



**SF Environment**

**Our home. Our city. Our planet.**

A Department of the City and County of San Francisco

# San Francisco Biodiversity

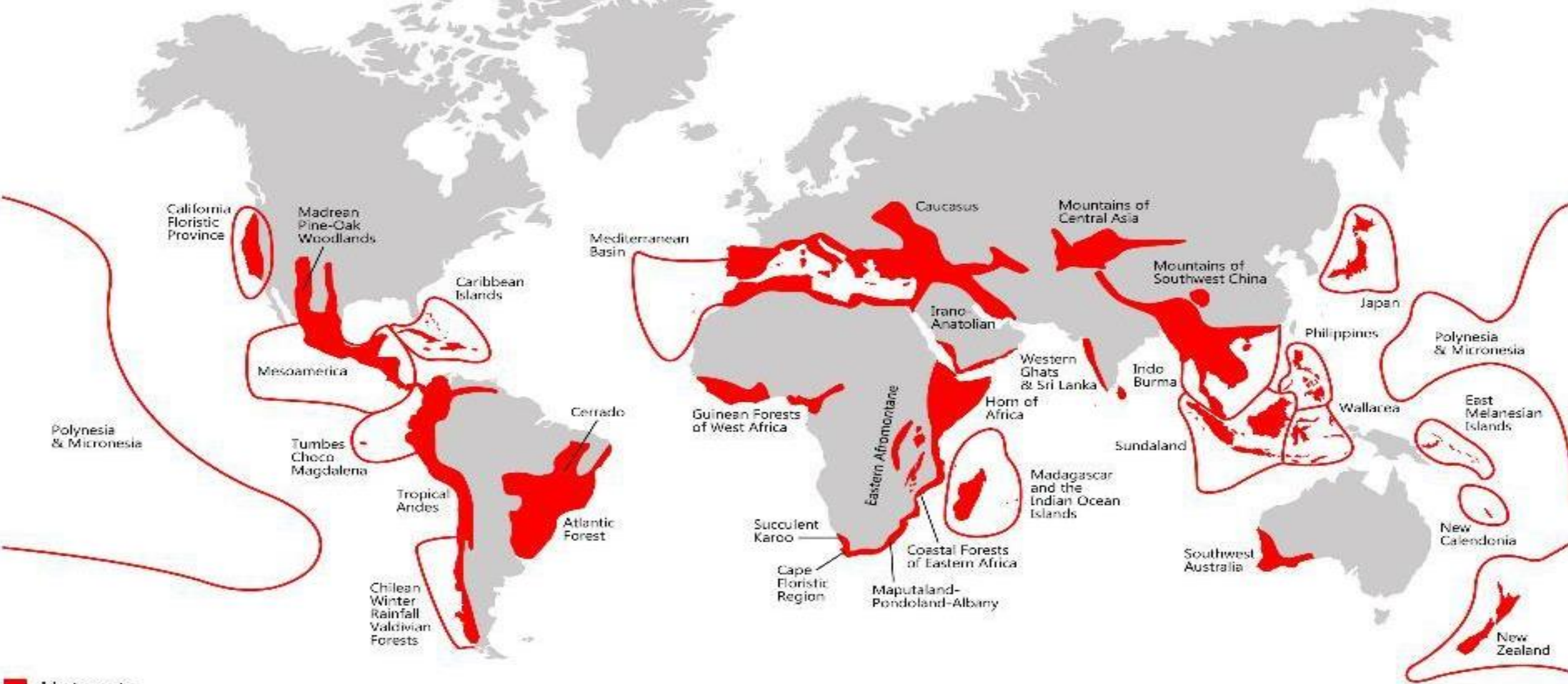
Dogpatch and NW Potrero Hill Green Benefit District Board Meeting  
July 17, 2019



Why do we care?



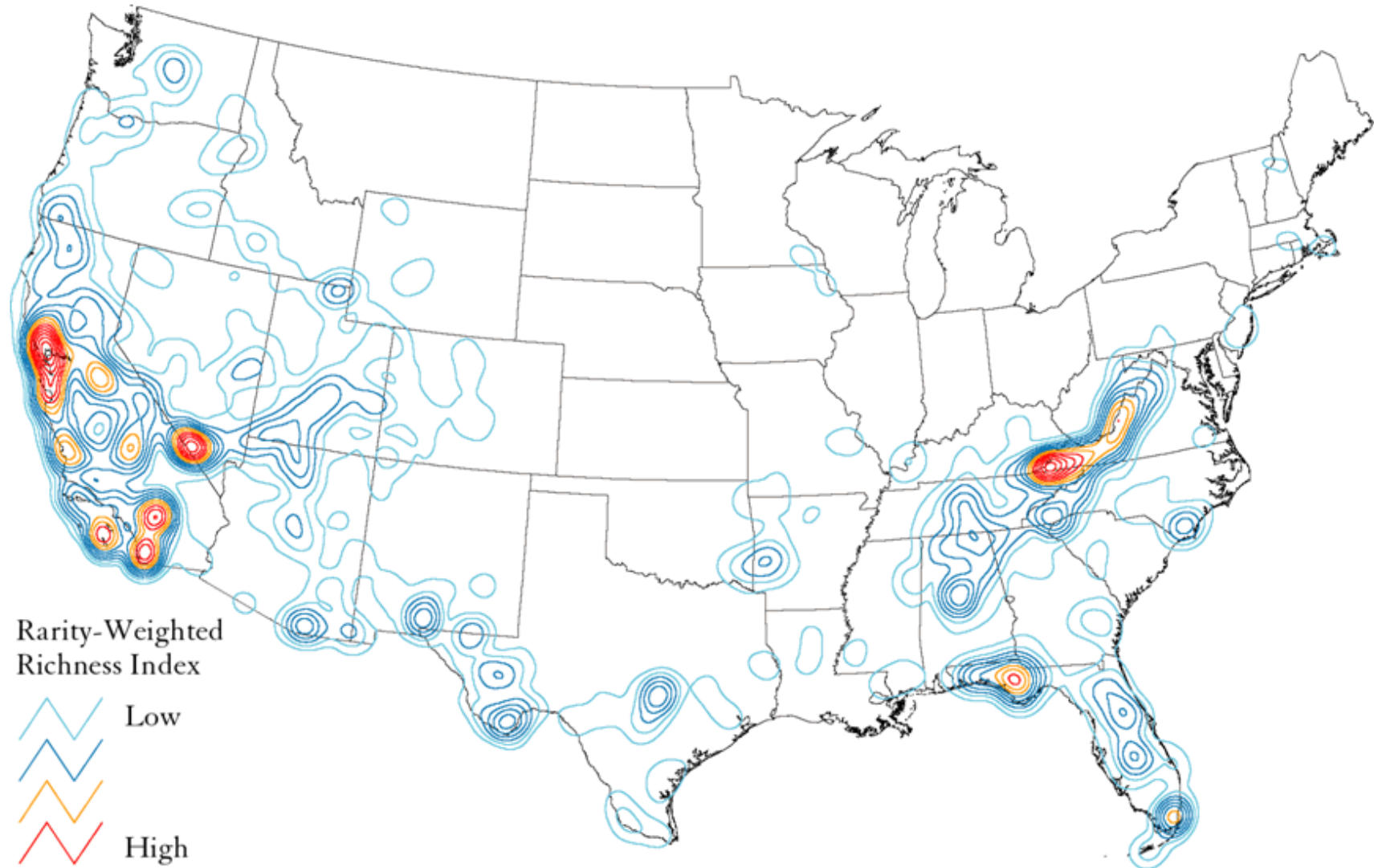
# Global "Hot Spots" -- Significant & Threatened Biodiversity



■ Hotspots

February 2005

# Rarity and Richness Hotspots



# Global Biodiversity Crisis – 6<sup>th</sup> Mass Extinction



<https://www.theguardian.com/environment/2017/oct/18/warning-of-ecological-armed-don-after-dramatic-plunge-in-insect-numbers>

<https://www.theguardian.com/environment/2018/jun/17/where-have-insects-gone-climate-change-population-decline>

<https://www.theguardian.com/environment/2018/nov/03/stop-biodiversity-loss-or-we-could-face-our-own-extinction-warns-un>

<https://www.theguardian.com/environment/2019/feb/10/plummeting-insect-numbers-threaten-collapse-of-nature>

<https://www.theguardian.com/global-development/2019/feb/21/worlds-food-supply-under-severe-threat-from-loss-of-biodiversity>

<https://www.theguardian.com/environment/2019/may/06/human-society-under-urgent-threat-loss-earth-natural-life-un-report>

<https://www.theguardian.com/environment/2019/may/07/can-we-humans-save-ourselves-from-self-destruction>

<https://www.theguardian.com/environment/2019/may/07/humanity-must-save-insects-to-save-ourselves-scientist-warns>

# Insect Apocalyps



# Monarch Population Collapse



## WESTERN MONARCHS IN CRISIS

Western monarchs have declined by 99.4% since the 1980s. For every 160 monarchs there were then, there is only one left today.



[xerces.org/save-western-monarchs](https://xerces.org/save-western-monarchs)



# IPBES Report on Earth's Ecosystems & Biodiversity



Media Release: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'





# UN Decade on Ecosystem Restoration



United Nations Environment Programme

About Us ▾ Regions ▾



Explore Topics ▾ News & Stories

Home / News and Stories / Press release

01 MAR 2019 | PRESS RELEASE | ECOSYSTEMS

## New UN Decade on Ecosystem Restoration offers unparalleled opportunity for job creation, food security and addressing climate change

- The United Nations General Assembly declared 2021 – 2030 the UN Decade on Ecosystem Restoration.
- Restoration could remove up to 26 gigatons of greenhouse gases from the atmosphere.
- UN Environment and FAO will lead the implementation.

**01 March 2019, New York** – The UN Decade on Ecosystem Restoration, declared today by the UN General Assembly, aims to massively scale up the restoration of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity.

# California Biodiversity Initiative (Executive Order)

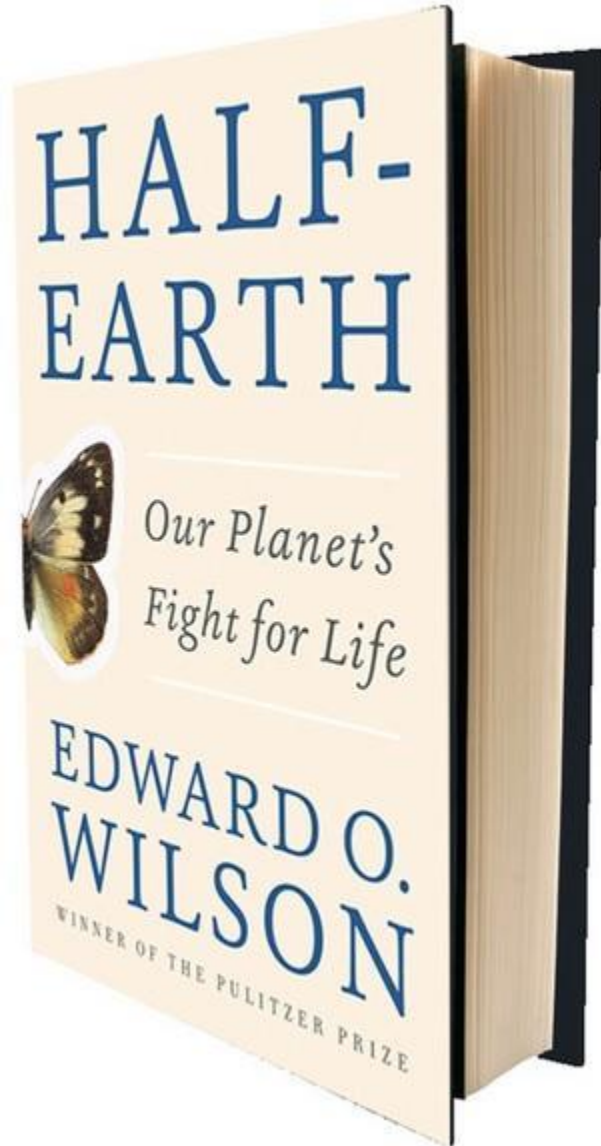


## **California Biodiversity Initiative** A Roadmap for Protecting the State's Natural Heritage



September 2018

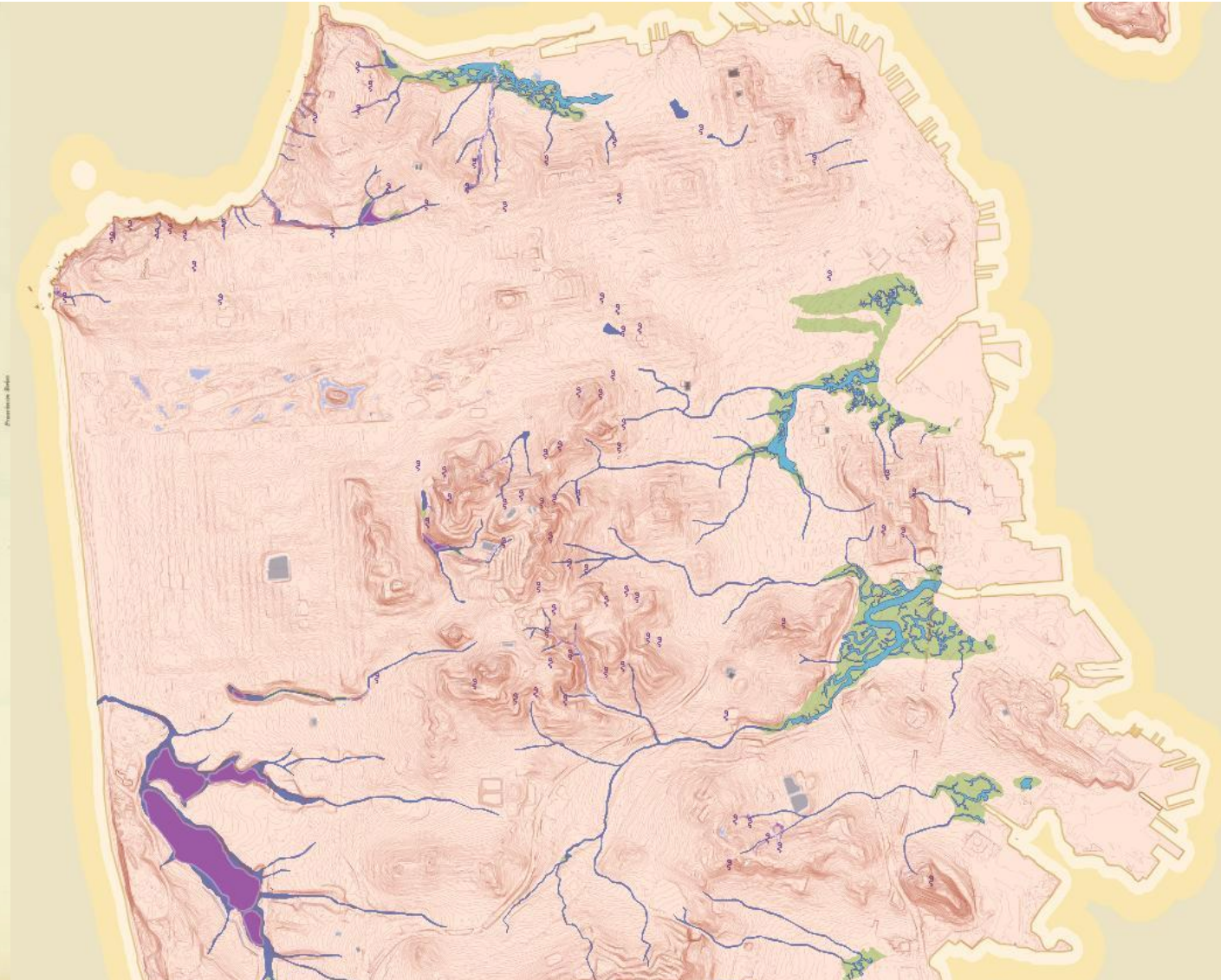
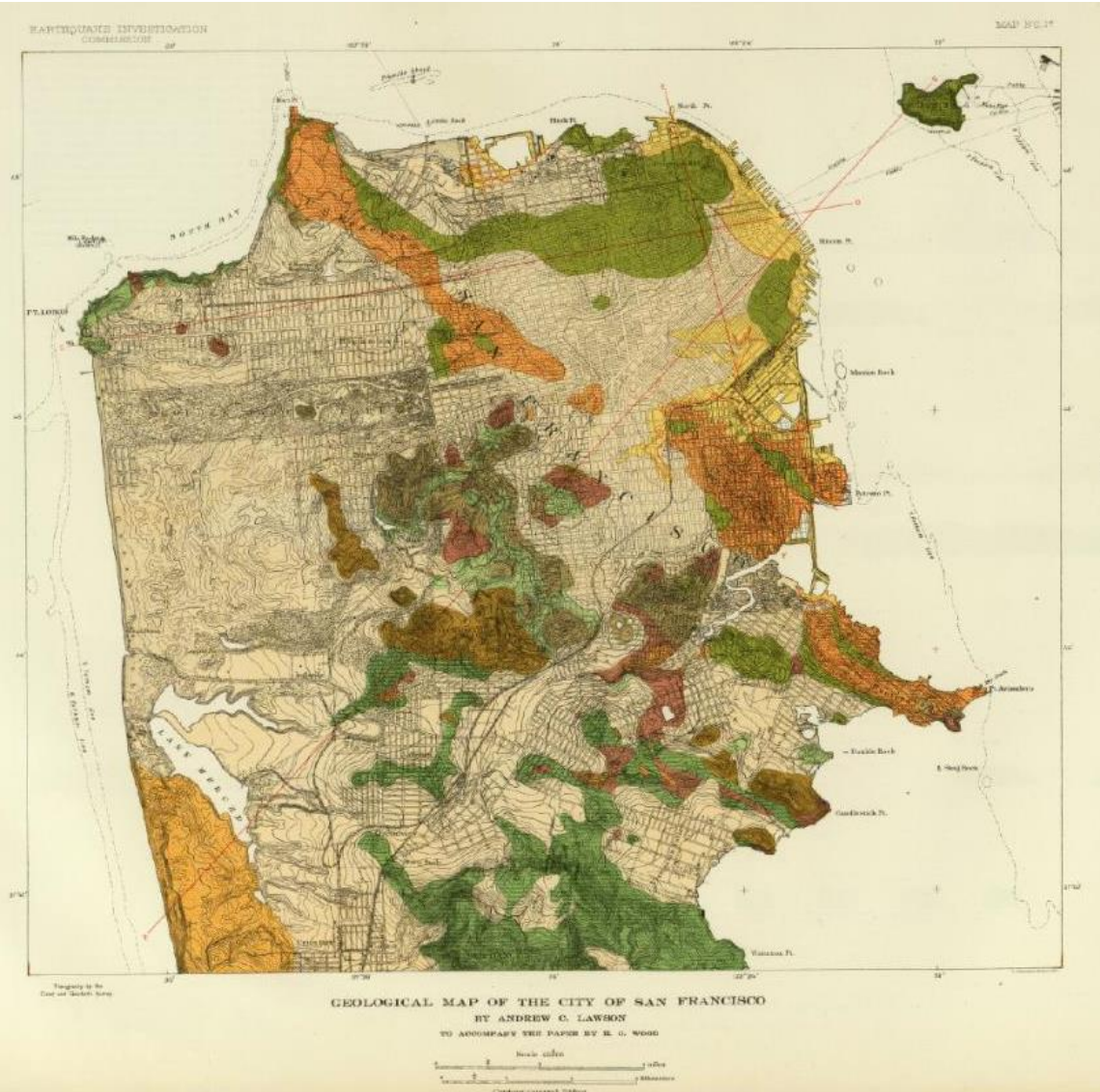
# Nature Needs Half



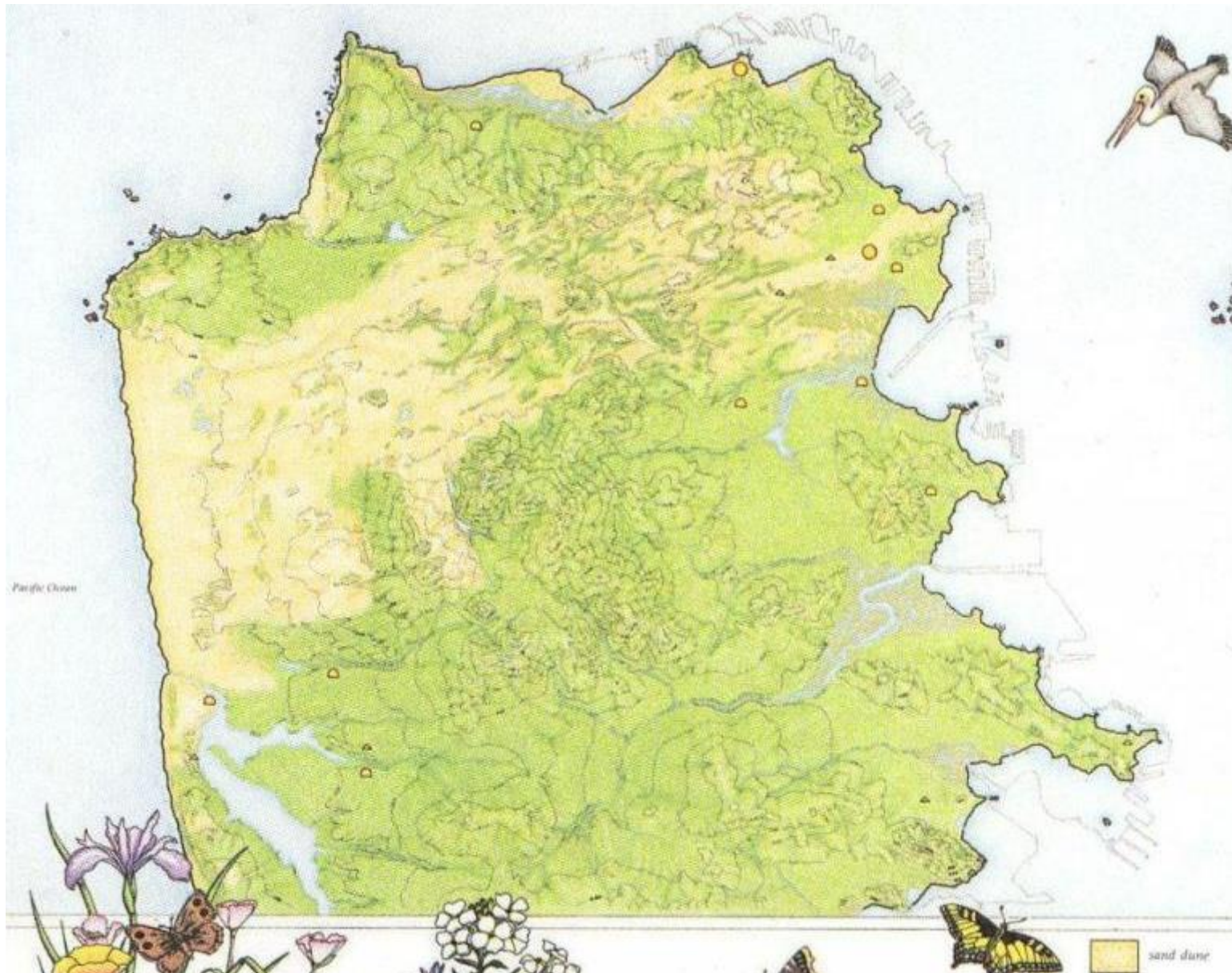
# The City in Nature



# Geology and “Seep City”



# Ancient San Francisco: historical ecology





1902



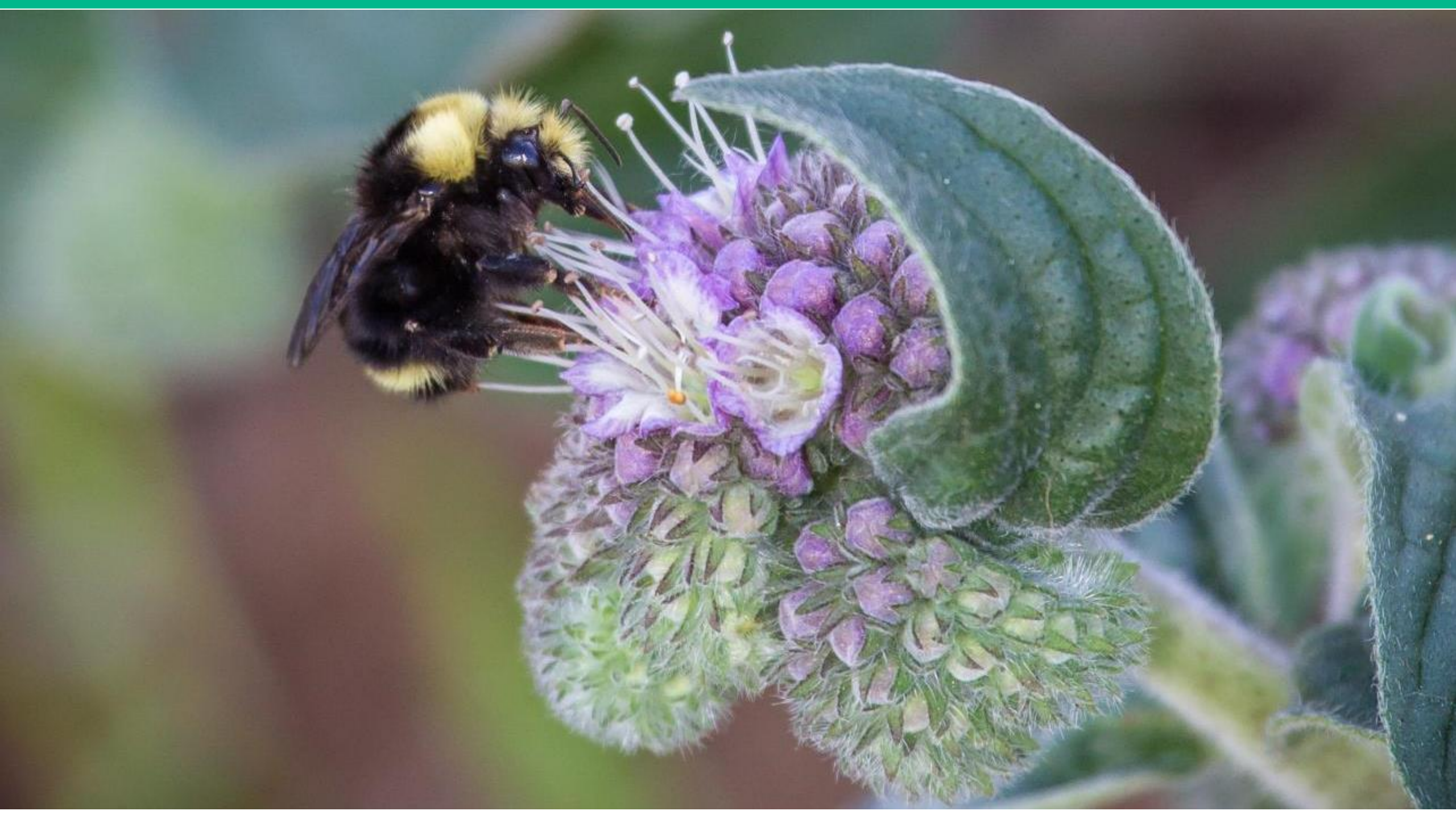


# Diverse Franciscan habitats









# San Francisco's Complex Ecosystem of Species



Birds 400

Land Mammals 22

Reptiles & Amphibians 12

Butterflies 35

Bees 150

Plants 468

CA Rare Plants 22

Federally Endangered 10



# Land and Natural Resources Stewardship



California Department of  
Parks and Recreation



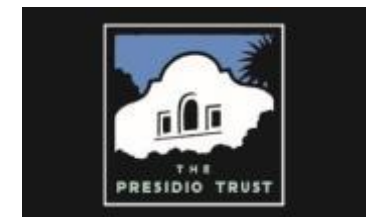
**SF Environment**  
Our home. Our city. Our planet.  
A Department of the City and County of San Francisco



CALIFORNIA  
NATIVE PLANT SOCIETY



San Francisco  
International  
Airport



**PARKS FOR ALL FOREVER**  
The nonprofit partner of the Golden Gate National Parks



# A Common Agenda



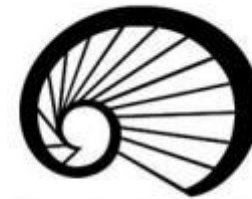
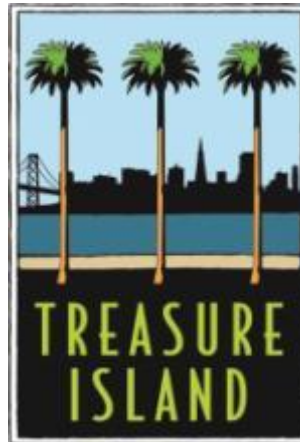
San Francisco International Airport



San Francisco Planning



**SF Environment**  
Our home. Our city. Our planet.  
A Department of the City and County of San Francisco



San Francisco Public Library



# Citywide Biodiversity Goals

1. Biologically Rich Ecosystems
2. Equitable Experience of Nature
3. Ecological Planning and Design
4. Community Stewardship
5. Resilience in a Living City





# San Francisco Biodiversity Policy



*Resolution Establishing Local Biodiversity as a Citywide Priority, with a Framework for Interagency Collaboration for Nature-Based Initiatives, April 17, 2018*

# San Francisco Biodiversity Vision



San Francisco is a place where our local biodiversity thrives in climate-resilient ecosystems that integrate healthy native wildlife and plant habitats throughout our city's physical environment, connecting ALL San Franciscans to nature daily and inspiring stewardship of our unique natural heritage in every neighborhood.



# Our Built and Natural Environments





# Where California Quail (our City bird) can thrive



# San Francisco Climate Action Strategy

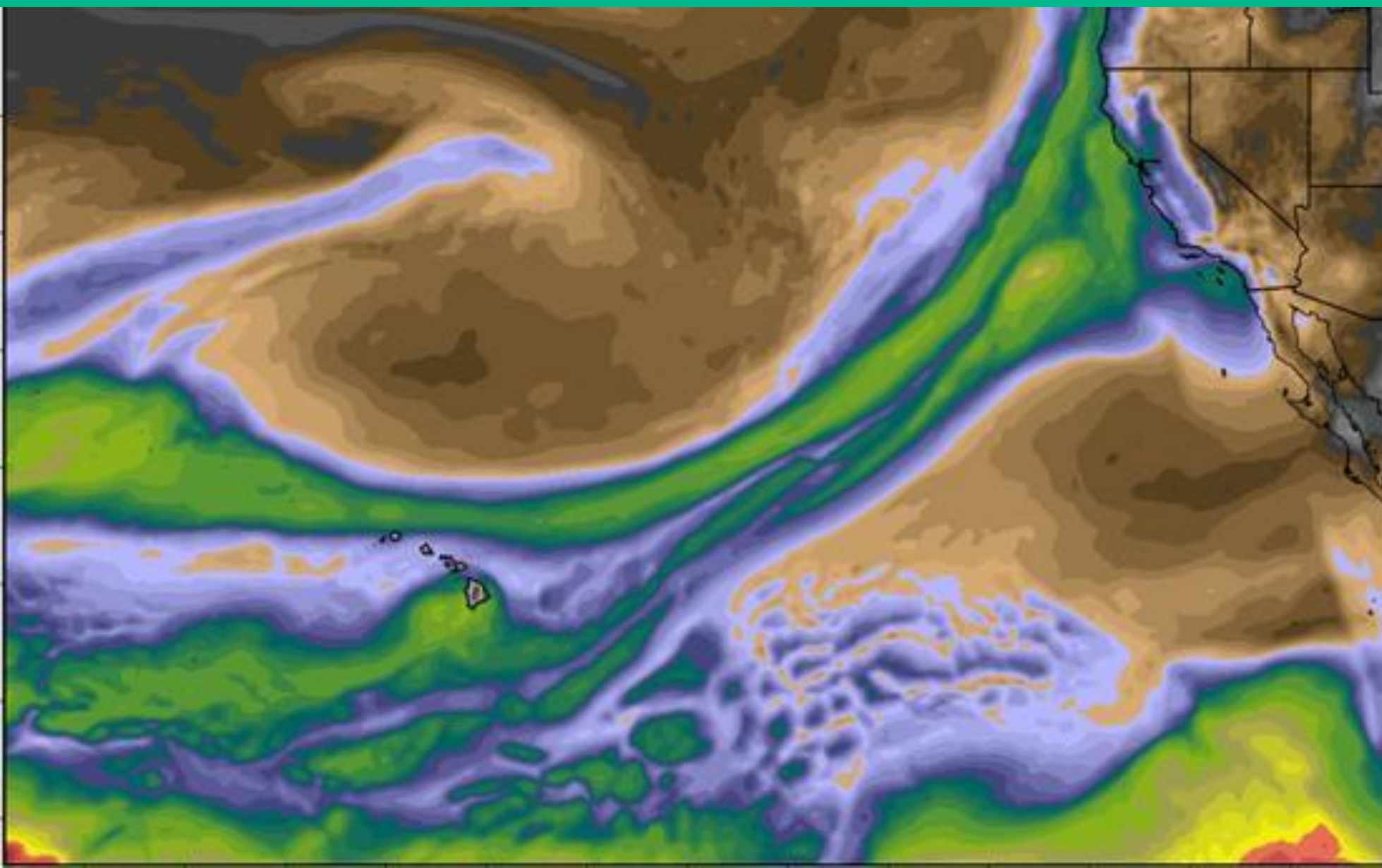


SAN FRANCISCO CLIMATE ACTION

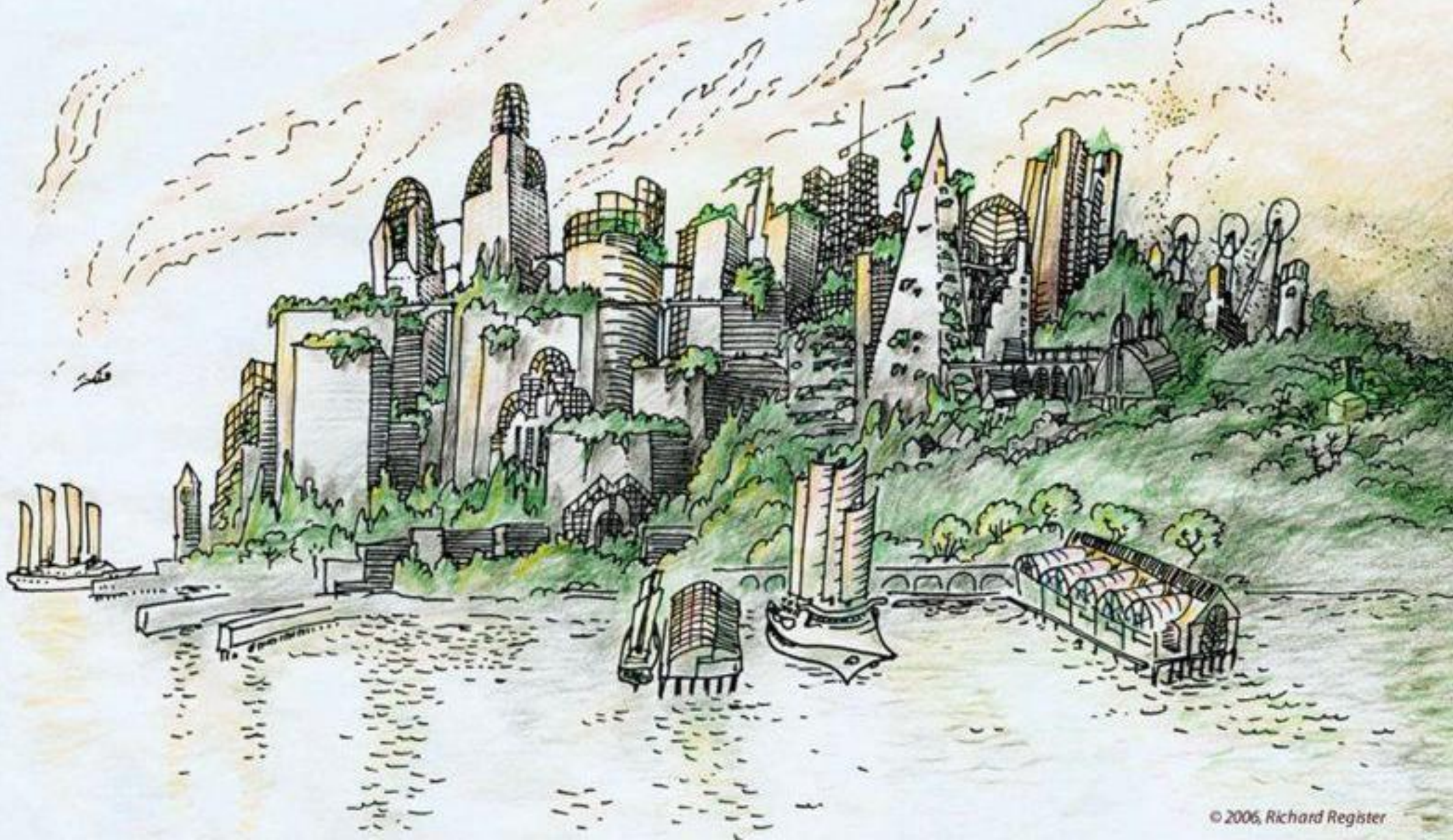
**0 80 100**



# The Climate Emergency



**FURTHER RESOLVED,** That the Board of Supervisors will work with the Mayor's office to develop a budget that supports action to address the climate emergency, avoid further investment of public dollars in fossil-fuel reliant infrastructure, and ensure a climate resilient future for all San Franciscans.





# Nature in the Built Environment



# Creek Day-lighting





## Nature in the City

Tigers on Market Street - A Field Guide

### Wildlife on San Francisco's Main Street

It's remarkable really, how the Western Tiger Swallowtail butterfly has found a home on San Francisco's Market Street. And it's not alone. While some of the wild plants and animals found in these urban canyons are rare, the vast majority are so common you can see them every day if you take the time to look. This guide pays homage to the Honey Bees, London Plane trees, the American Robins, and so many more that have found habitat here. With this guide, we seek to connect you with the wonder of these resilient creatures in this rather unnatural environment. As San Francisco prepares for a new Market Street, the ultimate design will include wildlife.

[www.natureinthecity.org](http://www.natureinthecity.org)

*"I love the story of the Tiger butterflies on Market Street! We welcome these beautiful butterflies and the other wild creatures to the mix. They have already made their home on the City's grandest boulevard and at Public Works we celebrate their presence as we bring new and vital life onto Market Street sidewalks and plazas."*

—Mohammed Nuru  
Director of San Francisco Public Works



# Green Hairstreak Butterfly



# Street Parks Program



# One Year Later-Green Hairstreak Habitat



# SFSU Students Monitoring the Green Hairstreak



# Local Insects Need Local Plants





# 468 species palette of SF native plants







## Bee-Friendly Plant Nurseries



Scientists suspect that pesticides contribute to pollinator decline, along with other factors. The nurseries listed have pledged to grow plants without neonicotinoid insecticides ("neonics"), which may harm pollinators.

Find a bee-friendly plant nursery near you: [San Francisco Peninsula](#) - [East Bay](#) - [Marin & Sonoma](#)

---

# Green Connections



## GREEN CONNECTIONS NETWORK

FINAL March 2014



### LEGEND

#### ROUTES

- 1 Presidio to Bay: Minstarch
- 2 China Beach to Bay: Pippin Nuthatch
- 3 Market to Beach: Anna's Hummingbird
- 4 Pege, Stanyan to Market: Cedar Waxwing
- 5 Kildon, Soto to Beach: Coyote Bush
- 6 Mission to Peala: Arise Swallowtail
- 7 Ortega, 14th to Beach: Coastal Prairie
- 8 Rice Valley to Central Waterfront: American Buckthorn
- 9 Valencia, 20th to Beach: Coastal Dune Scaevola
- 10 Yovonka Creek: Red-winged Blackbird
- 11 Ingleside: Coast Live Oak / California Bushy
- 12 Lake Merced to Candlestick: Western Fence Lizard
- 13 Lincoln Park to Zoo: American Dune Grass
- 14 Presidio to Park: Mendocino Coast Bushwhack
- 15 West of Twin Peaks: Green Hairstreak
- 16 Marina Green to Dolores Park: West Coast Painted Lady
- 17 Excelsior: Cliff Swallow
- 18 Tenderloin to Potrero: Western Tiger Swallowtail
- 19 Downtown to Mission Bay: Western Gull
- 20 Falson, Mission Creek to McLaren: Pollinator
- 21 Bayview to Bay Trail: Black-tailed Jaycreeper
- 22 Ridge Trail: Hutton's White-crowned Sparrow
- 23 Crossstown Trail: Coyote
- 24 Shoreline: Western Snowy Plover and Salt Marsh Harvest Mouse



Notes:  
Some portions of routes may not be ideal for bicycles due to conditions such as steep topography, stairs or trails.

The proposed network falls mostly on public rights of way, but occasionally deviates onto public properties such as park lands.

Connect to future street network as part of Hunters Point Shipyard Development.

Connect to new Bay Trail alignment.

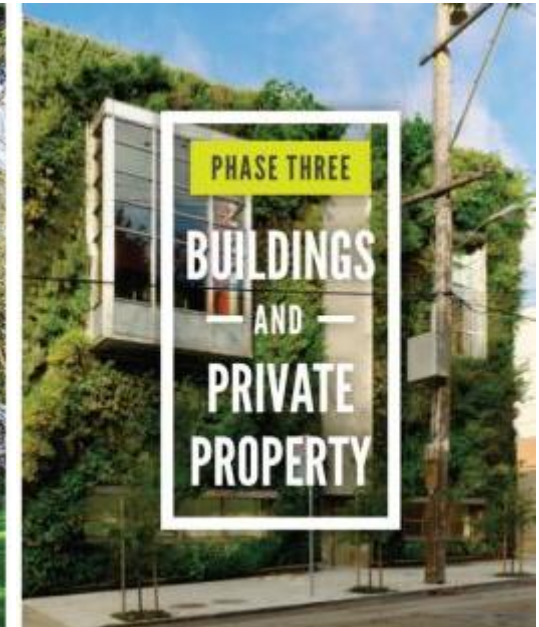
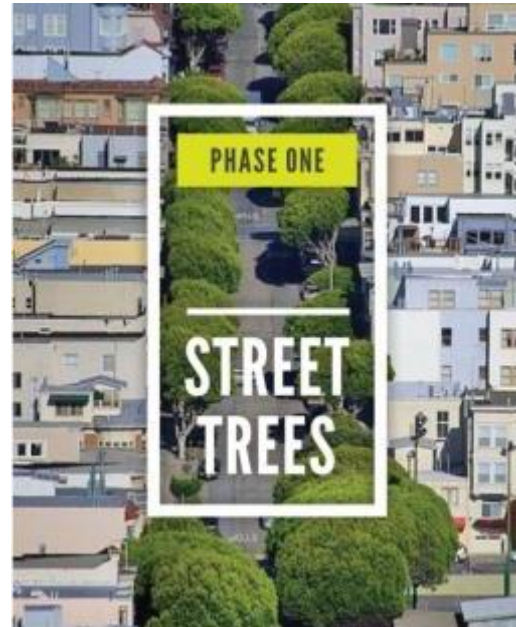
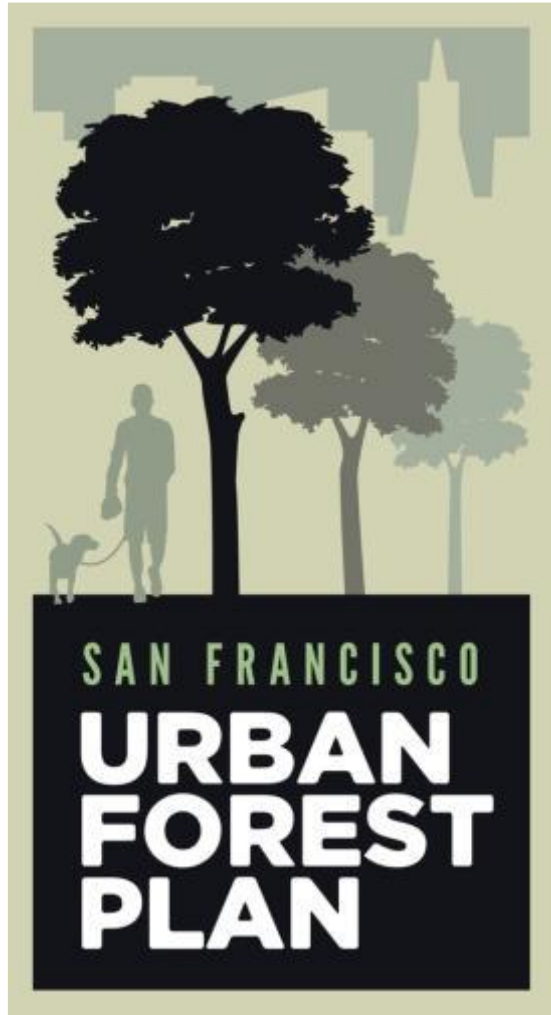


# Principles for Promoting Biodiversity



- 
- A large, close-up photograph of a bee, likely a bumblebee, is used as a background for the text. The bee is positioned in the center-right of the frame, facing right. Its body is covered in fine hairs, and its wings are partially visible. The background is a soft, out-of-focus yellow and orange, suggesting a natural outdoor setting.
- Principle** Emphasize greening and street trees.
  - Principle** Cultivate eco-literacy among San Franciscans.
  - Principle** Incorporate target species and target habitat in Green Connections.
  - Principle** Understand the target species' life cycle.
  - Principle** Create habitat structure.
  - Principle** Consider habitat patch scale and density.
  - Principle** Avoid habitat sinks.

# Urban Forest Plan (UFP)

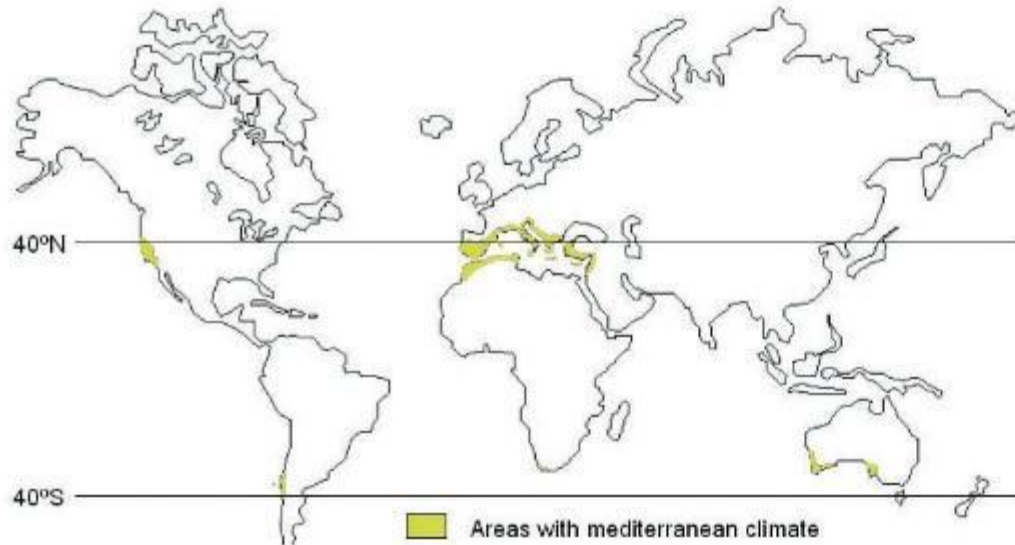


# UFP - Habitat and Biodiversity



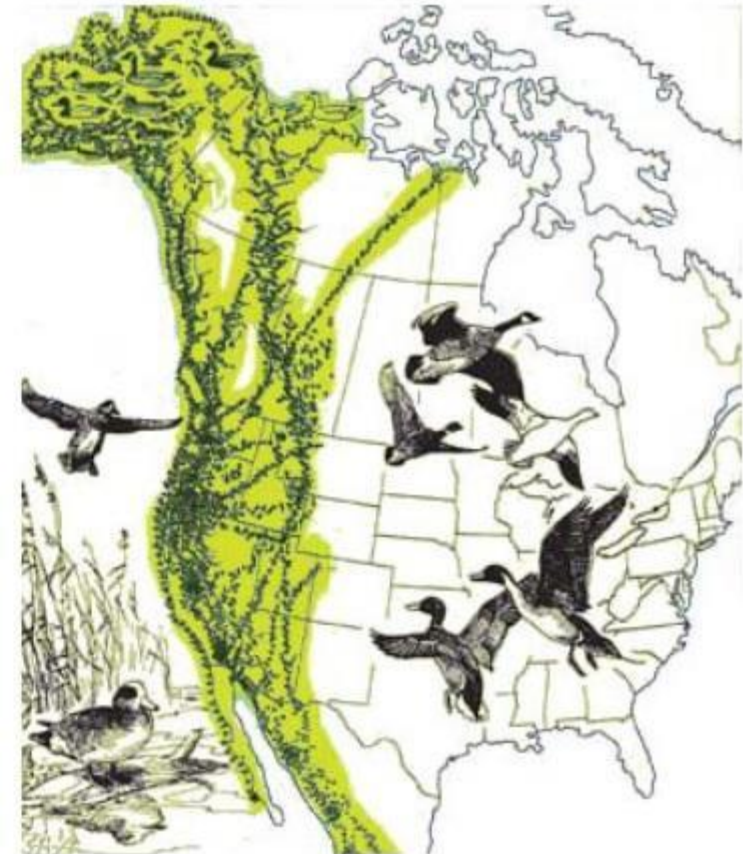
## MEDITERRANEAN CLIMATE

San Francisco's proximity to the ocean and moderate climate spare the city from extremes of hot and cold. Typical of the California coast, our Mediterranean climate is characterized by dry summers and wet winters. Similar climatic conditions are found in parts of Australia, South America, Africa, and the Mediterranean. This allows a wide variety of animals, trees and other plants from around the globe able to grow and thrive here.



## THE PACIFIC FLYWAY

The Pacific Flyway is a major north-south route of travel for migratory birds throughout North and South America, extending from Alaska to Patagonia. Every year, migratory birds travel some or all of this distance both in spring and in fall, to follow food sources, find breeding grounds, or reach overwintering sites. The San Francisco Bay consists of many protected estuaries and mountain open space preserves that provide suitable winter quarters for birds as they fly south. San Francisco's trees, parks and water bodies provide important habitat for these migratory birds.



Wild Parrot



Green Hairstreak Butterfly



Mission Blue Butterfly

# Guidelines for the Blue Greenway



## BLUE GREENWAY

Restoration and Revegetation Guidelines for  
Contaminated and Impacted Areas



SF Environment

AECOM



# Grow The Wild



## Grow the Wild



**SF**  
**PLANT**  
**FINDER**

Create  
wildlife  
habitat  
near you!

Visit the  
**SF Plant Finder**

To find plants, enter address or click on map.

[Search](#)

Or search by plant lists.

[ALL HABITAT PLANTS](#)

[SHOW ALL PLANTS](#)

City Lists ?

[SIDEWALK LANDSCAPING](#)

[STORMWATER](#)

[STREET TREES](#)

[THRIFTY 150](#)

Plant Palettes ?

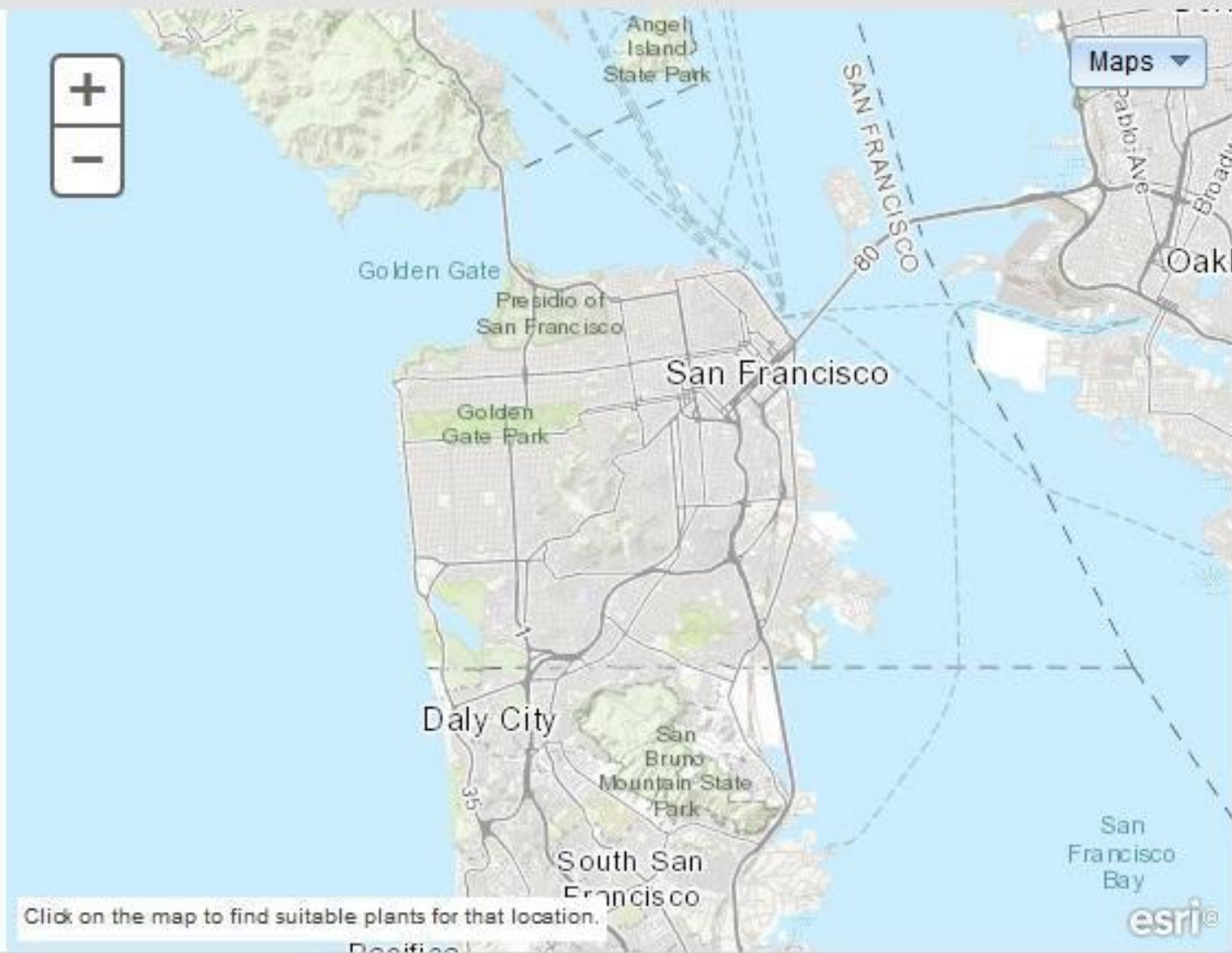
[SANDY SOIL](#)

[SHADY CLAY](#)

[SUPER 60](#)

[TOP 20](#)

[Learn how to use the Plant Finder!](#)



# Pollinators



We found 42 plants for plants for SUPER 60 (check for nursery availability by clicking on a plant).  
The following filters were applied: Habitat Value - Nectar.

Print

Filter results by



**Yarrow**

*Achillea millefolium*



**California Buckeye**

*Aesculus californica*



**Fiddleneck**

*Amsinckia spp*



**Pearly Everlasting**

*Anaphalis margaritacea*



**Manzanita**

*Arctostaphylos spp*



**Pipe Vine**

*Aristolochia californica*



**Sea Thrift**

*Armeria maritima var. californica*



**Coyotebrush**

*Baccharis pilularis*



**Blueblossom**

*Ceanothus thyrsiflorus*



**Soap Plant**

*Chlorogalum pomeridianum*



**Farewell to Spring**

*Clarkia rubicunda*



**North Coast Dudleya**

*Dudleya farinosa*



## Plant Type

- Annual
- Grass
- Perennial
- Shrub (Evergreen)
- Shrub (Deciduous)
- Tree (Evergreen)
- Tree (Deciduous)
- Vine

## Bloom Time

- Winter
- Spring
- Summer
- Fall
- Year Round

## Size at Maturity

- 1 ft.

A wide-angle photograph of a golf course. In the foreground, there is a field of low-lying, reddish-brown vegetation. A paved path curves through the middle ground, where a person is operating a red maintenance vehicle. The vehicle is positioned on the path, facing towards the right. In the background, a large, circular green area (likely a putting green) is visible, with a yellow flag in the center. The surrounding area is lush with various types of trees, including tall, thin evergreens and shorter, denser shrubs. The sky is overcast and grey.

Find Opportunities to Support Biodiversity  
within Existing Landscapes

# Landscaping for Climate and Ecological Resilience

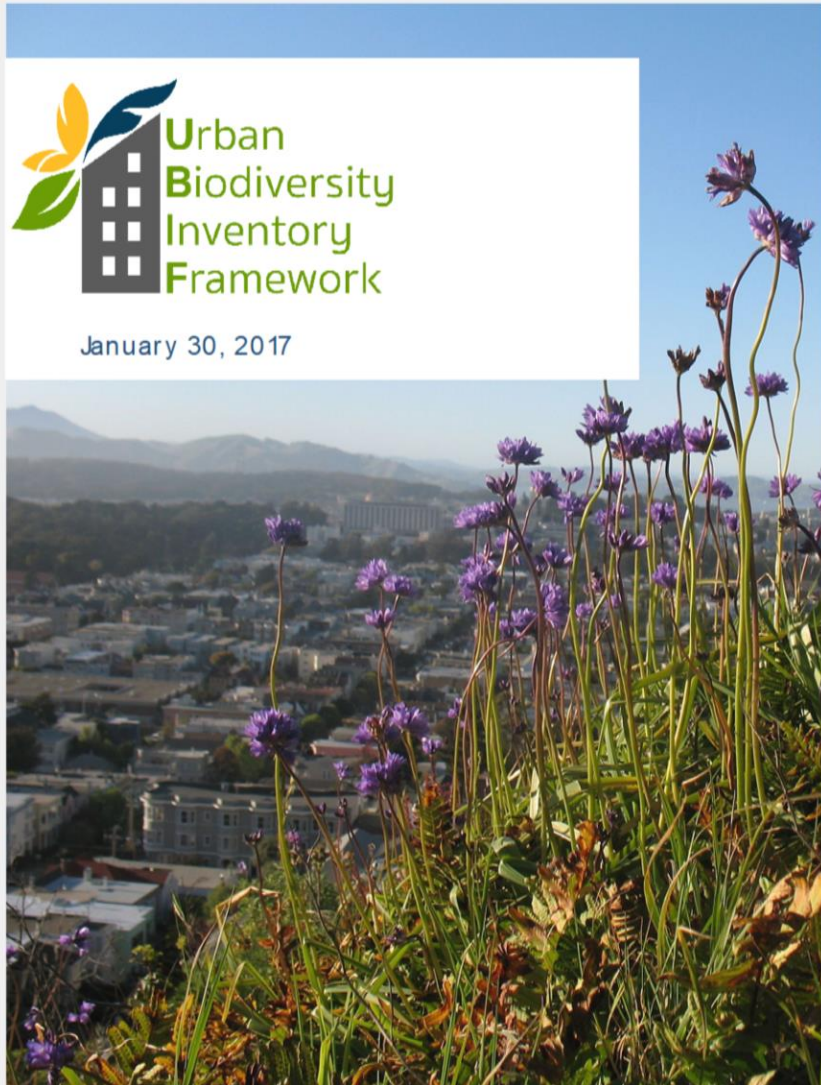


Illustrative rendering, conceptual only, subject to change

Illustrative view of the Wild Gardens and existing egret rookery



# Urban Biodiversity Inventories (UBIF)



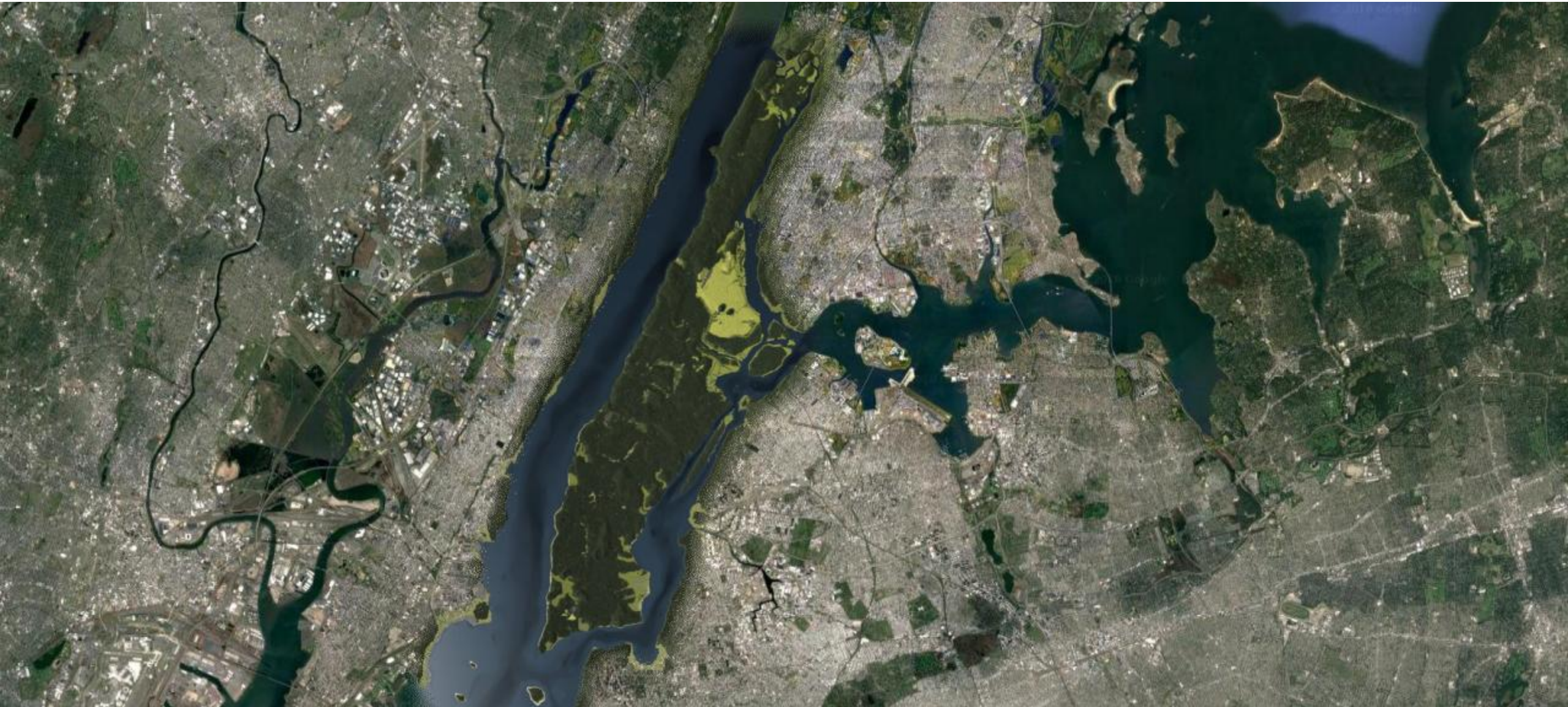
## San Francisco Partners

Presidio Trust  
California Academy of Sciences  
Recreation and Parks  
National Park Service  
Golden Gate Audubon Society  
Nature in the City  
Sutro Stewards  
California Native Plant Society  
Literacy for Environmental Justice

## Cities

Austin	Philadelphia
Blacksburg	Portland
Boulder	Saanich
Burlington	St. Louis
Northampton	San Francisco
Pittsburgh	Vail

# Mannahatta: historical ecology of Manhattan

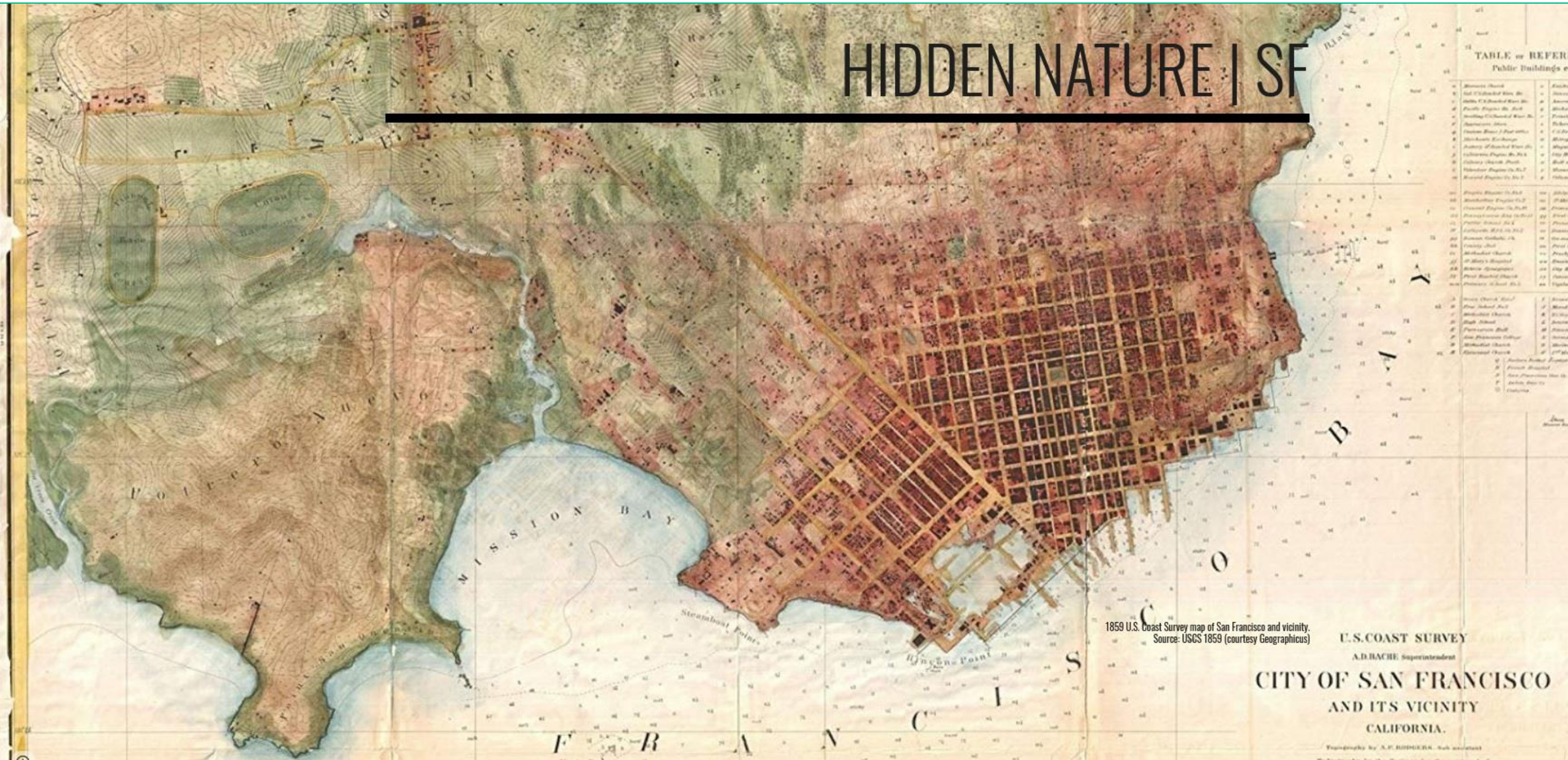




# Historical Ecology



## HIDDEN NATURE | SF



1859 U.S. Coast Survey map of San Francisco and vicinity.  
Source: USGS 1859 (courtesy Geographicus)

U.S. COAST SURVEY  
A.D. BACHE Superintendent  
**CITY OF SAN FRANCISCO**  
AND ITS VICINITY  
CALIFORNIA.

Engraved by A.P. BOHNER, San Francisco



# Islais Hyper-Creek



Thank you!



## **Peter Brastow**

Senior Biodiversity Coordinator  
SF Department of the Environment  
(415) 355-3733  
[peter.brastow@sfgov.org](mailto:peter.brastow@sfgov.org)



**SF Environment**

**Our home. Our city. Our planet.**

A Department of the City and County of San Francisco

**© 2018 SF Environment All Rights Reserved**

The author of this document has secured the necessary permission to use all the images depicted in this presentation. Permission to reuse or repurpose the graphics in this document should not be assumed nor is it transferable for any other use. Please do not reproduce or broadcast any content from this document without written permission from the holder of copyright.