2022

The Westwood Neighborhood Greenway Biodiversity Index

Advisor: Edith de Guzman

UCLA IoES Westwood Greenway Practicum Team:
Cassandra Kays, Claire Villegas, Cortney Kleczka, Daniela Lopez, Danielle Hoekstra, Alé Pulido, and Lynsea May Southwick

Table of Contents

Western Lady Beetle *(Cycloneda polita)*

Westwood Neighborhood Greenway

Introduction

Located adjacent to the Westwood/Rancho Park station of LA Metro's light rail E Line, the Westwood Neighborhood Greenway is a working example of an urban waterway. The site design centers around an engineered stream approximately 800 hundred feet long that pumps mostly dry-weather flow up from a storm drain, through the stream, and then back out into the storm drain system to eventually be released into Santa Monica Bay and the Pacific Ocean. The Westwood Greenway was constructed on the basis of an increasingly popular green infrastructure tactic known as daylighting, wherein the flow of a natural stream, creek, or stormwater drain is exposed to the surface in order to revitalize natural hydrological functions (Pinkham, 2000). In a narrow stretch of land off Exposition Blvd, the Greenway is designed to restore natural ecosystem services of water filtration and serve as habitat for native flora and fauna. Daylighted streams can also support recreational activities, access to nature, and opportunities for outdoor teaching.

The Greenway was developed on two parcels with a combined area of approximately two acres that were slated to become parking near the newly-developed Metro light rail line. However, strong grassroots efforts spearheaded by a group of concerned neighborhood advocates brought about a much different fate for the site. Long-term support of the project by the community via the incorporation of the nonprofit entity Westwood Greenway, Inc., our project client, enabled a multi-year effort to culminate in the daylighting of a stream and creation of a green space that saw a soft opening in October 2020 ("History," n.d.). Partnering with LA Sanitation and Environment (LASAN) and the City of Los Angeles Bureau of Engineering (BOE) enabled the community's grassroots effort to be realized. In a city with extensive gray storm drain infrastructure and growing concerns over sustainable water supply, the proliferation of the Greenway concept in Los Angeles has the potential to address a number of environmental concerns while also providing valuable sites for community pride, health, and education.

What is Urban Biodiversity?

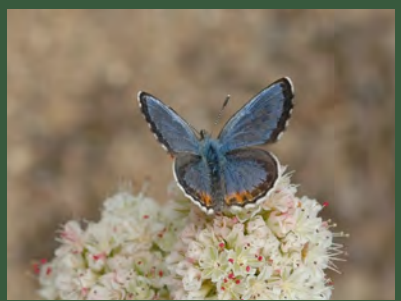
In Los Angeles, there is extensive opportunity to measure and study biodiversity. The City of Los Angeles is recognized as a biodiversity hotspot and is considered among the most biodiverse cities in the continental United States (Preziotti, 2021). The city contains over 450 certified wildlife habitat sites in its borders alone. Historically, LA's location and climate aided in its rise to becoming a "biodiversity jewel" (LA Sanitation and Environment, 2020). LA's waterways, including the LA River, are valuable resources supporting biodiversity. The river's constant change in flow and direction, plus the occasional flooding, helped create several habitats like lakes, wetlands, and mudflats (Gumprecht, 1997; Pilon-Briggs, 2019). Although conditions have changed, waterways continue to be a critical resource for biodiversity. These diverse habitats attracted a variety of plants and animals, from deer and antelope that lived near the river in what is now Griffith Park, to muskrats that fed on the cattails in river marshes (Gumprecht, 1997). Although the Mediterranean climate allows Los Angeles to host more than 3,500 different species of plants and animals, further urban development and population growth will continue to force a decline in biodiversity, creating several anthropogenic threats such as habitat fragmentation and pollution (Keeley & Swift, 1995). Several studies conclude that urbanization reduces species richness, especially at high levels (McKinney, 2008).

Today, nonnative plant species that are imported into residential areas contribute to a majority of LA's vibrant vegetation but outcompete LA's native flora, which can lead to overall decrease in species richness (McKinney, 2008). Loss of native plant species can also negatively affect the animal populations that relied on them for food and habitat. The state of biodiversity in Los Angeles is greatly dependent on whether species diversity and ecosystem services are valued over urban growth, which, unfortunately, is not often the case.

Indicator Species

The City of Los Angeles designated 37 species as indicators to assess biodiversity and habitat quality. Although in our project we did not observe any indicator species at the site, we have used this as a list of species to draw from when making recommendations for habitat quality and variety at the site in the future. Some examples of indicator species are pictured below.

Western Side-blotched Lizard (*Uta stansburiana*) by the Natural History Museum of Orange County, California



El Segundo Blue Butterfly (*Euphilotes battoides ssp. allyni*) by Butterfly Identification

Western bluebird (*Scalia mexicana*) by Shawn McCready

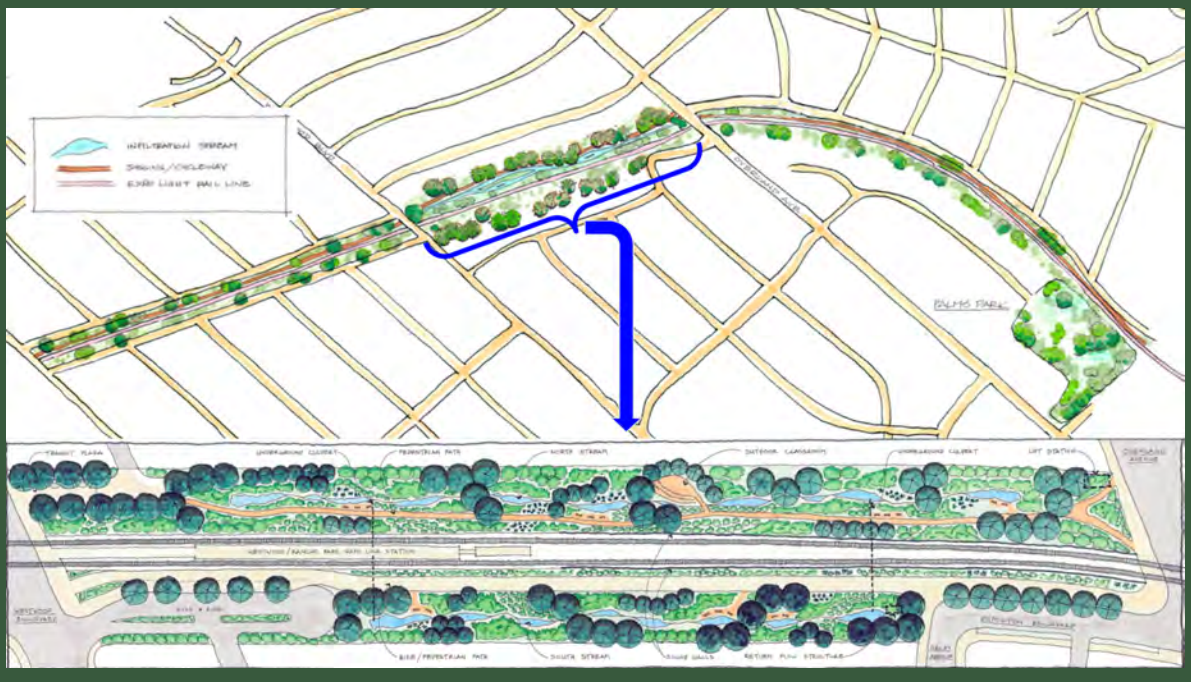
Benefits of the Westwood Greenway

Generally, urban greenways promote ecological benefits by enhancing biodiversity through habitat connectivity. By providing a variety of native plants, there is a network for insects, birds, and other animals to reproduce and thrive.

The Greenway also serves as a local green space for the community. The site is also a space for education about native plants and animals for local elementary schools, and a research opportunity for this UCLA practicum team.

The daylighted historic stream pumps urban water flows above ground into a vegetated bioswale for filtration. This effectively cleans dry- and wet-weather urban runoff.

The site was recently distinguished as an Ocean Friendly Garden by the Surfrider Foundation. Since runoff is the main source of urban pollution in the ocean, it is important for spaces like the Westwood Greenway to act as a filter.



Original layout planning for the Westwood Greenway courtesy of Westwood Greenway Inc

Habitat Quality

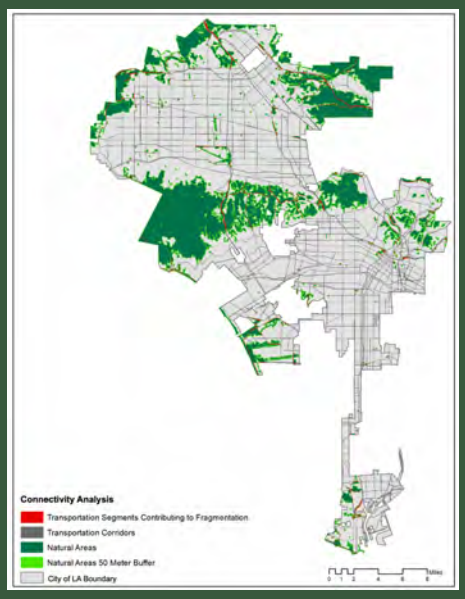
Habitat Quality describes the suitability of habitat to host native species. This metric was used to gauge the likelihood of fauna residing at the greenway and volunteer plants which have made the Greenway their home. Ratings for habitat quality were determined based on the species present at the Greenway when it was first created versus now. The species consistency and overall number of natives were used to rate this metric.

Habitat Variety

Habitat variety can be defined by the overall number of different plant species -- both planted and volunteer -- at the Greenway. For example, California poppies have self-established very successfully at the Greenway without being planted. There is also a variety of sage, milkweed, white Alden, and many more plants at the Greenway. The rating for habitat variety was calculated based on the number of native plant species per square acre as well as the number of native species found in this short period of time. This value was compared to the number of native species that were counted in the 2018 LA biodiversity index.

Offsite Connectivity

For urban biodiversity to succeed at the Greenway, it is important for there to be connectivity to other waterways and habitats. Protected islands themselves cannot restore ecosystems without some connection to other urban systems. Some examples of connectivity at the Westwood Greenway include twin culverts connecting the north and south side, stream connectivity to other waterways, fence holes that permit animals to pass back and forth, and native plants enhancing species richness (native plants are adapted to local environments and provide consistency for native species to survive). While connectivity to other urban habitats should be evaluated using mapping tools, the addition of this natural space in dense urban areas such as Westwood is contributing to the overall green space in Los Angeles, as seen in the 2018 biodiversity index map of natural spaces in Los Angeles, which shows a large gray area devoid of green space where the Greenway is located.



Los Angeles Biodiversity Index 2018

Edge Effects

Edge effects refers to the changes or interruptions present around habitat boundaries. In the Greenway's case, the north and south sides of the site are partitioned by a barbed wire fence and divided by the Metro rail. Although the Greenway is in an urban area, the partitions and open spaces allow for some species to feel protected and thrive. The south side is also a permanent sanctuary without a path for pedestrian traffic. Rating for edge effects was given observationally, based on the number of human interferences with the site present in relation to other urban environments.

A space for education at the Greenway

iNaturalist Data Collection


White-lined Sphinx *(Hyles lineata)*


Monarch butterfly *(Danaus plexippus)*


Oleander Aphid *(Aphis nerii)*


Gulf fritillary *(Dione vanillae)*


Three-lined potato beetle *(Lema daturaphila)*


Guinea paper wasp *(Polistes exclamans)*

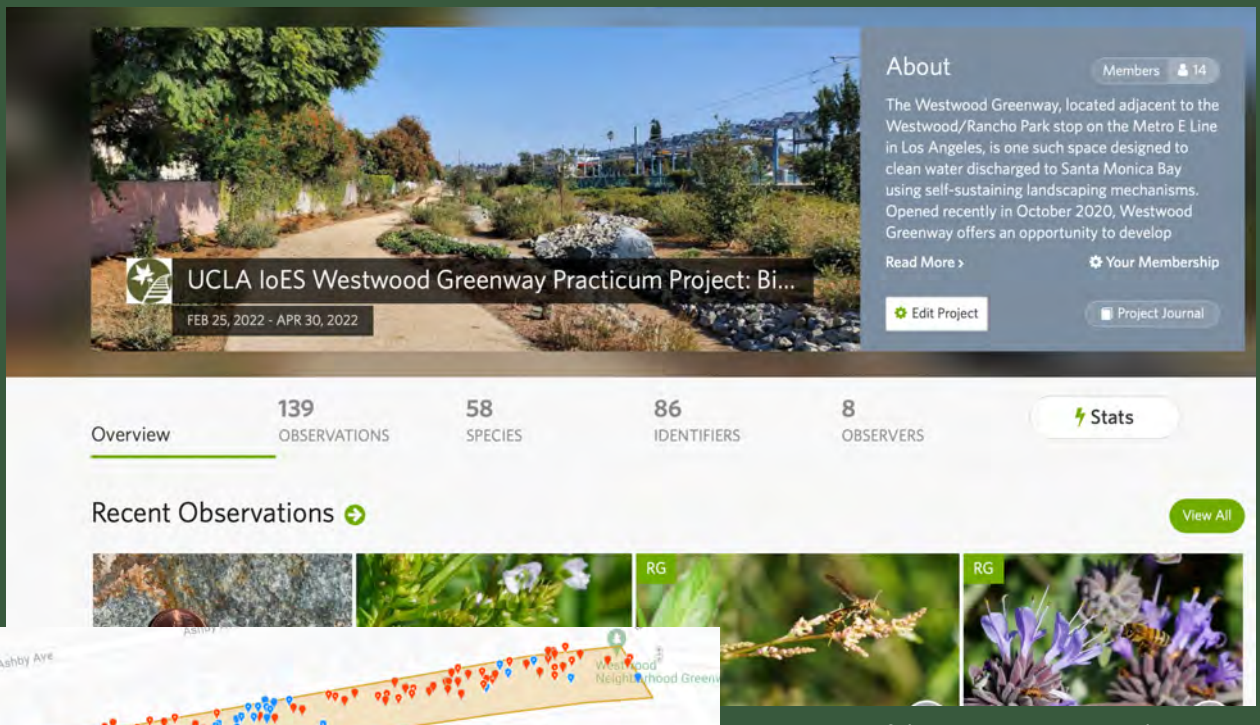

Lesser Goldfinch *(Spinus psaltria)*


Red shouldered bug *(Jadera haematoloma)*


Argentine ant *(Linepithema humile)*


House Sparrow *(Passer domesticus)*

The project conducted during this practicum on iNaturalist recorded 139 fauna observations at the Greenway. At least six native species were identified at the greenway in a period of two months. Three group outings focused on collecting observations for iNaturalist took place at different times of day and during different months to capitalize on variable weather conditions that may effect different species appearances at the Greenway. Visiting the Greenway in the morning means seeing a find a variety of birds, whereas towards the end of the day there is less activity from birds and invertebrates. Over 80 identifiers helped contribute to more than 75 research grade observations at the Westwood Greenway!



(Top) Image of the project on iNaturalist. (Right) This shape file of the Greenway was created to designate the area where obervations in the project would be recorded.

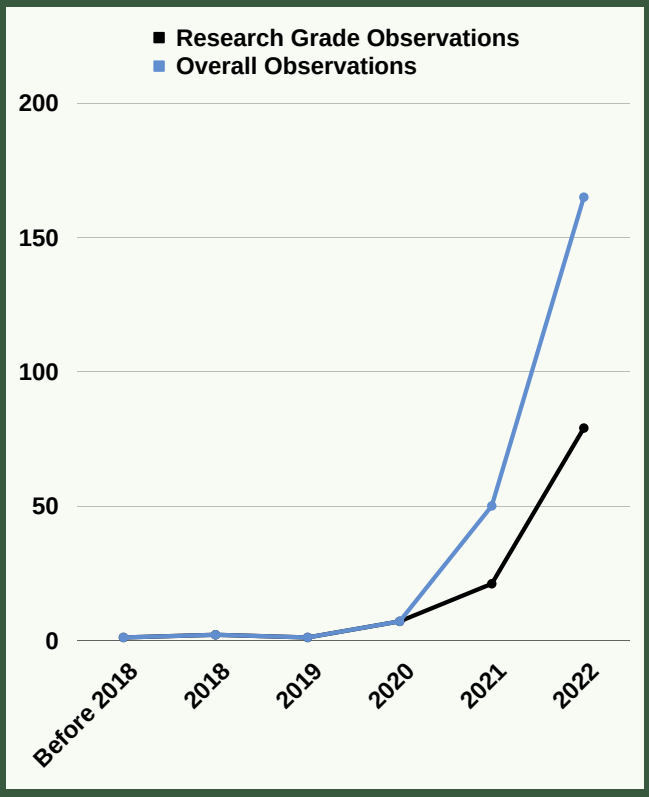


Figure 1: Number of observations made in the area surrounding and of the immediate site before and after its completion in the Fall of 2020.

Figure 2: Classifications of Species Identified to research grade at the Westwood Greenway

3 Bioblitzes were held to encourage community engagement with the project!

Western Honeybee *(Apis mellifera)* captured by Annete Mercer

Malaise Traps

To identify smaller insects that are difficult to observe and photograph, we employed Malaise traps. Invented by the Swedish entomologist René Malaise, the Malaise trap is a "simple tent-like structure designed to trap insects and other small organisms by passively obstructing their flight or drift patterns and then relying on their natural tendency to move upwards or towards light to ensure that they end up in the collection bottle" (Karlsson et al., 2020). We used bottles filled with an ethanol solution to preserve and trap the insects in the bottles. These traps were distributed across the Greenway near shrubs and plant species for three separate periods of three days each. Weather, wind, and humidity were recorded hourly during the tests. Some insects are carried into the trap passively by winds, however, in many cases, the insects tend to move up and down vegetation during the day (Karlsson et al., 2020). Although this trap is effective for smaller insects, large, active insect flyers with better vision such as dragonflies and butterflies are able to avoid being trapped. Malaise traps were an ideal option for the project because they can be left without emptying for a week or longer while most other insect traps must be emptied more frequently. The samples are also well preserved in ethanol and can be stored for a period before going to a lab. Based on where the species density/diversity is the greatest, the plants and natural spaces surrounding them were analyzed by correlation.

We performed three different Malaise trappings, each over a period of 48 to 72 hours, on both the north and south end of the Greenway.

Malaise trap data suggests there is a healthy variety of insect species and connectivity between the north and south side of the Greenway through the presence of similar plant species that promote biodiversity and provide space for fauna to flourish. This finding was supported by a particularly dense species collection closer to the stream and native flowering plants. When the malaise trapping was conducted during warmer weather, the insect collection also increased. We did not catch any butterflies, dragonflies, or moths during the three different testing periods, all observations of larger flyers were made through iNaturalist. All of our collected species have been sent to the Natural History Museum of LA County's archive to be cataloged. Once cataloged with location and duration of collection, the species data will be available for scientists at the museum to draw from. For this project, we did not have access to a laboratory for a more detailed taxonomy of the species caught. Due to time and resource constraints, our species were classified by sight, iNaturalist, and density of species rather than in a laboratory.

Flora at the site:

Narrowleaf milkweed
(Asclepias fascicularis)

California Sage Brush
(Artemisia californica)

White Alder
(Alnus rhombifolia)

Creeping Barberry
(Mahonia repens)

Douglas Iris
(Iris douglasiana)

California poppy
(Eschscholzia californica)

Brandegees Sage
(Salvia brandegei)

Tropical Milkweed
(Asclepias curassavica)

This project did not add images of flora at the Greenway to iNaturalist. Instead, we relied on a list of plants that were planted at the Greenway as well as some observational data of volunteer species or iNaturalist observations in the past.

From the images above:

- Planted vegetation: Asclepias fascicularis (Narrowleaf milkweed), Artemisia californica (California Sage Brush), Alnus rhombifolia (White Alder), Mahonia repens (Creeping Barberry), Iris douglasiana (Douglas Iris), and Salvia brandegei (Brandegees Sage)

- Volunteer vegetation: Eschscholzia californica (California poppy) and Asclepias curassavica (Tropical Milkweed)

A complete inventory of planted species at the Greenway are listed in Appendix III.

Habitat Quality 3.2/4

Habitat quality received a 3.2 out of 4 based on the numerous native plants and non-native plant species planted and growing voluntarily at the Greenway, which draw native species to the site. Habitat quality has improved since water flow began at the site, as the density of species increased and more insects were collected. There are a number of native volunteer plants (volunteer plants are plants that were not planted at the site), which indicates that the Greenway is a viable landscape for native plants to thrive on their own. Volunteer plants were distinguished by a comparison to a list of known planted species.

Asclepias fascicularis (Narrowleaf milkweed)

Habitat Variety 3.6/4

Habitat variety received a 3.6 out of 4. This value was derived by calculating the variety of native fauna and flora per acre. For the relatively small physical footprint of the Greenway there is a very high number of species. Habitat variety was assessed by looking at the overall number of different plant species — both planted and volunteer. For example, during spring of 2022, California poppy *(Eschscholzia californica*) plants were found all across the site There is also a variety of sage, common milkweed *(Asclepias syriaca L.)*, and white alder or California alder *(Alnus rhombifolia)*.There is also a great variety of native volunteer plants at the Greenway. The site was designated an Ocean Friendly Garden by Surfrider's program, which identifies sites that have a selection of plants that require less watering and block pollutants from free-flowing into the ocean (Dias, 2022). With runoff being the main source of urban pollution in the ocean (Dias, 2022), spaces like the Westwood Greenway act as a filter preventing urban waters from polluting coastal waters (Dias, 2022). In relation to the City of LA biodiversity index, there were 215 native butterflies and moths recorded, at our project there were 5 native species of butterflies and moths. This is 2.33% of the species found in the entire city, which is 2330 times more than the expected 0.001% (the portion of Greenway area relative to the City of Los Angeles).

Asclepias fascicularis (Narrowleaf milkweed)

Asclepias fascicularis (Narrowleaf milkweed)

Edge Effects 3/4

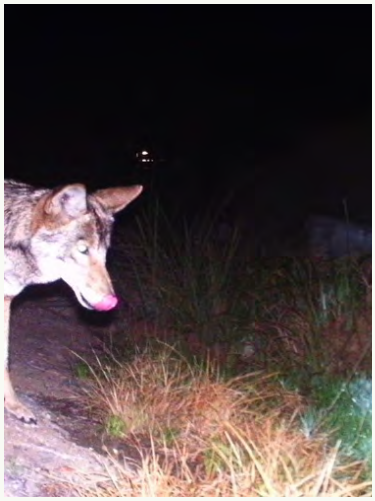
The edge effects rating for the Greenway was 3 out of 4. For edge effects, the influence of humans at the Greenway is largely due to adjacency to Metro traffic. At the site, we identified the following: neighborhood pets such as feral cats sighted on the motion sensor camera preventing amphibians and reptiles (important indicator species); the Metro line; Overland Elementary School with pick-up and drop-off traffic; general rush hour traffic; and overnight camping by unhoused individuals. The surrounding neighborhood is also developed and adjacent to a major walkway and bike path, which makes it difficult for many larger indicator species to establish at the site. Although these effects may play a larger role in the continual growth of biodiversity found at the site, it appears the Greenway has nevertheless maintained species that have been present since the site was completed. These include the Gulf Fritillary *(Dione vanillae)*, Monarch *(Danaus Plexippus)*, and Lesser Goldfinch *(Spinus psaltria)*. Attributes that likely support the survival of species at the site include the protected south side and chain link fences around the north side which keep pedestrians out of the site for the majority of time. Observations made at the site have increased since the Greenway was created. iNaturalist observations in the surrounding area have also increased since the site's completion in October, 2020. Even though the types of species that can be sustained at the site may be altered by the amount of human activity, overall observations in the surrounding neighborhood have also increased since the adoption of the Greenway. For example, observations on iNaturalist from the neighborhoods surrounding the Greenway went from less than 5 per year to over 30 in 2019.

Armadillidium vulgare (Common Pill Woodlouse)

Armadillidium vulgare (Common Pill Woodlouse)

Offsite Connectivity 3.6/4

Based on information from previous GIS studies, off-site connectivity at the Greenway was observationally rated 3.6 out of 4. For urban biodiversity to succeed at the site, it is important for there to be connectivity to other waterways and habitats. Protected 'islands' themselves cannot restore ecosystems without some connection to other urban systems. An island, or protected greenspace on all sides, if isolated without connectivity is at risk of species extinction and loss of critical ecosystem functions (Tabor, 2018). Some examples of existing and potential connectivity pathways at the Westwood Greenway include: twin culverts connecting the north and south sides; stream connectivity to other waterways; fence holes for small animals to pass; and native plants that are adapted to local environments providing consistency for native species to survive. Connectivity is critical for biodiversity to thrive. We found evidence that the addition of this natural habitat in a densely urbanized area will add another passage for wildlife and native plants to spread in the City of Los Angeles. We also looked at the types of insects collected in Malaise traps on the north versus the south side of the site. There were very similar insect species across both sides of the site. Consistent native plantings and volunteer plant species may play a large role in connectivity across the site.



Canis latrans (Coyote)

Recommendations

Attract more indicator species:

In order to attract more indicator species, we recommend planting several specific native plant species.

Lorquin's admiral butterfly *(Limenitis lorquini)*

- Planting California buckeye *(Aesculus californica)* could help to attract the Lorquin's admiral butterfly *(Limenitis lorquini)*, which relies on the flower's nectar for food (Butterflies, 2020).

Western Bluebird (*Sialia mexicana*) and Cedar Waxwing (*Bombycilla cedrorum*)

- To attract the California native cedar waxwing *(Bombycilla cedrorum)*, it would be beneficial to plant juniper *(Juniperus)* species or western chokecherry *(Prunus virginiana)* (Kaufman, 2022).
- Bluebird boxes could also be built at the site to draw the Western Bluebird *(Sialia mexicana)*.

The red winged blackbird (Agelaius phoeniceus), could also be drawn to the site. They live in or near wetlands full of cattails,and also near water in shrubby thickets of willow or blackberry (Kaufman, 2022).

Native lizard reintroduction:

Eventually, reintroducing native lizards and amphibians back to the greenway can support the health of the ecosystem. Possible candidates include the Western fence lizard *(Sceloporus occidentalis)*, alligator lizard *(Elgaria multicarinata)*, and/or Pacific tree frog *(Pseudacris regilla)*.

Blue Elderberry *(Sambucus nigra ssp. caerulea)*

Cedar Waxwing *(Bombycilla cedrorum)* photographed by James Brown/Audubon Photography Awards

Western fence lizard *(Sceloporus occidentalis)* by Jack Wolf, iNaturalist

Monitoring Biodiversity in the Future at the Greenway

Recommendations for evaluating biodiversity in the future:

- Continue a lifelong project on iNaturalist at the Greenway to continue making observations of volunteer flora and fauna.
- Organize longterm maintenance of noxious weeds to prevent suffocation of natives.
- Annual bioblitzes at the site to monitor the variety of species at the site and encourage community engagement with the site.
- Track sightings of indicator species at the Greenway.

Species: Eschscholzia californica (California poppy) and Sage

Species: Apis mellifera (Western honey bee) asleep in Eschscholzia californica (California poppy)

Thank you for making this index possible!

Joscha Beninde
Dr. Isaac Brown
Michelle Barton
Edith de Guzman
Annette Mercer
Dr. H. Bradley Shaffer
Alex Shepherd
Kat Superfisky
Jonathan Weiss
Alexis Wieland

Thank you to the iNaturalist community for research grade identifications and observations made during the project!

Mourning Cloak (*Nymphalis antiopa*) captured by Annette Mercer

iNaturalist Observations February 25, 2022 - April 30, 2022

Total # of Observations: 139	Total # of Research Grade observations: 80 (57.55%)	Total # of Species: 58
Group	**Common Name**	**Scientifc Name**
Invertebrates	Acute Bladder Snail	*Physa acuta*
Invertebrates	Argentine Ant	*Linepithema humile*
Invertebrates	Asian Lady Bettle	*Harmonia axyridis*
Invertebrates	Cabbage Aphid	*Brevicoryne brassicae*
Invertebrates	Cabbage White	*Physa rapae*
Invertebrates	Common Daddy Long-legs Spiders	*Genus Smeringopus*
Invertebrates	Common Earthworm	*Lubricus terrestris*
Invertebrates	Common Pill Woodlouse	*Armadillidium vulgare*
Invertebrates	Early Tachinid Fly	*Epalpus signifer*
Invertebrates	Earwig	*Genus Euborellia*
Invertebrates	False Black Widow	*Steatoda grossa*
Invertebrates	False Chinch Bugs	*Genus Nysius*
Invertebrates	Fiery Skipper	*Hyphila phyleus*
Invertebrates	Flat-backed Millipedes	*Order Polydesmida*
Invertebrates	Flowery Blue Isopod	*Porcellionides floria*
Mammals	Fox Squirrel	*Sciurus niger*
Invertebrates	Girdler Moth	*Dargida procinctus*
Invertebrates	Gray Bird Grasshopper	*Schistocerca nitens*
Invertebrates	Lesser Goldfinch	*Spinus psaltria*
Birds	Mallard	*Anas platyrhynchos*
Invertebrates	Marsh Crane Fly	*Tipula oleracea*
Invertebrates	Milky Slug	*Deroceras reticulatum*
Invertebrates	Millipede	*Ophyiulus pilosus*
Invertebrates	Monarch	*Danaus Plexippus*
Invertebrates	Mourning Cloak	*Nymphalis antiopa*
Invertebrates	Paradise Jumping Spider	*Genus Habronattus*
Invertebrates	Red Bugs	*Family Pyrrhocoridae*
Invertebrates	Red-shouldered Bug	*Jadera haematoloma*
Invertebrates	Scale Insects	*Superfamily Coccoidea*
Invertebrates	Seven spotted lady beetle	*Coccinella septempunctata*
Birds	Song Sparrow	*Melospiza melodia*
Invertebrates	Spottless Lady Beetle	*Cycloneda sanguinea*
Mammals	Striped Skunk	*Mephitis mephitis*
Invertebrates	Thin-legged Wolf Spiders	*Genus Pardosa*
Invertebrates	Three-lined Potato Beetle	*Lema daturaphila*
Invertebrates	Threeband Slugs	*Genus Ambigolimax*
Invertebrates	Tiger Crane Flies	*Genus Nephrotoma*
Invertebrates	Umber Skipper	*Lon melane*
Invertebrates	Western Aphideater	*Eupeodes fumipennis*
Invertebrates	Western Honey Bee	*Apis mellifera*
Invertebrates	White-lined Sphinx	*Hyles lineata*
Mammals	Virginia Oppossum	*Didelphis virginiana*
Birds	House Sparrow	*Passer domesticus*
Invertebrates	Gulf Fritillary	*Dione vanillae*
Invertebrates	Oleander Aphid	*Aphis nerii*
Mammals	Coyote	*Canis latrans*
Birds	American Crow	*Corvus brachyrhynchos*
Birds	Allen's hummingbird	*Selasphorus sasin*
Birds	Cooper's Hawk	*Accipiter cooperii*
Invertebrates	Nomad Bees	*Genus Nomada*
Invertebrates	Globetails	*Genus Sphaerophoria*
Invertebrates	Meadow Spittlebug	*Philaenus spumarius*
Invertebrates	Sweat Bees	*Genus lasioglossum*
Invertebrates	Calligrapher Flies	*Genus Toxomerus*
Invertebrates	Oblique Streaktail	*Allograpta obliqua*
Invertebrates	Guinea Paper Wasp	*Polistes exclamans*
Invertebrates	Volupial Mint moth	*Pyrausta volupialis*

*All listed historical and project observations were research grade identifications

Historical iNaturalist Observations

Group	Common Name	Scientifc Name	Date
Mammal	Virginia Opossum	*Didelphis virginiana*	04/02/2022
Birds	Red Tailed Hawk	*Buteo jamaicensis*	02/27/2022
Birds	American Crow	*Corvus brachyrhynchos*	02/27/2022
Birds	Black Phoebe	*Sayornis nigricans*	02/27/2022
Reptiles	San Diego Aligator Lizard	*Elgaria multicarinata webbii*	11/20/2021
Invertebrates	Johnson's Jumping Spider	*Phidippus johnsoni*	11/19/2021
Birds	Anna's Hummmingbird	*Calypte anna*	11/11/2021
Invertebrates	Gulf Fritillary	*Dione vanilllae*	11/11/2021
Birds	Coopers Hawk	*Accipiter cooperii*	11/07/2021
Invertebrates	Argentine ant	*Linepithema humile*	10/30/2021
Invertebrates	Yellow-legged Mud-dauber Wasp	*Sceliphron caementarium*	09/18/2021
Invertebrates	Flame Skimmer	*Libellula saturata*	09/05/2021
Plants	Sacred Datura	*Datura wrightii*	07/11/2021
Invertebrates	Spot-winged glider	*Pantala hymenaea*	05/28/2021
Invertebrates	Monarch Butterfly	*Danaus plexippus*	05/06/2021
Invertebrates	Red Shouldered Bug	*Jadera haematoloma*	05/01/2021
Invertebrates	Spottless Lady Beetle	*Cycloneda sanguinea*	05/01/2021
Birds	House Finch	*Haemorhous mexicanus*	05/01/2021
Birds	Lesser Goldfinch	*Spinus psaltria*	05/01/2021
Invertebrates	Western Honey bee	*Apis mellifera*	05/01/2021
Birds	Northern Mockingbird	*Mimus polyglottos*	05/01/2021
Invertebrates	Cabbage White	*Pieris rapae*	05/01/2021
Invertebrates	Convergent Lady Beetle	*Hippodamia convergens*	04/10/2021
Plants	Desert Globemallow	*Sphaeralcea ambigua*	03/26/2021
Invertebrates	Marine Blue	*Leptotes marina*	01/06/2021
Invertebrates	Grey Hairstreak	*Strymon melinus*	11/15/2020
Birds	Wilson's Snipe	*Gallinago delicata*	11/12/2020
Birds	Great Blue Heron	*Ardea herodias*	11/08/2020
Invertebrates	Anise Swallowtail	*Papillo zelicaon*	09/19/2020
Birds	Bushtit	*Psaltriparus minimus*	04/24/2020
Birds	Rufous, Allen's and Allied Hummingbirds	*Genus Selasphorus*	04/24/2020
Birds	California Towhee	*Melozone crissalis*	04/24/2020
Plants	Field Bindweed	*Convolvulus arvensis*	07/19/2019
Invertebrates	Southern Green Stink Bug	*Nezara viridula*	09/27/2018
Birds	Mourning Dove	*Zenaida macroura*	04/30/2018

*All listed historical and project observations were research grade identifications

Planted at the Westwood Greenway

Scientific Name	Common Name	Category
Alnus rhombifolia	White Alder	Trees
Juglans californica	So. California Black Walnut	Trees
Lyonothamnus floribundus ssp. aspleniifolius	Catalina Ironwood	Trees
Platanus racemosa	Western Sycamore	Trees
Prunus illicifolia lyonii	Catalina Cherry	Trees
Quercus agrifolia	Coast Live Oak	Trees
Quercus tomentella	Island Live Oak	Trees
Abutilon palmerii	Indian Mallow	Shrub
Arctostaphylos glandulosa "John Dourley" Artemisia californica	Manzanita	Shrub
Asclepias fascicularis	California Sagebrush Narrow leaf milkweed	Shrub
Baccharis piluaris 'Pigeon Pt,'	Coyote Bush	Shrub
Berberis x 'Golden Abundance'	Golden abundance Barberry	Shrub
Berberis repens	Creeping barberry California Lilac	Shrub
Ceanothus griseus horizontalis "yankee Point"	California fuchsia	Shrub
Epilobium canum Chapparal Silver	Santa Cruz Island Buckwheat	Shrub
Eriogonum arborescens	California buckwheat	Shrub
Eriogonum fasciculatum fasciculatum Gambelia speciosa	Island Snapdragon	Shrub
Salvia spathacea	Hummingbird sage	Shrub
Salvia leucophylla	Purple sage	Shrub
Sphaeralcea ambigua	Desert Globemallow	Shrub
Verbena lilacina	Lilac Verbena	Shrub
Achillea millefolium	Common Yarrow	Herb
Aster chilensis	Pacific aster	Herb
Carex barbarae	Santa Barbara sedge	Herb
Carex pansa	Sand dune sedge	Herb
Elymus triticoides	Alkali Rye grass or Creeping Wild Rye	Herb
Iris douglasiana	Douglas Iris	Herb
Juncus patens	California grey rush	Herb
Leymus condensatus	Native Blue Rye grass	Herb
Melica imperfecta	Imperfect melic grass	Herb
Muhlenbergia rigens	Deer grass	Herb
Grindelia stricta	Gumweed	Herb

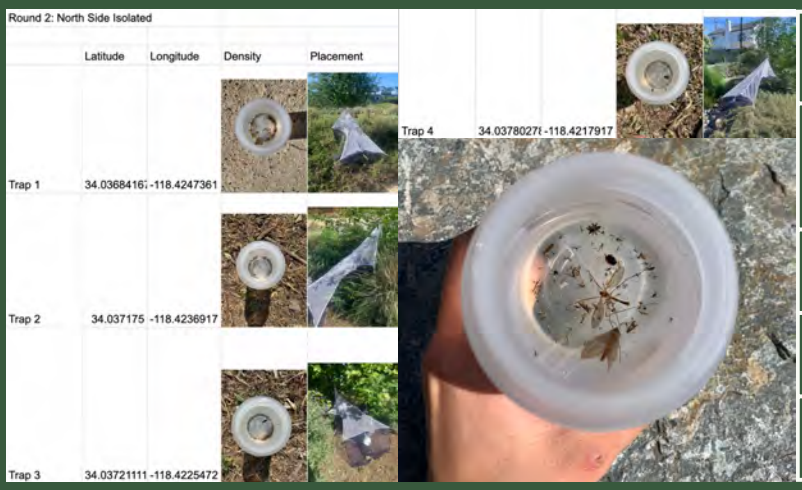
Indicator Species

Group	Common Name	Scientific Name
Amphibians	Western Toad	Anaxyrus boreas
Amphibians	Black-bellied Slender Salamander	Batrachoseps nigriventris
Amphibians	Baja California tree frog	Pseudacris hypochondriaca
Birds	Red-winged blackbird	Agelaius phoeniceus
Birds	Great blue heron	Ardea herodias
Birds	Great horned owl	Bubo virginianus
Birds	Red-tailed hawk	Buteo jamaicensis
Birds	California quail	Callipepla californica
Birds	Canyon wren	Catherpes mexicanus
Birds	Northern harrier	Circus hudsonius
Birds	Greater roadrunner	Geococcyx californianus
Birds	Hooded merganser	Lophodytes cucullatus
Birds	Acorn woodpecker	Melanerpes formicivorus
Birds	Spotted towhee	Pipilo maculatus
Birds	Western bluebird	Sialia mexicana
Birds	Cinnamon teal	Spatula cyanoptera
Birds	Western meadowlark	Sturnella neglecta
Invertebrates	North American Jerusalem crickets	Ammopelmatus sp.
Invertebrates	Sara orangetip	Anthocharis sara
Invertebrates	Behr's metalmark	Apodemia virgulti
Invertebrates	Bumblebees	Bombus sp.
Invertebrates	Bramble green hairstreak	Callophrys dumetorum
Invertebrates	El Segundo blue butterfly	Euphilotes battoides ssp. allyni
Invertebrates	Lorquin's admiral	Limenitis lorquini
Invertebrates	Velvet ants	Mutillidae (Family)
Invertebrates	Harvester ants	Pogonomyrmex (Genus)
Mammals	Bobcat	Lynx rufus
Mammals	Dusky footed woodrat	Neotoma macrotis
Mammals	Mule deer	Odocoileus hemionus
Mammals	Mountain lion	Puma concolor
Mammals	Gray fox	Urocyon cinereoargenteus
Reptiles	Western pond turtle	Actinemys marmorata
Reptiles	Coachwhip snake	Masticophis flagellum
Reptiles	Western rattlesnake	Crotalus oreganus
Reptiles	California kingsnake	Lampropeltis californiae
Reptiles	Gopher snake	Pituophis catenifer
Reptiles	Sideblotched lizard	Uta stansburiana

Malaise Traps

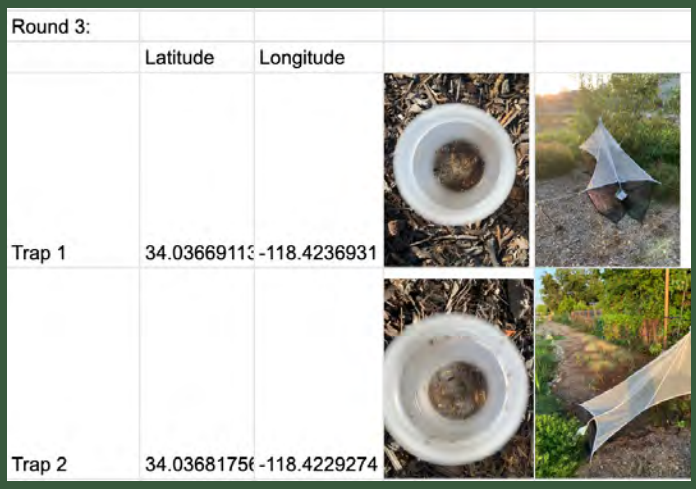
Round 1	Weather
Data collection period:	3/08/2022 2:11 PM - 3/10/2022 12:00 PM
Average Temp (°F):	58
Average Wind (mph):	7
Average Humidity (%):	64

Figure 1: First round of Malaise trapping at the site. Eight traps located on both south and north sides of the Greenway.



Round 2	
Data collection period:	4/13/2022 9:00am - 4/15/2022 9:00am
Average Temp (°F):	59
Average Wind (mph):	11
Average Humidity (%):	49

Figure 2: Second round of Malaise trapping at the site. Four traps placed on the north side of the greenway in locations similar to those of round one where there was a larger species density collected.



Round 3	Weather
Data collection period:	5/3/2022 6:00pm - 5/6/2022 6:00pm
Average Temp (°F):	62
Average Wind (mph):	7
Average Humidity (%):	76

Figure 3: Third and final round of trapping conducted on the south side only. Densest amount of species collected.

References

Biodiversity. Los Angeles Environment and Sanitation . (2018). Retrieved 2022, from https://www.lacitysan.org/san/faces/home/portal/s-lsh-es/s-lsh-es-si/s-lsh-es-si-bd?_afrLoop=4741493211940872&_afrWindowMode=0&_afrWindowId=null&_adf.ctrl-state=g7k6o9dj1_474#!%40%40%3F_afrWindowId%3Dnull%26_afrLoop%3D4741493211940872%26_afrWindowMode%3D0%26_adf.ctrl-state%3Dg7k6o9dj1_478

Dias, M. (2022). Ocean Friendly Gardens. Surfrider Foundation. Retrieved 2022, from https://www.surfrider.org/programs/ocean-friendly-gardens

Gumprecht, B. (1997). 51 Miles of Concrete: The Exploitation and Transformation of the Los Angeles River. Southern California Quarterly, 79(4), 431–486. https://doi.org/10.2307/41171869

History. Westwood Greenway. (n.d.). Retrieved January 31, 2022, from https://westwoodgreenway.org/history/

Karlsson D, Hartop E, Forshage M, Jaschhof M, Ronquist F (2020) The Swedish Malaise Trap Project: A 15 Year Retrospective on a Countrywide Insect Inventory. Biodiversity Data Journal 8: e47255. https://doi.org/10.3897/BDJ.8.e47255

Kaufman, K. (2022, May 5). Red-winged blackbird. Audubon. Retrieved May 21, 2022, from https://www.audubon.org/field-guide/bird/red-winged-blackbird

Kaufman, K. (2022, May 6). Cedar waxwing. Audubon. Retrieved May 30, 2022, from https://www.audubon.org/field-guide/bird/cedar-waxwing

Lasan releases first ever list of charismatic umbrella indicator species for Los Angeles. LASAN Releases First Ever List of Charismatic Umbrella Indicator Species for Los Angeles | Department of Public Works. (2021, June 21). Retrieved May 28, 2022, from https://dpw.lacity.org/blog/lasan-releases-first-ever-list-charismatic-umbrella-indicator-species-los-angeles

McKinney, M. L. (2008). Effects of urbanization on species richness: A review of plants and animals. Urban Ecosystems, 11(2), 161–176. https://doi.org/10.1007/s11252-007-0045-4

Pinkham, R. (2000). Daylighting: New Life for Buried Streams. Old Snowmass, CO; Rocky Mountain Institute.

Preziotti, E. (2021). The City of Los Angeles: Leaders in Biodiversity Protection. The National Wildlife Federation. Retrieved December 2, 2021, from https://blog.nwf.org/2021/01/the-city-of-los-angeles-leaders-in-biodiversity-protection/.

Society, N. A. (2022, April 26). How to build a bluebird nest box. Audubon. Retrieved May 30, 2022, from https://www.audubon.org/news/how-build-bluebird-nest-box

Westwood, CA Weather Station KCALOSAN925. Weather Underground. (n.d.). Retrieved May 30, 2022, from https://www.wunderground.com/history/daily/KRDD/date/2022-5-3

United States Department of Agriculture Natural Resources Conservation Service. (n.d.). USDA plants database. Retrieved May 20, 2022, from https://plants.sc.egov.usda.gov/home/characteristicsSearchResults?resultId=33fa1621-67fd-4bb6-8c0c-12a7f22d2935

Images:

Avise, J. C. (n.d.). Side-blotched Lizard. Retrieved from https://nathistoc.bio.uci.edu/Reptiles/Uta%20stansburiana.htm.

El Segundo Blue Butterfly. (n.d.). Butterfly Identification. Retrieved from https://www.butterflyidentification.com/el-segundo-blue.htm.

McCready, S. (2015). Western Bluebird. Audubon. Retrieved May 20, 2022, from https://ca.audubon.org/press-release/western-bluebird-wins-audubon-californias-2015-bird-year.