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INTRODUCTION TO THIS SPECIAL ISSUE ON URBAN WILDLANDS

Steve Hartman

For many years I have been contemplating an issue of *Fremontia* that would focus on Urban Wildlands. I have long been fascinated by these areas because, as a life-long resident of Los Angeles, when I visit these pieces of heaven, even as jets roar overhead and traffic zooms nearby, I can relax and find peace. The Los Angeles Times reported (Jan. 16, 2018) that “simply listening to the chirping of birds, glimpsing the sky and even noticing a scrawny city tree can boost your mental well-being.”

Urban wildlands offer healing benefits to humans and offer other species food, shelter, and often water. While the definition of an urban wildland varies from person to person, I consider it be a natural area surrounded by urban development that supports native vegetation.

This issue looks at some of California’s urban wildlands through the success and failure of native vegetation and wildlife recovery projects. The issue starts in the 29th largest urban area in the world—Los

Angeles—where the Sepulveda Flood Control Basin allows for the existence of a world-class urban wildlife reserve. Paula Schiffman discusses evidence that the San Fernando Valley was a historically wet place. Man-made riparian wetlands were added to the Sepulveda Basin starting in the late 1970s and additional native landscapes have been augmented in the 1980s and again in the 1990s. I discuss these changes in my articles in this edition of *Fremontia*.

Esther Feldman shares a recent project that incorporates “habitat landscaping.” Julie Clark DeBlasio’s article contributes to the understanding of the importance of urban forests. The City of Los Angeles has a native tree protection ordinance and DeBlasio’s article makes the compelling argument that it needs to be enforced. CNPS Fellow Jake Sigg provides us with a historical account of his and others’ efforts to preserve native patches of the San Francisco landscape.

There is a common theme in all these articles: in the 21st century, urban wildlands face an array of challenges. Forty years ago no one would have predicted that homeless encampments, pathogens, and lack of pollinators would turn out to be major issues. Areas

Above: Oyster Bay Regional Shoreline, San Leandro, California.
Photo by Michael Short for East Bay Regional Park Department.

we utilize as respites from the hustle of city life have, in many cases, suffered from a lack of management which contributes to both diminished aesthetic value and ecosystem services. Other struggles urban wildlands face are invasive species and the genetic isolation of native species.

Fortunately, many people see the value in creating more natural areas while better managing those we have. For example, there is a push to install greenways along both sides of the 51-mile Los Angeles River. Despite ongoing budget reductions for maintenance in most city parks, politicians continue to strongly advocate for new urban parklands, especially in the densest urban areas. But as we have discovered over the years, drawing a line around an area and calling it a “preserve” or “reserve” doesn’t automatically lead to adequate management. For these places, to fulfill their role as natural areas, controlling vegetation, weeds, humans, and dogs is required.

In order to control invasive plants, agencies and volunteers have sometimes resorted to using herbicides as a step in integrated pest control. While use of her-

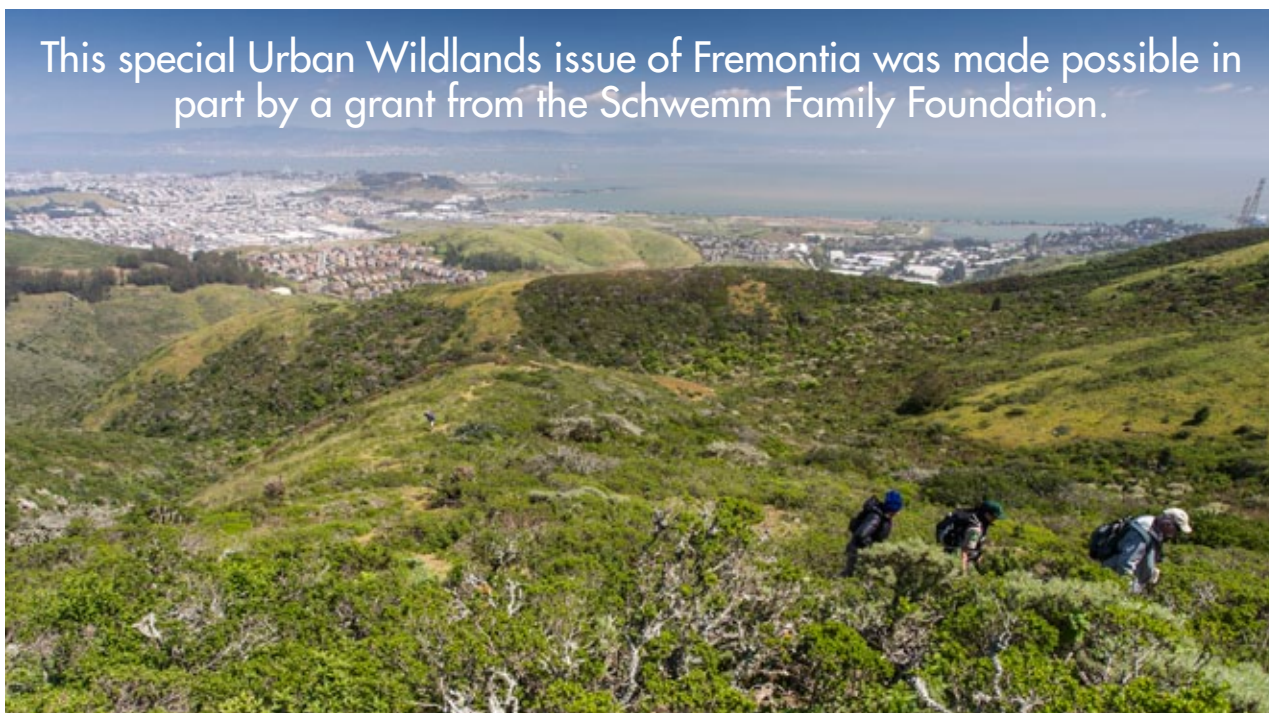
bicides is contentious, the use for spot treatments has enabled small groups of volunteers to successfully eliminate invasive weeds in some areas—where future herbicide use will not be needed. But recently, certain environmental groups have objected to the use of any herbicide, making public education another goal for these areas.

The time is now for CNPS to step up and provide guidance and education to residents adjacent to urban wildlands and agencies managing these areas. Local residents must play a role in monitoring nearby wildlands and be inspired to spend time removing weeds and trash. I recommend that CNPS activists take advantage of local social networks (Nextdoor, Facebook, Twitter, etc.) to set up work parties, which must be fun to be ongoing.

For those of you who live in the city, consider adopting a nearby urban wildland. Contact the land manager and find out what you can do to improve the beautiful urban wildlands of California.

-Steve Hartman: naturebase@aol.com

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Photo by Lech Naumovich



A VIEW FROM THE 21ST CENTURY: THE HISTORICAL SEPULVEDA BASIN ECOSYSTEM

Paula M. Schiffman

The Sepulveda Basin is a remnant of a historically vast network of wetlands and riparian corridors once common across the Los Angeles Basin in southern California. This network included an abundance of springs, creeks, rivers, sloughs, vernal pools, and other wetlands (Waring 1915, McCawley 1996, Gumprecht 1999). Occupying a broad low place in the southern San Fernando Valley, the Sepulveda Basin is at the confluence of Bull Creek, Encino Creek, Woodley Creek, Haskell Creek, and some nearby springs. These streams formed the headwaters of the Los Angeles River where the riparian zones once served as living connections between the Sepulveda Basin and much of the rest of southern California. Today, it is hard to imagine that, historically, water was once readily available in the now arid and sprawling Los Angeles metropolitan area.

A HISTORICALLY WET PLACE

Agriculture and urbanization that characterizes so much of California's development also radically altered the historical hydrology. Through the depletion and pollution of aquifers, filling of wetlands, and

invasion of non-native species into the surviving riparian corridors these wetlands have been forever altered. Eventually, most remaining riparian corridors were dammed and are now restricted to narrow concrete channels. In southern California, most of the water flowing in these channels is urban run-off.

Historically, Siutcanga, a native Tongva (also known as Gabrielino and Fernandino) community existed in or near the Sepulveda Basin area (McCawley 1996). On August 5 and 6, 1769, the First Portolá Expedition, led by Gaspar de Portolá, the Spanish governor of Las Californias, stopped in this area during a trek from Baja California to San Francisco Bay. Juan Crespi was a Franciscan priest who served as chaplain and recorder for the journey. His detailed journal (Brown 2001) described an encounter with a community of over 200 friendly people. Crespi explained that they shared bountiful meals of "well flavored gruel and sage" with the Spaniards. He also described the landscape as "a very large and wide-stretching valley," and called it "el Valle de Santa Catalina de Bononia." Today we know it as the San Fernando Valley. Crespi noted that large swaths of the valley's low-growing vegetation appeared to have been purposefully burned-off by the Native People. It is possible that this was done

Above: The Sepulveda Basin. Photograph by Steve Hartman.



This 1898 topographic map shows that the center of the San Fernando Valley was sparsely settled at the turn of the previous century. The Los Angeles River has been pushed south against the Santa Monica Mountains as the mountains to the north have been rising with each earthquake, raising the north end of the Valley.

to encourage growth of valued wild plant foods and to promote habitat for small game.

Crespi's party camped beneath oaks near a large freshwater pool that had southern western pond turtles (*Actinemys pallida*) swimming in it. He observed the presence of "a great deal of tule-rush patches" (*Typha* spp., Juncaceae spp.), "swamps" and "a great deal of trees visible to eastward." These were probably the floodplain forest of the Los Angeles River and Tujunga Wash. He referred to the river as "el rio de Nuestra Señora de los Angeles de Porciúncula. Crespi specifically mentioned seeing many "walnut trees and white oaks" (*Juglans californica* and *Quercus lobata*), "sycamores, willows and live oaks" (*Platanus racemosa*, *Salix* spp., *Quercus agrifolia*) as well as "prickly pear and sage" (*Opuntia littoralis* and *Salvia* spp.) and "a vast number of rose bushes" (*Rosa californica*). All of these native species continue to be common constituents of the Sepulveda Basin ecosystem today.

The presence of standing water and wetland vegetation in the middle of the summer of 1769 is an

indication that the Sepulveda Basin was a place of permanent water with spring-fed streams. Crespi described the presence of a hot spring near his group's campsite and in the early 20th Century, a United States Geological Survey report (Waring 1915) documented two warm carbonated springs on the Encino Ranch located in the Sepulveda Basin. A settlement with so many native people also suggests that this was a location where water was reliable and that it was a comfortable place to live during the hottest and driest time of the year. Interestingly, on January 15, 1770, when the Portolá Expedition revisited the Sepulveda Basin on its return trip, Crespi wrote that they found no people at the village site. The large pool of water persisted, however, and the reason for the absence of people is not known. Perhaps, they had moved to higher ground because January is typically one of the rainiest months in southern California and flooding in the lowland Sepulveda Basin and Los Angeles River floodplain was possible.



In 1953, neither the 405 or the 101 freeways had been built. The Sepulveda Basin was devoted to agriculture except where a new golf course was being installed. Notice how few homes are in the hills of the Santa Monica Mountains to the south. Photo by Steve Hartman.



By 2007, housing has been packed into the hills and the Sepulveda Basin is an oasis of green surrounded on all sides by urban Los Angeles. Google Earth Imagery.

A NOVEL ECOSYSTEM

Today, the Sepulveda Basin ecosystem hardly resembles the historical pre-European settlement environment. It is now too dry to support anything like the spring- and stream-fed wetlands and broad riparian zone that once occurred in the basin. The vegetation is a hodge-podge of wild plants including the native species Crespi encountered. This includes blue elderberry (*Sambucus nigra*) sugar bush (*Rhus ovata*), willows (*Salix* spp.), cottonwoods (*Populus* spp), and mulefat (*Baccharis* spp.). However, a multitude of non-native annuals and perennials also exist, like giant reed (*Arundo donax*), smilo grass (*Stipa miliacea*), castor bean (*Ricinus communis*), and fennel (*Foeniculum vulgare*) plus mustards, thistles, annual grasses and ornamental trees. Several of these trees are invasive, like tree of heaven (*Ailanthus altissima*), evergreen ash (*Fraxinus uhdei*), and black locust (*Robinia pseudo-acacia*). As with most wild places, new discoveries, good and bad, can

be found. In 2011, while walking with Steve Hartman in the Sepulveda Basin, I stumbled upon Los Angeles County's first record of stinkwort (*Dittrichia graveolens*), a disturbance-adapted invader that is relatively new to California.

The Sepulveda Basin is a novel ecosystem (Hobbs et al. 2006) that, without human agency, would not have developed as an interacting assemblage of organisms. The trait that all species in the area (native and non-native) have in common is their ability to tolerate, and even thrive in, the area's anthropic ecological regime. Like a natural ecosystem, the Basin is characterized by some obvious wildland attributes, such as diverse wildlife and patches of dense vegetation but, unlike a natural ecosystem, it is not self-organizing (Simberloff et al. 2015). Instead human activities such as irrigation, clearing, and planting are controlling elements, and invasive and ornamental species comprise a major proportion of the plant biodiversity and cover. This means that this novel ecosystem poses great challenges when

habitat restoration efforts are undertaken (Simberloff et al. 2015). Unlike a natural ecosystem, the ecosystem services of this novel ecosystem—complex natural processes that we rely upon to provision, regulate, and support life and culture—also depend upon considerable human inputs (Simberloff et al. 2015). For example, the Basin’s vegetation is habitat for a remarkable diversity of vertebrates but most of its plants and animals are also dependent upon the year-round availability of treated wastewater discharged from the Donald C. Tilman Water Reclamation Plant. Moreover, these organisms rely upon ongoing management activities conducted by the U.S. Army Corps of Engineers, Los Angeles Department of Recreation, as well as local chapters of CNPS and the Audubon Society. In fact, many years of persistent activism and labor by local volunteers have been essential to maintaining and revitalizing this environment. Without these substantial human inputs, the Basin’s environment would be very different.

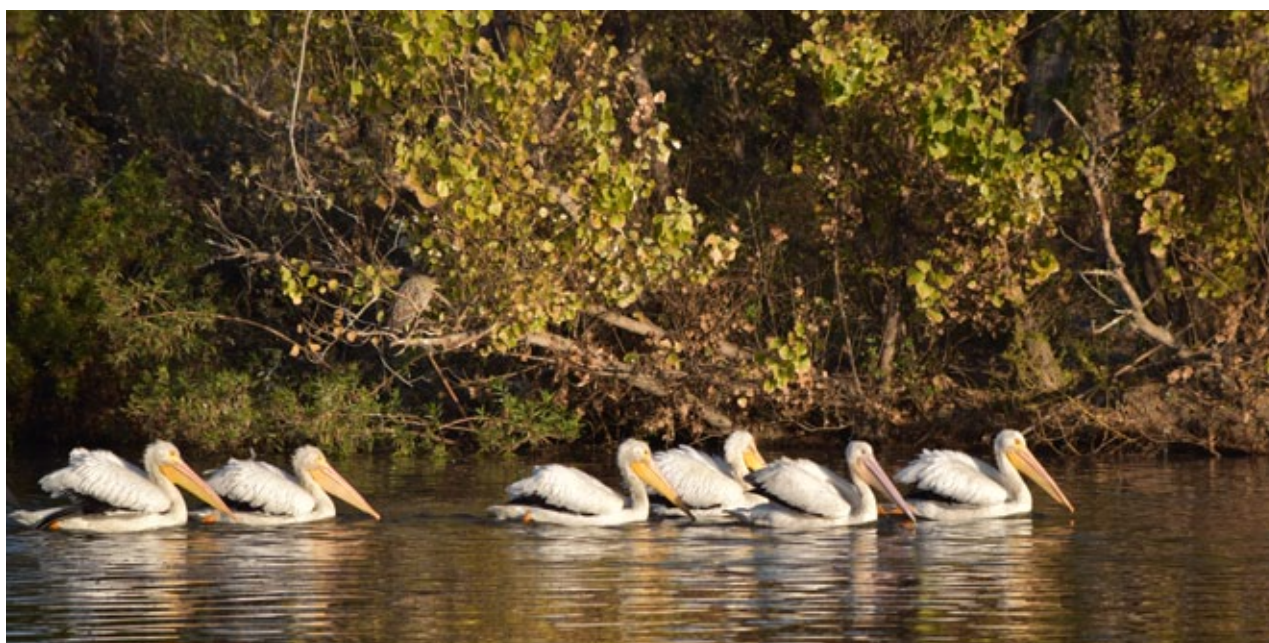
While Sepulveda Basin ecosystem is a valuable natural element of the San Fernando Valley, it is by no means pristine but still an island of green in a vast suburban sea. A multitude of birds, reptiles, amphibians, fishes, and invertebrates inhabit the Basin—particularly in the Sepulveda Basin Wildlife Reserve area and its 11-acre lake. The lake’s water is treated sewage from the water reclamation facility and flows from the lake into the Los Angeles River. Ecosystem services include recreational, educational, aesthetic,

and spiritual resources for local people seeking open space and natural respite from the hustle-bustle of modern urban life. People stroll, jog, and birdwatch along the nature trails where the majority of species are native. Visitors may meditate and find peace amid the foliage-enshrouded wildlife viewing areas or picnic and play sports on the lawns and athletic fields. While human benefits from this area are largely intangible, the Sepulveda Basin’s novel ecosystem is also an under appreciated asset for other biota.

A SOURCE OF WATER ONCE MORE?

Historically, one of the Basin’s most important services was its reliable supply of potable water used by the Tongva and early European and American settlers, particularly in the summertime, however a lot has changed since that then. To support southern California’s enormous and thirsty modern metropolis, water now has to be imported from the Sierra Nevada, Owens Valley, and Colorado River. The negative environmental consequences of those massive projects are considerable, and the water supply has proved to be insufficient in drought years. Perhaps one day the significance of those problems will lead us full circle, to again rely on the Sepulveda Basin as a potable water source.

The municipal plan Toilet to Tap is a catchy and, perhaps, overly vivid description of recycling highly treated sewage. In this plan wastewater would recharge



American white pelicans (*Pelecanus erythrorhynchos*) visit Wildlife Lake in the Sepulveda Basin. Photo by Paula Schiffman.



CNPS weed warriors (left to right) Anne Abramson, Steve Hartman, and George Wadell clearing invasive mustard at the Sepulveda Basin. Photo by Paula Schiffman.

underground aquifers and later be pumped from wells, purified, and delivered as potable water. In the mid-1990s, the concept, more mundanely known as “indirect potable reuse,” repelled many squeamish southern Californians. Yet, through the repeated evaporation, precipitation, accumulation, and use of our planet’s finite water supply, we are already drinking wastewater that has been recycled countless times. Because it was politically expedient for some powerful Los Angeles’ policy makers to exploit the “yuck factor,” the plan was abandoned (Haefele and Sklar 2007). Good ideas do not disappear forever and the realities of the changing climate have renewed interest in drought proof ways of managing southern California’s water supply.

In 2015, Southern California’s Metropolitan Water District (MWD), an agency that serves 19 million people, began to again assess the feasibility of indirect potable reuse at a large regional scale. Although inclusion of the Sepulveda Basin’s water reclamation plant does not appear to be part of the project that is currently under consideration by the MWD, Orange County’s Water and Sanitation Districts have recently confirmed that tasty purified potable water can be produced safely and economically from aquifers replenished with treated urban sewage.

It seems likely that climate change and the water demands of southern California’s burgeoning human population will necessitate that, at some point in the future, wastewater treated in the Sepulveda Basin will be recharged into the San Fernando Valley’s aquifer for subsequent purification and consumption. In fact, the East Valley Water Reclamation Project demonstrated feasibility in 1995 (Haefele and Sklar 2007). Replenishment of groundwater at this scale would

again change the region’s hydrology and the vegetation should be expected to respond. A higher, recharged water table might make the ecological restoration of wetlands and riparian areas in low-lying areas, like the Sepulveda Basin, more natural and sustainable. Recycling water in the area where it is needed would surely be a sensible way to manage this precious limited resource and promote the growth of locally adapted native plants.

—Paula Schiffman: paula.schiffman@csun.edu

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SEPULVEDA BASIN WILDLIFE RESERVE: A WORLD-CLASS URBAN REFUGE

Steve Hartman

Most visitors are surprised to find a green oasis full of wildlife in the heart of the San Fernando Valley. Surrounded by freeways, businesses, and homes within one of the largest cities on the planet, the Sepulveda Basin Wildlife Reserve is a world-class urban refuge. Flat, handicap-accessible trails lead to the shore of the Wildlife Lake or Haskell Creek where photographers prowl from dawn to dusk. Plein air painters visit on a regular basis to capture the seasons. The late fall change of the cottonwood forest from green to yellow is one of the more beautiful spectacles seen locally. Dawn can be a sublime affair, with ground fog hovering low and the rising sun reflecting across the lake.

The motto of the Reserve is a “Symphony of Sounds.” Even though it is encompassed by the 101 and 405 freeways, traffic sounds are muffled by the height of the dam. The private jets taking off from nearby Van Nuys airport are fast so the roar doesn’t last long. In springtime unnatural sounds are drowned out by squawking red-wing blackbirds, grackles, kingbirds, and kingfishers.

FROM AGRICULTURE TO NATIVE VEGETATION

The City of Los Angeles Department of Recreation and Park’s Sepulveda Basin Wildlife Reserve is located at the east end of the 2132-acre Sepulveda Flood Control Basin created to tame flow after raging winter rains. The headwaters of the Los Angeles River are located at the west end of the San Fernando Valley

and the River bisects the Basin. The L.A. River flooded regularly in the past and the unfettered floods changed the river course over time. The flood of 1938 was the last straw and eventually led to the regional system of channels and dams we have today. To comprehend the potential flow rates in the watershed, consider that the elevational drop over the 51 miles of the L.A. River is the same as the lower 2,000 miles of the Mississippi River! Today, most of the L.A. River is lined with concrete except where the water table is too high to allow for a concrete bottom. The L.A. River flows through the Sepulveda Basin where one of three soft-bottomed reaches occur (the others are near Griffith Park and at the southern outflow into the Pacific).

Before being designated as a Wildlife Reserve, the area was utilized for cattle grazing and later agriculture—most recently corn and sod farms—beginning in the late 1700’s (for a discussion of pre-European occupation see Schiffman this issue). The establishment of the 80-acre North Reserve began in 1988 with an 11-acre lake featuring an island and wildlife viewing stations east of Haskell Creek. In 1999, after a long campaign by local environmentalists, the Reserve was expanded to make Haskell Creek the center, not at the edge as it had been when first established. To reintroduce native trees, valley and coast live oaks were planted along the trails that circulate through the Wildlife Reserve (and also lead to the L.A. River). An additional area to the west was also added to the Reserve in 1999. While this new area is not for hiking because it is directly under the fly zone of a model airplane open space, it offers a buffer and an area off-limits to people.

Above: The Sepulveda Basin. Photograph by Steve Hartman.

PLANT COMMUNITIES IN THE SEPULVEDA BASIN WILDLIFE RESERVE

RIPARIAN FOREST

A forest is recognized by a closed canopy, meaning that the leaves of individual trees touch and overlap. In the North Reserve, the cottonwood trees along Haskell Creek form a closed canopy at the entrance to the Reserve and between the bridges (along with willows). Due to the deciduous nature of the riparian forest trees, the leaves that fall in autumn create a deep leaf litter that eventually turns into soil, but also cover the ground and suppresses the growth of invasive weeds.



The Wildlife Reserve is the only place in the San Fernando Valley where a forest including Fremont cottonwoods (*Populus fremontii*) can be seen turning yellow in the fall. Photo by Steve Hartman.

RIPARIAN SHRUBLAND

In the Sepulveda Basin, especially in lowlands, native shrubs such as mulefat and coyote bush dominate. There is a significant stand of these species around the Wildlife Lake and an open shrubland can be found east of the lake in the “uplands” of the Wildlife Reserve. Western ragweed, mugwort, and verbena can also be found in this plant community.

OAK AND WALNUT WOODLANDS

A woodland is recognized by scattered trees (or large shrubs) that, as a rule, do not touch each other—thus a woodland is characterized by an open canopy. The young oak trees planted between Woodley Avenue and Haskell Creek are almost mature enough for the area to be described as an oak woodland. On the north berm of Burbank Boulevard the oak trees are so dense that they form a closed-canopy forest, but there are so few that woodland better describes the area. California walnuts have volunteered and been planted in various areas in the Wildlife Reserve, and often occur with the oaks. In southern California, oak and walnut woodlands are often located on cooler, north-facing slopes.

AQUATIC PLANT COMMUNITY

With a creek, a lake, a pond, and a river, the Sepulveda Basin Wildlife Reserve has diverse and fecund aquatic plant communities. Cattails and bulrushes are prevalent in all wetlands. Common knotweed (*Persicaria lapathifolia*) and water smartweed (*Ludwigia peploides*) grow in the pond and lake and provide sustenance to waterfowl.



The oak woodland community includes coast live oak (*Quercus agrifolia*) and valley oak (*Q. lobata*). Photo by Paula Schiffman.

FLORA

Thousands of natives have been planted in the Sepulveda Basin Wildlife Reserve. The initial planting in the North Reserve took place late in the summer of 1988 but many perished because they were planted during the least hospitable time of year. Various organizations have planted additional trees and shrubs over the years. Many others have volunteered by growing on their own from seeds, underground shoots, or from broken pieces of plant that rooted and took hold. While certain native plants have volunteered such as coyote bush (*Baccharis pilularis*), mulefat (*Baccharis salicifolia*), California walnut (*Juglans californica*), elderberry (*Sambucus nigra*), western ragwort (*Ambrosia psilostachya*), verbena (*Verbena lasiostachys*), and mugwort (*Artemisia douglasiana*) many non-native plants have also taken advantage of disturbed soils. In other cases, the remoteness of certain areas has allowed weeds to take over the landscape. There are approximately 80 native California plants found in the Wildlife Reserve, and around half as many non-native species.

Since the Reserve is located in an active flood control basin, weed management is an ongoing practice. Every time the Basin floods, native and non-native seeds from the upper L.A. River watershed are translocated into the Basin. As the flood waters recede, a layer of silt remains. The silt is the perfect example of exposed disturbed soil, the kind of condition to which weed seeds are adapted. Because of this, active weed management is an ongoing project in the Basin.

RESTORATION VS. REVEGETATION?

While the Wildlife Reserve now looks like natural habitat, restoration is incomplete. The dam continues to cause floods which create an unnatural concentration of sediments. Because there are no detailed records of the native plants that once occupied the Basin, and since there are few populations of existing native plants in the Basin, nearly all the plant material that was introduced was purchased from nurseries or contract growers—creating ambiguity in genetic origins.

While native trees and shrubs are well established, there are few native annual plants. The increasing tree and shrub cover provides habitat for the native fauna, and that native fauna is becoming increasingly more populous and diverse over time. This understory habitat will eventually lead to the healthy establishment of annuals. As plants die and decay, nutrients are added to

the soil and microhabitats are created for small arthropods and other forms of life.

PONDERING THE FUTURE

In a city with little open space, there is a high demand for the few areas that remain. Fortunately the Wildlife Reserve has many supporters. When CalTrans proposed to reduce the Wildlife Reserve by 16 acres to build on- and off-ramps to the 405 freeway, the public uproar squelched that proposal. With the Tillman Water Reclamation Plant located in the Basin, there have been proposals from the Bureau of Sanitation for creating polishing ponds to treat water already treated three times, an additional time. A multi-day music festival was proposed adjacent to the Wildlife Reserve but the idea was soon abandoned when it became clear the environmental damage would be difficult to mitigate.

Until the late 1970's there was no natural habitat in the Sepulveda Basin except along the Los Angeles River. Over the next three decades the Wildlife Reserve was expanded and the Bull Creek Ecosystem Restoration Project was created (see Hartman this issue). Now that natural habitats within the Basin have been established it has never been more critical to manage these areas to make them safe for visitors. With each new threat—drones, combat kite string (high test filament line with ground glass used to cut other kite's strings), and radio controlled cars—urban wildlands take the brunt of human abuse.

It is not in our Society's best interest to have natural areas with native plants become synonymous with homeless encampments and weeds. We, as CNPS members, need to proactively guide management in the Sepulveda Basin Wildlife Area. These actions will sustain this beautiful reserve for the benefit of our society. Together we can continue to heal this world-class urban wildlife refuge

—Steve Hartman: naturebase@aol.com



BULL CREEK ECOSYSTEM RESTORATION PROJECT: NOT QUITE A SUCCESS STORY

Steve Hartman

With its headwaters in the mountains above the San Fernando Valley, Bull Creek is mostly a storm drain. When it reaches the Sepulveda Basin, Bull Creek flows for half a mile before emptying into the Los Angeles River.

Giant reed grass (*Arundo donax*), an invasive species from the Middle East, forms dense stands on disturbed sites and riparian habitats. The species arrived in Bull Creek in the 1990's and spread rapidly. In 1994, the City of Los Angeles Dept. of Recreation and Parks (RAP) and the Los Angeles Audubon Society submitted a grant application entitled "Arundo and Exotic Weed Removal within Bull Creek." The project's goal was to improve habitat quality by the complete removal and control of giant reed and other exotic weeds like castor bean (*Ricinus communis*) and tree tobacco (*Nicotiana glauca*). The grant was not funded and Bull Creek thus remained an eyesore and of high restoration priority.

SCOPING AND ENVIRONMENTAL ASSESSMENT

In May 1999 the city held a scoping meeting for Bull Creek environmental restoration. CNPS recommended restoration be based on plant communities and discouraged the use of hydro-seed mixtures. In September 1999 the Bull Creek Section 1135 Preliminary Restoration Plan was released. The Bull Creek Channel Ecosystem Restoration proposed to develop 26 acres of aquatic, riparian, and native upland habitat to enhance and restore wildlife resources in an area heavily impacted by urbanization. The project came at an estimated cost of \$4 million. Agency concerns dragged out approval until June 2005 when a draft project report and environmental assessment was released. In five years, the projected cost had escalated to nearly \$6 million.

IMPLEMENTATION

In September 2007, ACOE announced the project would be completed within 16 months. Groundbreaking occurred in February 2008, construction was complete in spring 2009, and a ribbon cutting

ceremony occurred in May. The project entailed re-contouring the creek bed to make it wider while adding an oxbow to create an island. The dirt removed by excavation was used to create two small hills.

Next came re-vegetation. Low-lying areas nearest the channel were planted with mostly willows (*Salix* spp.), hills with shrubs such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*), bush mallow (*Malacothamnus fasciculatus*) and California coffeeberry (*Rhamnus californica*). The west side incorporated a grassland with a terraced meadow of grasses including needlegrass (*Stipa* sp.), fescue (*Festuca* sp.), melic (*Melica* sp.), and annual and perennial wildflowers. The plan called for additional plantings of California black walnut (*Juglans californica*) and coast live oak (*Quercus agrifolia*).

Once construction was complete, weeds began to take over the site. The project required the contractor to maintain weed management for one year after construction was complete. In addition, the Los Angeles Conservation Corps worked to control castor bean, giant reed, Russian thistle (*Salsola* sp.) and tree tobacco during the summer of 2009. This was adequate.

Against our wishes, it appeared a solution of seeds and organic matter was sprayed on the hills and



Bull Creek, flowing from the Santa Susana Mountains to the north, empties into the Los Angeles River in the Sepulveda Basin. Over the years, the unchanneled portion in the Basin eroded and incised. Eventually, giant reed grass (*Arundo donax*) overtook native plants. 2004 photo by Steve Hartman.



CNPS weeders (from left) Kerri Barton and Julie Takayama stand proudly next to their day's bagging of weeds. A field of untreated mustard lies behind. Photo by Steve Hartman.

grasslands. In this mix were the remnants of seeds from other projects, as many non-native annuals appeared. We also saw large infestations of horehound (*Marrubium vulgare*).

After the weed control contract was completed in March 2010, I re-deployed a volunteer weeding group to work Bull Creek one day a week (4 people for 3 hours). We worked sections and were able to remove all the weeds with the exception of annual grasses. We had to explain why we were killing the beautiful gazanias and South African daisies. We bagged the weeds in large trash bags provided (and picked up) by the City, and the City disposed them as trash—not yard waste.

DECLINE

At this point the project was a success. The two hills were carpeted with wildflowers like golden yarrow (*Eriophyllum confertiflora*) and California poppies

(*Eschscholzia californica*). The grasslands were lush with natives. The willows were thriving along the creek.

After the rainy season of 2008, we noticed significant erosion along a bank of Bull Creek. Then, in the summer of 2009, the Station Fire ignited in the Angeles National Forest. Later that year, when the Santa Ana winds blew, areas to the south of the fire (such as the Sepulveda Basin) became covered in a thick layer of dust. Subsequently, during the first large rainstorm that winter, Bull Creek's channel was severely eroded opposite where the water left the oxbow—the oxbow itself filled with silt.

Weeds continued to thrive as the city continued to irrigate certain areas, often nurturing circles of weeds. In June 2010, we lobbied the city to turn off the irrigation. Our weeding efforts were effective in the short term, but as large areas became too difficult to manage we decided to concentrate our efforts. One such priority was a place we called Wildflower Hills. Here we targeted unusual weeds like *Plantago sempervirens* and stinkwort (*Dittrichea graveolens*). We dubbed 2011 the year of the clover (*Melilotus* spp.) and ultimately our team had to use herbicide to eradicate this and other invasive species. In particular we were targeting mustards like *Hirschfeldia incana* and *Brassica nigra* that were aggressively invasive.

In the fall of 2011 orange plastic fences, that had been in place to block foot travel after the initial work, were removed and public access to these wildflower hills became a new problem. Our group tried covering unauthorized trails by piling cut mustard plants but when the winds blew the piles went south.

Then the drought came. While it made the weeding easier at first, after a few years the native grasses declined and eventually disappeared. Now, tentative plans for the 2024 Olympics identify Wildflower Hill as the site for administration buildings as part of the Olympic sports facilities in the Sepulveda Basin.

While the volunteer weeding crew has abandoned its ongoing work at Bull Creek, CNPS will continue to monitor the area for giant reed grass or other significant weed invasions and attempt to direct proper resources to address problems as they occur. Restoration is forever in the Sepulveda Basin.

—Steve Hartman: naturebase@aol.com



In 2011, Bull Creek was significantly widened and planted with a mixture of riparian tree species. Photo by Steve Hartman.

WEED CONTROL EFFORTS IN THE SEPULVEDA BASIN

Steve Hartman

The California Native Plant Society has been active in the Sepulveda Basin since 1989, when members began volunteering to remove Russian and milk thistle in conjunction with the Army Corps of Engineers (ACOE). In the 1990s, members of the CNPS Los Angeles/Santa Monica Mountains Chapter monitored areas within the Basin and reported weed infestations to appropriate agencies. These citizen scientists noticed that large areas in the South Reserve and along the Los Angeles River within the Basin were being overtaken by the invasive giant reed grass (*Arundo donax*). Eventually the ACOE brought in heavy equipment to extract large swaths of the species while also contracting three year follow-up treatments.

Since 2000, CNPS and the Sepulveda Basin Wildlife Reserve Consortium have funded weed control work throughout the Sepulveda Basin. These remediations

are performed by licensed applicator Bill Neill of Riparian Repairs as part of an integrated weed control plan. Since 2010, I have has led a weeding team (Julie Takayama, Kerri Barton, Anne Abramson, George Waddell and others) that manually remove weeds by hand and with tools. Because weeds are often loaded with viable seeds, waste is considered trash and the City of LA Department of Recreation and Parks (RAP) has assisted by picking up bags and disposing of them in landfills.

Our records since 2011 show the following activities:

- 2011 – 144 hours (Oct.-Dec.) with 161 bags
- 2012 – 626 hours with 629 bags
- 2013 – 287 hours with 255 bags
- 2014 – 298 hours with 311 bags
- 2015 – 365 hours with 238 bags
- 2016 – 491 hours with 425 bags
- 2017 – 555 hours with 397 bags

Common weeds that that we've nearly eliminated from the North Wildlife Reserve include giant reed grass, castor bean (*Ricinus communis*), sweet fennel (*Foeniculum vulgare*), milk thistle (*Silybum marianum*), Harding grass (*Phalaris aquatica*), prickly lettuce (*Lactuca serriola*), Johnson grass (*Sorghum halepense*), tree of heaven (*Ailanthus altissima*), Mexican fan palm (*Washingtonia robusta*), and burning nettle (*Urtica urens*). Poison hemlock (*Conium maculatum*) has always been present in wet areas and as populations are discovered they are dispatched with several years of herbicide treatments. Russian thistle has been a challenge because it has a mid-summer phenology, often in remote places, requiring regular regional monitoring. We ignore annual non-native grasses as they seem to disappear once other weeds have been eliminated.

Annual non-native mustards—like *Hirschfeldia incana* and *Brassica* species—can grow to 6' tall and create a thick accumulation. This layer of biomass hides the dreaded horehound (*Marrubium vulgare*). We quickly learned that removing the mustard would allow us to find and remove horehound and other weeds such as Russian thistle (*Salsola* sp.), thistles (*Centaurea* spp., *Carduus* spp.), and wild radish (*Raphanus sativus*). By clearing these areas of dead mustard, it became easier to apply herbicide to kill emerging mustards. This soon allowed natives to establish.



Bill Neill of Riparian Repairs surveying a stand of Harding grass that he had previously treated with monocot specific herbicide. Photo by Steve Hartman.



Introduced evergreen ash (left) has much larger leaves (and usually more leaflets) than native velvet ash (right). Photo by Steve Hartman.



It is important to be able to describe the “desired condition” of a particular habitat. This image shows a cottonwood tree with a native understory of mugwort (*Artemisia douglasiana*) and western ragweed (*Ambrosia psilostachya*). Photo by Steve Hartman.

Another researched-based reason to remove mustard is that nonnative members of the mustard family can suppress mycorrhizal fungi. The lack of fungi reduces the germination success of native plants (Burke 2008). It appears that areas cleared of mustard for three years enhance the germination success of coyote bush (*Baccharis pilularis*) and other natives.

In addition to attempting to control invasive perennial and annual weeds species, CNPS has identified and worked to control nascent populations of invasive perennial weeds such as stinkwort (*Dittrichea graveolens*), perennial pepperweed (*Lepidium latifolium*), and passion vine (*Passiflora caerulea*).

The biggest problem is evergreen ash (*Fraxinus uhdei*). Originally introduced as a street tree, the species germinates easily and grows surreptitiously beneath existing shrubs, eventually becoming a vibrant sapling 10 feet tall. Evergreen ash has overtaken the riparian corridor of Haskell Creek south of the reserve and is now suppressing slower-growing natives. In areas where evergreen ash is dominant, understory vegetation is depauperate. Saplings are often found adjacent to creeks, making removal complicated because of the possibility for channel disturbance. This requires special permits.

In the Wildlife Reserve the evergreen ash is controlled but certainly has not been eliminated. On an annual basis, saplings and seedlings are treated with foliar herbicide. Larger trees are girdled and herbicide is applied to the cut areas. Since evergreen ash seems

to be entrenched, control will be an ongoing effort.

The best time to search for “evergreen” ash is during January or February, when all other native riparian species such as willows (*Salix* spp.), Fremont cottonwoods (*Populus fremontii*), box elder (*Acer negundo*), and native ash (*Fraxinus velutina*) will have lost their leaves. The only time evergreen ash trees lose their leaves is after a hard freeze, but this does not appear to kill the trees and leaves grow back quickly.

Based on more than 20 years of experience with attempting to control various weeds in the Sepulveda Basin, and given the lack of support from the city due to budgetary priorities, it is apparent that without herbicide it will be impossible to control non-native weeds that threaten regional biodiversity. Continued volunteer efforts have been expanding the “no mustard” zone using a variety of treatment methods. Eventually, native plants will return to mustard free zones but active management in these urban wildlands will continue to be a priority.

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THE VALUE OF AN URBAN FOREST

Julie Clark De Blasio

Trees are anchors of many of the native ecosystems across California. The importance of trees goes beyond the ecosystem services they offer in our wild forests—they have an aesthetic and cultural value for Californians in urban areas. In fact, governing bodies have adopted native tree protection ordinances. Cities like Los Angeles, Pasadena, and Calabasas have developed laws and ordinances that focus on saving both native and cultivated specimens from piecemeal development, especially along the Wildland-Urban Interface (WUI).

The tenets of state and federal environmental laws wisely support the science of protecting native plants by including guidelines like avoidance, minimizing impacts, and mitigation when no other options exist. California's §4799.07-*Urban Forestry of the Public Resources Code* recognizes that urban forests create an ecological link with nature, increase property values, attract residents, businesses, and visitors. Additionally, forests conserve energy, purify the air, capture carbon, reduce and capture runoff, provide habitat values, and enhance recreational opportunities. AB 1530 (2017-2018) proposes to strengthen the State Urban Forestry Code to require more protections, including—and not limited to—encouraging tree retention, combating pathogens, creating policies and economic incentives

for forest health (especially in disadvantaged communities), and increasing urban forests for all benefits including carbon sequestration.

Street trees, a subset of the urban forest, were recently studied as well. USDA Forest Service and the University of California Davis found that street trees increased across California by 154 percent between 1988 and 2014 (McPherson 2016). During the same period, canopy and density declined by 19 percent mostly due to a shift to younger age classes and a loss of mature trees. While the study did not differentiate between native and non-native species, an astounding ten percent of urban forest street trees are non-native London plane tree (*Platanus x hispanica*), which readily hybridizes with western sycamore (*Platanus racemosa*).

Governance often plants single species monocultures along parkways and meridians. While lacking in biodiversity and ecosystem services, the study also found that the economic benefits of urban street trees was estimated at \$2.49 billion. Cumulatively, annual ecosystem services have a value approaching \$1 billion—equating to \$111 per tree. California street trees sequester 567,748 tons carbon dioxide annually equaling the removal of the exhaust from 120,000 cars. Average annual maintenance cost is \$19 per tree—proving an effective cost-benefit ratio of \$1:\$6 (McPherson 2016).

Municipalities have created planning strategies and adopted sustainable city plans that wisely focus on improving and strengthening the urban core, while

Above: Torrey Pine State Reserve is an example of a well-managed urban forest. Photograph by Michael Kauffmann.

protecting the urban-wild interfaces from unbridled development. Often, the agencies entrusted with these plans and policies have difficulty adhering to the regulations and ordinances due to development pressures competing for the scarce, high-value remaining lands. Herein lies the tension between short-term economic decisions and long-term planning that can sustain natural communities and support our quality of life. Because California contains urban and wild lands, our future depends on understanding that human life depends on the health of both.

Destruction of protected native trees throughout the City of Los Angeles serves as case in point. Many of these old beauties disappear illegally. Municipalities permit others for removal—often along with the associated native plant communities. The removal of mature trees requires mitigation measures including active planting of same species seedlings without other associated native species. This replacement neither re-establishes the lost habitat nor ecosystem services of older trees and plant communities. Current research shows old growth native vegetation has high value—thus the protection need for legal, functional, and ethical reasons.

The City of Los Angeles' Baseline Hillside and Mansion Ordinances encourages the full development of lots along with removal of mature vegetation—often then substituted with impervious concrete.

Destruction of pristine habitat and associated wildlife corridors is rampant throughout the City and County, as seen in current urbanization projects like Old Ranch Road in Brentwood, The Edge project in Malibu, Andora Equestrian Estates in Chatsworth, Las Virgenes Corridor in Calabasas, and Agoura Village in Agoura Hills.

A 12 acre plot at Old Ranch had scores of mature riparian woodland trees removed to build two 34,000-square foot mansions. Three trees were cut without a permit, including a heritage western sycamore that provided shade, cooler temperatures, wildlife habitat, and an aesthetic anchor for the tightly knit canyon community.

A 17-year University of Southern California (USC) spatial study (Lee 2017) documented the loss of vegetation throughout the greater Los Angeles region. Researchers noted tree losses in every part of the city. With canopy decline ranging from 14 to 55 percent, many of the highest losses occurred in the WUI. The study concluded home renovation, remodeling, mansionization, and an increase in median home size were the primary reasons for vegetation removal. An irony noted was the period of loss coincided with the 2007 City of Los Angeles Million Trees Initiative. The Initiative passed due to compelling science showing neighborhoods with numerous trees realized benefits of more pollinators, wildlife, aesthetics, improved air



Cut stump of a heritage sycamore on Old Ranch Road, Brentwood (Los Angeles). Photo by Sara Nichols.



The knoll where the currently litigated Cornerstone Multi-use Project in Agoura Hills has been proposed. Photo courtesy of Save The Agoura Cornell Knoll.

quality, carbon capture, decreases in heat and crime. The findings of the USC study can serve as an example of cumulative effects of tree removal.

As an urban culture, planning and building within our communities needs to incorporate urban forests more effectively. Urban biodiversity is declining with the disappearance of heritage trees, old growth savannah, woodlands, forests, and their biotic communities.

As CNPS members, we can dually contribute at significant levels to support urban forests, while simultaneously ameliorating effects of climate change. Healthy ecosystems and soils, whether located in wildland, WUI, or urban areas serve as huge carbon sinks. Atmospheric carbon increases significantly from ground disturbance, vegetation removal, and impervious surfaces such as roads, parking lots, and concrete buildings. As stewards, we can work with government and organizations to uphold and enforce existing protected vegetation ordinances, help encourage and

promote new ones, and advise on urban forestry. The outcomes will encourage benefits of horticultural use with an emphasis to preserve native flora, biodiversity, ecosystem health, lower urban island temperatures, sequester carbon and airborne pollutants, lower crime, and provide recreation.

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NATURE IN THE CITY: RESTORED NATIVE HABITAT ALONG THE L.A. RIVER SETS NEW MODEL FOR SOUTHERN CALIFORNIA'S URBAN RIVERS

Esther Feldman

With California poppies, arroyo lupine, and jimson weed in stunning full bloom amidst 40 species of native plants, a new half-mile section of the L.A. River Greenway Trail in the San Fernando Valley opened to the public in June 2017, setting a new model for restoring native habitat along Los Angeles County's urban rivers. Community Conservation Solutions (CCS) led this nearly six-year project, which used an ecosystem-focused design to re-create the native plant communities that existed in this part of Los Angeles County over a hundred years ago, before urban development and channelization of the L.A. River. Integrated with an unpaved walking trail, other amenities include benches, a shaded river viewing area, and interpretive metal art highlighting the river's rich cultural and natural history. Located in Studio City, this restoration project mitigates native habitat that was destroyed during the widening of Interstate 405 in the nearby Sepulveda Pass.

The unpaved trail links existing segments of the

L.A. River Greenway to create a continuous four-mile trail loop. To date, this is the longest river walking trail in the heavily-populated San Fernando Valley. This is an important step toward transforming all of the L.A. River's 51 miles of concrete river channel into a continuous greenway of open space, natural habitat, walking, and biking trails. While all of the river's banks are lined with concrete, approximately 13 miles have a natural bottom where the groundwater table is too high and won't allow for concrete. The L.A. River drains an 834 square mile watershed, with its headwaters in the San Gabriel and Santa Monica Mountains. The river flows through 12 cities on its way to the Pacific Ocean at Long Beach and is readily accessible to millions of urban residents. Drawing attention to native habitat plays an important educational role as well as providing vital environmental benefits.

This L.A. River habitat restoration project creates a new precedent for urban river restoration by demonstrating how to use native plants—not just as landscaping—but to restore a functioning ecosystem, particularly in a linear, urban setting. This is a first-of-its-kind approach along the L.A. River, which is constrained not just by the concrete in the river channel

ABOVE: Artist's rendering of the landscaped L.A. River Greenway Trail after it matures in a few years. By Mia Lehrer + Associates.



Native habitat walk features examples of key native plants, and a view of Mt. Cahuenga in the Santa Monica Mountains. Photo by Diane Crumley.

itself, but also by the dense urban development that abuts both sides of the river.

In California, many urban river improvement projects and other urban park and open space projects require the use of native plants. However, these native trees, shrubs, and plants are typically arranged in very controlled and designed groupings with the emphasis on single species, and not in the species and size combinations that occur in nature. By design, we planted a mix of upper story, mid-story and understory trees and shrubs that are essential to healthy, functioning habitat and to restoration of healthy soils.

To ensure an ecosystem-focused approach that would work in this linear site, we retained Margot Griswold, a native habitat restoration scientist at Land IQ and Los Angeles Audubon, and Jeff Hutchins at Mia Lehrer and Associates to develop the habitat restoration and landscaping plan. VCA Engineers and VS2 Consulting helped us integrate engineering and leading technology to manage stormwater runoff and meet the requirements of L.A. County Department of Public Works (the property owner) and the U.S. Army Corps of Engineers. Dan Cooper of Cooper Ecological Monitoring, Inc. conducted the biological study prior to construction. We are grateful for the guidance and support of the CNPS Los Angeles/Santa Monica Mountains Chapter, Los Angeles Audubon, San Fernando Valley Audubon, and for the input of dozens of community members.

Steve Hartman, from CNPS, generously gave his time to advise us on long-term survival considerations and maintenance needs of native plants in the San Fernando Valley, drawing from CNPS' experience along other sections of the L.A. River where native plants have been used for landscaping. CNPS members attended community workshops to inform the habitat

restoration planning, and enthusiastically helped dig holes on our Community Tree-Planting Day to plant 55 live oaks and California sycamores—the first step in bringing life and nature back to this barren stretch of the L.A. River.

As with any urban open space or habitat restoration project, we had to contend with many site constraints, as well as with the impacts of decades of adjacent urban development. The half-mile site is bordered by a steep slope, which was heavily compacted and dominated by non-native trees. The dominant tree type was eucalyptus, which exacerbated ongoing erosion by preventing the development of the stabilizing root structures that an understory would provide. Palm trees planted at the top of the slope to demarcate the border of an adjacent, privately-owned golf course had not been trimmed in more than 50 years, and frequent wind events resulted in thick carpets of palm fronds.

The steep slope also presented a great opportunity, with enough square footage for meaningful native habitat restoration, which could link to nearby mountains and other habitat areas both upstream and downstream. In addition, the steepness offered built-in protection for young trees and plants, as future visitors would not be walking in this area. CCS saw a habitat restoration opportunity in the 60 to 90-foot wide natural dirt right-of-way along the river and in the steep slope that separates this part of the L.A. River from the adjacent property and city street.

On the slope we removed 24 non-native trees, including ficus (*Ficus benjamina*), eucalyptus (*Eucalyptus globulus*), carrot wood (*Cupaniopsis anacardioides*) and tree of heaven (*Ailanthus altissima*). We worked closely with L.A. County Department of Public Works, and persuaded them to remove 37 palms and to aggressively prune the remainder to get rid of as much of the palm frond problem as possible. The site was sprayed with Roundup (glyphosate) several times to remove as much of the non-native seed bank as possible. Weeding continued throughout the habitat restoration and construction period.

The plant communities we restored include riparian transitional woodland, oak/walnut woodland, and mixed chaparral/coastal sage scrub. We also created a half-mile native grass-lined bioswale to naturally capture and filter urban runoff. The overstory consists of coast live oak (*Quercus agrifolia*), California sycamore (*Platanus racemosa*), California walnut (*Juglans californica*), and valley oak (*Quercus lobata*). We planted 40 different native species (see the plant list), and more than 3,000 trees, shrubs, grasses and plants to re-establish



Native plants blooming during spring include TOP: California encelia (*Encelia californica*) MIDDLE: California rose (*Rosa californica*) BOTTOM: Sacred datura (*Datura wrightii*). Top two photos by Joe Laskin, bottom photo by Tom Gamache.

PLANT LIST

Trees and Large Shrubs

<i>Heteromeles arbutifolia</i>	Toyon
<i>Juglans californica</i>	California walnut
<i>Platanus racemosa</i>	Western sycamore
<i>Prunus ilicifolia</i>	Holly-leaf cherry
<i>Quercus agrifolia</i>	Coast live oak
<i>Quercus lobata</i>	Valley oak
<i>Sambucus caerulea</i>	Blue elderberry

Chaparral and Coastal Sage Scrub Species

<i>Artemisia californica</i>	California sagebrush
<i>Aristida purpurea</i>	Three-awned grass
<i>Asclepias fascicularis</i>	Narrow-leaf milkweed
<i>Baccharis pilularis</i>	Coyote bush
<i>Berberis nevadensis</i>	Nevin's barberry
<i>Brickellia californica</i>	California brickellbush
<i>Carex praegracilis</i>	Field sedge
<i>Ceanothus megacarpa</i>	Big pod ceanothus
<i>Corethrogyne filaginifolia</i>	Cudleaf aster
<i>Dudleya pulverulenta</i>	Chalk-leaf dudleya
<i>Encelia californica</i>	California bush sunflower
<i>Epilobium californicum</i>	California fuchsia
<i>Eriogonum fasciculatum</i>	California buckwheat
<i>Fremontodendron californicum</i>	Flannelbush
<i>Hazardia squarrosa</i>	Sawtooth goldenbush
<i>Heteromeles arbutifolia</i>	Toyon
<i>Isocoma menziesii</i>	Goldenbush
<i>Keckiella cordifolia</i>	Heart-leaf penstemon
<i>Lonicera subspicata</i>	Honeysuckle
<i>Muhlenbergia rigens</i>	Deer grass
<i>Penstemon spectabilis</i>	Penstemon
<i>Peritoma arborea</i>	Bladderpod
<i>Rhamnus californica</i>	Coffeeberry
<i>Rhus ovata</i>	Sugar bush
<i>Rosa californica</i>	Wild rose
<i>Salvia apiana</i>	White sage
<i>Salvia clevelandia</i>	Cleveland sage
<i>Salvia mellifera</i>	Black sage
<i>Salvia spathacea</i>	Hummingbird sage
<i>Sambucus caerulea</i>	Mexican elderberry
<i>Sisyrinchium bellum</i>	Blue-eyed grass
<i>Solidago californica</i>	Goldenrod

Slope Seed Mix

<i>Aristida purpurea</i>	Three awn grass
<i>Deinandra fasciculata</i>	Fascicled tarweed
<i>Encelia californica</i>	California brittlebush
<i>Eriogonum fasciculatum</i>	California buckwheat
<i>Eschscholzia californica</i>	California poppy
<i>Isocoma menziesii</i>	Coast goldenbush
<i>Lasthenia californica</i>	Goldfields
<i>Layia platyglossa</i>	Tidytips
<i>Lupinus succulentus</i>	Arroyo lupine
<i>Plantago ovata</i> subsp. <i>insularis</i>	Woolly plantain
<i>Salvia mellifera</i>	Black sage
<i>Stipa cernua</i>	Nodding needlegrass



LEFT: Before the project began. RIGHT: California poppies grace the walking trail adjacent to the rain-runoff catching swale which is planted with creeping wild rye (*Leymus triticoides*) and field sedge (*Carex praegracilis*), which runs the length of the project. Photos by Joe Laskin.

the diversity of microhabitats that native animals, birds, and invertebrates need to survive, including nesting, foraging, and shelter activities. The species mix is in accordance with the L.A. River Master Plan Landscaping Guidelines and Plant Palette, and takes into consideration the south-facing aspect of the site.

Most of the area was also hydroseeded with a mix of *Aristida purpurea*, *Deinandra fasciculata*, *Encelia californica*, *Eriogonum fasciculatum*, *Eschscholzia californica*, *Isocoma menziesii*, *Lasthenia californica*, *Layia platyglossa*, *Lupinus succulentus*, *Stipa cernua*, *Plantago patagonica*, and *Salvia mellifera*. The mix was designed to include several early-germinating species that will establish in the first two years, while other species may take two to three years to germinate, depending on rainfall.

To ensure optimal long-term survival and establishment of healthy root systems, we planted one-gallon nursery starts for most of the trees and plants, and an additional 55 trees in 15-gallon containers. The trees were planted in May, 2016, a full year before the site opened to give them time to get established. We reached out to the Studio City Residents Association, surrounding neighborhoods, CNPS, Audubon, Friends of the L.A. River, and local schools to recruit volunteers. We were delighted when over 100 community volunteers showed up to help plant the trees, including local elected officials residents and students from nearby high schools.

As the trees and vegetation become established, this site will provide habitat for many of the 300 species of birds that have been observed along the L.A. River and will provide critical habitat linkages along the L.A. River between the river and the nearby Santa Monica

Mountains, and to other habitat restoration efforts along upstream tributaries. From a habitat linkage perspective, this site also connects to the Sepulveda Basin Wildlife Area a few miles upstream, and to the 4,000 acre Griffith Park a few miles downstream.

The L.A. River Greenway Trail provides many diverse environmental benefits for both wildlife and people. Besides re-establishing habitat linkages and increasing biodiversity, this ecosystem-focused approach is the most efficient way to address other serious environmental concerns that are typical in densely-developed urban areas. These include air quality, water quality, urban heat island effects, and the effects of climate change—as well as the pressing need for green, natural open space in the heart of the city.

Re-establishing a natural ecosystem maximizes long-term sustainability by using native plants that are adapted to the specific climatic conditions of Los Angeles' San Fernando Valley, and to the cycles of heat and drought that are common in Southern California. Once established, these plantings will need little or no irrigation. The mixture of trees and mid- and understory shrubs and plants will provide robust root systems that will stabilize the steep slope, prevent erosion, and substantially increase runoff infiltration and uptake—including the uptake, use and neutralization of excess nutrients and other pollutants carried by urban stormwater runoff.

The result is improved water quality in the L.A. River, which benefits the birds and fish in the soft-bottom sections of the river downstream, as well as the many people who now kayak those reaches. The nearly half-mile long bioswale at the toe of the slope, which

is planted with creeping wild rye (*Leymus triticoides*), further improves water quality in the L.A. River by capturing and naturally cleaning some of the stormwater runoff from nearly 160 acres of impermeable surfaces in the surrounding urban business and residential area and city streets. And the benefits don't stop there.

Climate change? Native habitat excels here, too. This heavily-urbanized area, only a half block from the busy commercial corridor of Ventura Boulevard, is dominated by asphalt, concrete, and buildings which produce a great deal of heat. The rich complex of native trees, shrubs, and groundcover creates a natural forest that provides cooling in summer and heat retention in winter. By helping to both lower and raise surrounding temperatures at the appropriate times, this natural forest mediates heat island effects generated by heat absorption in and reflection by concrete, and helps to compensate for swings in local weather exacerbated by climate change.

This part of the L.A. River is in an area especially vulnerable to climate change. It is within three miles of the Sepulveda Pass, the natural opening in the Santa Monica Mountains that connects the San Fernando Valley with West Los Angeles and the coast. Climate change is causing longer periods of higher and lower temperatures and thereby affecting the inversion layers in the Sepulveda Pass. This in turn affects air flow over the Sepulveda Pass and into the San Fernando Valley.



CNPS and community volunteers helped plant more than 50 western sycamores and coast live oaks. Photo by Joe Laskin.

If designed and maintained correctly, restored native habitat in urban environments can significantly reduce greenhouse gases by helping to store carbon, as well as reducing urban air pollution. Once mature, these rich ecosystems along the L.A. River will store at least 20,000 pounds of carbon per year. Because native trees and plants maximize canopy coverage, have long life-spans, and are self-perpetuating, carbon sequestration will continue for many decades to come. This will help California to reach its targets for greenhouse gas emission reductions, adding to our state's leadership model around the world.

Invertebrates benefit, too, as native habitat re-establishes key parts of the natural food chain that are lacking in densely-populated, urban environments. Understory plants were specifically selected to support butterflies and other invertebrates that provide key food sources for both resident and migratory birds. Examples include the California sycamore which is used extensively by hummingbirds and butterflies and is a food plant for western tiger swallowtail. Coast live oak, which attracts more than 30 species of native birds, provides nesting sites and is a food plant and larval host for the California sister butterfly.

Frequently, native landscapes are inadvertently damaged or destroyed by the wrong kind of maintenance. While the special maintenance needs of restored native plant communities are quite obvious to scientists, specialists, and native plant enthusiasts, most park and public works landscaping crews are accustomed to non-native landscaping protocols. Fortunately, the Mountains Recreation and Conservation Authority (MRCA) is the public agency maintaining the L.A. River Greenway Trail over the long-term. The MRCA has decades of experience in restoring a diversity of native habitats, familiarity with habitat native to the L.A. River. The team includes seasoned staff who are sensitive to the special irrigation, pruning and other needs of native trees and plants. Land IQ provided detailed maintenance specifications, which include these important directions: leave plant litter in place; do not fertilize; do not prune lower branches of young trees; do not top trees; avoid pruning and shearing; and do not worry when native plants become brown or lose their leaves in the summer and fall.

Other key features of the L.A. River Greenway Trail are the interpretive elements, which are integrated into the overall "Nature in the City" focus. This includes the Native Habitat Walk, a self-guided nature trail that includes key species from the restored site and granite boulders engraved with the Latin and common names

of these key plants. The Native Habitat Walk ends in a lovely shaded trellis with seating, providing down-river views toward Mt. Cahuenga, a high point in the nearby Santa Monica Mountains.

The signature River and Mountains entry gate and River Story fence panels highlight the river's rich cultural and natural history through interpretive, hand-crafted metal art work, designed and fabricated by Owen Gabbert Designs. The entry gate shows the river flowing from the mountains to the sea, and six different fence panel designs feature different parts of the river's story.

The L.A. River Greenway Trail and Habitat Restoration project would not have been possible without the support of many public agencies, organizations, community members and numerous individual donors. The project was funded by Community Conservation Solutions and with grants from the California Natural Resources Agency, California Department of Transportation's Environmental Enhancement and Mitigation Program, Santa Monica Mountains Conservancy, the L.A. County Regional Park and Open Space District, and the Studio City Residents Association. L.A. County Department of Public Works provided additional support. The proj-

ect team consisted of Murow CM, Mia Lehrer and Associates, Nakae and Associates, VCA Engineers Inc., Owen Gabbert Designs, Land IQ, and LA Audubon.

This ecosystem-focused approach to bringing nature back to urban rivers establishes an important model for river restoration projects not only in Los Angeles County, but also along the hundreds of miles of concrete-lined, channelized creeks and rivers that exist both in Southern California and statewide. In cities and suburbia alike, communities and conservation leaders see the strips of land along urban rivers as a tremendous opportunity, and are re-imagining and re-inventing these spaces as linear greenways, trails, and badly-needed green open space. This ecosystem-focused approach is applicable anywhere in California where rivers have been channelized and natural habitat removed. By using nature as a guide and restoring natural plant communities along our urban river channels, we can create networks of functioning native habitat that provide a myriad of significant environmental benefits to our air, water, wildlife—and to us.

For more information, visit www.conservationsolutions.org/larivergreenway

— Ester Feldman: efeldman@conservationsolutions.org



Beautiful entrance gates welcome visitors and help tell the story of the Los Angeles River and its natural environs. Photo by Joe Laskin. Gate by Owen Gabbert Designs.



A LIFE UNCULTIVATED

Jake Sigg

In the mid-1950s my life was in crisis as I came to realize that I was unable to work in a conventional business—it was imperative I find another way to earn a living. As a consequence, I was experiencing severe psychosomatic pains and was in the depths of despair and anxiety. Fortuitously, I was showing an out-of-town visitor Golden Gate Park and, after climbing a hill, chanced upon the huge Rhododendron Dell in full bloom. Not a nanosecond elapsed between the sight and the thought: I will become a gardener. That was a Sunday, and first thing Monday morning I went to the office manager and gave two weeks notice. I was offered a promotion and a raise but my mind was made up.

When I first began gardening (with a private gardener) in 1957, the ideal garden promoted by *Sunset Magazine* was saturated with chemicals and deemed aesthetically perfect by readers. The vision of perfection included a lawn that was all grass and no weeds, and fallen leaves were to be immediately removed, lest they provide hiding places for critters. In my ignorance I bought into this model of perfection and control. However, the farm boy in my soul soon rebelled

against raking leaves, knowing they were necessary for healthy soil. Faith in this sterile regime, fragile to begin with, began to unravel. This decoupling from horticulture would only accelerate as I became familiar with the city's wildlands.

A NATURAL AWAKENING

In my first three decades of gardening I did not know categories like native or nonnative—plants were plants and I valued them equally. Much later I realized the importance of native plants and why habitat preservation was of supreme importance. The degradation of natural ecosystems around the world colored my view of human civilization and allowed me to understand the relationship between human health and that of the Earth as a whole.

I also understood that California's Mediterranean-type climate placed stringent demands on plants. When most gardens require weekly watering, our native plants survive long, hot, dry summers. I admired these adaptations and came to value the toughness of California natives. Today, I am unmoved by gardens deemed conventionally "beautiful." To the degree it satisfies, it is solely a rather shallow view of how nature should interact. The world is deeper and more interesting than that.

Above: Jake Sigg and his trusty 52 year-old VW Bug. Photo by Margo Bors.

From the moment I decided to become a gardener, Golden Gate Park was my destination, which I achieved in 1959. I loved the work, but three decades later I was making waves in the park bureaucracy, and the superintendent of parks removed me from supervising the botanical garden staff and put me in the southeast section of the city supervising athletic field and playground maintenance. This move left the botanical garden without a staff member who knew plants. While this transfer hurt, during my commutes to the satellite grounds I came across pieces of original landscape with rich assemblages of native plants—including the 318-acre McLaren Park adjacent to my office. I also noticed for the first time that these areas were threatened with invasive plants like fennel and French broom.

I experienced deep satisfaction when pulling out a single gorse in the middle of a wildflower meadow—the only gorse in the park—but acres were visible across Geneva Avenue on San Bruno Mountain. In my mind, eliminating this one plant was equal to pulling 40 acres of it in a few years. But there was more than just gorse—fennel was numerous and eradicating it was beyond the ability of one person. Action



Yerba buena (*Clinopodium douglasii*) means the good herb in Spanish and was the original name the Spanish gave to San Francisco. Photo by Margo Bors.



On Mount Davidson, unhealthy and overcrowded conditions in the city's blue gum plantation pose dangers including the possibility of catastrophic fires. Photo by Craig Dawson.

was required to save the grassland and even though McLaren Park was not part of my responsibilities, I started grubbing out fennel on company time.

That was my epiphany. After 32 years as a gardener, my interest in horticulture evaporated before my eyes—I was now only interested in urban wildland gardening. Gardening without walls was the only thing that made sense in a crazy world. I soon noticed invasive plants everywhere and remnant public land became my focus. At the same time, my attitude about reassignment shifted—it was a blessing in disguise. I now wondered if my superintendent was a bodhisattva who put me on a path to enlightenment.

GOAL OF BUILDING COMMUNITY

My friend Greg Gaar and I began pulling invasive plants weekly. It was fun work and a process of ecological- and self-discovery where we were restoring ourselves as much as the land. As we discovered all the native plant riches in 31 city-owned parks, we started encouraging neighborhoods to adopt an area. We were sure that once people were introduced to the idea that it would catch fire and become a fad. Greg, a product of the hippie era, created an ornate whimsical sign that read “Ecology: The Last Fad” which he posted for curious passersby when we were working. Our plan was to get neighbors to adopt-an-area, restore wildlands, get to know each other, have a good time, and relate to each other in a different way—thus building community.

Greg is a photographer and owns an intimidatingly huge historical collection of San Francisco photo-



Left to right: Greg Gaar, Werner Schumann, three City gardeners from the Natural Resources Division of RecPark, and Jake Sigg. One of the city's healthiest grasslands is in the background. Regular burning by native people preserved the grasslands. In the absence of fire or human disturbance the grasslands converts to shrublands. Photo by Margo Bors.

graphs. We took a dog and pony show around town which showed the concurrent development of the city and destruction of the unique plant and animal communities. Talks were customized for particular neighborhood. While people loved the slide shows few came out for the work parties. Those that did often found the steep rocky terrain, thistles, blackberry and poison oak unsuitable. Still we had hope, albeit naively, that once people discovered the satisfaction of restoration work volunteers would join us en masse. We were unaware of storm clouds gathering on the horizon.

Fragmentation into 31 heavily-impacted parcels is bad enough for restoration efforts but soon weeds began to mix with politics. Because my work was interfering with what I wanted to do, I retired at the end of 1990 and devoted myself full time to CNPS Yerba Buena chapter work. As chapter president, I put a heavy focus on preserving and enhancing these 31 San Francisco parks, San Bruno Mountain, Montara Mountain, and the Crystal Springs Watershed (owned by San Francisco) in San Mateo County.

USING THE SYSTEM TO SAVE AN ECOSYSTEM

Greg and I sought, and achieved, seats on the citizens advisory committee. This group made recommendations to the Recreation & Park Department on

distribution of the City's dedicated open space funding. The 23 committee members were fierce partisans for their myriad causes and were nervous about Greg and I competing for funding requests. We pointed out, as an example, that those advocating for natural area funding were the very same as those plumping for high need areas and other causes. Tensions began to relax as committee members began to view us as allies rather than competitors.

Over our six years on the committee we succeeded in getting over six million dollars for purchasing remnant pieces of the original landscape that remained in private hands. We reminded RecPark that natural areas need managing. Until then, there had been no management except for hazards—not even for trash removal. The Department agreed with us and created the Natural Areas Program in 1995 and started staffing it in 1997, the year of the Fort Funston imbroglio (more later).

The Department had no job classification suited to describe this work and thus placed field workers under the 3417 Gardener classification. This choice proved problematic, as the classification does not mention knowledge and experience requisite to the job. Just as the staffing began to get underway, the dot.com crash hit, followed by the Iraq war, and then the 2007-2008 meltdown, and budgets were hit hard. The requisite staff were never hired, and the prospect of saving a

GRASSLANDS

An ecology degree is not needed to understand that the smaller an area the less viable the natural processes are. Thus, to look objectively at saving the biological resources of a metropolitan area it is important to look beyond the 31 remnants of the original landscape in the third-densest city in the United States.

Field practitioners, often CNPS members who care about California natives, are reinventing restoration algorithms as understandings evolve. The understanding of an invasive plant's risk evolves over time. For example, yellow oxalis (*Oxalis pes-caprae*) was little remarked upon 25 years ago. Many did not consider it a threat because the species does not produce seed. However, it aggressively spreads by rooting, aided by animals. Gophers cache huge numbers of bulbs, far beyond the numbers they are able to eat. Credible witnesses have seen scrub jays deliberately planting them on more than one occasion. To boot, it is apparently allelopathic: influencing the germination, growth, survival, and reproduction of other plants—including decades- or centuries-old bunchgrasses. The result, in surprisingly few years, is an *Oxalis* monoculture. When the rainy season ends, it dies back to the bulb and large tracts of bare ground exist for several months. An important ecosystem service grasslands provide are foraging grounds for coyotes, hawks, owls and others. *Oxalis* is our #1 problem plant par excellence.

Communicating these issues to the public has been a challenge for our chapter. We have ambitions towards this goal, but its magnitude may not allow success in the little time we have available.

An irony in this regime is that maintaining native grasslands, typically, is the most efficient and least problematic of the urban wildlands. Native perennial bunchgrasses have extremely deep and highly ramified networks of roots that are ideal for protecting soils from erosion and for enduring long dry periods.



The invasive *Oxalis pes-caprae* is decimating grasslands in the Bay Area. Photo by Michael Kauffmann.

Bunchgrasses are a necessary matrix for wildflowers from both a visual and ecological standpoint. They provide good hiding places for a host of critters necessary for healthy ecological functions.

My fear is that if we succeed in getting public attention it may come too late. Even the spectacular panoramic views of the Bay and city will be less appealing if people have to wade through tracts of thistles or other invasive brush. Management of these areas, without native bunchgrasses, will be a problem and one not yet recognized by the public.

The word biodiversity, which used to elicit blank stares, is now heard more often and is sometimes the center of discussion. In fact, San Francisco now has a full-time biodiversity coordinator. San Francisco proudly trumpets that it is a city of diversity. It aims to present itself as a rich jambalaya of cultures mixing with each other to become a better whole—colorful, dynamic, and proud. Can we frame a process which will create a biodiverse and climate-resilient city, one that will include its biological heritage on the list? Stay tuned.



Active management on Bayview Hill in southeastern San Francisco. Photo by Margo Bors.

valuable part of our heritage still lingers under these shadows.

LOGIC GOES OFF-LEASH

When the Army decided to close its operations at the Presidio and Fort Funston, Congress provided that they become part of the Golden Gate National Recreation Area (GGNRA). The public had long been accustomed to running dogs at Fort Funston, and when the GGNRA belatedly, after looking the other way for 25 years, finally decided in 1997 to enforce National Park Service policy requiring pets to be on-leash, it did so precipitately, without laying a groundwork. That proved a disaster. The dog runners formed a political action committee (DogPAC), which contributed heavily to a city supervisor's campaign and walked precincts for him; he rewarded them handsomely. CNPS should have been involved in this battle, but our recently-formed chapter did not have the resources—especially for an issue of this magnitude that was often on the front page and on prime-time television.

Even though we were uninvolved in this battle, off-leash militants regarded us as a potential threat, and they were well organized, making alliances with feral cat defenders, as well as those who didn't want trees cut anywhere, anytime, for any reason—including the 11,000 Tasmanian blue gums (*Eucalyptus globulus*) on Mount Davidson. Unknown to us, over the next five years, DogPAC was speaking to neighborhood and other community groups throughout the city spreading false information like the Natural Areas Program was working to fence off access. People believed it and

showed up in force at an advisory committee meeting in February 2002. Five years of misinformation now bore fruit in the packed meeting. With rhetorical knives slashed into the Natural Areas Program, our world was turned upside down.

Adopt-an-area, so full of promise, now seemed like a distant dream. We had entered a bizarre world where nothing resembled what we thought we knew, and we struggled to make sense of it. Similar scenes occurred over the next two years in other meetings before the Recreation and Park Commission and Board of Supervisors, where we were subject to accusations of heinous acts and skulduggery.

RecPark had created an advisory committee (AC) that included multiple interests, including off-leash advocates. DogPAC politicized this by getting their Supervisor to convince the Board to eliminate the AC and reorganize it to report to the Board rather than to the Department! Such a thing had never been heard of before, and made no administrative sense.

The AC was stacked 7-5 against us. However, we were steadily building up our numbers at Board hearings and at the final vote, after two years, we matched their numbers. With the winds shifting, the Board pulled the plug and decided to return the issue to the Department, which eventually produced a draft management plan for these urban wildlands. The plan was sent to environmental review in 2006; it stayed there for ten years, a painful thorn in our side. Eventually it was jointly approved by the RecPark and Planning Commissions. (Public testimony was 75-42 in favor.) The plan was appealed to the Board of Supervisors but ultimately denied 9-1.

Victory was ours at long last, but it was partial. That is, we won the political battle; the biological battle is proving more difficult. Ten years of potential active management was lost during the debate wherein the natural parks further deteriorated.

The political victory was only the beginning, as implementation means creating actual detailed funded projects, all of which must go through contentious hearings. With a strengthened CNPS Yerba Buena Chapter and a public that is beginning to understand the importance of biodiversity, we have hope that we can save valuable parts of our heritage..

—Jake Sigg: jakesigg@earthlink.net



Presidio and CNPS restoration volunteers working in the Presidio. Photo by Margo Bors.

BOOK REVIEWS

Citizen Scientist: Searching for Heroes and Hope in an Age of Extinction by Mary Ellen Hannibal

ISBN-13: 978-1615192434
432 pages, hardcover, \$25.95

Citizen science “is needed as never before,” writes author Mary Ellen Hannibal in her 2016 book, which makes a forceful case for conservation projects that encourage non-experts to take part in science. It’s an impassioned, sprawling read, ideal for anyone participating in or starting up citizen scientist projects, or those at a loss for how to respond to our environmental crisis.

Citizen science isn’t just some cool new fad, Hannibal says—its roots go back centuries, to the specimen collectors of the 19th century and men of history like Thomas Jefferson and Lewis and Clark. Even Charles Darwin, she writes, was “a citizen scientist exemplar”: “He built his monumental case for natural selection based on years of painstaking observation, under the aegis of no institution, and he did not have an advanced academic degree.” In part, that’s because the very act of observing and collecting data about nature—traversing a meadow and noting where certain species of wildflower grow, or nowadays snapping pictures of them with iNaturalist—is a foundational bedrock of science, especially ecology and conservation science.

And, she argues, now that we’re faced with the sheer global scale of climate change, citizen science is one of the only ways to gather all the information we need to adequately understand and address the problem. “Just to drum it home again,” she writes with equal parts agitation and spirit, “species are going extinct at a rate and magnitude equal to that which took out the dinosaurs. What do we do about it? Identify which species are the most threatened, and protect their habitat. If you protect it, they will come.” And the best way to accomplish that, she says, is by enjoining regular nature enthusiasts to fan out and collect data about the environment around them.

This argument is both cogent and urgent, and Hannibal lays it out while simultaneously taking readers on a whirlwind tour of the Bay Area-based projects she participates in. She watches for hawks in Marin, identifies grasses on Mount Tamalpais, scans for sea star wasting disease in Half Moon Bay tidepools. Along the way, she highlights tips useful for anyone devising their own citizen science endeavor: charismatic leaders are key to successful projects, as is cultivating a core group of invested, committed members.

At times, the book can get bewildering. Hannibal interviews a truly daunting host of researchers and

project organizers, mostly concentrated in Northern California, to present a dizzying array of information on topics in biology, philosophy, and literature. The book meanders from coastal redwoods to Joseph Campbell’s hero’s journey to how Aristotle’s prejudices influenced his philosophy. There are long interludes into the lives of novelists like John Steinbeck and Hannibal’s own father, who sickens with lung cancer and eventually dies. But seen another way, these disparate subjects are a reflection of nature’s all-encompassing importance—her grief, for example, lends her narrative emotional heft, and puts a fine point on the devastation of mass extinction. Readers feeling the same sense of loss will find Hannibal’s tome cathartic.

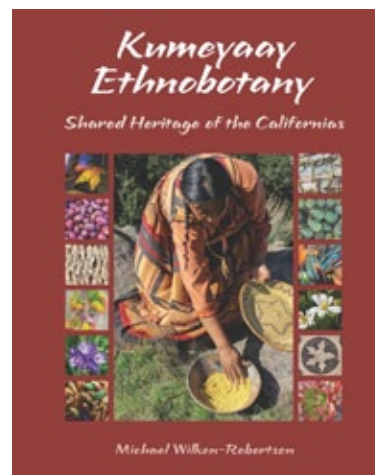
— Chelsea Leu

Kumeyaay Ethnobotany: Shared Heritage of the Californias by Michael Wilken-Robertson

ISBN-13: 978-1941384305
312 pages, softcover, \$29.95

The Kumeyaay made up a major proportion of the native people that have been divided by the international border with Mexico. There are a number of reservations in Southern California and a diverse group of communities south of the border in northern Baja California. The ancient lifestyles and even language that were specific to the areas of their origin, have been declining over the past century. However, in recent times, there has been renewed interest in maintaining them by members of the native communities.

Mike Wilken-Robertson has been working with the communities in Northern Baja California for many years, documenting the local uses of plants by the native people. He found local native consultants who could describe and demonstrate the common uses of local plants in the ancestral lifestyle and which in fact are still used in some locations. He also learned the languages of the groups though there were more than one in the area of his study. In this book, he documents the history and the



uses of plants by the native people in the area north and south of the Border in the Southern California, Northern Baja California region.

The book begins by describing the known history of the native people in the region for thousands of years. It includes discussions of the evidence that provides an indication of their distribution and culture, the geography and the various communities that still exist. The communities described include Juntas de Neji in the upper foothills of the Sierra Juarez, San Jose de la Zorra in the midst of the coast ranges west of the Valley of Guadalupe wine producing area, San Antonio Necua-Canon

de los Encinos at the base of Sierra Blanca north east of Ensenada, Sierra de los Pinos La Huerta east of Ojos Negros valley, and Santa Catarina in the Sierra Juarez around a former Dominican mission site in the transition area of the southern Sierra Juarez. These communities are located in striking landscapes of semi-wilderness with a transition of vegetation between sage scrub and chaparral with oak woodlands.

Much of the book is a catalog of the various resident plants and their uses. Most pages are richly illustrated with beautiful photographs of the plants but also the people who maintain the knowledge of their uses. In many cases, the photographs demonstrate the actual use of the plant be it for construction of houses or cooking up in basic foods. The photographs are so crisp that one can imagine feeling the heat and steam emanating from the pots of acorn mush and Cleome flowers and hearing the voices of the indigenous consultants describing the plant collection process.

One idea the book confirms is that the processing of native plants for basic uses is labor intensive. Most people are familiar with the fact that acorns were and can be a main source of staple food, however they can only be used after extensive processing. They must be dried, cracked opened, and cleaned of the inner skins. To reduce the bitter tannins in the acorns, it is necessary to pound them in a mortar and pestle into meal and leach the meal with water. The book describes

how, in modern times, the acorn meal is placed on a cloth and water poured on it to rinse out the tannins.

Before European contact, when animal skins and plant materials were the common garments, cloth was not present. In some cases, a porous basket would serve the purpose but in many cases, the ground acorns were placed in a hole scooped out of sandy soil, and the water was poured over them and then they were later cleaned of the sand for use. Imagine the difficulty of separating ground acorn from sand and then cooking it up to make acorn mush. Acorn mush is like congealed corn meal, a gelatinous semi-solid which has a bland flavor but which would be cooked with rabbit or venison. Acorns would also be kept in large basket-like granaries for the times that there were not available from trees in the wild.

Overall, this book is a wonderful compilation of plant uses but also of people who use them, even now. This book illustrates the link between the past and the present for uses of native plants and it provides a glimpse into the lives of those who still inhabit a fascinating area of Northern Baja California. The photographs alone make the book worthwhile but the information is phenomenally interesting.

—Tom Oberbauer, CNPS San Diego



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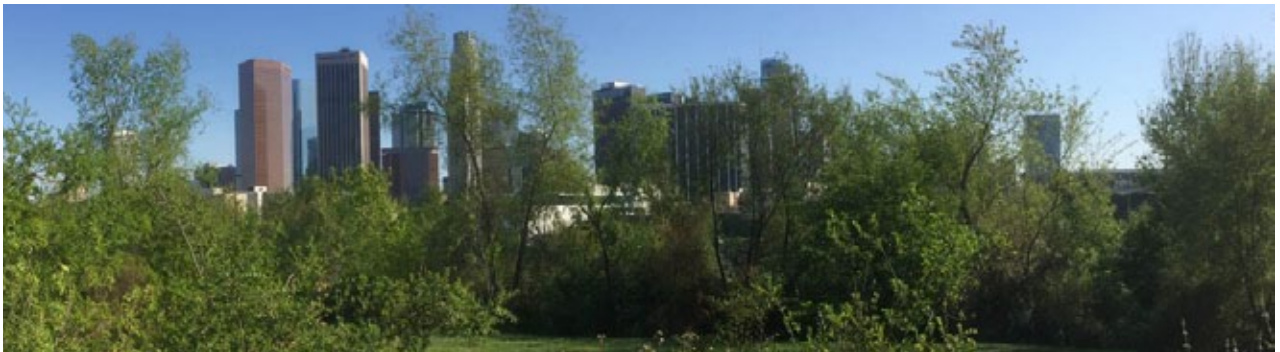
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Downtown Los Angeles as seen from Vista Hermosa Natural Park. Photo by Michael Kauffmann.

From the Editor

Cities have always amplified my anxiety. As it would be, in my travels through life, I have generally lived in rural areas or at least on tracks of land that allowed for open space access. On an excursion to the National Science Teacher's conference in Los Angeles I discovered the value of urban wildlands.

The Los Angeles Convention Center is a different world from the environments I typically inhabit. While thrilled to attend the workshops and interact with other science teachers, after two days I needed to find some open space.

The Los Angeles Basin is renowned for wild national forests surrounding the cityscape but infamous for the lack of green space within cities themselves. Most of the "green" found in a Google Earth search

reflects golf course imagery—which is off limits to 99 percent of the Basin's residence.

While I did not have high hopes for an urban retreat, to my surprise I found a refuge called the Vista Hermosa Natural Park, managed by the Santa Monica Mountains Conservancy. What a place! In addition to wandering through several acres of well managed native vegetation I watched hummingbirds feed and white-throated swifts soar. It was just what I needed.

This issue, created by Steve Hartman's vision, will surely inspire more people to discover urban wildlands as well as become proponents and stewards for these important places.

- Michael Kauffmann, fremontia@cnps.org



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ACKNOWLEDGMENTS BY STEVE HARTMAN

Thank you to my wife Leslie (who thinks I'm crazy to weed at dawn twice a week) and to my regular weeders who are crazy enough to meet at dawn twice a week. To Jo Kitz, CNPS Fellow, who was my mentor for decades and to my parents—Larry and Sylvia. Special thanks to Michael Kauffmann for persevering through this multiyear project, to Jake Sigg for his patience in making his article accurate and complete, and to Paula Schiffman, Esther Feldman and Julie Clark De Blasio for providing important and timely information.



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Julie Clark DeBlasio is a community education specialist with University of California Cooperative Extension Ventura focusing on emerging tree pests, with emphasis on invasive shot hole borers (*Enwallacea* sp.)/Fusarium dieback complex. She is Conservation Chair of the Los Angeles/Santa Monica Mountains Chapter of CNPS, active with several municipalities on policy, planning, and conservation issues related to the urban forest.

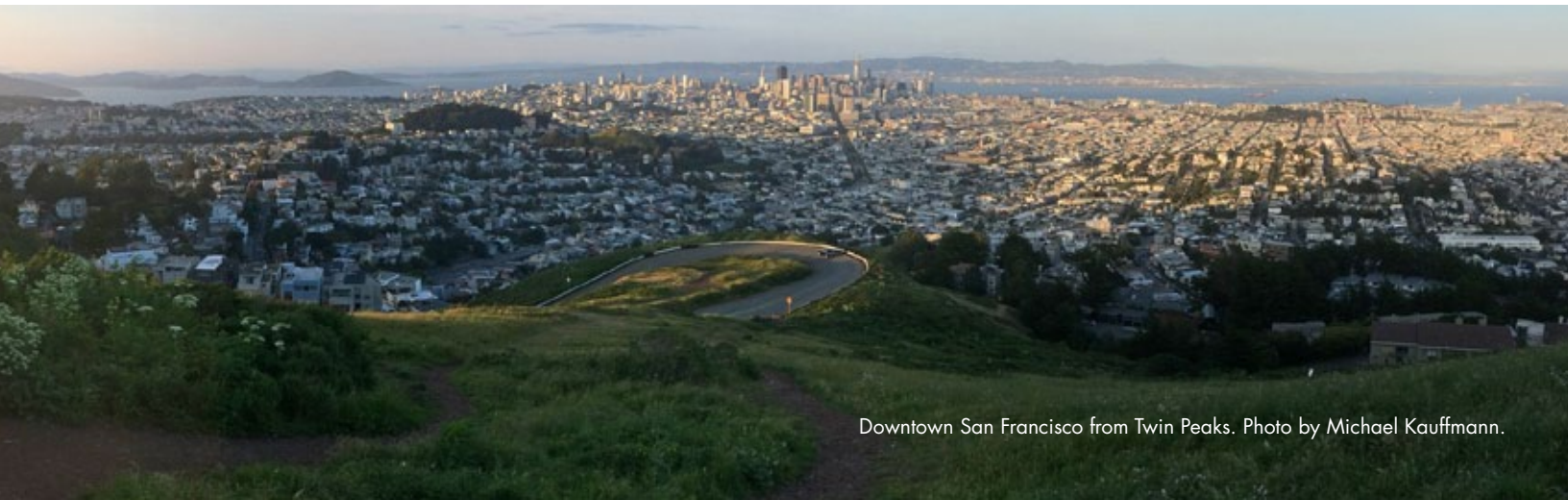
Esther Feldman is President of Community Conservation Solutions, a non-profit that pioneers innovative, practical solutions to conservation problems by integrating science, people and nature. She led the first land acquisitions along the L.A. River in the 1990s, helping to launch today's L.A. River revitalization, and helped create over \$3 billion in new public funds throughout California and the U.S. for parks, beaches, rivers, and natural lands. She has a B.S. in Soil and Water Science from UC Davis.

Steve Hartman is currently President of the CNPS Board, is a CNPS Fellow, and a member since 1974. Steve has previously served as Society Treasurer, Director, and Los Angeles/Santa Monica Mountains Chapter

President. He has been involved with local, desert, and southern Sierra Nevada conservation issues and is still quite active with his chapter.

Jake Sigg has focused on invasive exotic plants at both the CNPS chapter and state level and chaired the state Invasive and Exotic Committee for about 15 years. He was one of the founding members of the California Invasive Plant Council, a participant in its annual Weed Day at the Capitol in Sacramento, and in lobbying the entire California Congressional delegation in Washington. He raised about \$200,000 (mostly from CNPS chapters) for research on Cape ivy biocontrol. One agent has now been released in the wild.

Paula M. Schiffman is biology professor at California State University, Northridge where she teaches courses in evolutionary biology, plant ecology, and conservation biology. Natural history and environmental history are among the things she is especially interested in. Most of her research has been focused on Carrizo Plain National Monument, Santa Monica Mountains National Recreation Area, and Owens Valley.



Downtown San Francisco from Twin Peaks. Photo by Michael Kauffmann.