. *Cyclemys tcheponensis* (Stripe-necked leaf turtle);
3. *Geoemyda spengleri* (Black-breasted leaf turtle or Chinese leaf turtle, aka Vietnamese Wood Turtle);
4. *Mauremys (Annamemys) annamensis* (Vietnamese or Annam leaf turtle, aka Vietnamese Pond Turtle);
5. *Siebenrockiella crassicollis* (Borneo black leaf turtle, aka Malaysian Black Mud Turtle);
6. *Hieremys annandalii* (Yellow-headed temple turtle, aka Asian leaf turtle).

Focusing on *Cyclemys dentata,* the current article will profile the most widely studied species in this group. Moreover, rather than being a single species, as taxonomists initially thought, chelonian science now recognizes a species ***complex*** with as many as five to six species in the *C. dentata* complex.

According to the Asian Turtle Trade Working Group, the genera within this species complex as of 2000 (the last year of assessment) included the following:

- Western black-bridged leaf turtle, *C. atripons* (Iverson & McCord, 1997), native to Cambodia, Thailand;
- Asian leaf turtle, *C. dentata* (Gray, 1831), native to Brunei, Indonesia, Thailand, Malaysia, Singapore;
- Oldham's leaf turtle, *C. oldhamii* (Gray, 1863), native to India, Indonesia, Lao People's Democratic Republic, Myanmar, Malaysia, Thailand;
- Eastern black-bridged leaf turtle, *C. pulchristriata* (Fritz, Gaulke & Lehr, 1997), native to Vietnam; and
- Stripe-necked leaf turtle, *C. tcheponensis* (Bourret, 1939), native to Lao People's Democratic Republic, Thailand, Vietnam (*Cyclemys dentata*, 2016).

Table of Contents

Turtle of the Month

Asian Leaf Turtle
Cyclemys dentata

1 The Circle Turtle by M. A. Cohen

4 Everybody in the Pond! by Karen Berry

8 The Turtle's Garden: Corkscrew Vine by M. A. Cohen

10 Chicago Herpetological Society abstracts

11 CITES CoP17: Conservationists Urge Immediate Action to End Poaching of Ploughshare Tortoise

12 Conservationists Raise Alarm Over Hawaiian Green Sea Turtle Nesting Numbers – Turtle Island Restoration Network press release

Arizona's Sonoyta Mud Turtle Proposed for Endangered Species Act Protection After Waiting for 19 Years – Center for Biological Diversity press release

in every issue:

2 Table of Contents

7 Mike's Turtle Net Picks by Michael J. Connor, PhD

- Meetings and Programs

9 Classified Advertisements

- Membership Information

Follow CTTC on Facebook

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

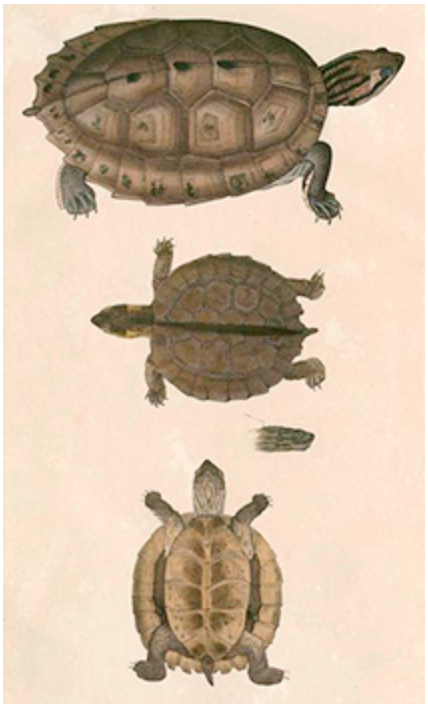
The *Tortuga Gazette* (ISSN 1073-1334) is owned by the California Turtle & Tortoise Club Executive Board, which is incorporated in the State of California as a Not-for-Profit Corporation and is tax-exempt under IRS code 501(c)(3).

All material is copyright © CTTC unless otherwise attributed. CTTC policy permits reproduction of articles by other not-for-profit groups and educational institutions when permission is requested. Permission is granted on a case-by-case basis and CTTC must be cited as the source of the material.

Views expressed in the *Tortuga Gazette* are those of the contributors and not necessarily those of the Editor or the California Turtle & Tortoise Club.

Is your email address changing?
Update your email address through your MailChimp account, or send address changes and corrections to this address: **tgdistribution@tortoise.org**

Cyclemys, the genus name of this turtle, derives from two Greek root words: *cycl-*, which means "circle," and *emys-*, meaning "a turtle or tortoise." Referring to the carapace of some individuals, the generic name describes the distinctly circular shape of some turtles in the species complex.



Rendering from *Illustrations of Indian Zoology*, Vol. 2, published between 1833 and 1834. Illustration by Thomas Hardwicke (1755-1835). Public domain.

Derived from the Latin root word *dentat*, the species name, *dentata*, means "toothed." A term characterizing a physical attribute, *dentata* refers to the serrated marginal scutes of the hatchlings and juveniles of *C. dentata*. Ordinarily, as the turtle matures, the edges of these marginal scutes transform shape from serrated to smooth. However, some individuals retain the serrated marginals throughout their lives.

As a member of the chelonian family of Old World Pond Turtles (Geoemydidae, formerly known as Bataguridae), *C. dentata* belongs to a large and diverse family of some 70 species that occur in tropical and subtropical Asia, Europe and North Africa, with a single genus, *Rhinoclemmys*, being native to Central and South America.

Officially described in 1831 by John Edward Gray (1800-1875), *C. dentata* is one of various species of cetaceans (dolphins, porpoises and whales), reptiles and fish studied and described by the British zoologist. A prolific writer, during his tenure as the Keeper of Zoology at the British Museum (1840 to 1874), Gray produced over 1,000 papers on an array of topics related to his field of expertise.

Identification

A small to medium-sized semi-aquatic species, at maturity *C. dentata* reaches 6 to 9.5 inches (15 to 24 centimeters) in carapace length. Oval in shape with one medial keel, the species' flattened carapace ranges in coloration from black to dark brown through olive, light brown and occasionally mahogany (Ernst et al.). Radiations, i.e., fine parallel lines, sometimes mark the carapace.

Ranging in coloration from yellow to black, the species' plastron varies from yellow to light brown with narrow dark radiations to solid brown or black, and is noticeably narrower than the carapace (Ernst et al.). A transverse plastral hinge develops as the turtle matures. Such a hinge is likely to facilitate egg-laying in females, as the eggs produced by the species are large relative to the size of the turtle.

Reddish-brown with darker brown jaws, the skin of the young turtle's head displays red and yellow linear markings called stria, as does the neck. These striations generally fade or disappear altogether as the turtle matures. Conversely, in some portions of its range, individuals retain the bright stria throughout their lives. The turtle's head features a slightly projecting snout and an upper jaw with smooth rather than toothlike edges. Coloration of the limbs and tail varies from cream to light brown (Ernst et al.).

In keeping with many chelonian species, females typically reach larger sizes than males, while the males have longer, thicker tails than the females.

Range and Habitat

Native to Southeast Asia, documented populations of *C. dentata* occur in Bangladesh; Brunei Darussalam; Cambodia; northeastern India; Indonesia (Borneo, Java and Sumatra); Lao People's Democratic Republic; the Malaysian peninsula; Myanmar; Nepal; the Philippines, Singapore; Thailand,

Young Asian leaf turtle, *Cyclemys dentata*, with a carapace length of 14 centimeters (5.5 inches), from Banten, West Java, Indonesia. Photo © 2010 by Wibowo Djatmiko. Note the distinctively circular shape of the turtle's carapace.

and Vietnam (Asian Turtle Trade Working Group, 2016). It may occur in eastern Nepal as well (Ernst et al.).

Characterized as a semi-aquatic species, the Asian leaf turtle favors clear-water ponds, rivers, and streams with shallow, slow-moving water in both highland and lowland ecosystems (Ernst et al.). The turtle prefers walking on the bottom of the waterbody to actually swimming in the water. As it matures, *C. dentata* spends more time on land than in the water.

Natural History

A true omnivore in its feeding habits, *C. dentata* consumes an array of foods, including figs and other fruits, vegetation, crustaceans, fish, insects, and carrion (Tabaka and Senneke). The turtle will consume food both in the water and on land.

Between 7 and 10 years of age, females attain reproductive maturity. Laying clutches of 2 to 4 large eggs each, females may nest as many as 4 to 5 times per year.

Variability in Appearance

Significant coloration and conformation differences exist within the *C. dentata* complex throughout its geographic range. Moreover, even within a given population, researchers are documenting substantial variations. For example, chelonian researcher Dr. Peter Paul van Dijk studied a population in the Huai Kha Khaeng Wildlife Sanctuary in western Thailand. Within this one population, appearance differences included "striated vs. uniformly dark animals, round and broad-shelled vs. elongated and oval-shelled animals, and individuals with domed shells vs. flattened individuals" (Ernst et al.).

Accordingly, in 2008 a team of scientists from the Norwegian Academy of Science and Letters led by Uwe Fritz tackled the sequencing of the *C. dentata* genome. Through earlier studies, Fritz and colleagues had established "two morphologically-distinct major groups" within the *C. dentata* complex based on the coloration of their plastrons, which the researchers termed the yellow-bellied group and the dark-bellied group (Fritz et al.).

As a result of the Norwegian Academy study, the team concluded that the *Cyclemys* complex "data indicate a high diversity." Comprising the yellow-bellied group are *Cyclemys atripons*, *C. dentata*, and *C. pulchristriata,* while *C. oldhamii* plus three new species*, C. enigmatica* n. sp.*, C. fusca* n. sp., and *C. gemeli* n. sp. comprise the dark-bellied group.

Following the publication of the aforementioned paper in 2008, a team of researchers from Guangxi University in Nanning, China determined the complete mitochondrial genome of the species, as chronicled in a paper published in 2015.

Young Asian leaf turtle, *Cyclemys dentata*, with a carapace length of 14 centimeters (5.5 inches), from Banten, West Java, Indonesia. Photo © 2010 by Wibowo Djatmiko. The individual's plastron shows the light-brown coloration with dark markings known as radiations.

Data developed during this study indicated that *Cyclemys atripons* and *C. dentata* are sister species which the team grouped as a single species. Extensive hybridization among closely related species leads to a loss of biodiversity, as the vanishing *C. enigmatica* genome serves to confirm.

Reaching the conclusion that "the pet trade, food trade, and use in Traditional Chinese Medicine threaten wild populations of *Cyclemys* species," the Guangxi University team suggests that the scientific determination of "genetic diversities" is essential to formulating strategies for protecting wild these populations (Huang et al., 2015).

Threats and Conservation

Threatened by a similar set of circumstances as other chelonian species worldwide, the *C. dentata* complex, "currently faces a unique overkill scenario, caused by massive overexploitation for food and Traditional Chinese Medicine acting in accord with large-scale habitat destruction, and this is especially true for Southeast Asia," to quote a succinct statement by Dr. van Dijk of the Asian Turtle Trade Working Group.

These facts notwithstanding, the IUCN Red List categorizes the *C. dentata* complex as "Lower risk/near threatened," and CITES does not grant the species any legal protection. **Ω**

References

Asian Leaf Terrapin - Cyclemys dentata. Ecologyasia.com. Retrieved 3 September 2016, from http://www.ecologyasia.com/verts/turtles/asian-leaf-terrapin.htm

Asian Turtle Trade Working Group. 2016. Cyclemys dentata. Retrieved on 5 September 2016 from The IUCN Red List of Threatened Species 2016: e.T39551A97360951.

Cyclemys dentata (Asian Leaf Turtle, Brown Stream Terrapin). Iucnredlist.org. Retrieved 21 September 2016, from http://www.iucnredlist.org/details/39551/0.

Ernst, C., Altenburg, R., & Barbour, R. Turtles of the World: Cyclemys dentata. Retrieved 20 September 2016, from http://wbd.etibioinformatics.nl/bis/turtles.php?selected=beschrijving&menuentry=soorten&record=Cyclemys%20dentata.

Fritz, U., Guicking, D., Auer, M., Sommer, R., Wink, M., & Hundsdorfer, A. (2008). Diversity of the Southeast Asian leaf turtle genus Cyclemys : how many leaves on its tree of life?. Zoologica Scripta, 37(4), 367–390. http://dx.doi.org/doi:10.1111/j.1463-6409.2008.00332.x

Huang, Y., Li, J., Jiang, Q., Shen, X., Yan, X., & Tang, Y. et al. (2015). Complete mitochondrial genome of the Cyclemys dentata and phylogenetic analysis of the major family Geoemydidae. Genetic And Molecular Research, 14(2), 3234-3243. http://dx.doi.org/10.4238/2015.April.13.2

Tabaka DVM, C. & Senneke, D. Cyclemys Care: The Leaf Turtles. Chelonia.org. Retrieved 3 September 2016, from http://www.chelonia.org/Articles/Cyclmeys-care.htm

Everybody in the Pond!

by Karen Berry, CTTC Valley Chapter

That little face had you the moment you looked at it. That adorable baby red-eared slider (*Trachemys scripta elegans*), the size of a quarter, crammed into a container with so many others. And, notwithstanding the fact that baby sliders are illegal to sell in California, you felt you had to buy it to rescue it from its current existence.

You purchased an aquarium, the pump, filter and food, and all the accessories a baby slider could ever want.

Throughout the last few years, as your turtle grew, you have gotten larger tanks, better filtration systems, diligently cleaned the tank, fed the youngster, and watched it swim along or bask on a floating log. Now, you've reached the point where an even larger tank isn't practical, for space or financial reasons. What do you do, other than contact your nearest CTTC chapter and ask them to take your slider?

The nursery at Sunland Water Gardens featuring aquatic plants and pondscaping plants. Photo courtesy of Sunland Water Gardens, Sunland, CA.

Move your turtle outside!

Red-eared sliders, despite not being indigenous to California, are probably the most common turtle utilized in ponds for residential or commercial properties. As everyone is aware, despite the illegality of selling turtles less than four inches in length in California, it's done in a number of places, especially in the southern part of the state. The proliferation of sliders, and difficulty in preventing their sale, has resulted in the creation of the greatest "throw away" species of turtle. That has caused an overtaxing of every turtle and tortoise rescue group in the state, especially our own. A day doesn't go by where the CTTC chapters don't receive calls or e-mails from people whose sliders have gotten large, and they can't or don't want to care for them anymore, or have to move to a place where keeping them isn't practical.

Whenever possible, CTTC chapters place these pets, many of which are loved by their owners who don't want to have to give them up but circumstances demand otherwise, in new homes with nice ponds.

So many people have merely found the nearest body of water, urban or rural, and "dumped" their sliders. That, when done in areas inhabited by our native Western Pond Turtle (*Actinemys marmorata*), results in competition for habitat and food that is most detrimental to our native turtle.

In an effort to curb the purchase of sliders and their ultimate release into our waterways and urban park ponds, CTTC education programs seek to advise the public about the plight of the red-eared slider and encourage them to refrain from purchasing them. CTTC chapters have no shortage of red-eared sliders available for adoption, all ages and sizes (except those under legal size), if you want one or several for your pond.

For some expert advice on moving sliders outside, I contacted Jacklyn Rodman and Jeff Kite, owner and manager respectively, of Sunland Water Gardens. Located in a residential area, this little oasis of tranquility provides the soothing sounds of waterfalls, or you can watch the fish and turtles, while you wait to speak with Jeff, Jacklyn, or one of the other employees.

What many people don't realize is that it is not difficult to move the turtle outside, where it really belongs, and allow it to have the pond life it was meant to have. The minute someone mentions "pond," a lot of people conjure up an image of the large "multi-thousand gallon, in-ground, complete with waterfall, takes-up-most-of-the-backyard" type of pond found at very spacious estates or in chic architecture and home magazines. While that's nice, and if you have the room and the means, your turtle will be grateful to you forever, it's not the only way to provide your turtle with the most natural habitat possible.

History of Sunland Water Gardens

As we discussed the various types of ponds available to fit every wallet, Jacklyn and Jeff told me a little about the history of their business. Sunland Water Gardens was started by their grandfather about 50 years ago. This brother and sister team has proudly continued this great family business. Jeff said his after-school job while in high school was working at the Garden, and over the last 20 or so years, he's graduated to running the day-to-day operations.

While you can get most of what you need for your pond from the major home improvement stores, a small business can provide considerable product knowledge and personal customer service that is often lacking in the world of mega-stores. Both Jacklyn and Jeff have been at this a very long time, and have developed expertise that enables them to tailor a pond to your individual needs, and give you plenty of good advice on how to accomplish it if you want to create it yourself.

In addition to pond forms, troughs, pumps and filters, Sunland Water Gardens also has all the creatures you might want for your pond, ranging from koi, catfish, and goldfish to unusual things like bullfrogs. There is also an impressive array of various kinds of water plants and also pondscaping plants to make that simple pond look as beautiful as any you'd see in a magazine.

Pond Options

Even though they are also pond builders, Jeff and Jacklyn readily advise people that you can build your own pond and save a lot of money. Jacklyn indicated that an above-ground pond usually won't require a permit (check with your local jurisdiction to be sure), and would allow you to achieve the straight sides

Manufactured pond forms are available in various shapes and sizes for above- or in-ground ponds. Photos by Karen Berry.

and appropriate depth (minimum 2½ to 3 feet) to help deter raccoons from making a gourmet meal out of your sliders and koi. Jeff mentioned that the beauty of an above-ground cinder block pond is that it is a do-it-yourself project, and you can configure it to a size to suit your yard. Whether it is narrow and long, rectangular or square, whatever fits into your landscaping, you can beautify it by using stucco or cement on the exterior to make smooth sides or a design to disguise the ugly cinder block. This type of pond utilizes a rubber pond liner, which makes keeping the water inside the pond and cleaning it much easier.

For those who don't count masonry skills among their many talents, you can also dig a deep hole, use a pond liner, and surround it with dirt, rocks, a sunning area and plants, and if it's needed in your area, build an enclosure (that can be covered if you wish) around it to thwart predators. Jacklyn says a rubber liner will last a long time, and you can get one about ten feet square for around 82^{00} or so. Depending on the size of your in-ground or above-ground pond, your filter and pump also do not have to be extremely large and expensive. Price varies with the models and the volume of water they will be filtering.

Other options, as you can see in the photos, are rubber watering troughs, more commonly used for horses and grazing livestock, or preformed pond forms from various manufacturers. These can be used above- or in-ground, depending on your preference, the configuration of your yard, and whether or not the turtles and their pond will share yard space with your dog. These can have an enclosure build around them, too. For an easy to build structure, you can use the 2- foot by 8-foot privacy lattice nailed or screwed to a 2" x 4" frame for each of the 4 sides, secured at the corners. It's sturdy enough so that you could place a similar-sized lid over the enclosure at night, if you wish, to keep the predators out. It might be necessary to have some sort of mesh or other material on the inside to keep the turtles from climbing the lattice, or escaping through the holes if they are small. That size enclosure, 8 feet by 8 feet square, utilized with a small pond form or rubber trough, gives the turtles a place outside the pond to sun, a place to put land plants, and if you have female turtles, a place where they can lay their eggs, plus plenty of room for the pump and filter.

Even easier, many people utilize pond forms or troughs without pumps or filters, place a basking area in the center, and just empty them on a schedule to keep the pond clean of debris and turtle feces. If you have only one turtle, a very limited budget, and you have the time to do the maintenance, that's another alternative to consider. Since sliders have to be in water to eat, many people who use this pond method also keep a second smaller form, trough or tub as a feeding area to keep the main living area from being contaminated by food.

Pond Security

No discussion on ponds would be complete without considering pond security. Raccoons are the biggest threat to our turtles and tortoises these days, and considerable measures are taken by owners to keep their animals safe. Raccoons are nocturnal, so we don't see them prowling our yards while we are fast asleep. They are often after koi fish, but a turtle that can't escape will also become either a meal, or may survive, but have been seriously injured, minus a leg or other body part. Jeff advised me that the best thing to deter them is a deep, straight-sided pond. Jacklyn said that if there is no shelf, or anything they can use to climb out, they are less likely to go in after fish or turtles. They are usually looking to scoop dinner out of the pond and not have to go in after it, although they can swim.

A small, round, in-ground pond with floating aquatic plants and a waterfall. Perfect for a single turtle, it can be enclosed for security. Photo courtesy of Sunland Water Gardens.

Other methods of securing a pond include a wire or other cover for a pond small enough to make that practical. Both Jeff and Jacklyn said that motion detector lights are also an added benefit, as are devices such as the "Fido Shock". They have it in stock, retailing for around 80^{00}. It uses an electrical fence to keep raccoons, (or the family dog, if that's an issue), away from the pond. It can be set by timer to operate only during night time hours, to prevent you, your kids, gardeners, or anyone else allowed in the yard from getting zapped. Some people have also utilized a motion-detector sprinkler that goes on when the raccoon goes by. Not every method will be successful with every raccoon. Some raccoons are very urbanized and have become pretty fearless when dealing with our security measures.

Large water birds, such as herons, also consider koi and turtles a delicacy. Some pond owners use netting over their pond to keep the birds from using the pond as a buffet, coupled with other bird-frightening measures, such as shiny spinners. As with raccoons, some of the large birds aren't frightened of our attempts to keep them on a non-turtle and non-koi diet.

The "baby-slider" pond at Sunland Water Gardens. It is constructed with cinder block faced with cement, capped with bricks, and lined with a rubber pond liner. Photo by Karen Berry.

Hopefully this article has given you some ideas on how to move your turtle outside, where it can live naturally and be happier. Be sure to contact Jeff Kite, 818-353-5131, if you have any questions about building or setting up your own pond, or you need supplies for an existing one.
Click **www.sunlandwatergardens.com/** to visit the Sunland Water Gardens web site for more information, a map and directions to the nursery.

Hatchling sliders on the floating log pond accessory in the "baby pond" at Sunland Water Gardens. Photo by Karen Berry.

If you stop by, be sure to check out the turtles in residence. Jeff fields most of the calls we refer, or from others who know of their business, and whenever there is room, has been kind enough to take in turtles from people who can't or don't want to keep them anymore. These turtles will eventually get a new home in a private pond somewhere. In the meantime, they have the company of other turtles, are well fed, and kept healthy. Jeff said there have been a number of little "ceremonies" where families have released the kids' turtle or turtles into the pond, and then taken lots of pictures as mementos of the pet they can no longer keep.

§ § §

Jeff has also helped us out considerably with sliders turned in to the animal shelter, including some babies, and those that were removed from a San Fernando Valley, CA park lake last year. He and his sister have done a lot to educate people, and to assist with the slider problem, and we look forward to an going relationship with them. **Ω**

Originally published in the *Tortuga Gazette*, 47(6), November/December 2011.

An in-ground small pond form in an 8' x 8' enclosure constructed of 2" x 4" lumber-framed lattice. The pump and filter are hidden by plants. Photo by Donna Selnick.

"I'm ready for my close-up, Mr. DeMille." This yellow-bellied slider (*Trachemys scripta scripta*) is a permanent resident at Sunland Water Gardens. Photo by Karen Berry.

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.**

Aesop Redux!
Viral video of a leopard tortoise and a lop-eared rabbit hot-footing it in a rerun of the famous Tortoise and the Hare fable.

Desert Tortoises at Red Cliffs
Listen to Ann McLuckie as she does her desert tortoise field work at Red Cliffs Desert Reserve in southwest Utah.

Diego Does His Thing and Saves His Species
Diego, one of the two male Hood or Española Island giant tortoises that survived to modern times, has now fathered over 800 young and made a major contribution to the survival of his species

Saving Cambodia's "Royal" Turtles
Conservation of the southern river terrapin or royal turtle, *Batagur affinis*, made a giant leap forward with the release of 206 head-started specimens of the nearly extinct turtles into protected waters at the Koh Kong Reptile Conservation Center in western Cambodia.

Florida *Washbacks*
Brevard Zoo video on rehabbing sea turtle hatchlings stranded by Hurricane Nicole.

Important New Sea Turtle Fossils From Alabama
The recovery of two near-complete skeletons of *Ctenochelys acris* may help clarify the evolutionary lineage that yielded the green sea turtle, Kemp's ridley, and the loggerhead.

Climate Change and Rising Sea Levels Threaten Sea Turtle Nesting Beaches
Interesting Turtle Island Restoration Network report highlights threats from climate change to sea turtle nesting beaches.

Marine Turtle Newsletter
Issue 150 of the Marine Turtle Newsletter is now available.

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

Silicon Valley Chapter Life Members

- Marney Stroud
- Gary & Ginger Wilfong

A custom pond that holds 5,000 gallons of water and is 5 ½ feet deep. It is home to turtles and koi. Photo by BL.

CTTC Meetings and Programs

Cen-Val: 10 November; 18 December

Chino Valley: 18 November; 16 December – No meeting

Foothill: 25 November; 23 December

High Desert: 14 November; 12 December

Inland Empire: 4 November; 2 December

Kern County: 14 November; 12 December

Low Desert: 5 December

Orange County: 11 November; 9 December

Ridgecrest: 14 November; 12 December

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

Santa Clarita: 19 November

Silicon Valley: 18 November; 16 December

TOOSLO (San Luis Obispo): 9 November; 14 December

TTCS (Long Beach): 18 November; 16 December – Annual Holiday Party and Cut-Throat Gift Exchange

Valley: 18 November; 16 December

Executive Board: 14 January 2017. 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 Turtle's Garden

planting for chelonians
by M. A. Cohen

Corkscrew Vine: *Cochliasanthus* (=*Vigna*) *caracalla*

Corkscrew vine, *Cocliacanthus* (= *Vigna*) *caracalla* close-up. Note the white, spiral flower buds that resemble shells. Photo © 2004 by Teclasorg. Source: Creative Commons, license CC-BY-2.0.

Horticulturists commonly call *Cochliasanthus caracalla* corkscrew vine, shell vine, shell plant, caracalla bean, and several other common names. Belonging to the legume family, the Fabaceae, the species resembles a pole bean. Native to tropical regions of Central and South America, the exotic corkscrew vine enhances the garden with fragrant, flamboyant flowers.

Two related, but completely different plant species cause considerable confusion. Both species are legumes, both have similar growth habits, and both are native to the New World tropics. *Vigna speciosa,* commonly called snail vine, bears lavender flowers that lack fragrance, and has invasive tendencies. *Cochliasanthus* (=*Vigna*) *caracalla* has the true common name corkscrew vine. Though erroneous, some gardeners call corkscrew vine snail vine. Focusing on the corkscrew vine, *Cochliasanthus* (=*Vigna*) *caracalla*, the current article profiles its horticultural attributes and requirements.

President Thomas Jefferson (from 1801 to 1809) was a skillful, enthusiastic horticulturist at his Virginia plantation, Monticello. Writing a letter to one Benjamin Hawkins dated 1 April 1792, Jefferson exclaimed "The most beautiful bean in the world is the caracalla bean which, though in England a green-house plant, will grow in the open air in Virginia and Carolina" (Caracalla bean, n.d.).

According to the director of the Thomas Jefferson Center for Historic Plants at Monticello, Jefferson encountered the caracalla bean at Kew Botanical Garden in London, England but did not grow it at Monticello. Even though he wanted to do so, he was unable to secure plants (Land, 1998).

Formerly assigned to the genus *Vigna,* named to honor the 17th-century Italian botanist Dominico Vigna, corkscrew vine subsequently received its own genus, *Cochliasanthus*. As for the species name, one version of its meaning contends *caracalla* refers to the city of Caracas, the capital of Venezuela. Another version of *caracalla* says that it is "a corruption of the Portuguese *caracol*, meaning snail" (Snail Vine, n.d.). Notwithstanding the change in its genus name, the outdated moniker *Vigna caracalla* persists in the literature and the horticulture industry and on gardening forums.

Imported from its New World habitat into Europe in the 18th century, travelers brought corkscrew vine to North America in the early 19th century. Cultivation of the species in American gardens began in the 1830s and continues to the present.

Propagation

Many seed suppliers stock seeds for corkscrew vine. For best germination results, pour boiling water over the seeds and soak overnight. Some growers recommend scarifying seeds prior to planting. Conversely, others advise against the practice of scarification. Sow the seeds in an area with full sun and moist loam soil with a slightly acidic pH.

Propagation by cuttings is straightforward with the correct technique. Prepare cuttings that are no longer than 6 inches (15 centimeters) long in early spring shortly after plants leaf out. Propagators recommend moistened Perlite® as a rooting medium. Remove all leaves from at least 2 inches (5 centimeters) of the bottom of the cutting. Dip the bottom of the cutting in a rooting compound and anchor it in the moist Perlite®. Ample humidity and indirect light benefit the rooting process. After the roots develop, transplant the start into a container of potting soil or into a suitable garden location (see the following sections for guidelines).

Another popular propagation method for *C. caracalla* is layering, defined as encouraging new roots to form on an aerial branch while the branch remains attached to the parent plant. Pin the aerial branch to the soil surface or to potting soil in a container using jute staples or pieces of wire clothes hangers. Moreover, nicking the contact site with a knife or razor blade promotes the formation of roots. After the roots form, sever the rooted branch from the parent plant and transplant elsewhere in the garden.

Culture

C. caracalla is an evergreen perennial, meaning it lives more than one season, providing winters are mild. Tolerant of summer heat, including reflected heat, corkscrew vine has a vining growth habit and readily climbs any available support using tendrils. Accordingly, place the vine near a fence, espalier, pergola, trellis, or other supportive structure. Thornless, the vine grows rapidly to 20 feet (6 meters) in a single season with regular watering.

Being native to the tropics, corkscrew vine is tender (i.e., sensitive to cold temperatures). Prolonged temperatures below 40 to 50° F (4.4 to 10° C) kill *C. caracalla*. In cold-winter areas, gardeners treat corkscrew vine as a summer annual, setting out new plants each season. Alternatively, gardeners grow *C. caracalla* in a large container and move the container into a protected location during the coldest weather. In the garden, corkscrew vine will tolerate a brief cold snap that may kill

the plant above ground while leaving the roots undamaged. In this case, trim dead growth, leaving the roots undisturbed.

C. caracalla requires partial sun to full sun in a garden location with well-drained soil. Horticulturists recommend regular garden watering for best performance. Increase the frequency of watering during extreme heat.

Medium green, heart-shaped leaves clothe the vines of *C. caracalla*. Flowers display soft colors of lilac and purple with cream and white. Flower buds possess an unusual shell- or corkscrew-shaped structure, which is why the plant has common names such as corkscrew vine, corkscrew flower, and shell vine. Corkscrew vine's ornate and highly fragrant flowers release a scent comparable to hyacinth blossoms and oriental lilies.

Corkscrew vine blooms on new wood. To promote abundant flowering, prune the vines as early as possible. During the late winter/early spring clean-up, prune spent flowers, dead leaves and overgrown vines to allow the plant to push new growth before its flowering season, which occurs from summer through fall.

Edibility

Corkscrew vine produces edible flowers and small pods resembling green beans. Tortoises and other herbivores relish the flowers of *C. caracalla*. **Ω**

References

Caracalla bean. Retrieved 20 September 2016, from https://www.monticello.org/site/house-and-gardens/in-bloom/caracalla-bean

Land, L. (1998). Garden Q.& A.. Nytimes.com. Retrieved 23 September 2016, from http://www.nytimes.com/1998/07/30/garden/garden-q-a.html?_r=0

Patterson, S. Corkscrew Vine Care – Growing Information For Vigna Caracalla Corkscrew Vine. Gardening Know How. Retrieved 20 September 2016, from http://www.gardeningknowhow.com/ornamental/vines/snail-vine/growing-snail-vine.htm

Snail Vine, Vigna caracalla. Retrieved 20 September 2016, from http://www.monrovia.com/plant-catalog/plants/3589/corkscrew-vine/

Cockscrew vine, *Cochliasanthus caracalla*, in bloom. Photo © 2007 by Dave Whitinger. Source: Creative Commons; license CC-BY-SA-3.0/GFDL.

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**.

FOR SALE: Radiated tortoises hatched in 2015. $1,000.00 each. CA residents only. Email **rhoekstra@aol.com** (2)

FOR SALE: 5- and 6-month-old Red Foot tortoises (*Geochelone carbonaria*). Please send an email to Linda **laccturtle@earthlink.net** (1)

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!

"... 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

Chicago Herpetological Society: Herpetology 2016

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

Chicken Turtle Nesting and activity

Chicken turtle, *Dierochelys reticularia.* Photo © 2012 by the Virginia Parks State staff. Source: Creative Commons; license: CC-BY-2.0.

D. T. McKnight et al. [2015, Copeia 103(4):1043-1047] note that the eastern and Florida chicken turtle subspecies (*Deirochelys reticularia reticularia* and *D. r. chrysea*) exhibit nesting cycles that are atypical for aquatic North American turtles, with nesting occurring in the fall, winter, and early spring. The reproductive cycles of the western subspecies (*D. r. miaria*) have not been studied. Therefore, the authors monitored the reproductive status of female. *D. r. miaria* in 2012 and 2013. In their populations, both male and female *D. r. miaria* were inactive on land from mid-July to mid–March. This differs from the activity patterns of other subspecies in which females typically remain active into the fall and sometimes winter. Also, in contrast to the nesting patterns of *D. r. reticularia* and *D. r. chrysea*, female *D. r. miaria* developed follicles in the spring and summer (March – July) and contained eggs in the summer (May – July). Therefore, the western chicken turtle exhibits a nesting pattern more similar to that of other sympatric [1] species in the family Emydidae that to other species of *D. reticularia.* [Published in issue 50(3):54, 2016]

§ § §

Box Turtles on Man–Made Islands

M. T. Jones et al. [2016, Journal of Herpetology 50(1):94-101] investigated the ecology, distribution, and density of Florida box turtle (*Terrapene carolina bauri* Taylor 1895) population in the Ten Thousand Islands (TTI), an estuarine mangrove ecosystem in southwestern Florida. The distribution and ecology of box turtles in this region and this habitat type have not been previously investigated. The study area encompassed 18 islands and included five natural islands, 13 man–made shell islands, and adjacent mangrove environments. Two hundred and twenty-nine live box turtles and 95 box turtle shells were detected a total of 409 times on seven of the 18 islands. The seven islands where box turtles were detected ranged in size from 7.3 to 31.0 hectares [18 to 76.6 acres] and were ancient shell work sites, apparently constructed by the Calusa or other prehistoric Indians approximately 1,900 to 900 years before present (ybp). Box turtles were not detected on natural islands. The authors detected box turtles primarily in subtropical hardwood hammock forests, but detected 10% of turtles in mangrove or mangrove ecotones. Males were larger than females across all sites.

Florida box turtle, *Terrapene carolina bauri.* Photo © 2010 by Andrea Westmoreland. Source: Creative Commons; license CC-BY-SA-2.0

There was a significant difference in body size between living and dead adults. The authors estimated population size on four shell work islands to range from 43 (SE = 3.5) turtles to 270 (SE = 244) turtles and estimated densities ranging from 2.7 – 12.2 turtles/hectare [ed. note: 1 hectare = 2.5 acres]. Box turtles on the shell work islands of the TTI are a unique example of populations living on ancient, man–made islands. However, known populations are small and isolated and may be susceptible to increased human recreational use, mechanized vegetation management or predation by raccoons. [Published in issue 51(4):69, 2016]

§ § §

Defensive Biting in Mud Turtles

Sonoran mud turtle, *Kinosternon sonoriense*, swimming in the Little Rincon Mountains of Arizona. Photo by Don Swann.

S. M. Peno et al. [2016, Journal of Herpetology 50(1):26-28] note that propensity for defensive biting in turtles should vary ontogenetically [2]. In species with plastral kinesis, the effectiveness of retraction into the shell as a defensive mechanism increased with body size. Therefore, adults should be less likely to bite and more likely to retract than juveniles. The authors tested this hypothesis by measuring biting and retraction propensities from an ontogenetic series of *Kinosternon sonoriense* (Sonora mud turtle), a species with plastral kinesis. As predicted, biting in *K. sonoriense* was restricted to younger, smaller turtles, whereas capacity for retraction was restricted to older, larger turtles. [Published in issue 51(4):70, 2016]

§ § §

Terrestrial Habitat Use by Pond Turtles

G. Zaragoza et al. [2015, Journal of Herpetology 49(3):437-441] note that western pond turtles (*Actinemys marmorata*) are endemic to western North America and

[1] **sympatric:** plants or animals with overlapping geographical ranges.

[2] **ontogenesis:** development from the earliest stage to maturity.

are found in a diversity of aquatic habitats. To date, few studies have examined the ecology of populations in ephemeral or intermittent ponds. Terrestrial habitat requirements of western pond turtles were studied in an intermittent pond that dries in years with below-average rainfall. The authors tracked terrestrial movements of western pond turtles in an ephemeral pond at the San Joaquin Experimental Range in Madera County, in the western foothills of the Sierra Nevada. They used radio telemetry in 2012-13 to record their terrestrial locations and timing of departure from, and return to, the pond. Also, they examined the terrestrial microhabitat turtles selected for aestivation and overwintering. Turtles began leaving the pond as it dried in late spring and early summer, spending an average of 235 days out of water, and their return to the pond was correlated with increasing rainfall during late winter. The majority of terrestrial locations were concealed completely in litter or duff and 95% of terrestrial locations during the study occurred within 187 meters [613.5 feet] of the pond edge. Turtles in this study generally exhibited terrestrial habitat use similar to that of populations in intermittent lotic[3] systems such as the many snow–melt and rain–fed rivers in northern California. These results reinforce the importance of terrestrial habitat in the life history of western pond turtles and the context–dependence of their habitat needs. **Ω**

Western pond turtle, *Actinemys marmorata*, photographed in California. Photo © 2009 by Yathin S. Krishnappa. Source: Creative Commons; license CC-BY-SA-3.0.

[Published in issue 51(5):85, 2016]

Abstracts originally published in issues 50(3), 51(4), and 51(5) of the *Bulletin* of the Chicago Herpetological Society. Reprinted with permission of the Editor.

[3] **lotic:** refers to localities with swiftly moving fresh water .

CITES CoP17: Conservationists Urge Immediate Action to End Poaching of Ploughshare Tortoise – Angonoka Working Group Calls on CITES Conference of the Parties and Government of Madagascar to Prevent Imminent Extinction of Emblematic Species

Johannesburg, South Africa—26 September 2016—Unless the government of Madagascar takes swift action to enforce international anti-poaching and anti-trafficking laws, the country's largest tortoise—the ploughshare tortoise (or angonoka tortoise)—will likely go extinct in the wild within the next two years. The dire warning comes from a coalition of international conservation organizations (Wildlife Conservation Society, Durrell Wildlife Conservation Trust, Turtle Survival Alliance, Turtle Conservancy and Global Wildlife Conservation) that issued a statement to governments attending the CITES meeting of the Conference of the Parties. CoP17 meets Sep. 24 – Oct. 5 in Johannesburg, South Africa.

"This is a wildlife emergency—the ploughshare tortoise is on the verge of extinction, driven by criminal networks and unscrupulous collectors who will pay top dollar the rarer a species is," said Susan Lieberman, vice president for international conservation with WCS and head of the WCS delegation at the CITES meeting. "The CITES Parties must take urgent and immediate action at the upcoming meeting in Johannesburg to prevent this amazing species and part of Madagascar's unique natural heritage from disappearing forever."

Ploughshare tortoises live only in the Baly Bay National Park in northwestern Madagascar, a park that was established in 1997 specifically to protect the species in its natural habitat. Poachers target the animal to export to international collectors as a highly coveted pet with its striking gold and black shell. Over the last year, poaching of the species has reached its highest level, and conservationists estimate there may be less than 100 mature adults left in the reserve. The IUCN Red List of Threatened Species classifies the tortoise as critically endangered.

"At this point the fate of the tortoise is up to the government of Madagascar," said Peter Paul van Dijk, Turtle Conservancy's field conservation programs director and an associate conservation scientist with GWC. "Conservationists can't go in and be the police force or the customs official or the border inspections officer at the airport. If the responsible authorities don't take urgent action to stop the poaching and trafficking, our world is going to feel a little emptier without these enchanting animals."

In their joint statement to the CITES Conference, the coalition of conservation organizations together urged the member governments to prioritize working with the government of Madagascar to "develop effective and long-term solutions to the current crisis." This includes encouraging the government to pursue all observed poaching or trafficking infractions; commit resources to the adequate enforcement of Baly Bay National Park; and to build institutional and technical capacity of customs at the country's main airport.

"CITES is the only locally and globally binding treaty for wildlife and the international trade in wildlife," said Richard Lewis, director of Durrell Wildlife Conservation Trust's Madagascar Programme. "As the global forum for addressing issues around international illegal wildlife trade, we have the world's attention and we can hopefully help facilitate connections between the Malagasy government and countries that are receiving the smuggled tortoises. But at the end of the day, it is up to Madagascar to seize these opportunities and take control of this trade."

Since 1975, the ploughshare tortoise has been listed in CITES Appendix I, which includes the most threatened among the CITES-listed animals and plants. As the species is driven to extinction in the wild, conservationists are working to establish and protect a network of captive populations as a last resort to save the species. **Ω**

— Wildlife Conservation Society press release

Conservationists Raise Alarm Over Hawaiian Green Sea Turtle Nesting Numbers — Nesting Turtles Plummet by 84 Percent — Turtle Island Restoration Network press release

Honolulu, Hawaii—September 6, 2016— On the heels of the expansion of Hawaii's Papahānaumokuākea Marine National Monument, new information released by federal researchers reveals a dangerous drop in the number of nesting Hawaiian green sea turtles. According to the NOAA Marine Turtle Biology and Assessment Program, nesting green sea turtle numbers dropped 84 percent compared to last year. Now, Turtle Island Restoration Network (**seaturtles.org**), a leading ocean and marine conservation organization, is calling for urgent actions to reduce all mortality of green sea turtles, including in industrial fishing operations such as longlining.

"An 84 percent decline should trigger emergency actions to protect green sea turtles," said Peter Fugazzotto, Strategic Programs Director with Turtle Island Restoration. "Number one on that list should be reducing adult mortality from industrial fishing. With this recent information, we cannot afford the death of even one more green sea turtle," he added.

NOAA researchers spent more than two months monitoring green sea turtles within the French Frigate Shoals, where more than 90 percent of all Hawaiian green sea turtles nest. This year they counted just 88 turtles compared to 492 last year.

Earlier this month, Turtle Island released a report on the impacts of sea level rise on major sea turtle nesting beaches worldwide and highlighted French Frigate Shoals as an especially high-priority site because of its low elevation and the extreme nesting concentration. Turtle Island is advocating for the re-establishment of a secondary major nesting colony to spread the risk.

Green turtle, *Chelonia mydas*, swimming in the sea off Hawaii. Photo © 2007 by Brocken Inaglory. Source: Creative Commons, CC-BY-SA3.0.

Turtle Island also is calling for efforts to reduce to zero the impact of longline fishing on sea turtles.

In 2015, Hawaiian-based deep set longline fishery killed an estimated 5 green sea turtles (based on an extrapolation of ~20 percent observer coverage). Through June 2016, an estimated 5 green sea turtles already have been killed.

"While researchers try to determine whether this nesting decline is related to a population decline, common sense dictates a precautionary approach," said Fugazzotto. "That approach is one that greatly reduces the death of adult green sea turtles." **Ω**

> Read the Turtle Island Restoration Network report on the climate change and the impact to nesting sea turtle populations here: **https://seaturtles.org/deadly-waters**

Arizona's Sonoyta Mud Turtle Proposed for Endangered Species Act Protection After Waiting for 19 Years — Center for Biological Diversity press release

Tucson, Arizona—20 September 2016— In accordance with a settlement with the Center for Biological Diversity to speed protections for 757 species, the U.S. Fish and Wildlife Service today proposed Endangered Species Act protection for the Sonoyta mud turtle, which was first identified as a "candidate" for federal protection in 1997. These highly aquatic turtles are found only in Pima County, Ariz. and Sonora, Mexico.

"These turtles have been pushed to the brink as their aquatic habitats have been degraded and destroyed," said Jenny Loda, a biologist and attorney with the Center who focuses on protecting rare amphibians and reptiles. "Endangered Species Act protection is our best hope for saving these guys, since the Act has a nearly perfect record of preventing plants and animals from going extinct."

With webbed feet and an innate ability to swim, the Sonoyta mud turtle has evolved to be highly aquatic in one of the driest parts of the Sonoran Desert. Diversion of surface water and pumping of groundwater have led to the loss of much of this habitat, which the turtle needs to survive. The problem has been exacerbated by drought conditions that have persisted for the past 20 years. Long stretches of dry streams have isolated populations of the turtles, limiting opportunities for migration.

"I'm so happy to see Endangered Species Act protection for these turtles move forward after an almost 20-year wait," said Loda. "With dry conditions in the desert expected to worsen with climate change, the Act is hands down our best tool for saving these guys."

In the United States, the Sonoyta mud turtle has been reduced to a single reservoir called Quitobaquito Springs within Organ Pipe Cactus National Monument. Four populations are currently known in Mexico, but the loss of the turtle has already been reported from an additional site. At all of these sites the number of turtles has declined as aquatic habitat has been reduced.

To date 147 plants and animals have received protection as a result of the Center's 2011 agreement, and another 40 are proposed for protection. Read more about the Center's 757 agreement and its campaign to address the amphibian and reptile extinction crisis.

The public has 60 days to comment on today's proposed listing. **Ω**

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]

SunPower will also award (up to) $1,000 to CTTC for each system sold under this Fund Raising Program. (Discount & Award is based on 20 cents per AC watt).

How do I get started?

1. Request a free solar evaluation.
2. Receive a customized proposal.
3. Receive rebate after installation.

Sign up for a free solar evaluation:
Visit sunpower.com/kg or call 661-644-6357

Why Do More Homeowners Choose SunPower® Solar?

- SunPower panels produce up to 50% more power than other panels.[2] This means that your system will take up less space on your roof.
- SunPower has a wide range of financing options including lease and loan plans to make your solar system truly affordable.
- Our best-in-class network of installers and industry-leading warranty gives you peace of mind for years to come.

Visit sunpower.com/kg or call 661-644-6357

[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.

© 2014 SunPower Corporation. All rights reserved. SUNPOWER, the SUNPOWER Logo, and MORE ENERGY. FOR LIFE. are trademarks or registered trademarks of SunPower Corporation in the U.S. and other countries.

SUNPOWER®

,

the *Tortuga Gazette*
November | December 2016
Volume 52, Number 6

Turtle of the Month
Asian Leaf Turtle
Cyclemys dentata

CTTC Online: tortoise.org
Follow CTTC on Facebook

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 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}
- Canada/Mexico...$25^{00}
- Foreign...$40^{00}
- Life membership...$500^{00}

The Chapters' postal mailing addresses are listed in the following section. Click on the links to visit the Chapters' web sites.

Cen-Val Chapter
Postal mailing address: P.O. Box 16418, Fresno, CA 93755-6418.

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

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

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

Inland Empire Chapter
Postal mailing address: P.O. Box 2371, San Bernardino, CA 92406-2371.

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

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

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

Ridgecrest Chapter
Postal mailing address: P. O. Box 1272, Ridgecrest, CA 93555.

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

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

Silicon Valley Chapter
Postal mailing address: P.O. Box 64135, Sunnyvale, CA 94088-4135.

TOOSLO (San Luis Obispo) Chapter
Postal mailing address: P.O. Box 14222, San Luis Obispo, CA 93406.

Turtle & Tortoise Care Society Chapter
Postal mailing address: P.O. Box 15965, Long Beach, CA 90815-0965.

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

ICYMI [In Case You Missed It]

Desert Tortoise Annotated Bibliography, 1991–2015
Dr. Kristin Berry of the US Geological Survey and her team compiled this comprehensive bibliography.

Enhancing and Restoring Habitat for the Desert Tortoise *Gopherus agassizii*
This document, coauthored by Dr. Kristin Berry and Dr. Scott Abella, describes methodologies for restoring desert tortoise habitat.

Herpetological Conservation and Biology: Volume 10, Issue 1 (June 2015)
The journal *Herpetological Conservation and Biology* recently published 13 papers from a 2010 symposium on Chelonian Head-starting.