

LILA HIGGINS AND EMILY HARTOP

# Looking for Nature in LA

The view from the Natural History Museum of Los Angeles County

**E**ditor's Note: The natural history museum is a venerable seventeenth-century institution. But curiously, it may well be one of the civic institutions best suited to help us think with nature in the twenty-first century. In recent years, the Natural History Museum of Los Angeles County has reinvigorated both the “natural” and the “history” in its mission. The museum is reconnecting to the city around it and in the process discovering a vital role for itself in the life of the city and its future. Lila Higgins and Emily Hartop both work at the museum.

**Lila Higgins writes:**

I grew up in the British countryside, five miles from the closest city. My parents were both children of farming families, and I spent my early years living in and playing around farms. I had a huge home range, which included woods, hollow trees, streams, hedgerows, and derelict farm buildings. I searched for tadpoles in the farmer's pond, pretended to be a badger, and once tried to dig up an ant's nest to find the queen (sorry, ants). I was allowed to stay out until it got dark. Even when bad things happened—like the time I fell out of a rotten tree into a stream and lost a Wellington boot, or the time a puffball mushroom exploded all over my head while I was climbing inside a hollow tree—it was always an adventure. I developed a deep connection with nature and these adventures became the foundation of my more serious interest in nature exploration. When I moved to Southern California in the 1990s—the Inland Empire, to be exact—I didn't so much experience culture shock as nature shock. The environment was just so different. In the suburbs, there were yards instead of gardens. These small parcels of land allotted to each house, fenced or walled off from your neighbors, were full of sharp prickly grass and other plants that had to be watered every day. As I walked through my neighborhood, I'd look into yards where my new neighbors were trying

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Vaux's swifts in Downtown Los Angeles. Photograph by Flickr user waltarrrr.

hard to mimic the landscape I'd just left behind in England. The yards made such a stark contrast to the San Gabriel Mountains that towered behind.

The hillsides and open spaces that abutted the mountains were brown, gray, and muted. Up until this point, nature for me had meant vibrant green hues and lots of them. It was difficult to believe that these small, scrubby plots could support life. But when I looked closer, I found a vast array of nature inhabiting California's muted landscape. Charismatic mega- and minifauna were out there to be discovered. I was compelled to understand these new landscapes, to find nature in my new home.

Los Angeles is often cast as the iconic concrete jungle—it is the second largest urban agglomeration in the United States, with over thirteen million people residing in a metropolitan area of about five thousand square miles. It's

viewed as a place devoid of flora and fauna, and certainly devoid of anything worth caring about or studying. But this just isn't true. The city sits in the southern portion of the California Floristic Province—one of thirty-five biodiversity hotspots in the world.

A biodiversity hotspot is a classification given by Conservation International. It denotes a place not just where there is an incredible range of biodiversity (there are over fifteen hundred species of vascular plants endemic to the California Floristic Province), but where species are under threat (over 75 percent of the natural vegetation has been lost here). This puts the vast majority of California on par with places like the island of Madagascar and the tropical Andes.

As soon as I moved to Los Angeles in 2009, I began looking for natural places to play. One of my first discoveries was Debs Park in northeast LA, home to the local Audubon



center and miles of trails. The first time I explored it, I walked up a very steep path on the south side of the hill. It eventually led me to a stand of walnut trees where I heard an odd guttural gurgling sound. Big dark birds flew overhead, and I realized they were common ravens. As I began to explore, I turned a corner and my jaw dropped. I came upon a large pond at the very peak of the hill. It was the last thing I expected in this dry climate, but it was just so stunning. A big placid pond, ringed by green vegetation, with downtown LA as the backdrop—whoa!

I have come back to this spot many times. Sometimes I share this special place with the introduced species that call this pond home—the red-eared slider turtles, the American bullfrogs, and the mosquito fish. Other times I'm there watching children playing in the mud, searching for tadpoles—just as I did when I was a kid.

Downtown is home to what is probably the most awesome nature spectacle LA has to offer. Vaux's swifts are small sickle-shaped birds that spend their days on the wing feeding on insects. Every spring they migrate from south of the Mexican border up the West Coast to their breeding grounds in the Pacific Northwest. In the fall, they stop off in LA for a breather on their way back. During the day, they hang out by the LA River and other open spaces, eating their fill of insects. But, every evening the group—which can



range up to tens of thousands—comes home to roost in abandoned chimney shafts.

You can witness this massive influx of birds from the roof of a parking garage on Broadway. On one visit, I saw thousands of birds flitting around above us, and as sunset approached they began swirling toward the chimney. Soon, it became a very precise choreographed dance. The birds vortexed around and around, and on their last turn they neatly slipped down the chimney. The drama didn't end there. We also saw hungry common ravens and even a peregrine falcon attack and catch a few of the swifts for dinner. Even in the heart of this urban megalopolis nature can still take your breath away.

Although I've still never seen a tarantula in LA proper (the closest was in Eaton Canyon in the San Gabriel Mountains), I have seen its arch nemesis—the tarantula hawk wasp. It was a hot, sunny day, only a few miles from downtown. I was out hunting for bugs in the Natural History Museum's new Nature Gardens with the curator of entomology, Brian Brown. He was looking for flies, I was looking for anything that caught my eye—and there's nothing that can quite catch your eye like a tarantula hawk! They are one of the largest wasps in Southern California, measuring in at an impressive one-and-a-half inches. Their exoskeletons are metallic blue with large orange wings, and



long curly antennae. This particular wasp had no idea the ruckus it was causing. It placidly landed on a flowering coyote bush while Brian and I snapped pictures. It was the very first wasp of its kind recorded in the Nature Gardens. Naturally, I wondered: where is it going to find a tarantula?

The Nature Gardens were built on three-and-a-half acres of outdoor space surrounding the main Museum building in LA's Exposition Park. Parking lots and lawns were transformed into an urban habitat—a place for wildlife to call home, and for visitors to experience and study nature in the city. But would it work? If we built an urban nature habitat, would any nature show up? The scientists said yes. Nature is everywhere in Los Angeles, and our gardens aren't any different.

Brown was so certain about the new urban habitat he made a bet with a museum trustee: not only will nature show up in our new gardens, it would be as easy to find new species in Los Angeles as it was at his research sites in Costa Rica and Brazil. To prove the point, Brian set up an insect trap on an ivy-covered slope next to a swimming pool in a Brentwood backyard. After a week of collecting, the first fly Brian put under his microscope was a brand-new species, never before identified by science. In that same sample, Brian also discovered two other interesting flies, neither found before in North America.



The garden at the museum is an experiment, but we see the whole region as our laboratory. The trouble is there aren't nearly enough scientists to study the whole thing, so we've turned to citizen scientists. Essentially, citizen science is a way to crowdsource research by engaging people in the scientific process. It's an emerging field that the Natural History Museum's scientists have been exploring since 1994 when ornithologist Kimball Garrett launched the California Parrot Project, looking at introduced parrot populations. Then, in 2002 we launched the Los Angeles Spider Survey to get a more accurate picture of which species live here. The project opened to all Angelenos, and in the first weekend, over one thousand specimens were submitted to the museum. Today we have almost six thousand local spider specimens in the entomology collection and a much better sense of spider diversity in the region.

Angelenos now have many citizen science projects they can participate in to help us better understand biodiversity in Los Angeles. The Reptile and Amphibians of Southern California project—or as the Museum's herpetologist Greg Pauly nicknamed it, RASCals—calls on the twenty-two million people living in Southern California to document reptiles and amphibians by snapping photos with their smart phones. A nine-year-old boy, who found an interesting gecko in the San Fernando Valley, made one of the most



interesting discoveries so far. Will Bernstein and his son Reese had found what they thought might be the local Western Banded Gecko. With the help of the Museum and herpetologist Bobby Espinoza of California State University, Northridge, it was identified as an introduced species from Europe, the Mediterranean House Gecko. To follow up on this discovery, a group of us went to Chatsworth on a lizard-hunting adventure. A number of curious homeowners helped us; and by the end of the night, we had determined there was, indeed, a population present in this neighborhood. It was an important moment—not only did we make a lasting scientific discovery but we found a neighborhood awake to the nature in their own backyards.

I've found that the best way to experience urban nature is to just take a walk. I walk around my Koreatown neighborhood often and stop to photograph European garden snails, grasshoppers, roadkill (which I later submit to a citizen science project called the California Roadkill Observation System), and a slime mold aptly called dog's vomit slime. The beauty of nature in the city is that anyone can participate in its discovery—not just scientists—and every Angeleno can contribute to a project that interests them.

Urban planners and conservation biologists can use data from these projects to help make decisions that shape the very fabric of the city. Collectively, the data has potential to



alter the city. The hope, of course, is that when the datasets are larger and closer to complete, we'll all be able to make more holistic decisions. Who better to engage in the process of gathering this data than the residents of the city themselves?

But it isn't all about data collection. It's also about the joy of adventure and discovery. It isn't just about the science. It's about communing with the wild creatures and plants that live around us. Together, we're working toward a new urban paradigm—one in which a city is designed for the betterment of humans and wildlife alike. Get out and explore your city, find the wildlife that lives here, and help to make the Los Angeles of the future.

**Emily Hartop writes:**

As a child of Los Angeles, I cherished a worn copy of the *Usborne Book of the Future: A Trip in Time to the Year 2000 and Beyond*. Published in 1979, the book was filled with all sorts of fantastic imagery and ideas that were fun to dream about but, alas, didn't come true come the turn of the millennium. What I remember most about the book was a spread entitled "Two Trips to the 21st Century" that featured pictures of two possible futures, two outcomes dependent on mankind's choices. One was dark, dreary, polluted, and practically uninhabitable; the other was bright, green, thriving.



I remember thinking that Los Angeles seemed to be headed toward the bleak future—with the smog enveloping us, the trash overwhelming us, the concrete and asphalt taking over the Earth. In 2014, I'm surprised to find that I'm feeling a bit better about the future. I look around Los Angeles today and see a thriving natural world in the heart of the city.

But what, exactly, is thriving out there? At BioSCAN—the acronym stands for Biodiversity Science: City and Nature—at the Natural History Museum of Los Angeles County, we're trying to find out.

Urban biodiversity is an understudied subject. Researchers often travel to the tropics or other exotic locales to study nature, but studying the biodiversity in their own cities back home has often seemed, well, far too pedestrian. That's changing now. Studies of urban ecosystems have been conducted in several cities in the United States, and a number of large studies are underway internationally.

In Los Angeles, BioSCAN is undertaking a study of unprecedented scope and scale: millions of insects will be collected at thirty sampling sites around the city for three years. Unlike the majority of urban biodiversity studies, which have surveyed birds and reptiles, BioSCAN's subjects have short lifespans and ranges. But they are



members of a class that constitutes the majority of animals on Earth, and they are ideal study subjects because insects often reflect hyper-local, small-scale, and short-term changes in environments.

To understand biodiversity in the context of any city, you must frame your study within the context of that specific city: its history, geography, culture, and economy. Los Angeles is a city of backyards, so we are using private backyards for twenty-six of our thirty study sites (the remaining four are at a community garden, a school, the Los Angeles Eco-Village, and in the Natural History Museum's Nature Gardens). The thirty sites cover a fifteen-mile transect across Los Angeles. Each study site hosts a Malaise trap—a tent-like structure used to capture flying insects—and a weather station to collect environmental data. Insects enter the traps and fall into a bottle of ethanol. Samples are collected weekly. There are hundreds and sometimes thousands of insects in each sample.

Brian Brown, the museum's curator of entomology, dreamed up the project and oversees the small army that keeps it humming along. The first specimen processing is done by a group of work-study students from the University of Southern California who have been trained to sort insects to order, a taxonomic level that separates the flies from the bees from the beetles. Once sorted, the insects are handed

off to the two resident BioSCAN entomologists, Lisa Gonzalez and me. Lisa and I do the detailed sorting, pulling out specific families of insects to send to collaborators around the world. We also keep our eyes out for anything unusual. Interesting finds appear on the BioSCAN blog or are studied further for scientific publication.

BioSCAN's own insect family of focus is the Phoridae, or scuttle flies. These tiny flies are mega-diverse—there are approximately four thousand different species in this one family of flies—and extremely plentiful. In a single backyard sample, it is not uncommon to have hundreds of individual specimens made up of dozens of species. I spend much of my time staring through a microscope at these tiny flies, sorting one Angeleno species of phorid from one another. In addition to pitching in on the sorting, Lisa collects the data and samples from the study sites. She put up the thirty BioSCAN traps, maintains them, and is our ambassador to the families that host the traps in their backyards.

None of this would be possible without these hosts, who have devoted parts of their backyards to science for three years. Their individual interests in the project vary—some are museum members who want to be more involved; some want their children to grow up watching real science at work in their own backyard. We have artists, a student, teachers, a lawyer, a retired doctor, and even a roboticist as site hosts. We have a retired curator of entomology as well as a watershed ambassador to the Urban Waters Federal Partnership. We have a map specialist who works at LA's Central Library, and we have a woman who has volunteered her time with the entomology department at the museum for decades. We have people who love insects and people who are learning to love insects.

The first study sites have been running since 2012, and already we are seeing striking differences between trap catches in different areas. This is exciting, because it means there are correlations to be made with environmental factors at play in different neighborhoods. A site that borders the LA River is different from a site bordering nearby Griffith Park, which is again different from a site in the midst of the urban core. In all traps, we are seeing many recognizable creatures, but we are also finding a number of species new to science. These undescribed species aren't a huge surprise because extensive work on entomological diversity in Los Angeles has never been done before—but they sure are intriguing and a thrill to discover!

We are also investigating which of the species we see are introduced from other parts of the world. Preliminary data indicate that the number of these cosmopolitan species may be substantial—no mystery given LA's history. The last 150 years have seen a tiny pueblo mushroom to a sprawling urban center of millions, complete with the largest port in the country. The growth and change in the last century didn't just bring people. As Carey McWilliams wrote in *Southern California: An Island on the Land*, "Southern California is man-made, a gigantic improvisation. Virtually everything in the region has been imported: plants, flowers, shrubs, trees, people, water, electrical energy, and, to some extent, even the soils." The iconic palm trees lining Sunset Boulevard, the groves of eucalyptus in Malibu, the papery riotous blossoms of the bougainvillea, the citrus industry that created an empire were all brought in from elsewhere. With all that wonderful, fragrant, colorful, delicious fauna came insects—some pests, some beneficial. When pests were discovered, people brought in pests of the pests for control. Sometimes that worked beautifully; other times they kept going, bringing in still more introduced species. But the vast majority of the insect aliens in the city undoubtedly arrived accidentally.

Right now we're finding out what's here. The first step of BioSCAN is piecing together this massive inventory of the entomological fauna of Los Angeles. This will continue over the next three years of sampling. Then we can begin using the data to help explain the differences in biodiversity that we see. These results can eventually be used to educate citizens and inform city policy.

We are working closely with ecologists to look at all the factors affecting biodiversity in Los Angeles neighborhoods. Once we know how these factors affect biodiversity, we may be able to manipulate them intelligently to maximize biodiversity, help people make informed decisions about their private backyard spaces, and shape public policy. These data from citizen science could help us create a more natural city. But we aren't looking to some mythical pristine past for the answers. We can't go back. But we can go forward with a better awareness of the nature we have and the nature we could have in LA. **B**

#### Note

Photographs by Lila Higgins unless otherwise noted.