



TORREYANA

THE DOCENT NEWSLETTER FOR
TORREY PINES
STATE NATURAL RESERVE

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Analyzing the Future of Torrey Pine Trees

by Joan R. Simon

Dr. Katie Heineman from the San Diego Zoo Wildlife Alliance (SDZWA) brought a wealth of information to the June 14 general meeting about one of our favorite topics: the Torrey pine tree. She is Program Officer for Biodiversity Banking at SDZWA, where threatened species, such as the Torrey pine, are conserved in biological collections for future conservation action and research.

Dr. Heineman started with some very old history: 1.2 million years ago, the earliest Torrey pine population was separated by the movement of tectonic plates, creating the two subspecies we have today in TPSNR and on Santa Rosa Island. Perhaps surprisingly, the population of Torrey pines has been consistently small over its evolutionary history and never larger than what exists today. With only two small natural habitats, it is probably the rarest pine in the world, with a population of 3000 – 4000 trees.

It is also a moderately common and easy-to-propagate species in the San Diego area, with at least ten nurseries offering plants for sale. And it can be found in botanical gardens around the world. More significantly, there is a non-native population along California's central coast that has grown exponentially in recent years. It has been most successful in the Monterey area, where ironically it has become a threat to the federally endangered Monterey gilia (*Gilia tenuiflora* ssp. *tenuifloralar*).

More than 100 years ago, the need to protect the two native Torrey pine



Docent General Meeting

Date: Saturday, July 12, 9:00 am

Location: St. Peter's Episcopal Church Parish Hall, Del Mar

Speaker: Erin Xavier, Scripps Institution of Oceanography

Topic: Our Health in a Changing Climate

Extreme heat waves and poor air quality are fueling a public health crisis. Ms. Xavier will talk about how climate change is affecting our health and explore research and solutions to protect our communities. She holds a Master of Public Health in Environmental Health Sciences from UC Berkeley.

Refreshments: Docents with last names beginning with **H, I, J, K** will be responsible for providing snacks for this meeting.

populations became paramount. In 1889, there were fewer than 100 mature Torrey pines on Santa Rosa because sheep grazing had prevented propagation. Protections began to be put into place against sheep and later other grazing herbivores, and the population of Torrey pines on Santa Rosa has rebounded.

In the late 1800s, Charles Parry, who had discovered and named the Torrey pine in 1850, became concerned about its ability to survive in its natural groves with encroaching urbanization. In 1899, he secured an ordinance from the City of San Diego to set aside the area as a public park. Between 1909 and 1912, Ellen Browning Scripps purchased the land that is now the Guy Fleming and Parry Grove Trails and donated it to the public park. In 1959, the park was turned over to the State and became Torrey Pines State Reserve.

The next (and continuing) threat to Torrey pines has been infestations of bark beetles (*Ips paraconfusus*), with two massive die-offs: 1988 to 1993, with 800+ trees dying; (Cont. on pg. 3.)

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President's Message

Stewardship: At the Heart of What We Do

As volunteer docents at Torrey Pines, we wear many hats – educator, storyteller, guide – but perhaps the most meaningful is that of **steward**. Stewardship is more than a concept; it's a daily practice. It's how we care for the land, model respect for nature, and inspire others to do the same.

Each time we lead a walk, answer a curious question, or share a fun fact about native species, we're not just teaching – we're building deeper connections between people and the natural world.

That connection is the first step toward conservation. When visitors understand how ecosystems work and why they matter, they're more likely to care – and to act.

Stewardship also shows in quiet moments: staying on the trail, picking up a stray piece of litter, gently reminding guests not to feed wildlife. These simple acts, especially when observed by others, help set the tone for responsible behavior outdoors.

Being a good steward also means being a lifelong learner. Nature constantly changes, and so do we. Staying curious and open allows us to grow alongside the environments we love.

In today's world, where our wild spaces face increasing pressures, your role as a docent is more important than ever. You are not only helping people enjoy nature – you are helping them understand why it matters.

Thank you for all the ways you show up as stewards. Every story you share and every thoughtful moment you offer leaves a lasting impact. We sincerely appreciate it.

The New Docent Training committee had its kickoff meeting in early June. Composed of **Ingo Renner, Barbara Wallach, Pao**

Chau, Gabriele Wienhausen, Allen Heryet, Julia Halter, Susan Elliott, Cres Torres, and Coach Vance, this group will plan and execute the next training program. Barbara and Pao were elected co-chairs.

I want to extend a huge thank you to the rethinking the NomCom committee members who delivered an excellent report to the Board: **Linda Brown, Santosh Nichani, Janice Bernard, Myrna Trust, Jeannie Smith**, and chair **Bob Friedman**. A job well done!

Lastly, I also want to thank **Mukesh Mehta** and **Lisa Kakone** for their continued work on CEED events. The visit to Leo Carrillo Ranch on June 6 was a great success (see pg. 5).

Happy trails,

Matt Xavier

TPDS President



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(Cont. from pg. 1.) and 2014 to 2018, when 500+ trees died, totaling 12% of the existing trees. These two beetle infestations were initiated by periods of drought and, given our increasingly dry conditions, they are expected to recur.

In 2022 a new threat emerged: pitch canker, which affects large swaths of a tree's crown. Unlike bark beetle attacks, which are almost always fatal, large trees seem able to survive with pitch canker for long periods of time, but it has affected 50% of the pines in the Reserve. An additional concern was the 2024 wildfire in the Extension, which burned or scorched at least 54 adult trees.

Today, as in the past, small populations of Torrey pines continue to exist in their two natural habitats, but there are growing threats to their survival. With climate change, Dr. Heineman said, "It's probably not an option to just let nature take its course" to ensure the survival of the Torrey pines species. "We know there will be diebacks from drought and bark beetles, but our best defense is a good offense."

The focus of the SDZWA's management team is to learn more about how Torrey pines survive. The first task has been to determine what best supports a seedling's growth.

As an experiment, 522 seedlings were planted in three different ecosystems: 1) sites where Torrey pines

currently exist; 2) sites where Torrey pines have died; and 3) habitats where pines had not been previously growing. The seedlings were given only minimal irrigation during the first dry season in order to develop a model that was not onerous to maintain. The chart above shows an overall survival rate of 36%, which Dr. Heineman considered to be "fairly successful."

Researchers found that the most successful sites were the reforested areas where Torrey pines had succumbed to the bark beetle infection (e.g., the North Grove of the Guy Fleming Trail). Two factors were significant: the open canopy and nitrogen-rich soil from the former presence of Torrey pines. The forest sites with Torrey pines already present did not provide enough sunlight, and the novel habitats did not have sufficient nitrates in their soil. The winning formula seems to be: soil nitrate + open canopy = happy Torrey pines!

Another key factor was found to be the size of the seedlings. They need to be at least 1 foot (30 cm) tall to succeed, which means an initial two years of growth in a greenhouse – a disappointing finding, since propagation efforts will take more than one year for plants to achieve optimal planting size.

Another part of the program has been to install dendrometer bands on 200 trees in 10 plots. By measuring the gap in the band twice a year, these provide a proxy for radial growth.

Researchers are also looking for "health" attributes, such as signs of stress from red turpentine beetles, short or yellowing needles, signs of pitch canker – and for signs of resilience, such as the amount of active pitch. Their findings indicate east-facing slopes had lower mortality in the bark beetle dieback than west- and south-facing slopes.

An additional tool is taking core samples from trees and comparing the historical growth rate with current rates, determining the age of a tree, and analyzing growth during different climate modes.



The genetic diversity in the Torrey pines at the Reserve, as well as on Santa Rosa Island, is very low. An additional aspect of the management plan is finding ways to increase this limited diversity. Researchers are sampling genetics of trees in botanical gardens as well as the flourishing non-native population along the California central coast. In addition, the SDZWA is collecting needles from local San Diego properties and has asked Torrey Pines docents to participate in this project (see box below) to investigate how different the genetics might be between wild and captive Torrey pine populations. They are hoping to evaluate whether genetic diversity occurring outside the native population could be adaptive to trees in their native range.

The research group plans to put together the results from all of these projects in a document for State Parks by December 2025 to assist in the long-term management of trees at Torrey Pines.

We thanked Dr. Heineman for updating us on all the research that is happening around the Reserve and for participating in the docent training classes of 2024 and 2025. To view her full talk, click [here](#):

For more information on current research on the Torrey pine at the Reserve, see "State of the Pine" in the [May 2024 Torreyana](#).

Torrey Pine Tree on Your Property?

The San Diego Zoo Wildlife Alliance (SDZWA) is studying the genetic diversity of the iconic Torrey pine tree. If you have a Torrey pine growing on your property, especially within five miles of TPSNR, your tree could play a role in this research.

The SDZWA is collecting samples of pine needles (just three to five clusters per tree) over the next two months. You can gather them yourself with materials they'll provide, or have a team member come collect them.

Email researcher Ruby Iacuaniello to be a part of this research: ciacuaniello@sdzwa.org

General Meeting Minutes: June 14, 2025

Speaker: Katie Heineman, PhD, from the San Diego Zoo Wildlife Alliance on the past, present and future of Torrey pines (see pg. 1). Approximately 50 docents attended the meeting.

President **Matt Xavier** led the business meeting.

Docent of the Month: Coleen Huang, class of 2017, who works at the Lodge, TIK and BLIK.

Museum Shop: Valerie Thomas showed a new item in the Museum Shop: T-shirts from sizes 6 months to 7 years, with the TP tracks logo (see pg. 7).

TIK: Lisa Kakone noted that the deer skull model and the sea turtle shell at the TIK have been damaged. In the future, all the skulls will be kept in plexiglass cases. Unfortunately, the damage done to the sea turtle shell, which was stored improperly, probably cannot be fixed. Lisa asked that all TIK volunteers return items to their specific storage places in the cabinet. Please reference the photographs that are displayed on the inside of the cabinet doors for placement. If docents wish to add items to the TIK cabinets, please clear this with a TAC member: **Allan Heryet, Lisa Kakone, Gary McCook, Tony Mondini, Kathy Simmons**, or Ranger Stephanie Adams.

Selection Committee: Matt thanked the group that drew up new guidelines for the Selection Committee (formerly the Nominating Committee – see President's Message on pg. 2). The goal is to make the process of selecting TPDS board members more democratic and transparent. The new guidelines will be presented at the July meeting. Matt said that in the future we will be able to vote for board members online so that every member can participate.

Personal Property: Matt said that guidelines for the use of personal property at the Reserve were being drawn up.

Whale Bones: Matt encouraged docents to sign up for the project to excavate a gray whale skeleton at Camp Elliot on June 23 – 27. The whale was hit by a Navy ship off Mission Beach. The Navy subsequently transported the whale to Camp Elliot. The bones will be laser-measured and reconstructed and the 26' reconstruction will be available for display at Torrey Pines (date and location to be determined).

Utilities Project: Bids have gone out for the utility project which, will involve tearing up the park road between the Lodge and the pedestrian entrance at the TP Golf Course. It will include a sewer line, so that the bathrooms at the West Parking lot can be restored, and updated electrical and water lines. (Laws require that the water and sewer lines, when running in parallel, must be at least 10 feet apart.)

New Docent Training: The new nine-member docent training committee has been named, under the leadership of **Barbara Wallach** and **Pao Chau** (see President's Message on pg. 2). Further details on the program to come.

Docent of the Month: Coleen Huang

Photo by Herb Knufken

I was born in Chicago. My parents moved to San Diego in 1973 when I was in 7th grade. We settled in University City, and I have some memories of hiking Fat Man's Misery as a teenager. At that time, I had no real appreciation for Torrey Pines Reserve. After some time at UC Santa Cruz, I transferred to UC San Diego as a communication major. I never visited the Reserve just down the road during that whole time as a student!



Years later I settled with my husband in Rancho Bernardo, where we raised three sons. In 2007, my neighborhood was severely impacted by the Witch Creek Fire. We live directly up against a wildland-urban interface connecting to the San Pasqual Valley. My home barely survived, and I was struck by the moonscape that was left in the aftermath of the fire. This event, which was so tragic for many of my neighbors who lost their homes, opened my eyes to the unique natural environment I live in.

This led me to join up with the California Chaparral Institute. I went on hikes where I learned about the fragile and threatened coastal sage scrub and chaparral ecosystems. I came to learn about and truly appreciate the diverse native plant communities that surround us and about the features of a Mediterranean climate. I was fascinated to learn about the delicate process of vegetation renewal and adaptations to wildfires. During one of those hikes, I met a woman who said she was becoming a docent at Torrey Pines.

I kept that conversation in the back of my mind for many years. Then came November of 2016. I needed a way to get involved in environmental conservation efforts. I had a calling to help educate others about the magnificent natural environment we live in, and I wanted to be of service as a volunteer. It was my birthday, and my husband asked me what I wanted to do. I wanted to hike in the Torrey Pines Reserve. It was on the Guy Fleming Trail, looking out at the ocean, that the inspiration came to me to become a docent at Torrey Pines.

That has been my path to becoming part of this awesome group of people. Thank you for the Docent of the Month award. I am very proud to be a docent here. I really enjoy engaging with visitors from all over the world at the TIK and BLIK and sharing the magnificent wonder of Torrey Pines Reserve. But I have to admit, the best part of being a docent is that it renews my spirit.

Lodge Restoration Update

by Joan R. Simon

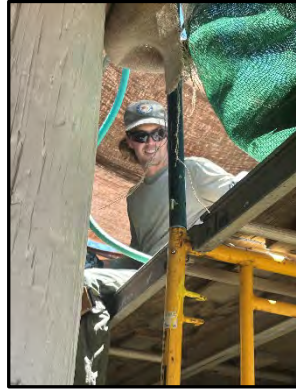
Work on the repairs to the Lodge began at the beginning of May. The focus was the inner right column (as you face the Lodge), which has been shored up with supports for close to ten years. But according to Corbin Schuppert, the state Restoration Specialist who is leading the project, "plans had to be altered" right from the start. Not only did the inner right column on the right side need to be replaced; the remaining three columns (two on each side) were failing and needed to be replaced.

The two inner columns on either side of the entryway were part of the original building that went up in 1923; within twenty years, two outer columns were added on either side of them. While the initial columns sat on concrete piers, the outer columns went down to the foundation and were embedded in the plaster wall. The workers saw that the outer right column had rotted out at an earlier time and was supported only by a simple two-by-four.

By the end of May, all four new columns were in place, with supports surrounding each of them. The two original inner columns now sit on custom steel plates secured to the concrete piers beneath them. The structural grout work that was applied with the plates required 28 days to cure. That phase will be completed by the week of June 23, when workers will be able to remove the supports holding up the columns. They will then begin to re-plaster around the columns.

The green construction fencing will remain in place until the re-plastering in front is completed. Re-plastering the entire outside of the Lodge will continue through the summer.

For more information on this project, see pg. 5 of the [April 2025 Torreyana](#).



Project director Corbin Schuppert on the scaffolding in front of the Lodge



Outer left column showing significant rot and previous alterations



New inner column atop stainless-steel plate and concrete pier

BLIK: Learn at Lunch

Date: Thursday, July 3

Time: 12 noon

Location: Docent shed, North Beach parking lot

Speaker: Jen Schlauch Saiyawong, UC Irvine

Topic: Native Bees of Wetlands

Bring your lunch, a chair, your curiosity, and all your questions about native bees! No need to register. You may claim one hour on Better Impact under Training, Continuing Education (up to 12 hours per year).

BLIK Learn at Lunch is the first Thursday of every month at noon at the Torrey Pines docent shed in the North Beach parking lot. All docents, park employees, and visitors are welcome.

CEED: Leo Carrillo Ranch Historic Park

by Mukesh Mehta

The June 6 CEED event was at Leo Carrillo Ranch Historic Park in Carlsbad. On a cool and drizzly morning, ten Torrey Pines docents attended this event. Our tour guide, Leo Carrillo docent Mike Schofield, pointed out that Leo Carrillo was a famous Hollywood actor, philanthropist, author and poet who starred in over 90 films. His full name was Leopoldo Antonio Carrillo. In 1937 he bought the property and began to build a ranch house that was inspired by historic ranchos of the early Californio era. The Carrillo family used the ranch as a vacation retreat and a gathering place for family and friends. During our walk, we saw and walked into some magnificent southwestern-style adobe hacienda architecture and rustic outbuildings that Leo Carrillo built.

Mike told us that in 1978 the City of Carlsbad acquired the ranch from the Carrillo family. Today, the ranch occupies 27 acres, and most of the historic landscaping has been preserved, such as queen palms, Canary Island palms, yucca, aloe vera, dragon trees, eucalyptus, olive trees, coast live oak, willow, and California pepper trees. Several peafowl (peacocks) share the ranch, descendants of the original birds that Leo Carrillo brought in back in 1937. The park is open daily with free admission and guided tours Saturdays and Sundays at 10 am and 1 pm. For more information, click [here](#).



Keeping Track of the Pelican Trackers

Interview by Dan Hammer

At the November 2024 TPDS meeting, Scripps marine ornithologist Tammy Russell outlined her groundbreaking research on tracking the elusive Brown Pelican. (Read more in the [December 2024 Torreya](#)) To learn where this work has led her since then, I recently interviewed Dr. Russell by phone.

Thanks for following up with us, Tammy. How is the tracking project going, and what have you learned in the past six months?

Since I spoke with you all last fall, we finished our annual report and have banded the first chicks in the U.S. In our report, we presented our findings that there were multiple pelican migration strategies: the *classic migrators* that go south and north once per year, the *residents* that stay within a small region year-round, and the *travelers* that undertake multiple coast-wide movements during the year. We also did our first survival analysis and found high survivability of our banded birds.

We have been working with Channel Islands National Park and others to band chicks in the Channel Islands. They deployed three of our eBands on chicks on Santa Barbara Island, and we hope to join them to band chicks on Anacapa Island this July. All the banded chicks fledged and were detected by [Motus](#) stations. All three first headed south for a short period, and two of them are already headed back north; one of the chicks was detected on June 2 on Point Loma. We had no idea chicks that breed in the Channel Islands moved south after leaving, so we are continuing to learn brand new things about this species through this work.

How are the eBands helping you to track the movements of individual birds? Have you added more bands?

Yes, we learned where the Channel Islands chicks are going, and every week we are getting additional detections of our birds. With longer datasets and more birds, we will continue to learn more and figure out what are “normal” movements for these birds and what is abnormal and hopefully better understand how they respond to poor conditions.

In mid-June, we are going to Todos Santos Island off Ensenada to band ten chicks with our collaborators at [Grupo de Ecología y Conservación de Islas](#). We then hope to get to Anacapa Island; hopefully the timing of the birds and our access will work out to get ten more eBands out there this season.

Are you still working with the [Motus](#) collaborative research network? How does this enhance your research?

Although we conduct other pelican research, most of our work centers on the [Motus](#) network. We have an amazing network of collaborators, from US Geological Survey and

National Parks to UC Davis and bird rehabilitation centers. Because Motus is open access, our sensor stations and technologies are helping other projects as well. Compared with other ocean-related sciences, the costs of the stations (around \$2,500) and the bands (\$350) are quite minimal, and with the coding we have been developing, processing the data is becoming easier, so it's exciting to think of what we can do if the project can continue.

You and your collaborators recently installed your own Motus tracking station in Half Moon Bay. What are you learning there, and how does this fit into the Motus network?

We installed a new sensor station at Pillar Point Harbor in Half Moon Bay last year. Around the harbor, there are many long jetties filled with pelicans – thousands! This location not only filled a hole in the spatial coverage of Motus stations; it was also a huge pelican roost we had been missing, so having a station there dramatically increases the chances of detecting one of our birds. After the station was installed, we instantly started detecting some of our banded pelicans. The whole Pelican Science crew is meeting at that station at the end of June to check on the station, do pelican surveys, and brainstorm next steps for our science, which includes setting up a new station at Alameda breakwater on San Francisco Bay.

What is Pelican Science? How can this organization help you to carry on your research?

Pelican Science is a nonprofit that was started by my colleague Deborah Jaques in 2017. It is now run by Deborah, PhD candidate Amelia DuVall, and me. Its goal is to understand Brown Pelicans so we can better protect them, and now white pelicans too. Through this organization we have helped to develop the eBands, set up new stations, analyze all the data coming in, and conduct outreach. You can find out more on our website, www.pelicanscience.org.

What role has federal funding played in your research? What is the impact of funding cuts?

My research has almost all relied on federal funding. My undergraduate work was funded by the NOAA Hollings Scholarship, and my PhD was funded by the NOAA Dr. Nancy Foster Scholarship. As a researcher, funding for me and our lab has come from NOAA, National Science Foundation (NSF), Smithsonian, and NASA grants.

Up until now, my role at Pelican Science has been supported by my position at Scripps, which covers my salary as well as access to labs, published literature, and more. Because of the current science funding freeze, I will be leaving Scripps at the end of June, and my future involvement with Pelican Science is uncertain. All of us who lead this project believe in this work and want to see it progress. But like other research, typical funding streams

were federally funded, and even funded projects are not guaranteed.

It's forcing us to get more creative about how to fund science. For example, we are starting a White Pelican project in Oregon; we're working with local businesses to conduct fundraising and outreach to get that project started. I remain hopeful, because the alternative is too devastating. For me personally, to go through all of the work and sacrifice to become a scientist, I can't even imagine what it would be like to not be able to do science.

What can individual citizens do?

There are many things you can do. If you happen to see a banded bird, take a picture or try to read the band and [report it on our website](#). For those who can, [donating](#) is highly impactful with such a small organization as ours; donations help us buy bands, pay for field work, publish our work, and more. You can also share information about why these birds matter and why we should protect them and the marine ecosystem – although I'm sure, as docents, many of you are already doing this!

Docents Busy from the Start

by Judy Schulman, TPDS Historian

In 1975, as soon as the first training class was over, the new docents were busy enhancing the experience of park visitors. In addition to nature walks, they showed slide programs and environment-related films. The slide show was an introduction to the park and was shown on request. The films came from the County Library. The most popular ones were about whales. I remember that the rangers would set up the projector for us. About a dozen chairs were put in the main room to view the movies. At that time, there was a portable screen that was put up. One docent created a Spanish-language nature walk and slide show. Some docents also created exhibits for the museum.

The bookstore came into existence around June 1977. Ralph "Rowdy" James became the first sales manager. It was noted that we made about \$40 a week. Items included nature-related books, greeting cards, and postcards. The postcards were from views all over San Diego. It wasn't until later that we created our own Torrey Pines postcards.



“Snake Day” at the TIK

by Ingo Renner

On May 22, herpetologist Jeff Nordland showed up for “Snake Day,” an interpretive session at the TIK, bringing along his usual entourage of snakes and lizards. Lucky visitors had the chance to see these beautiful animals up close and to learn about their unique habits and characteristics. Some folks even opted to hold the snakes with their own hands to feel their waxy skin and contracting musculature. Or perhaps it was just to show off their bravado! Needless to say, this special event drew attention to a normally unseen part of the Reserve and instilled a newfound appreciation and respect for the scaled creatures who live in the Torrey Pines ecosystem. Among Jeff's guests were a striped racer, California kingsnake morph (having a mixture of bands, stripes and dots), Yuma kingsnake, nightsnake, and alligator lizard.

(See “Goodness Snakes Alive” in the [April 2025 Torreyana](#).)



Museum Shop Spotlight

Calling all children! Bright turquoise T-shirts, sizes 6 months to 7 years, are now available at the Museum Shop. They sport our trademark tracks design, are made of 100% cotton, and cost \$14.95.



What's on the Beach? Sargassum

article and photo by Kathy Dickey

In May, while wandering the beach near the North Beach parking lot, I came across a handful of interesting yellow-brown seaweed. When I told my editor/writer husband that I thought I had found sargassum, he told me that I pronounced it wrong, it was *sargasso*, like the Sargasso Sea. He was right about the sea, but not about the seaweed name.

Sargassum is extremely abundant in the northwestern Atlantic, covering miles of ocean with floating islands of seaweed (the Sargasso Sea) and ruining beach resorts for swimmers and suntanning tourists. After it dies ashore, it also emits a horrible smell of H₂S (hydrogen sulfide) that smells like rotten eggs. In 2023, the Sargasso Sea in the Atlantic was estimated to be 8000 km long and to weigh 10 million tons.

While less common in the Pacific Ocean, sargassum is becoming more prevalent and worrisome as non-native species continue to thrive and expand their habitats, threatening native species of algae including kelp. In San Diego, we have at least three species: *Sargassum agardhianum* (a native species), *S. muticum* (Japanese wireweed, introduced in the 1930s), and *S. horneri* (a newer invasive species, Japanese devilweed). Though each of the three species has some unique features, such as size (from 40 cm to 10 m), they are often difficult to tell apart: all of them are brown in color. They all have tiny pneumatocysts (bladders) at the end of spines to help them float at the surface of the water, where they get their energy from sunlight through photosynthesis. Carotinoid pigments from photosynthesis give the brown algae their color.



As the sargassum floats in the ocean, it provides an important ecosystem including food, shelter, and breeding grounds for many marine animals. Crabs, shrimp, turtles, and fish travel with the sargassum. Once it reaches the beach, it provides another important food source for crabs and shorebirds.

Sargassum in our area is monoecious, meaning one

individual is capable of having both male and female gametes. The male gametes are shed into the seawater, while the female gametes stay in a special receptacle awaiting fertilization. Development of the seedling also occurs in the receptacle; at maturity it attaches to a solid surface.

A few companies are harvesting dead or dying sargassum from the beaches and developing it as a source of nutrients (especially proteins, beta-carotene, and antioxidants), as well as bio-fertilizer, fuel, bioplastics, and even skincare products. Harvesting sargassum is a better alternative to giant kelp beds because it does not need to be alive and cut in the ocean.

References available upon request

World Oceans Day at the BLIK

by Ed Saade

On June 8, the Beach and Lagoon Interpretive Kiosk supported the World Oceans Day theme of *Wonder: Sustaining What Sustains Us*. That is a pretty easy statement to support when working any day at the BLIK. We had another great turnout of more than 250 visitors, with extended discussions, and children (and adults) having a good time while touching everything. They also saw our two families of finches feeding the half dozen or so hungry chicks nested in the rafters. Of all the exciting and happy experiences that transpired, the biggest excitement was witnessing the very first rollout of our brand-new Beach Buggy chair, which a family borrowed to celebrate the birthday of their patriarch. They were very complimentary about how easy the process was and how well the chair worked. A great day all around.

Thanks to **Pam Burdt, Malana Tabak, Kathy Dickey, and Janice Barnard** for their help during World Oceans Day.



Bird of the Month: California Least Tern

by Robert James; photo by Andrea Carpio

The California Least Tern (*Sternula antillarum browni*) is a state and federally endangered species, one of five listed birds that occur at the Reserve. It is a migratory species, arriving in our area in mid-April to breed at undisturbed sandy locations near the ocean, usually departing by September. Its breeding range extends from San Francisco Bay to Baja California. As long-distance migrants, the birds winter in coastal Mexico and Central America.

Terns are related to gulls but are generally smaller and more slender, with long, pointed wings and straight, pointed bills. Most terns specialize in fishes, and the least tern is no exception. They feed on species such as silversides and anchovies, captured by diving headfirst into the water from flight. Their small size, white forehead, and yellow bill in breeding plumage separate the Least Tern from other terns at the Reserve. They have also been referred to as “sea sparrows.”



Our monthly bird counts, as well as reports in eBird, show that Least Terns are occasionally observed in our lagoon and at the beach, foraging and possibly roosting. The nearest current breeding colony is at Batiquitos Lagoon, between Encinitas and Carlsbad, and some birds breeding there may forage at the Reserve. Historically, there was breeding in Los Peñasquitos Lagoon.

The obvious and vexing conflict is that land use and human recreational activities conflict with the life cycle needs of the Least Tern. Both can be accommodated, and the goal when a species is listed as endangered is for its recovery. The recovery plan by the U.S. Fish and Wildlife Service describes goals for the number of pairs, number of occupied locations with sufficient birds, and pair productivity.

To that end, there have been conservation and recovery activities over many years by incredibly resolute people in government (including the military) and private organizations. Although the number of Least Tern pairs and occupied locations is on track for recovery, pair productivity has been in decline. Nest site preparation, timely and effective predator control, and consistent management of human disturbance continue to be strong challenges requiring consistent funding, applied expertise, and effective advocacy.

In addition, the Least Tern is subject to fluctuations in prey availability related to changes in ocean temperature, as well as possible impacts on its wintering grounds and during migration. To contribute to recovery of the Least Tern, we can document observations on community science platforms, continue work to ensure protection of wildlife in the Reserve,

and advocate for timely restoration and management of the Los Peñasquitos Lagoon.

Bee of the Month: California Bumble Bee

by Robert James; photo by Laura Chaing

Closing your eyes and listening to wildlife gives you another window into the Reserve, including our bumble bee friends. The word *bumble* means “to hum, buzz, drone, or move flounderingly,” and bumble bees certainly do all that. They were also referred to as “humble bees” by Shakespeare and Charles Darwin. Darwin studied their behavior and noted their value for pollination.



Four species of bumble bees have been documented at the Reserve. Although about nine of every ten individuals reported in iNaturalist.org are the widespread yellow-faced bumble bee (*Bombus vosnesenskii*), the next most common, at about one of every twenty, is the California bumble bee (*Bombus californicus*). Both can be seen most frequently foraging on flowers of coastal deerweed (*Acmispon glaber*). The most conspicuous character to distinguish the latter bumble bee is its completely black head. Our Sonoran bumble bee (*B. sonorus*), featured in the [June 2025 Torreyana](#) article by Jess Mullins, is similar but uncommonly seen. It has a black head but has much more yellow on its larger body.

California bumble bee populations range along the Pacific states into British Columbia and dipping into the Mountain West; however, they are thought to be in decline. The species is noted as “vulnerable” by the International Union for Conservation of Nature (IUCN). Possible factors contributing to its decline are invasive species, pesticide use, commercial bumble bee rearing, habitat destruction, and climate change. Another factor is that they usually nest on the ground, which may make them more vulnerable to disturbance.

Taxonomists, biologists who study organism classification, continually review relationships among organisms. Contemporary techniques using DNA comparison provide new insights into those relationships, complementing the classic study of morphology, or form. The California bumble bee is an example where its name may change. In fact, the IUCN considers it to be a form of the more widespread (but also “vulnerable”) yellow bumble bee (*B. fervidus*). Time (and further study) will tell.

Interestingly, Crotch’s bumble bee (*B. crotchii*), a candidate for California Endangered Species Act listing, has been documented nearby. It may also be at the Reserve. Now after you open your eyes and see “humblebees,” take photos and upload them to iNaturalist.org for identification. By taking this simple but meaningful action, you provide valuable information, contribute to native bee conservation, and perhaps document a new bee in the Reserve.

Science Fair Winners

The abstracts from the two TPDS grand prize winners at the 2025 Greater San Diego Science and Engineering Fair are included below. Austin Zhang will present his project at the July 12 general meeting. For information on the five other winners, see the [May 2025 Torreyana](#). Thanks to **Wayne Kornreich** and **Robert James** for mentoring our two grand prize winners.

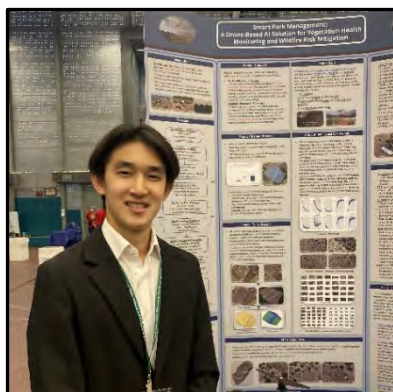
Smart Park Management: A Drone-Based AI Solution for Vegetation Health and Wildfire Risk Mitigation

Austin Zhang, Del Norte High School, 11th grade

Black Mountain Open Space Park (Black Mountain) in the City of San Diego faces significant challenges in wildfire risk mitigation, vegetation management, and trail maintenance due to its vast, 2,350-acre size which contains much rugged terrain. Current manual methods of trail maintenance and fire risk monitoring are time-consuming and labor-intensive, and have safety concerns that require rangers and volunteers to physically access locations at Black Mountain. Manual monitoring of vegetation and wildfire risk is inefficient and impractical for large parks.

This project explored the use of a drone-based AI system to improve these processes. The goal is to develop a smart park-management system that integrates drone technology with AI to significantly reduce the time and effort needed, while improving the accuracy of fire risk assessments and vegetation health analysis. The system uses customized drones with high-resolution cameras for image collection. These images are processed using GIS for terrain mapping and AI for vegetation health and fire risk detection. The system was evaluated by conducting multiple drone flights across Black Mountain to assess its effectiveness in real-time monitoring.

The drone system reduces scanning time by at least 5x compared to manual methods, while also creating 3D terrain maps for detailed analysis. The AI model, trained with collected images, accurately identifies dry plants and high-risk fire zones, achieving reliable detection results for risk mitigation. The project demonstrated significant improvements in vegetation management and wildfire risk monitoring at Black Mountain. The system's ability to automate data collection and analysis also provides considerable time savings, with potential for scaling to other parks and automating tasks such as watering and weed control.



Eco-Safe Marine Sunscreen: Protect Your Skin, Protect the Ocean!

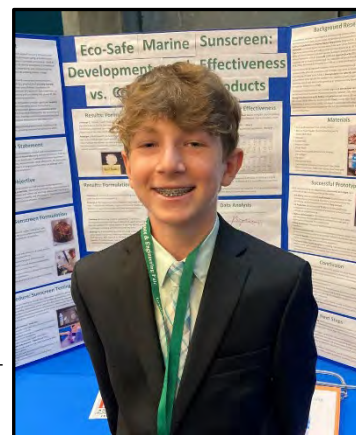
Martin Valkanov, San Diego French-American School, grade 7

As awareness grows around the harmful effects of traditional sunscreens on marine life, the need for eco-safe sun protection has never been more urgent. Many sunscreens on the market today contain chemical or mineral ingredients like oxybenzone, octinoxate, zinc oxide, and titanium dioxide—all of which can accumulate in oceans and damage coral reefs, fish, and other aquatic life. Despite offering protection against UV radiation, these formulations pose a serious threat to fragile marine ecosystems.

Motivated by a love for the ocean and firsthand observation of sunscreen pollution in crowded swimming areas, I set out to find a better solution – one that protects both human skin and marine habitats. My research led me to marine organisms like kelp and algae, which naturally shield themselves from harmful ultraviolet rays using compounds such as mycosporine-like amino acids (MAAs). I also identified calcium carbonate from shellfish shells – a byproduct of the seafood industry – as a sustainable alternative to mineral UV blockers.

The result is an eco-friendly sunscreen prototype made with kelp extract and marine-sourced calcium carbonate. It offers 72.6% UV-blocking efficiency – comparable to conventional sunscreens – while reducing the environmental footprint. In addition to protecting ocean life, this approach promotes sustainable waste use and supports local beach economies by encouraging eco-tourism and green innovation.

Marine-based sunscreens show that it is possible to stay sun-safe without sacrificing the health of our oceans.



Torrey Pines Book Club

We will meet via Zoom at our regularly scheduled time. Please notify **Annette Ring** if you plan to participate or if you need any extra help getting connected.

When: Tuesday, July 8, 1:00 pm

What: *The Wide Wide Sea: Imperial Ambition, First Contact and the Fateful Final Voyage of Captain James Cook* by Hampton Sides

Amazon says:

In 1776, Captain James Cook, already lionized as the greatest explorer in British history, set off on his third voyage. Two-and-a-half years later, on the island of Hawaii, Cook was killed in a conflict with native Hawaiians. How did Cook, who was unique among captains for his respect for Indigenous peoples and cultures, come to that fatal moment?

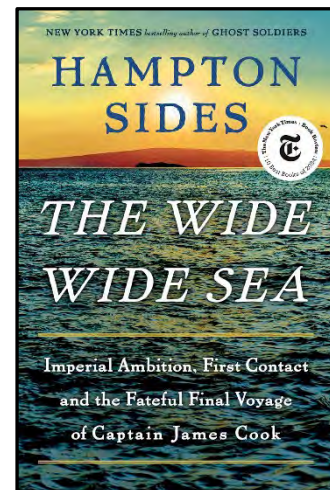
Hampton Sides' bravura account of Cook's last journey both wrestles with Cook's legacy and provides a thrilling narrative of the titanic efforts and continual danger that characterized exploration in the 1700s. Cook was renowned for his peerless seamanship, his humane leadership, and his dedication to science. He treated his crew well and endeavored to learn about the societies he encountered with curiosity and without judgment.

Yet something was different on this last voyage. Cook became mercurial, and his changed behavior may have had something to do with his secret orders, which were to chart and claim lands ahead of Britain's imperial rivals. The tensions between Cook's overt and covert missions came to a head on the shores of Hawaii, the site of his fatal encounter.

At once a ferociously-paced story of adventure on the high seas and a searching examination of the complexities and consequences of the Age of Exploration, *The Wide Wide Sea* is a major work from one of our finest narrative nonfiction writers.

All TPDS docents are welcome. Meetings usually last an hour and a half.

August 12: *Farther Than Any Man: The Rise and Fall of Captain James Cook* by Martin Dugard



Torrey Pines Docent Society Bird Survey: June 2025

Number of species: 76
(+2 other taxa)

Gadwall 3
Mallard 2
Surf Scoter 9
California Quail 2
Mourning Dove 46
White-throated Swift 3
Anna's Hummingbird 18
Allen's Hummingbird 6
hummingbird sp. 2
Ridgway's Rail 2
Killdeer 1
Semipalmated Plover 12
Long-billed Curlew 2
Marbled Godwit 1
Willet 3
Western Gull 30
California Gull 3
Caspian Tern 4
Elegant Tern 12
Royal Tern 6

Pied-billed Grebe 1
Black-vented Shearwater 75
Brandt's Cormorant 84
Double-crested Cormorant 6
White-faced Ibis 1
Snowy Egret 3
Great Egret 4
Great Blue Heron 3
Brown Pelican 24
Osprey 2
White-tailed Kite 2
Cooper's Hawk 2
Red-shouldered Hawk 1
Red-tailed Hawk 3
Great Horned Owl 1
Nuttall's Woodpecker 16
American Kestrel 1
Peregrine Falcon 6
Western Wood-Pewee 8
Willow Flycatcher 1
Western Flycatcher 12
Black Phoebe 9
Say's Phoebe 3
Ash-throated Flycatcher 14

Cassin's Kingbird 3
Hutton's Vireo 5
California Scrub-Jay 22
American Crow 6
Common Raven 32
Tree Swallow 3
Northern Rough-winged Swallow 10
swallow sp. 2
Bushtit 80
Wrentit 132
Blue-gray Gnatcatcher 1
California Gnatcatcher 4
Northern House Wren 17
Bewick's Wren 19
California Thrasher 11
Northern Mockingbird 5
Scaly-breasted Munia 13
House Finch 89
Lesser Goldfinch 20
Chipping Sparrow 1
Dark-eyed Junco 24
Savannah Sparrow 2
Song Sparrow 30

California Towhee 93
Rufous-crowned Sparrow 9
Spotted Towhee 40
Yellow-breasted Chat 7
Hooded Oriole 3
Orange-crowned Warbler 74
Common Yellowthroat 11
Yellow Warbler 2
Townsend's Warbler 1
Probably the last of the year
Black-headed Grosbeak 7
Blue Grosbeak 2

Observers: Donna Mancuso, Dinah Carl, Andy Rathbone, Kathy Estey, Manolo Turner, Marty Hales, Steve Neal, Dylan Hardenbrook, Gabriele Wienhausen, Debbie Regottaz, Tsaiwei Olee, David Walker

Herb Knufken's photo gallery includes many birds: pbase.com/herb1rm



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