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A basking Yellow-headed Temple Turtle, *Heosemys annandalii*, photographed in Thailand. Photo © 2024 by Wilson Yao

featured species

Yellow-headed Temple Turtle, *Heosemys annandalii* (Boulenger, 1903)

The Critically Endangered Temple Turtle

by M. A. Cohen

First described by the prolific Belgian-British herpetologist George Albert Boulenger (1858-1937) in 1903, the Yellow-headed Temple Turtle is a member of the Geoemydidae chelonian family, formerly called the Bataguridae.

The Geoemydidae family is a diverse family of Testudine turtles, comprising 60 to 70 species, depending on the authority consulted. Geoemydid species include Eurasian pond turtles, river turtles, and Neotropical wood turtles. The *Heosemys* genus contains four species, and the yellow-headed temple turtle, *H. annandalii*, is the focus of this article.

The genus name *Heosemys* derives from word roots that mean eastern turtle, referring to its Asian origin. The species name *annandalii* honors the British zoologist Dr. "Thomas" Nelson Annandale (1876-1924).

The common name describes two characteristics of the species. 'Yellow-headed' details the color of the head and neck markings displayed by the species. 'Temple turtle' refers to the fact that many populations occur adjacent to Buddhist temples within their range. Local people often release the species into the temple ponds and canals during a Buddhist

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ritual that has ancient roots in Chinese culture.

In chelonian literature published before 2007, *Hieremys* was the genus name of the yellow-headed temple turtle. Currently, *Hieremys* is a historical synonym of the genus *Heosemys*.

An image captured in Thailand showing the distinctive cusps on the upper jaw of the yellow-headed temple turtle. **Photo © 2022 by nbasargin**

Even though Southeast Asia is a biodiversity hotspot, the distribution and ecology of its chelonian species, including *H. annandalii*, need to be better studied (Platt et al., 2008).

Description

A sizable species at maturity, *H. annandalii* may grow to a straight-line carapace length of 20 inches (51 centimeters) or more.

The species' carapace is brown, dark gray, or black, comparatively smooth, and high-domed. The plastron of the juvenile is typically yellow without black markings. Black blotches develop as the turtles mature, and older animals usually have uniformly dark plastra.

The juvenile *H. annandalii* possesses a single, low medial keel on the vertebral (central) scutes of its carapace that flattens as the turtle matures.

The species' common name refers to its head coloration. The turtle's head combines yellow with dark gray or black solid or dotted bands, particularly in younger animals. The yellow coloring will likely fade in older turtles, and its head will become gray.

Another distinguishing feature of the species' head is the two sharp projections separated by a notch on its upper jaw. These tooth-like jaw structures are known as cusps.

The limbs and tail of the yellow-headed temple turtle are usually gray on the upper surface and cream-colored below. Large scales cover the forelimbs, and the toes are heavily webbed (Hieremys annandalii, n.d.).

The male yellow-headed temple turtle's distinguishing characteristics include a concave plastron and a longer, thicker tail than the female.

Diet

As an herbivore, *H. annandalii* eats aquatic vegetation such as water lilies, terrestrial leaves, and fruits that fall from the plants overhanging the aquatic habitat.

Range and Habitat

H. annandalii is a freshwater species endemic to regions within Southeast Asia. According to the International Union for the Conservation of Nature's Red List of Threatened Species, the species' range "includes Cambodia, the Mekong lowlands of Lao PDR, northern Malaysia, central and southern Thailand, and southern Viet Nam. Its presence in peninsular Myanmar is uncertain" (Cota et al., 2021). Lao PDR (i.e., People's Democratic Republic) is

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the official name for Laos.

Tonlé Sap is a vast lake in northwest Cambodia and the largest freshwater lake in Southeast Asia. In 1997, the United Nations Educational, Scientific and Cultural Organization designated Tonlé Sap as a World Network Biosphere Reserve, known as the TSBR, on account of its biological diversity.

In 2001 and 2002, Steven G. Platt and his team of researchers conducted a species-inventory study of the four turtle species native to Tonlé Sap, including the yellow-headed temple turtle, to make conservation recommendations.

During their study, the scientists found that locals harvested the native turtle species in unsustainable numbers from the TSBR. Urban markets in Cambodia and wildlife markets in Vietnam and China are the primary destinations for harvested animals (Platt et al., 2008).

Reasons for exploitation includes local and international consumption of meat and eggs and use in traditional Cambodian and Chinese medicine.

The yellow-headed temple turtle inhabits lowland habitats, including wetlands, swamps, flooded fields, and slow-moving rivers. While the species usually lives in freshwater habitats, it will tolerate brackish (slightly saline) water.

Juvenile yellow-headed temple turtle photographed in Thailand. **Photo © 2015 by Jeff LeClere**

Threats

H. annandalii populations suffer from severe threats, and researchers surmise there has been an alarming 80% decline over the past three generations (111 years) throughout its entire range. Scientists expect this decreasing population trend to continue (Cota et al., 2021).

Close-up of the head of *Heosemys annandalii* photographed in Thailand. **Photo © 2022 by Sam Hambly**

Scientists estimate that the yellow-headed turtle populations in Thailand are in slightly better condition, down 50% from earlier population censuses.

The predominant threats to the species are harvest by humans and habitat fragmentation and destruction. Local people harvest the turtles and their eggs for subsistence and commercial purposes. Scientists view the harvest of eggs as slightly less damaging to populations than the harvest of turtles of breeding age.

Conservation

The Convention on International Trade in Endangered Species of Wild Fauna and Flora, often abbreviated as CITES, added *H. annandalii* to Appendix II in 2012, effectively terminating trade in the species.

The International Union for the Conservation of Nature Red List of Threatened Species lists the yellow-headed temple turtle as critically endangered, a dire warning that the species is perilously close to becoming "extinct in the wild" (Cota et al., 2021).

H. annandalii is "protected from exploitation in Thailand under the Wild Animals Reservation and Protection Act." The species occurs in some legally protected areas within its range. Ω

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Spotted softshell turtle release boosts reptile conservation in Vietnam

By Carolyn Cowan as posted on 4 April 2024 on Mongabay.com

- The rewilding of 50 captive-bred spotted softshell turtles has sparked hope among conservationists for the future of the rare and threatened species in Vietnam, a country where softshell turtles are widely considered a culinary delicacy.
- Described by scientists as recently as 2019, the species is considered critically endangered throughout its range in China and Southeast Asia due to hunting for human consumption and habitat loss.
- The reintroduction of the young turtles is the first rewilding of offspring reared at a dedicated turtle conservation breeding facility in northern Vietnam to safeguard Vietnam's rare and threatened amphibian and reptile species.
- Turtle conservationists say that while it will be a long and perilous road to recovery for the species in Vietnam amid persistent threats, the work to preserve the species is a positive step toward changing people's view of freshwater turtles as primarily a food item and curbing hunting pressure not only on this species, but many others as well.

Two live paratype specimens of *Pelodiscus variegatus* sp. n., a newly described species from northeastern Indochina. Images A and C, a female with a plastral length of 75.2 millimeters (2.96 inches); images B and D, a female with a plastral length of 86.6 millimeters (3.4 inches). **Photo © 2019 by Thomas Ziegler**

Vietnam's struggling population of spotted softshell turtles received a helping hand in December 2023 when researchers released 50 captive-bred hatchlings into a freshwater lake in a northern province. Now, new research indicates where further wild releases could result in the most conservation gains for the rare and threatened species, which was only described by scientists as recently as 2019.

Spotted softshell turtles, *Pelodiscus variegatus*, were previously considered part of the genetically and morphologically variable Chinese softshell turtle (*Pelodiscus sinensis*), a widely distributed species ranging from eastern Russia through China and Korea to Vietnam. However, scientists now classify Chinese softshell turtles as a species complex comprising seven separate species, one of which is the spotted softshell turtle.

Although the orange-and-black-speckled turtles were described as distinct in 2019, frustratingly little is known about them in order to inform conservation actions, according to Thomas Ziegler, coordinator of nature conservation projects for Vietnam and Laos at Cologne Zoological Garden in Germany.

"It's actually a race against time, to discover species before they disappear," Ziegler, who was involved in the scientific description of the species, told Mongabay in an email. "The joy of the discovery quickly gave way to worry — does it still exist, or has it already been extirpated?"

Following the first scientific description of the species, Ziegler and his colleagues from Germany and Vietnam quickly set about gathering information from field surveys, market visits, trade data and historical records to build a picture of the new species' distribution, status and immediate threats.

The team's latest findings, published in Nature Conservation, indicate the species has a very restricted distribution, likely

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confined to freshwater habitats in north-central Vietnam and possibly in areas across the border in Laos. Moreover, in a part of the world where softshell turtles are widely considered a culinary delicacy, the researchers say threats abound.

In addition to widespread evidence of overexploitation of softshell turtles for human consumption and intense pressure on their freshwater habitats from fishing, land conversion and pollution, the researchers recorded interbreeding between softshell turtle species in farms. Millions of Chinese softshell turtles are farmed and traded each year in China and Vietnam for their meat, giving rise to the risk of genetic pollution of native wild populations.

What's more, spotted softshell turtles have never been recorded in a protected area in Vietnam or Laos; and to date, scientists have genetically identified very few individuals in the wild. Ziegler said such vulnerabilities underscore the importance of combining in-situ and ex-situ measures to maximize the chances of the species' long-term survival in the wild.

"Once a species is extinct, it is too late for any efforts … it is lost forever … It is therefore important to set off on time and not when it is too late." Ziegler said. "If [in-situ] species protection is not possible in time [to save it] on site, or is going too slowly, [then] modern, species conservation-oriented zoos and stations can get involved in building up a reserve population" with which to repopulate the species' former range.

The cohort of turtles released in 2023 were from animals collected at Vietnam's wet markets and subsequently genetically confirmed as spotted softshell turtles. They were raised at a purpose-built conservation breeding facility at Melinh Station for Biodiversity, part of Vietnam's Institute of Ecology and Biological Resources (IEBR) near Tam Dao National Park in northern Vietnam.

The captive-breeding facility is a key component of a collaborative initiative between researchers from the IEBR and Cologne Zoo to safeguard the future of rare and threatened reptiles and amphibians in Vietnam, a country home to some 484 species of reptiles alone.

Having learned how to breed spotted softshell turtles in captivity, Ziegler said the next step will be to increase the number of populations kept in captivity in both Southeast Asia and Europe so that there are animals available for future releases, some of which he hopes will be within Vietnam's network of protected areas.

Given the considerable threats facing the species and its restricted range, the researchers propose the spotted softshell turtle be categorized as critically endangered on the IUCN Red List, the global authority on species' extinction risk, which is yet to make an official assessment.

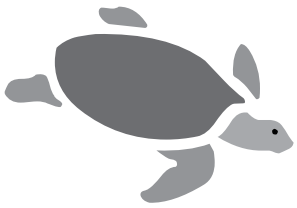
Andrew Walde, director of conservation and science at the Turtle Survival Alliance, who wasn't involved in the study or release initiative, told Mongabay that wild releases work best in situations where threats facing the animals in the wild have been removed and safe conditions prevail. In the case of Vietnam, he said this would necessitate countering wildlife trafficking, plugging gaps in wildlife law enforcement, educating communities who associate turtles with food about why the animals are best left in nature, and protecting habitats from degradation — a tall order, he added.

"In a hotspot like Vietnam where there's an extremely high diversity of turtles, getting to that [shift in attitude toward turtles] could take decades," Walde said. "In countries where turtles are food, you've got a big uphill battle."

Walde said a lot remains unknown about spotted softshell turtles that would help to optimize the success of the captive-breeding program. For this reason, post-release monitoring should be a high priority for the teams in Vietnam, he said. "Monitoring enables adaptive management, so you can tweak things and perhaps more [animals] survive, or less survive, and you can try and refine the techniques involved."

Walde added that any such turtle captivity project, if managed well, usually brings benefits for broader conservation. "It gets turtle conservation into the minds of people, shifts attitudes and makes people realize they can be part of turtle conservation." Ω

To read the research article "A new species of *Pelodiscus* from northeastern Indochina (Testudines, Trionychidae)" published in the journal *ZooKeys*, click this link: **https://doi.org/10.3897/zookeys.824.31376**



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

Calandrinia ciliata Fringed Red Maids

Calandrinia ciliata blossom photographed in the Briones Regional Park in northern California. Photo © 2008 by kqedquest

Native to the Americas, *Calandrinia ciliata* is a wildflower that occurs in the United States in Washington, Oregon, California, Idaho, Arizona, and New Mexico. A disjunct population also exists in Massachusetts.

In addition, the species occurs in British Columbia in Canada, in Baja California and elsewhere in Mexico, in Guatemala, Central America, and Colombia, Peru, and Chile in South America (Sturla, 2017; Calandrinia ciliata, Red Maids, 2024).

Fringed red maids formerly belonged to the purslane family, Portulacaceae, but its current placement is in the Montiaceae family of flowering plants.

Foliage of the fringed red maids showing the cilia (fine hairs) on the edges and undersides of the leaves. Photo © 2011 by Zoya Akulova

Common names for the species include fringed red maids, redmaids, and desert rock purslane.

The genus *Calandrinia* honors the 18th-century Swiss botanist J.L. Calandrini (Calandrinia ciliata, 2021).

Description

When it grows wild, *C. ciliata* occurs in grasslands, open forested areas, the edges of desert areas, and cultivated fields. The species colonizes disturbed areas and often increases in abundance following fire (Calandrinia Ciliata, 2021). It is sometimes present in vernal (spring-season) wetlands (Sturla, 2017).

Fringed red maids is a short-lived perennial best treated as an annual. It is a low-growing, herbaceous species with edible properties. The mature height is typically 12 inches (30 centimeters) but may reach 18 inches (46 centimeters).

The leaves of fringed red maids are flat, linear, slightly succulent, and alternately arranged on their stems. The edges and undersides of the leaves may be glabrous (smooth-textured) or have fine hairs that botanists call cilia.

The five-petaled blossoms of *C. ciliata* are rose-red, purple, magenta, pink, or white. Flowers are often vibrant in color and resemble poppies in appearance. Blossoms are about 1 inch (2.54 centimeters) in diameter and slightly notched at the tip.

The growth habit of fringed red maids is upright or spreading. It is appropriate for wildflower meadows and rock gardens. Gardeners use the species as a ground cover, bedding plant, or cottage garden species.

According to Forest Gauna of the US Fish and Wildlife Service, the fruit of fringed red maids "is a thin, papery capsule with 3 slits for opening. Each capsule contains 10-20 seeds, which are small, flattish and black (1-2½ mm long)." The seed capsule splits open and reveals its seeds when the fruit ripens, generally in late summer and early fall.

North American Indians ate the minuscule edible seeds, which

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are rich in a nutritious oil, raw or prepared into various nourishing staple foods. See the section on "Edibility and Ethnobotany" for more information.

The blooming season of fringed red maids starts in early spring and can continue through early fall.

Cultivation

Fringed red maids is a low-maintenance, drought-tolerant plant species that requires full sun and will not grow in shade. The species thrives in sandy or loamy soil types as long as drainage is rapid and excellent.

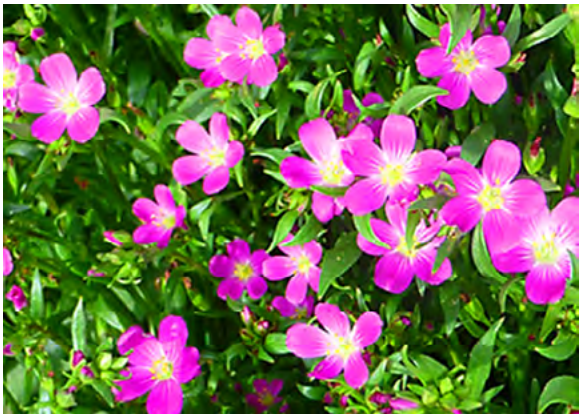
C. ciliata resents root disturbance and is best grown from seed sown in place in the landscape.

Once established, fringed red maids needs little or no supplementary irrigation because of its drought tolerance. It also requires no fertilizer, as soils with low to moderate nutrient content are acceptable for good growth.

Edibility and Ethnobotany

The young leaves and tender shoots of *C. ciliata* are edible and often used raw as garnishes and salad greens, with the caution that these contain oxalic acid, as does spinach, and should be eaten raw in moderation. Foragers describe the taste of the raw leaves as similar to arugula.

Cooking the *C. ciliata* plant, which may be eaten whole, reduces the amount of oxalic acid (Fern, 2022).



Blossoms and foliage of fringed red maids photographed in Finegold Creek Preserve in northern California. Photo © 2016 by Wendy Fisher

Native Americans, especially those in what is now southern California, extensively utilized the plant for their nutritional needs.

Forest Gauna writes that "the seed was collected, winnowed, toasted, and ground into pinole (a Spanish term for pulverized, parched, oily seeds)." The word pinole derives from an Aztec word *pinolli* that translates as seed flour.

The Native Americans ground the toasted seeds using a stone mortar and pestle, preparing a meal that they pressed into balls and cakes for eating.

They added water to the prepared meal for a nutritious smoothie-style drink and cooked the meal with water for a porridge. North American Indians also dried the meal for storage and consumed pinole for sustenance during their travels.

White-flowering form of fringed red maids photographed in Edgewood Natural Preserve in northern California. Photo © 2009 by Neal Kramer

Wildlife

C. ciliata provides food for many species of wildlife and domesticated animals. Many small mammals, birds, and insects eat the seeds.

Cattle readily graze on fringed red maid plants growing in their pasture lands, and the animals have no adverse reaction to the oxalic acid. Ω

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Nile Basin Farmers Grow Food Forests to Restore Wetlands and Bring Back a Turtle

By David Njagi as posted on Mongabay.com on 28 February 2024

- Sugarcane is a widely grown crop in the Nile Basin, but its destructive effects on soils, water resources and biodiversity have become increasingly apparent.
- As the thirsty crop draws down water resources, aquatic species like the critically endangered Nubian flapshell turtle suffer a loss of habitat, forage and nesting sites.
- In an effort to revive soils, diversify diets and incomes, and boost water levels that many animals rely on, communities are implementing agroforestry projects in lieu of monocultures.
- The resulting "food forests" attract an array of wildlife while refilling wetlands and river systems where the culturally important flapshell turtles swim.

The critically endangered Nubian flapshell turtle (*Cyclanorbis elegans*) in its preferred riverbank habitat in Benin. Photo © 2012 by ONG OeBenin

Western Province, Kenya—In the 44 years Naomi Rita Sitati has lived in Bukirimo village in western Kenya, she has known only one system of farming, which her community has depended on for generations.

Cultivating sugarcane as the only crop in large plots is a common practice in the region, which is part of the larger Nile Basin, and Sitati was happy with it. Apart from creating jobs for thousands of Kenyans throughout the agriculture value chain, it's a foreign exchange earner for Kenya, and a popular domestic sweetener.

All along, Sitati knew growing sugarcane was a monoculture system and was comfortable with it. Lately, however, she's begun questioning that after witnessing its destructive effects on soils and the environment.

Its impact on the region's food supplies and biodiversity has been high, and over the years, she has seen the system accelerate deforestation and dependency on industrial agrochemicals to boost production.

"Our soils are dead. When you try planting a food crop in a field where there was previously sugarcane, it does not grow. You cannot even see things like earthworms and ants," Sitati says.

Emmanuel Atamba, chief executive at Agricultural Production Systems and Institutions Development (APSID), a farming consultancy based in Nairobi, says sugarcane is also reliant on irrigation, where farmers must extract huge volumes of water from rivers and other water bodies. In the region, this extraction by communities in the upper reaches of the Nile Basin reduces the volume of water reaching the lowlands, leading to drying of wetlands, surface water sources and aquifers.

Turtle trouble

This is the situation for farms, but on a biodiversity level, such farming practices have endangered the existence of already threatened wildlife species like the Nubian flapshell turtle (*Cyclanorbis elegans*).

The turtle used to range from West Africa to sub-Saharan Africa, and along the White Nile Basin in Sudan. But it's disappeared from much of this range and today is listed as critically endangered on the IUCN Red List. In 2017, researchers rediscovered it in South Sudan and northern Uganda, but this remaining group is threatened by habitat loss, especially the retreat of the wetlands that constitute its natural habitat.

A report co-authored by Ugandan herpetologist Mathias Behangana indicates that the animal inhabits

large rivers with muddy bottoms, but that these habitats are generally not protected. Nor is the turtle protected or regulated under international legislation at present.

"The turtle faces many threats, including hunting for meat [and for its shell and claws] for witchcraft as well as habitat destruction. Increased destruction of its nesting sites is reducing its chances of survival," Behangana says.

Multiple challenges

Albert Nkwasa, a Ugandan research scientist based at the Free University of Brussels (VUB), makes the connection between habitat destruction and its life-threatening consequences for the turtle on two fronts: one is the pollution that leaches into wetlands and water bodies from agrochemical use in the Nile Basin. When sediment enriched with fertilizers gets into a water body or wetland, it can lead to growth of invasive plants that choke food sources that the turtles feed on.

The other is deforestation, which leads to drier spells and increased sediment loads flowing into wetlands, he says, adding that trees and forests control the water cycle by regulating precipitation, evaporation and water flow, as well as preventing soil erosion.

"These two threats are occurring simultaneously in most parts of Africa, threatening wildlife that depend on wetlands for food and nesting," Nkwasa says.

A brief by the international wetlands conservation treaty organization, Ramsar, says many such sites, including ones of international importance, are being destroyed by agriculture. It says the extent of natural wetlands has declined by 35% since 1970 from conversion to agriculture.

On pollution, it says, "High use of fertilizer within or near wetlands increases surface water and groundwater inputs of nitrogen and phosphorus to wetland ecosystems resulting in nutrient enrichment that can have significant ecological effects, including eutrophication*, increased productivity of invasive species, higher rates of nutrient leaching and shifts in species composition."

In Uganda, where Nubian flapshell turtles were only discovered in 2021, both of these threats are squeezing the country's rich wetland diversity out of the species' habitat map.

From its border with Kenya to the deep eastern belt of the country, monoculture sugarcane farming is a well-entrenched system in Uganda, and with climate change, the system has slowly been depleting wetlands in the country, according to field observations by Mongabay.

These wetlands have been further degraded by upstream communities converting drying wetlands into farms growing rice, sweet potato and eucalyptus.

The environmental impact threatens the biodiversity of Lake Victoria as well as in the country's lowlands, according to Kiyimba Mugagga, national coordinator of the Schools and Colleges Permaculture Programme (SCOPE Uganda).

While Behangana says droughts are depleting food sources for the Nubian flapshells, Kiyimba says the absence of wetlands, which act as water sponges, leads to flooding during heavy rains, threatening the turtle's nesting sites.

"Flooded wetlands displace and wash away the turtle's nests, while floodwaters bring aquatic predators closer to the nests, where they prey on the eggs," Kiyimba says.

Food forest solution

To soften the blow of these threats while continuing to feed people, communities in East Africa are working with food experts and conservationists to establish several smart-farming initiatives aimed at restoring the Nile Basin's biodiversity.

Sitati's village in Kenya recently introduced food forests, a technique that changes how the community manages both agriculture and the environment. A kind of agroforestry, it involves intercropping a variety of food crops like cereals, fruits, vegetables, tubers and herbs among woody trees on the same piece of land.

Xavier Imondo, a teacher, oversees the community food forest in the 0.1-hectare (0.25-acre) garden at St. Denis Libolina School. The project also serves as a learning site for the community, where a mix of crops like banana, sweet potato, hibiscus, papaya, avocado, chili and many more grow between trees like silver oak (*Grevillea robusta*). This gives the garden a bushy appeal that attracts various wildlife species like pigeons, weaverbirds, sunbirds, earthworms, white ants, caterpillars, honey bees and crickets, among others.

"Food forests are a game changer for our farmers. Apart from giving families a variety of food,

* **Eutrophication:** the process of nutrient enrichment in bodies of water, often caused by agricultural runoff, that causes serious problems such as harmful growth of aquatic plants and depletion of oxygen resulting in the death of aquatic animals.

rivers and wetlands are regaining water recharge. The water is also safe because we do not use farm chemicals," Imondo says.

At the school garden and in the wider community, these plots grow naturally with a little application of composted livestock manure. But in parts of western Kenya where the soils have become infertile due to continued use of monoculture agriculture and synthetic fertilizers over the years, farmers are adopting biofertilizers to revive their farms.

Felista Omuronji, a farmer in Esiruli village, says that in 2020 she started making biofertilizer from food waste, yielding a compost called bokashi. She says she's seen this system improve yields at her 0.6-hectare (1.5-acre) farm. Omuronji makes it using local materials that she composts and mixes with molasses, yeast and a bit of bran.

"Organic farming is enjoyable and I love it. When I was using synthetic fertilizers, you could not find even termites on my farm. But now many soil organisms can be found in my garden. If fertilizers could do this to my farm, imagine what they are doing to the regional food and environment," she says.

Further fresh ideas

Karen Nekesa, the regional advocacy and communications coordinator at Regional Schools and Colleges Permaculture Programme (RESCOP), says destructive farming practices threaten biodiversity in the whole of East Africa. To help the region recover from food insecurity and environmental degradation, RESCOP has been working with farmers in Kenya, Uganda, Zambia, Malawi and Zimbabwe to establish agroecological farming.

In Uganda, the battle to save Nile Basin biodiversity is also being fought with renewable energy, plastic waste recycling, and agroforestry, according to Francis Ssemetimba, head teacher at St. Maria Gorreti Mpugwe Primary School.

At the school, which also acts as a learning center, farmers gain skills like reusing plastic waste to create vertical gardens and remote irrigation units. But these efforts alone can't work without efforts to reduce deforestation, Ssemetimba says. This is why the community is adopting more efficient cooking methods, aiming to reduce the amount of firewood and charcoal they need to burn in their kitchens.

Working with SCOPE Uganda, farmers are replacing traditional cooking hearths, which consume large amounts of firewood, with more efficient stoves. The program comes with increased use of charcoal briquettes, which are made from local recycled materials like corn husks, banana peels, sawdust and peanut shells.

In instances where there's a shortage of briquettes, or where a family is compelled to use firewood, woodlots have been established among their homes to serve as a source of firewood instead of collecting it from community forests.

"The combined use of energy-saving stoves and establishment of woodlots in the farms is reducing dependency on natural forests. I see it as a smart move to fight deforestation and save our endangered wetlands," Ssemetimba says.

Over a span of four years, the woodlots have bloomed with a mix of timber and fruit trees. Farmers recently added another ingredient to their agroforestry: replacing eucalyptus with coffee trees.

A thirsty tree that's also toxic to other plants, eucalyptus is becoming less appealing and being cut down to create space for coffee plantings. Ssemetimba says farmers have realized eucalyptus is one of the leading agents threatening the country's wetlands. But coffee, which is intercropped with environmentally friendly timber trees, doesn't pose such a threat. It's also a carbon sink and an income-generating plant for communities.

"We have been practicing production for eating. But now we need somebody who produces for food to have some income," Ssemetimba says. "Coffee prices have been low on the world market, but farmers have realized that however little you get, as long as you get it, is a beginning."

At the sixth session of the United Nations Environment Assembly taking place in Nairobi this week, the global biodiversity framework and overuse of fertilizers will be part of the six issues under discussion.

That's happy news for Sitati, the sugarcane farmer from western Kenya. It lets her know that she's not alone and that the global community is battling biodiversity loss alongside smallholder farmers like her, even in a small region of the planet like the Nile Basin.

"We are doing the most we can to restore the environment and save endangered wildlife species," she says. "But we cannot win this battle without support from governments and world leaders." Ω

The California Turtle & Tortoise Club
CHINO VALLEY CHAPTER

TURTLE AND TORTOISE SHOW IN CHINO

SATURDAY, MAY 4, 2024
10:00am to 3:00pm

ADMISSION $2.00

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

CHINO GIRL SCOUT HOUSE
5007 Center Street, Chino, CA 91710
Come support our Chapter, fee supports our turtle care and vet expenses

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

E-MAIL: jlcalif2@aol.com OR CALL LYNDA AT 909/263-4629 FOR MORE SHOW INFORMATION

CTTC Valley Chapter
Turtle & Tortoise Show
Saturday, May 18, 2024
11:00 AM ~ 4:00 PM
Woodland Hills Christian Church
5920 Shoup Avenue, Woodland Hills, CA 91367

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

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

ADMISSION FEES

Adults	$3.00	Children under 5	FREE
Seniors 60+	2.00	Active Military & Veterans	FREE
Children 6+	2.00	First Responders	FREE

In honor of Armed Services Day, we are offering free admission to our active military, veterans, and first responders.

Sponsored by CTTC Valley Chapter, P.O. Box 7364, Van Nuys, CA 91409-7364.
CTTC is a not-for-profit 501(c)(3) organization. https://www.tortoise.org/valley

Special Thanks to Dr. Michael J. Connor

On behalf of the ***Tortuga Gazette*** staff and readers, I want to thank Dr. Michael J. Connor for his creativity and diligence in producing his column "Mike's Turtle Net Picks" for a remarkable 100 recurring installments.

From its inception, the column has informed, educated, and entertained us through Michael's skill at compiling highly readable news items from his many science-based resources.

I am deeply grateful, Michael, for your contributions, encouragement, and support.

Mary Anderson Cohen

California Turtle and Tortoise Club
Inland Empire Chapter

A Non-Profit Organization

AIR-CONDITIONED ROOM!!!

FREE Turtle & Tortoise Show

Saturday, September 21, 2024
10:00am – 3:00pm
Admission: FREE

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

The Ark Church Fellowship Hall
1307 E Citrus Ave
Redlands, CA 92374

COME JOIN THE FUN !!
For show information
Check out: www.tortoise.org/inlandempire

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A CRITICALLY ENDANGERED TORTOISE ENJOYS ZOO MED GRASSLAND TORTOISE FOOD

The Radiated Tortoise *(Astrochelys radiata)* is the 6th rarest tortoise in the world, and the heroes at Turtle Survival Alliance (TSA) are fighting for its future. As a non-profit, the TSA relies on support from the community. Zoo Med has pledged to donate pallets of their Natural Grassland Tortoise Food to TSA's Madagascar location 3 times a year. This food prevents shell and spinal growth deformities by matching the nutrient profile and high fiber content of a wild tortoise diet.

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

TSA
turtle survival alliance

Sea Turtle Rescue Assistance and Rehabilitation Act Passes U.S. House of Representatives

Legislation championed by the National Aquarium and dozens of partner organizations would help fill a crucial gap in support for endangered sea turtles—*press release from the National Aquarium, Baltimore, Maryland*

12 April 2024—The Sea Turtle Rescue Assistance and Rehabilitation Act, originally known as the Sea Turtle Rescue Assistance Act, passed the U.S. House of Representatives on Thursday, April 11, 2024. For more than four years, the National Aquarium has enthusiastically partnered with Representative William Keating (MA-9) and more than 70 organizations from 27 states and territories to advocate for this important legislation which could increase direct federal investment in sea turtle stranding response, rescue, rehabilitation and release, providing much needed financial support for organizations like the National Aquarium that have long undertaken this painstaking work on behalf of all sea turtle species native to U.S. waters.

While the federal government has long provided support for programs providing similar services for marine mammal stranding, response and rehabilitation, no permanent federal grant program exists to assist sea turtle rescue programs. Thanks to the leadership of Senator Chris Van Hollen of Maryland and other bipartisan champions in Congress, the federal government has already begun to provide limited funding for sea turtle rescue and rehabilitation over the last two years. The passing of the Sea Turtle Rescue Assistance and Rehabilitation Act through the House brings the Aquarium and other rescue organizations one step closer to establishing a permanent grant program for years to come.

In their leadership roles within the foremost advocate organizations of this legislation, National Aquarium President & CEO John Racanelli, New England Aquarium President & CEO Vikki N. Spruill, and South Carolina Aquarium President & CEO Kevin Mills released the following joint statement after the House vote:

Rescued cold stunned sea turtles rest and wait for transportation to rehabilitation facilities. National Park Service photo. Public domain.

"We are grateful for the growing bipartisan momentum for this important legislation and the resounding support of the U.S. House of Representatives. It is time for Congress to adequately support those who have voluntarily helped the federal government fulfill its mandate under the Endangered Species Act to conserve and recover sea turtle species. To continue this critical sea turtle rescue, recovery, and research, organizations like ours across the country need sustained federal support. We encourage the Senate to act quickly to pass this bipartisan legislation."

Since its inception in 1991, National Aquarium Animal Rescue has rescued, rehabilitated and released more than 400 animals—primarily sea turtles—in their role as the organization federally permitted by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Fish and Wildlife Service to respond to sick and injured sea turtles and marine mammals along Maryland's 3,190 miles of coastline. We also partner with other institutions to rehabilitate animals that strand up and down the East Coast, and work with the Greater Atlantic Region Stranding Network (GARS) year-round to assist with animal rescue operations, transports, monitoring, rehabilitation, releases and more. In the course of a typical year, we work with these partners to assist in rehabilitating and returning dozens of sea turtles back to their ocean home. Turtles from the 2023-2024 rescue season remain in the care of our Animal Rescue team. These sea turtles typically require rehabilitation related to the impacts of climate-driven cold-stunning events or human interactions, including boat strikes, fishing by-catch and habitat loss.

The National Aquarium and our partners will now focus our attention on the U.S. Senate, where a companion bill is already enjoying growing bipartisan support. Ω

To read the text of this act, click **H.R. 2560**

Meeting Schedule: May/June 2024

Check your chapter website for program information.

Chino Valley
May 17; June 21

Foothill
May 24; June 21

High Desert
May 13; June 10

Inland Empire
May 3; June 7

Kern County
May 13; June 10

Low Desert
Meeting information to be announced.

Orange County
May 3; June 7

Ridgecrest
May 13; June 10

Santa Barbara-Ventura
Meeting information to be announced.

Santa Clarita
Meeting information to be announced.

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

TTCS (Long Beach)
May 18; June 15

Valley
May 17; June 21

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

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CTTC Memberships and Renewals

Each chapter handles its own memberships/renewals.

There are three options for membership renewal:

1. Send a check to the mailing address of your chapter. In the panel below, you will find the current membership fees and the mailing addresses for each chapter.
2. Renew your membership in person at your chapter's meeting.
3. Some chapters have PayPal accounts that enable their members to renew memberships online.

The California Turtle & Tortoise Club (CTTC) 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).

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

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

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

Membership fees

- **Student membership** 15^{00}
- **Individual membership** 25^{00}
- **Family membership** 35^{00}
- **Life membership** 500^{00}

CTTC Chapter Mailing Addresses

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

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

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

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

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

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

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

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

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

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

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

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

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

Tortuga Gazette
California Turtle & Tortoise Club
P.O. Box 7300
Van Nuys, California 91409-7300

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