

# Sketches

JULY/AUGUST 2019 • VOLUME 70 • NUMBER 6

## SAN DIEGO AUDUBON

*The Nat's  
Amphibian  
and Reptile  
Atlas of  
Peninsular  
California*



From top: Blaineville's Horned Lizard (formerly Coast), Desert Horned Lizard, and Flat-tailed Horned Lizard. All are native to San Diego County.

Illustration by David Stump



# The Nat's Amphibian and Reptile Atlas of Peninsular California

*The Ancient Classes of Reptilia and Amphibia Get High-Tech Presentation on the Nat's Website*

by David Stump



Red Diamond Rattlesnake (top) and Isla San Lorenzo Diamond Rattlesnake.  
Top photo by Karen Straus, lower from SDNHM

The San Diego Natural History Museum has created two landmark books with the *San Diego County Bird Atlas* published in 2004 and its more recent companion, the *San Diego County Mammal Atlas*. Sketches has published feature articles on both. There is also an extensive and detailed Plant Atlas of regional flora which can be viewed on their website ([www.sdnhm.org](http://www.sdnhm.org)). As part of the museum's dedication to the biodiversity of our region, and commitment to the original mission to promote understanding of the evolution and diversity of southern California and the peninsula of Baja California, they have developed an on-line atlas ([herpatlas.sdnhm.org](http://herpatlas.sdnhm.org)) that is continuously updated and expanded—the *Amphibian and Reptile Atlas of Peninsular California*.

The staff of the museum's Biodiversity Research Center of the Californias and a large cadre of citizen scientists maintain a comprehensive site that provides vital information on all 189 species of herpetofauna found from Orange County to the tip of Cabo San Lucas—an approximately 860-mile stretch of diverse habitats. Over the past decades, much has been learned about the biodiversity of Baja California, and a significant part of that is the naming of several new species and the reclassification of well-known animals and plants. There are plans to expand the site.

Just over half (91) of the species identified in the atlas are lizards, and roughly another third (56) are snakes. Most of the 15 species of turtles are sea turtles or introduced freshwater species. The state-protected Western Pond Turtle is the sole native freshwater turtle in southern California. Our amphibian count is much lower—21 frog and toad species (including 7 non-natives), and only 6 salamanders, all natives. Within these species totals we see a wide diversity of animals, with many adapted to specific plant communities, geologic formations, altitudes, including

temperature/rainfall zones. While these numbers are well under half of the avian species count for San Diego County alone, this taxonomic component of the total biodiversity of our region is significant for important reasons. Native reptiles and amphibians do not naturally have rapidly expanding or flexible ranges, as of course they can only get places by crawling. Most will live out their lives within a few acres at most. They are therefore signature species, whose presence or absence may reveal much about the overall health of a given ecosystem. They can be just as strong an indicator of climate change as birds are.

A fascinating dimension of this digital atlas is the large number of islands that cluster along the Pacific coast and the Gulf of California. Somewhat like the Galapagos, they are home to numerous endemic reptiles, many named for the islands they have colonized. Most have close mainland relatives, but the differences reveal the adaptations that shape the animal to the unique conditions they encounter on a specific island. A list of the Baja island endemics described on the website is provided on page 4. And yes, there is a species named the Dead Side-blotched Lizard. (Now you *have* to visit the site.)

Typically range maps (species distribution polygons) show a contour drawing colored in to show the perimeter of locations where a specific animal or plant has been recorded. This of course can be significantly misleading, as much of the shaded-in area is likely to be devoid of actual populations. The perimeters themselves may often be little more than educated guesses. The bird and mammal atlases mentioned above use a far more sophisticated grid system, based on carefully verified field observations made over years to show a complex mosaic of sighting densities. This atlas uses three mapping

models: the aforementioned polygon map, dot distribution maps that provide a map built out of proven loci, and the information-rich atlas mapping interface (basically the push-pin model seen in Google searches for desired retail locations) which, when clicked on, provide vital statistics from the field observations. Taken together these three models present a composite far transcending the binary “here/not here” approach with a more scientifically descriptive overview of the presence of a given species within the complexity of our changing landscapes. They also are developing a model-based approach which can currently be seen on the map for the Flat-tailed Horned Lizard.



Garden Slender Salamander Photo from SDNHM



The Western Pond Turtle, our sole native freshwater turtle, faces diminished and fragmented habitat.





The dune specialist Coachella Fringe-toed Lizard (on far left), one of three closely related species found in the California deserts, has been reduced to a few pockets of viable habitat.

Southern California has several reptile species that are fairly widespread in Baja but have a very limited U.S. range. These include the Granite Spiny Lizard (shown to left), the Orange-throated Whiptail, the Granite Night Lizard, the Banded Rock Lizard, and the Red Diamond Rattlesnake (on facing page).

Photos provided by SDNHM

The three species of horned lizard illustrated on the cover are each native to San Diego County and represent the local diversity found within just one lizard genus, *Phrynosoma*. There are 21 species of horned lizard currently described, ranging from the Canadian border to southern Mexico, and from the Pacific coast to Texas. Most are under threat, for a list of reasons familiar to us: habitat loss to development and agriculture, degradation and fragmentation of habitat, direct removal (illegal collection), other environmental changes (such as roads) that lead to higher mortality, and introduced species. In the case of the Blaineville's (formerly named Coast) Horned Lizard, it is the introduced Argentine Brown Ant, inedible to the lizard, that is of concern: They replace the native species of ants the lizard depends on as its principle food source. The intense fires, droughts and extended heat waves we are learning to associate with climate change are likely contributing to their decline as well.



Arroyo Toad Photo provided by SDNHM

The seldom seen Flat-tailed Horned Lizard, also illustrated on the cover, is a case study of a species under continued pressure in some of its main strongholds—in a regional example, the Coachella Valley. This broad, flat agricultural valley north of the Salton Sea is framed on the west by the San Jacinto ridgeline, and on the east by Joshua Tree National Park. The Flat-tailed is specialized for sparsely vegetated sandy flats and dunes, a habitat shared with the endangered Coachella Valley

Fringe-toed Lizard (shown at top of page), a true dune specialist. Most of their habitat in the valley has been lost to the rapid and extensive urbanization of the Palm Springs/Indio corridor and the impact of a growing human population on the fragile desert environment. Both species are especially vulnerable to off-road recreation. The Flat-tailed Horned Lizard, after many years of governmental wrangling, now receives some state protection as a species “of special concern.”

An especially valuable feature of the Nat's website is the interface it has created via iNaturalist for citizen scientists to upload their own data and photos. They serve two such projects, one for Southern California and one for Baja California. The first, named RASCals (Reptiles and Amphibians of Southern California) is a partnership including the Nat, the Natural History Museum of Los Angeles County, the Santa Monica Mountains National Recreation Area, and the La Brea Center for California Conservation Science at UCLA. The second, Herpetofauna de Baja California, covers all of Baja. This networking of professional biologists, academics, and citizen scientists represents a genuine hope for creating detailed, reliable, and up-to-date data that may prove valuable in providing needed protections for the growing number of vulnerable species.

Each of the 189 species has its own page featuring a photograph, a very brief description, basic distribution information, and general status. The herpetology department at the museum does not organize its collection based on sub-species. This site was not primarily designed for species identification, as only one photo is provided for each species and herptiles can be highly variable in both color and pattern. Indeed, some will change in appearance over the course of a few hours depending on light and temperature. Many are sexually dimorphic. Perhaps the best website for identification of California herpetofauna is [www.californiaherps.com](http://www.californiaherps.com). The *Stebbins Field Guide to Western Reptiles and Amphibians* remains, arguably, the most useful for clear and accurate descriptions, though printed books are always at risk of lagging behind taxonomic changes. Silverwood Wildlife Sanctuary provides a comprehensive checklist of all reptiles and amphibians found in the sanctuary (see article on page 5). The list includes 30 reptiles and 8 amphibians. Whatever their governmental status, they are all safe at Silverwood.

On your next birding walk, remember to look down as well as up, and pause a moment to consider the small creatures that have skittered, slithered, and hopped across both Alta and Baja California for tens or even hundreds of millennia.



Greater Roadrunner with its prize, a Western (or Tiger) Whiptail. Herptiles are prey for many species of birds, some which rely on them as a significant food source.

Photo by Karen Straus



## A Thousand Mile Chain of Baja Islands Is Home to a Myriad of Unique Reptile Species



### Reptilian Island Endemics of Baja California

#### Lizards:

Isla Cedros Alligator Lizard  
Isla Los Coronado Alligator Lizard  
Piebald Chuckwalla  
Spotted Chuckwalla  
Spiny Chuckwalla  
Isla Santa Catalina Spiny Lizard  
Isla Angel de La Guarda Collared Lizard  
Isla Cedros Horned Lizard  
Isla Cerralvo Sator  
Isla Santa Catalina Side-blotched Lizard  
Swollen-nosed Side-blotched Lizard  
Enchanted Side-blotched Lizard  
Dead Side-blotched Lizard  
San Benito Side-blotched Lizard  
Isla San Marcos Barefoot Gecko  
Isla Santa Catalina Leaf-toed Gecko  
Isla Partida Leaf-toed Gecko

Isla Monserrato Whiptail  
Isla Espiritu Santo Whiptail  
Isla Santa Catalina Whiptail  
Isla Carmen Whiptail  
Isla San Francisco Whiptail  
Isla San Jose Western Whiptail

#### Snakes:

Isla San Marcos Night Snake  
Isla Partida Norte Night Snake  
Isla Cerralvo Long-nosed Snake  
Isla Santa Catalina Kingsnake  
Isla Todos Santos Sur Mountain Kingsnake  
Isla Cerralvo Sandsnake  
Isla Cedros Gopher Snake  
Isla Coronado Rattlesnake  
Isla Santa Catalina Rattlesnake  
Isla Angel de La Guarda Rattlesnake  
Isla Tortuga Rattlesnake  
Isla San Lorenzo Diamond Rattlesnake

*The island endemic Isla Todos Santos Sur Mountain Kingsnake (top) is closely related to the widespread but rare California Mountain Kingsnake (below), but lacks the bright red bands. Photos provided by SDNHM*

## The Sixth Great Extinction: Coming to a Habitat Near You

*"Biological diversity is the key to the maintenance of the world as we know it."* E.O. Wilson

Following a week-long meeting in early May, a coalition of scientists and governments published an unparalleled global report that finds that the biosphere's diversity of species is declining at a rate unknown throughout human history. This report has been endorsed and adopted by governments around the globe, as members of the Intergovernmental Science-Policy Panel on Biodiversity and Ecosystem Services.

The bottom line: A projection of 1 million species lost, many within decades. In case you're wondering what the total planetary species count is, it is estimated to be 8 million, including 5.5 million insects. The extinction rate is somewhere between tens to *hundreds* of times higher than during any era in the past 10 million years, and the rate is accelerating. It appears that the "sixth great extinction" is indeed upon us.

The compelling evidence from this systematic review of about 15,000 scientific and government sources, compiled by nearly 150 expert authors from 50 countries over three years, now urges transformative change, as rapidly as possible. The pressing question for the greater and growing environmental community is: What does it take to turn things around, and how quickly? And, critically, how much can be saved? San Diego Audubon is ramping up to address these major environmental concerns with decisive and focused local action.

### San Diego Audubon Is Training Tomorrow's Conservation Advocates

This year, San Diego Audubon launched a training program for folks interested in becoming better advocates and getting their feet wet in the real world of conservation advocacy. The goal of the training is to increase the success of our conservation work for birds, other wildlife and their habitats with a focus on equity, diversity and inclusion. It is funded by a grant from National Audubon.

About 20 people started the Audubon Advocates Training in late April, beginning the five-month program with a group pot luck and overview of the aspirations and logistics of the training (*see photo at right*). The training is free, counts for college credit, and offers skills and perspectives such as how to use CEQA for advocacy, how to talk to elected officials, and a history and current understanding of environmental justice. Advocates also chose a topic for an advocacy project and work with other participants to define and achieve a conservation action.

The topics that the groups have chosen are exciting, and they're issues that San Diego Audubon needs and wants to address. Trainees chose to focus on native plant restoration, climate change communication, the Salton Sea, Tijuana River Valley water problems, and the ReWild Mission Bay project. Stay tuned for the fruits of their work on each of these topics over the summer and into the fall. This training is an excellent opportunity to gain experience in real-world conservation advocacy, make friends and build networks in the environmental field, and generate progress on an issue that you're passionate about. We hope to run it again next year. Other programmatic advances, some in place and others being planned, will give us higher visibility, stronger impact, and greater reach. Our two sanctuaries secure invaluable habitat for many hundreds of species of plants and animals. Our various education programs touch thousands of people each year, both young and old. If you want to be a part of the local solution to the global challenges described above, there may be few better places to invest your efforts than San Diego Audubon.





# Silverwood Scene

## Adding to the Snake List: The Elusive Serpents of Silverwood

By Phillip Lambert, Silverwood Resident Manager

Over the 15 years I've spent working at Silverwood, I have been able to observe many exciting and wonderful species of wildlife. Yet, as I examine the species log compiled by Frank Gander, Silverwood's first manager, from 1966 through 1976, I see a number of mammals and reptiles I still have not observed here at the sanctuary.

What makes up for that, though, are the new species I've observed that were never before recorded here. The snake sightings are particularly exhilarating for me. Of Gander's list of 18 snake species at Silverwood, the 11 that had been observed and recorded on the sanctuary are denoted by an asterisk. The seven others were included based on range maps suggesting only a possible presence. During my time here, I've been able to confirm three of those possibilities.



San Diego Night Snake

The first of the new species I observed was the San Diego Night Snake (*Hypsiglena torquata*) in July of 2007. This recent resident of Silverwood ranges from Northern California through Baja California. It can grow to 24 inches in length, with vertical pupils and a pair of dark brown blotches on the side of its neck. Being nocturnal and a crepuscular prowler (meaning it's active during twilight hours), it is rarely seen. It feeds on lizards, snakes, frogs, salamanders, and other small animals, subduing its prey with venom injected from enlarged teeth at the back of the upper jaw. Fortunately, its venom is usually harmless to humans. Since that first sighting, two more have been spotted here.

The second new sighting came during September of 2009: a roughly foot-long California Lyre Snake (*Trimorphodon lyrophanes*). Named for the V-shaped mark on the top of its head, it had a gray body with brown square blotches on its back. This specimen has a greater number of body blotches than the Sonora Lyre Snake (*T. lambda*), also found in Southern California and Baja. And like the San Diego Night Snake, its pupils are vertical. Being nocturnal, it emerges at night from its rocky retreat to feed on lizards, birds, and small mammals and amphibians. It subdues its prey with a mild venom injected from enlarged grooved teeth toward the back of its upper jaw. A bite from Lyre snakes may cause localized swelling in humans. The species can grow to 48 inches long, leading me to suspect that the 12-inch snake that made an appearance at Silverwood 10 years ago was very young—and strongly suggested the presence of other young plus the fertile adults that produced them.



California Lyre Snake (Immature).



Western Patch-nosed Snake

to identify it, as will the location where it's found. It is terrestrial but also climbs shrubs in pursuit of prey. Acute vision allows this snake to escape quickly when threatened, making it so difficult to observe or capture during the heat of the day. Enlarged back teeth might be used to envenomate prey, while the enlarged rostral scale on the tip of the nose is thought to be useful in excavating buried lizard eggs or digging into underground burrows. A Western Patch-nosed Snake in San Bernardino County was observed in an apparent attempt to catch a small rodent by forcefully ramming its head into the dirt at the base of a Creosote bush which opened a small hole in the ground, and crawling into the hole. A small rodent emerged from a different hole under the bush and ran away.

So far, over the past 53 years, there have been no sightings of the other four species: Western Blind Snake (*Leptotyphlops humilis*), Coachwhip (*Masticophis flagellum*), the Glossy Snake (*Arizona elegans*), and the Western Black-headed Snake (*Tantilla planiceps*). Perhaps you'll be the lucky one to break one of those streaks the next time you visit us at Silverwood Wildlife Sanctuary.



Patch-nosed Snake showing enlarged rostral (nose) scale, used for probing and digging.

### Silverwood Calendar for July 2019

Please note: There will be no Sunday guided nature tours during the month of July.

**July 7, 14, 21, and 28 (Sundays)** — Open visitation from 9 am to 4 pm.

**July 3, 10, 17, 24, and 31 (Wednesdays)** — Open visitation from 8 am to noon (members only).

**Silverwood will be closed during the months of August and September due to predicted extreme heat and fire danger.**

All photos on this page were taken at Silverwood by Phil Lambert. Visit [www.sandiegoaudubon.org](http://www.sandiegoaudubon.org) for complete species checklists.



The first time I learned about the destructive power of wildfire, I was a child. Standing on the front porch, the collar of my T-shirt pulled over my mouth as a makeshift mask, I caught ashes in my hands, ghost white and fragile. What was it before it burned, I wondered? Was it from a tree? Someone's home? A photograph? The air around me swirled with the ash as I looked out at the smoke in the horizon.

This might sound like a familiar scene to you, or perhaps you've experienced a wildfire at closer range. Many of us have. Due to drought and climate change, the fire season has stretched across most of the calendar year in California, with fire danger signs stuck in the red for much longer than they used to be. In a way, the fear of a fire unites Californians.

Last year was one of the most destructive fire years on record, with more than 8,500 fires throughout our state. But the real problem is not necessarily quantity, but intensity. It's a concern that became too real for us in late 2017 when the Lilac Fire that originated in Bonsall came dangerously close to Anstine-Audubon Nature Preserve in Vista. Other nature preserves in Southern California haven't been as fortunate as Anstine in avoiding a blaze, including our own Silverwood which was temporarily reduced to ashes in the devastating Cedar Fire over a decade ago.

However, while wildfires often leave native landscapes denuded of vegetation and of little use as habitat to most animals for many months or even years, it's important to remember that native ecosystems in fire country are remarkably adaptive. Wildfires



Cottonwoods completely burned, with new growth from burl. Photos by Rebekah Angona.



Wild Cucumber

are a natural part of life in California's chaparral, historically occurring every 30 to 150 years. And California wildlife thrived long before brush clearings and fire suppression. Just how are our native species adapted to the historical fire pattern? And how can we get back to it?

Native plants use one of two main strategies to survive

with the parent plant burned away but its offspring germinating by either heat from the fires or the chemicals from the smoke and char. Most species of *Ceanothus*, or mountain lilac, are germinated by heat. Both strategies have their strengths and weaknesses, as the resprouter survives the fire, but at the cost of creating genetically identical plants; while the obligate seeder, though providing genetic diversity, requires rain and other favorable conditions to reseed the next generation. A third strategy used by facultative seeders, such as California Buckwheat (*Eriogonum fasciculatum*) and Monkey Flower (*Mimulus aurantiacus*), employs the best of both, surviving by burls and seeding combined. Each of the aforementioned plants can be found at Anstine and are common to a healthy sage or chaparral ecosystem.

All this leaves the question: If fire is so integral to the reproduction of these plants, why are wildfires larger and more intense now, when there's so little of the native habitat left? Why were fires generally less destructive in the past? To put it bluntly, it's us. Upturning soil from construction and clearing out "overgrowth" (a gardening term, not one properly applied to native habitat) ruins seed banks and leaves space for invasive species like Black Mustard (*Brassica nigra*) and Bromus (*Bromus diandrus*) to thrive. These species grow more quickly than our natives and burn with a higher intensity, leading to fires that



The Monkey Flower recovers after fire from both seed and burl.

can burn too hot for our natives to survive. Additional pressures from disease and drought kill off or weaken plant life.

What can we do to help? Protect what native habitat is left, especially old growth sage scrub and chaparral. Cleaning shoes between hikes stops the spread of invasive seeds and fungus. Become familiar with the native species in your area and grow them in your own backyard. Support laws that work with nature, not against it.

Wildfire is an inevitable part of life in California, but we don't have to destroy native habitat to protect ourselves from it. If we're to survive like our wildlife has, we would be wise to adapt our way of life rather than attempt to change theirs. Let's not be united by fear but by knowledge.

**Anstine will be closed from July through September.**



# The Shorebird Guide: A Review by Shari Dorantes Hatch

O'Brien, Michael, Richard Crossley, & Kevin Karlson. (2006). *The Shorebird Guide*. New York: Houghton Mifflin. (477 pp.)

Most San Diegans live near a shore, where the looks, actions, and calls of shorebirds offer abundant delights. Our local shorebirds include an oystercatcher, a stilt, an avocet, 6 plovers, and 25 sandpipers, as well as 16 more shorebirds rarely seen here (fewer than 100 sightings ever reported to eBird). Though some other orders of birds include many more species, shorebirds can challenge the identification skills of even experienced birders. Shorebird plumage tends toward an earth-toned palette, and many shorebirds share similar coloration patterns. What's more, typical shorebirds are small and relish wading along distant mudflats. Seasonal and life-span variations in plumage further complicate identification. What can a puzzled birder do? Read *The Shorebird Guide*.

These authors help readers to focus on four basic keys to identifying shorebirds: *relative size*, *structure* (e.g., shape and length of body, bill, and wing), *behavior* (e.g., foraging, flying, walking), and *vocalizations* (e.g., flight songs, alert calls). The book's introduction describes how to use these keys and offers an overview of shorebirds, their topography (feather groups), and their distinct families of species. Applying the four keys to shorebird families can help to narrow down the possibilities for birds seen in the field.

The next section, "Species Photos," offers almost 300 pages of vivid photos of shorebirds, organized by families and offering range maps by species. For each species, the size, structure, behavior, and vocalization are not only described but also beautifully illustrated with numerous photos, including large portraits, birds in context, and plumage variations related to season and age. Each photo is identified by season and location, approximate age of the bird, and tips regarding what features will aid in identifying the bird (e.g., small head, slim neck; bright orange-red orbital-ring; laterally compressed bill; browner than other peeps; upright stance; spins in water; flight call is a hard, squeaky *pwit*).

Following the photo section is the "Species Accounts" section, more than 100 pages of information on each species, including its *status* (distribution and abundance), *taxonomy* (subspecies, if applicable), *behavior* (habitat, foraging style, etc.), *migration* (e.g., route, length, timing), *molt* (timing, extent), and *vocalizations* (phonetic descriptions of the most common vocalizations for primary calls).

The book closes with an appendix (quiz answers and photo information) and an explicit glossary (from *accidental* to *wing point*). One more thing: The rear endpapers of the book offer two pages of shorebird silhouettes, highlighting size and shape. Reading this book will embolden you to identify some of our most challenging shorebirds. ***This book is among many available for borrowing from our San Diego Audubon Society's library. Please stop by and check it out.***



Whimbrel  
by Ed Henry



A Great Blue Heron's  
Great Orange Fish Tale

These photos taken by Audubon member Cindy Hedgecock at the SD River Flood Channel show a dramatic struggle played out between a hungry Great Blue Heron and a desperate Garibaldi (our state fish), with gulls in constant pursuit.







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## Sketches SAN DIEGO AUDUBON

**SKETCHES** is published bimonthly, in odd-numbered months.

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