

California Red-sided Garter Snakes in the Wild and in Captivity

By Tim Spuckler

It was August of 2011 and I was visiting California when I hit “paydirt” and found what many would consider to be the most beautiful snake residing in the United States. And to be quite honest, it wasn’t hard. I was walking on a path in a well-visited natural area that already had a fair number of birdwatchers on the scene. It was early in the morning and the fog from the Pacific Ocean was starting to burn off. My herping companion and I had already found a few Coast Garter Snakes (*Thamnophis elegans terrestris*) and an Aquatic Intergrade Garter (*Thamnophis atratus* sp.), when there, right along the trail was a California Red-sided Garter Snake (*Thamnophis sirtalis infernalis*) coiled up and sunning itself. Although dusty and not particularly vibrant, its blue dorsal stripe was proof enough that I found my first-ever example of this subspecies.

T. s. infernalis features a basic Common Garter Snake pattern of three stripes of yellow or blue over a primarily red body, with a row of black spots or blotches appearing along its sides. The red can be prominent, depending on the specimen, or less distinguished, with the snake appearing to be mostly black with minimal red markings. This subspecies features an orange or red head and can vary significantly in appearance based on its geographical location.

Although most hobbyists are familiar with the “neon blue” color morph of this snake, that version is only found in a few counties. Most specimens resemble Red-sided Garter Snakes (*Thamnophis sirtalis parietalis*) or Valley Garter Snakes (*Thamnophis sirtalis fitchi*).



California Red-sided Garter Snake Habitat in Marin County.

The author's first-ever encounter with a California Red-sided Garter Snake in August of 2011.

A Marin County specimen with a yellow dorsal stripe that the author found in April of 2021.

In the counties adjacent to the San Francisco Garter Snake’s (*T.s tetrataenia*) range, the blue-striped version California Red-sided Garter Snake looks very much like a San Francisco Garter Snake except with dark blotches in its red side stripes; its lifestyle and habits are remarkably similar to *T.s tetrataenia*. At the present time the Garter Snakes found at Stanford University are considered to be intergrades between these two subspecies. The blue-striped variety tends to be thin-bodied and not particularly large – about two feet in length for males and on average about 28 inches in length for females.

In the 1990s a dispute arose over the naming of the San Francisco Garter Snake and the California Red-Sided Garter Snake. Taxonomists Jeff Boundy and Doug Rossman made a surprising discovery. In preparation for a systematic review of the genus *Thamnophis*, they decided to check the type specimens that anchored the subspecies names *infernalis* and *tetrataenia*. Much to everyone’s surprise, they found

that the type specimen for *tetrataenia* that had been deposited in Paris Museum of Natural History in 1835 was actually an *infernalis*, as evidenced by its color and pattern characteristics. Their findings appeared in *Copeia* [1995 91]: 236-240]. A nomenclature change never occurred, but the “neon blue” morph’s similarity to *T.s tetrataenia* is hard to deny – especially after observing a fair number of both in the field.

Outside of Marin, Sonoma and one or two other counties, the “look” of the California Red-sided Garter Snake is decidedly different than the “neon blue” morph. These snakes tend to be larger in size, have a yellow dorsal stripe and feature mostly black sides with few red markings.



California Red-sided Garter Snake habitat in Santa Clara County.

The author (with his co-herpers) and an adult female California Red-sided Garter Snake in Santa Clara County.

A Santa Clara County California Red-sided Garter Snake that looks a lot like a Valley Garter, except for its red head.

The California Red-sided Garter Snake is endemic to California. It ranges from Humboldt County, along the coast (with most of San Francisco Peninsula excluded), east of San Francisco Bay to San Diego County, along the central and southern coasts.

Although *T. s. infernalis* is typically associated with permanent or near-permanent bodies of water such as marshland, shallow water, and dunes, it is actually a habitat generalist. I have found them in deeply wooded areas, grasslands, mixed woodlands, farmlands and chaparral. But in fairness, I most often encounter them along waterways.



California Red-sided Garter Snake habitat in Mendocino County.

A wild Mendocino County California Red-sided Garter Snake.

A Mendocino County California Red-sided Garter Snake with a gray dorsal stripe.

Like most subspecies of the Common Garter Snake, it eats a wide variety of prey, including frogs and salamanders and their larvae, fish, birds, small mammals, reptiles, earthworms, slugs, and leeches.

This subspecies is famous in the scientific world for its ability to kill and eat adult Pacific Newts (*Taricha*) which contain a poison known as tetrodotoxin that is deadly to most predators. These snakes are believed to also store the newt's toxin to protect themselves against their own predators. An arms race between *T. sirtalis* and the tetrodotoxin contained in *Taricha* has been documented, with newt toxicity varying by location and snake resistance to the toxin also varying by location.



Some of the author's set-ups for keeping Garter Snakes.
California Red-sided Garter Snakes basking under an overhead light.

The care and breeding of the California Red-sided Garter Snake is fairly straightforward if you keep in mind two things. First, compared to other types of popularly kept garter snakes, *T. s. infernalis* generally does not like to be handled. This subspecies is often described as "spastic" and will often thrash around when restrained, release musk and sometimes bite. I regard Garters Snakes as "terrarium animals" that are best observed and not handled and this subspecies definitely lives up to that philosophy.



One of the author's California Red-sided Garter Snakes giving birth.
One of the author's California Red-sided Garter Snakes with her offspring.
This subspecies seems to average between 8-20 babies in a litter.

The second thing to keep in mind is that *T. s. infernalis* is prone to vitamin B1 deficiency more so than any other Garter Snakes that I have experience with. Even if fed a "safe" diet of silversides and tilapia, I've observed these snakes exhibit the telltale loss of motor skills, crawling upside down and restlessness associated with a thiamin deficiency.

Fortunately, in most cases this has been easily solved by giving the affected snake liquid vitamin B1. So a varied diet is important and giving vitamin supplements (something I don't do with any of the other snakes that I work with) is recommended.

I tend to keep my garters in screen-covered aquariums with semi-naturalistic set-ups. I vary the tank size in accordance with the size of the snakes kept in them. For heat I generally use an overhead basking light on a timer combined with a heating pad left on all the time (except during winter cooling) placed underneath part of the cage.



Adult Marin County California Red-sided Garter Snakes produced by the author.

The vivarium must be secure to prevent escapes and free from hazards that might cause injury. Garter Snakes are active snakes that love to explore, and are enthusiastic climbers and swimmers, so although they may seem small and of slender build, they still need plenty of room to accommodate their preferred lifestyle.



Newborn California Red-sided Garter Snakes usually have muted colors that become more intense with each shed.

A California Red-sided Garter Snake at a few weeks old, starting to get its colors.

A six-month-old "high red" California Red-sided Garter Snake produced by the author.

For substrate I use ordinary potting soil with about 20 percent sand mixed in. Over the top of the soil, I place either a layer of dried leaves or cypress bark. This is important, because soil can hold moisture, and although garter snakes are often found in moist habitats, their skin must be kept dry to prevent skin infections.

I like to include live plants in my Garter Snake enclosures. By far the easiest terrarium plant to keep is Pothos (*Epipremnum aureum*). Pothos is a vine with heart-shaped green leaves featuring different color variations of white and yellow, depending on the variety. It is durable and tolerant of a wide range of light and watering conditions, making it an ideal terrarium plant. If I have live plants planted in the soil, when watering them, I pour water near the base of the plant to limit substrate saturation. I also sometimes plant Pothos in pots or put cuttings of them in glass jars.



A couple of adult California Red-sided Garter Snakes produced by the author.

An incandescent bulb in a spotlight fixture at one end of the cage works well for creating heat and light. If kept at room temperature, a 40-watt bulb is usually enough to create a hotspot between 84 and 88 degrees Fahrenheit. The cool end of the enclosure should be between 68 and 72 degrees. I check cage temperatures using a reliable digital thermometer. I like using an under-tank heating pad for gravid females and they spend time on the heated area it creates when not basking under their light in the daytime as well as at night. I keep my lights on a timer starting at 8 hours when the snakes come out of winter cooling and advancing to 16 hours by mid-June, before gradually going back to 8 hours of light by mid-November.

A variety of naturalistic options exist in providing hiding areas for garter snakes. Cork bark provides a nice flat surface for them to hide under. There are some commercially available, naturalistic-looking caves on the market as well. Crafty keepers can build their own custom hiding areas out of stone or wood. I often use pieces of slate under the basking light. Sometimes the snakes warm themselves under the slate which has a gap underneath that can accommodate the snake.

The water dishes I use are large enough to allow snakes to completely submerge in and soak.



A typical Marin County California Red-sided Garter Snake and a "high red" Marin County example – both produced by the author.

My adult California Red-sided Garter Snakes mainly eat chopped rodents mixed with chicken hearts. I occasionally add fish to the mix, but it seems a whole-food diet of rodents satisfies their nutritional needs. Newborns will eat live guppies, but I tend to avoid feeding them earthworms and try to switch them over to rodents as soon as feasible. These snakes grow fast and males can successfully breed at less than one year of age. Females can reach near-adult size in one year, but usually don't breed until their second year.

For snakes that I wish to breed, winter cooling goes from late November to mid-February. The snakes are kept in their enclosures with no heat and whatever natural light is present. Winter cooling temperatures vary, but average about 55 degrees F. I tend to keep my California Red-sided Garter Snakes in pairs year-round and breeding is often observed not only in early spring, but also in late summer after my females have given birth.



A female and male "neon blue" morph originating from Marin County.

The number of babies produced varies widely. I've had litters as small as two and as large as 44. My records indicate that 8 to 20 babies would be average-sized litters. Their babies are significantly smaller than newborns from Garter Snakes that usually produce small litters, like Coast and Santa Cruz Garter Snakes (*Thamnophis atratus atratus*). *T. s. infernalis* are born with faint colors, which become increasingly brighter as the snakes mature and shed. For the "neon blue" morph, most juveniles are born with yellow stripes that become successively more blue over time. This variety hits its peak color vibrancy at 18 to 24 months of age and then often begins to fade.

This is an exceptionally attractive reptile that is a thrill to find in the field and is enjoyable and easy to keep and breed in the home. Here in the United States, interest in keeping Garter Snakes has increased in the last few years and the California Red-sided Garter Snake is a large part of why people find *Thamnophis* so appealing.

Tim Spuckler has been breeding snakes for over 30 years and has many photos of the snakes he's worked with as well as his field outings on his webpage: www.thirdeyeherp.com

Published in The Garter Snake - European Garter Snake Association © Copyright 2024 Tim Spuckler