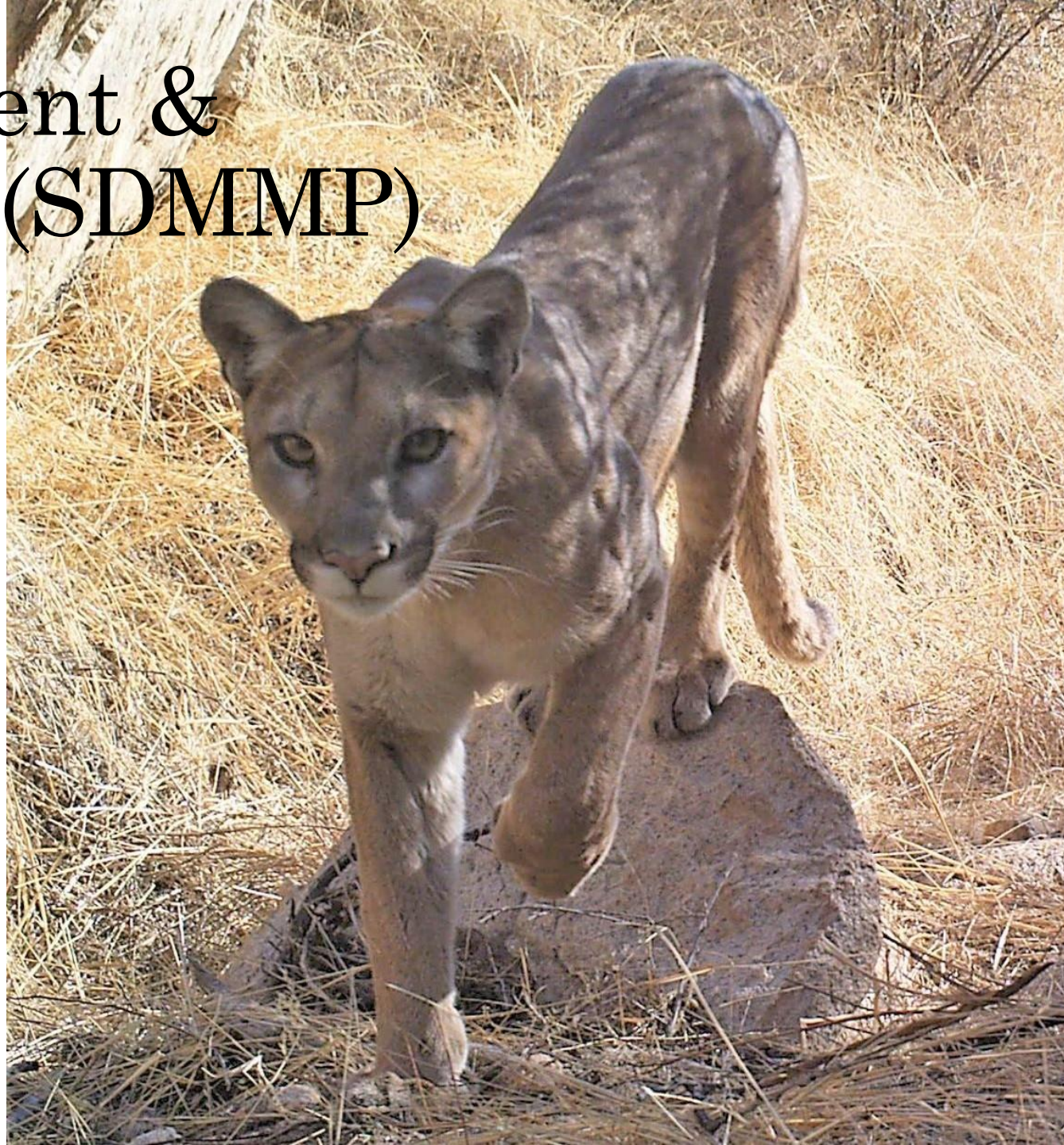


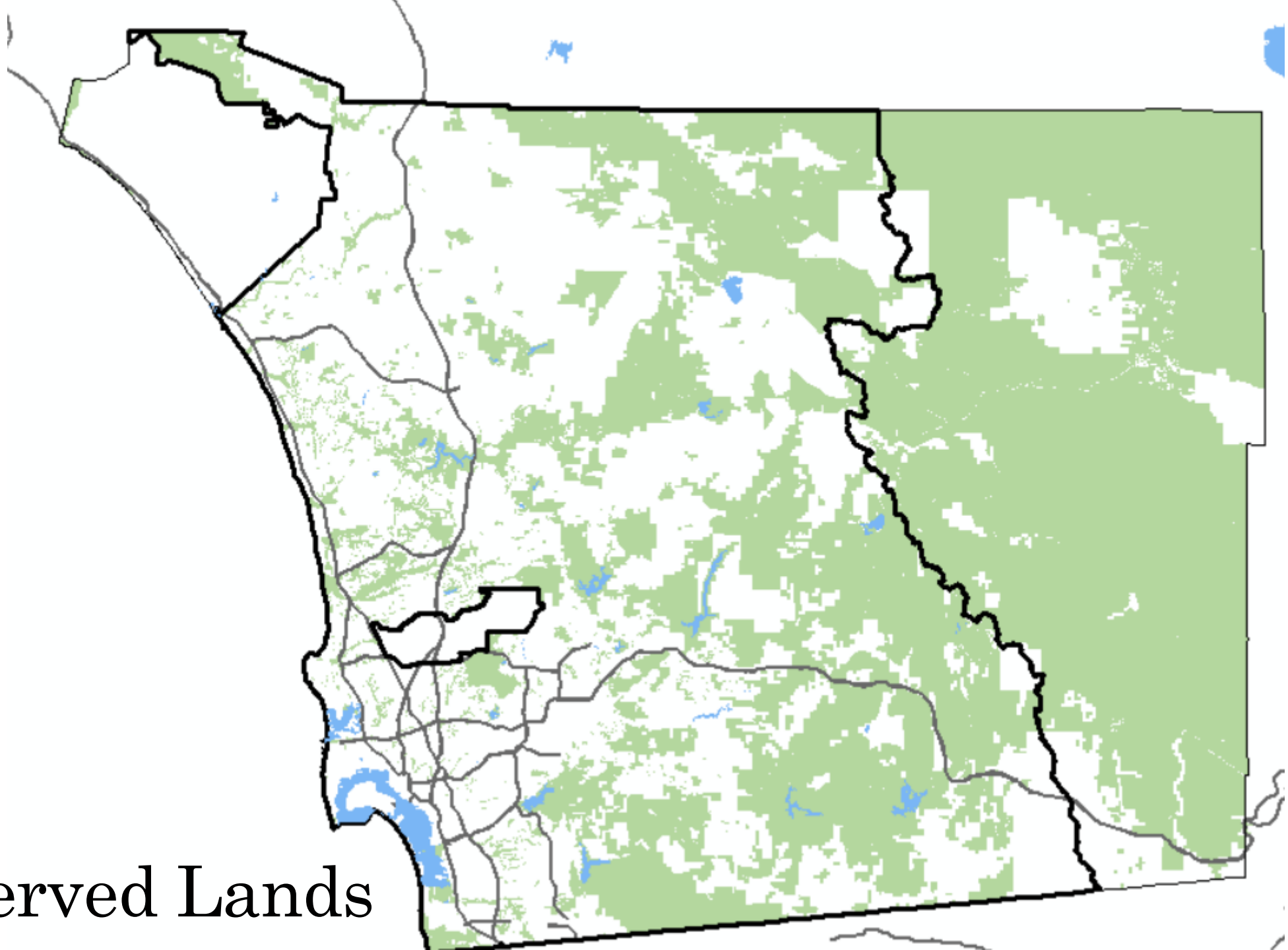
A photograph of a butterfly perched on a flowering plant. The butterfly is orange with dark spots on its wings. The plant has several tall, thin stems with small, light-colored flowers. The background is a blurred natural setting with green foliage and a clear blue sky. The text is overlaid in white, serif font.

San Diego Management and  
Monitoring Program  
Emily Perkins

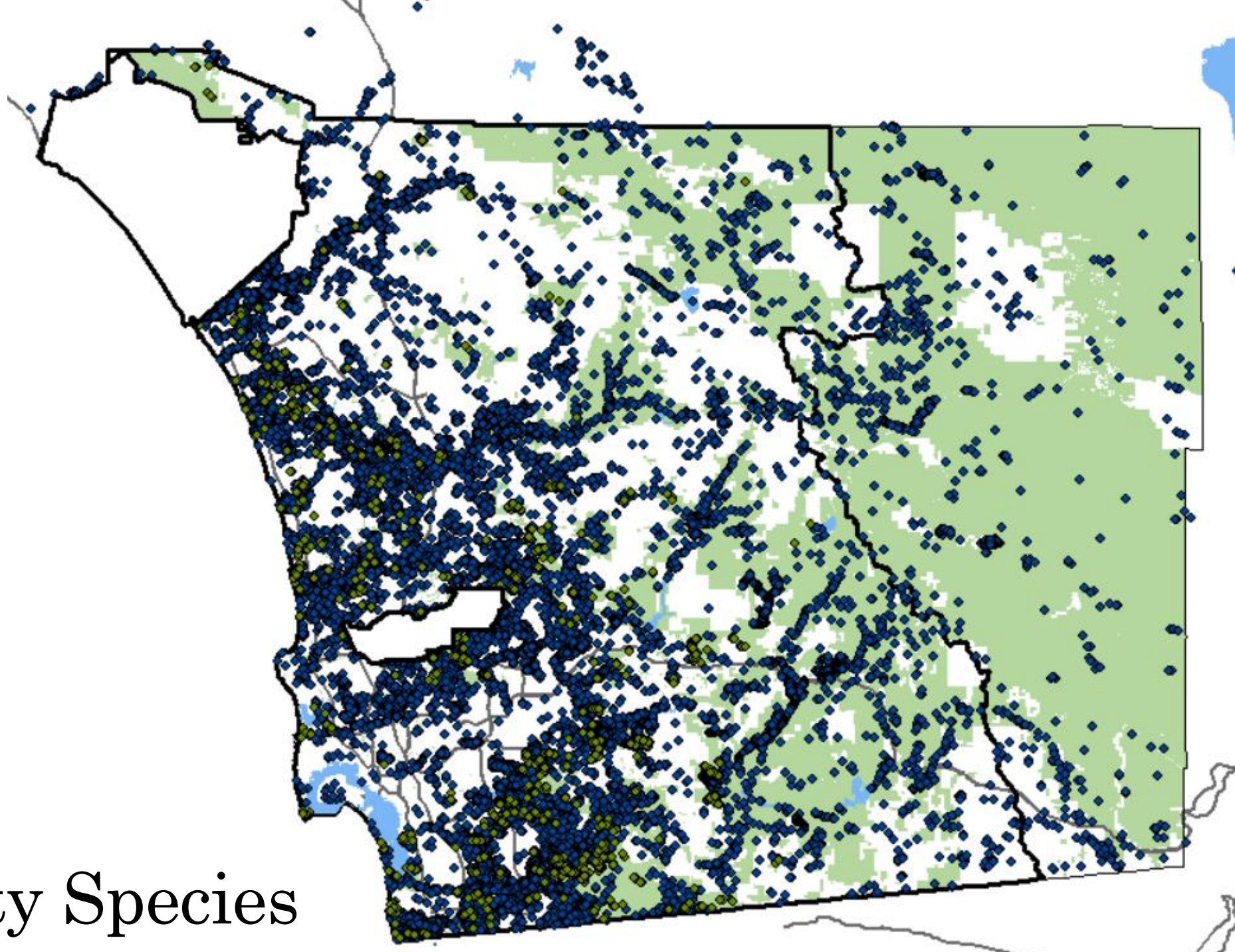
# San Diego Management & Monitoring Program (SDMMP)

- Funded by SANDAG, employed by USGS
- Started in 2008 with the Transnet sales tax
- \$4 million a year budget for habitat and species management and monitoring
- Cover 111 species
- Work with all local, state, and federal agencies, non-profits, others
- Provide support for species permit requirements
- Grant program available for habitat projects





Conserved Lands



Priority Species

# Main tasks of SDMMP

- Prioritize species and actions needed to ensure the persistence of native species in San Diego County (MSP Portal)
- Evaluate the success of projects and the preserve system (Metrics Dashboard)
- Provide project support to partners
- Maintain website
- Manage a central database and GIS gdb
- Provide funding for priority projects



# SDMMP website

- [Sdmmp.com](http://Sdmmp.com)
- Contains information on:
  - Species biology and threats
  - Priority actions and status
  - Evaluation of species status in the county
  - Project information and data
  - Maps and tables of data



## Basic Information

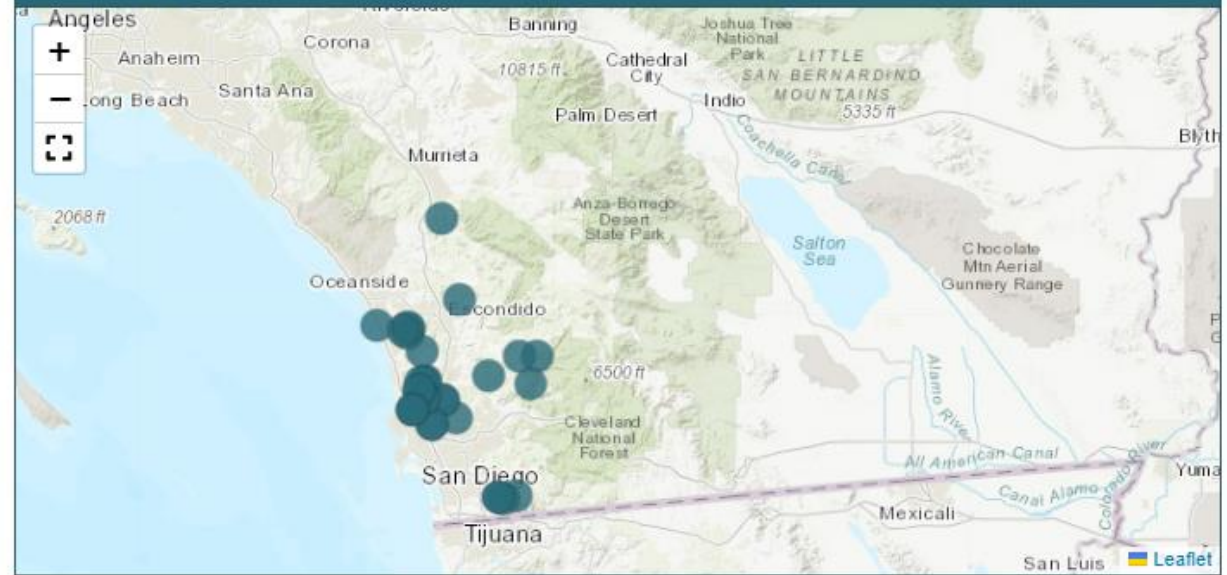
Common Name: Encinitas Baccharis

Scientific Name: *Baccharis vanessae*

Species Code: BACVAN

Management Category: SO (significant occurrence at risk of loss)

## Map of Species Occurrences



## Table of Species Occurrences

Show  entries

Search:

Preserve	Land Owner	Land Manager	Management Unit	Survey Year	Number Detected	Source
Boulder Oaks Preserve	County Of San Diego Dpr	County of San Diego DPR	4	2007	200	Jones and Stokes 2007
Carroll Canyon Vernal Pool Preserve	City Of San Diego	City of San Diego Park and Recreation Department	6	2014	1	Rare Plants 2014 Survey - City of San Diego
Carroll Canyon Vernal Pool Preserve	City Of San Diego	City of San Diego Park and Recreation Department	6	2001	5000	City of San Diego 1999-2012 Monitoring Summary
Cleveland National Forest	U.S. Forest Service	U.S. Forest Service	4	2009	-999	SDNHM 2013

# Goals and Objectives

Export results

**Goal:** Maintain or enhance existing Encinitas baccharis occurrences to ensure multiple conserved occurrences with self sustaining populations to increase resilience to environmental and demographic stochasticity, maintain genetic diversity, and ensure persistence over the long term (>100 years) in chaparral vegetation communities.

## MON-IMG BACVAN-1

Regional and/or Local

2017, 2019, 2021

SO

**Management units:** 3, 4, 6

Beginning in 2017, inspect Encinitas baccharis occurrences on Conserved Lands (see occurrence table) using the regional "IMG" monitoring protocol to record abundance and collect habitat and threat covariate data to determine management needs. After 2017, repeat monitoring every 2 years.

Actions	Success Criteria	Associated Threats	Related Objectives	
<b>Action</b>	<b>Statement</b>		<b>Action status</b>	<b>Projects</b>
IMG-1	Based upon occurrence status and threats, determine management needs including whether routine management or more intensive management is warranted.		In progress	
IMG-2	Submit project metadata, monitoring datasets and management recommendations to the MSP Web Portal.		In progress	



[Overview](#)[MSP Information](#)[Metrics](#)[Projects](#)[Species Profile](#)

### Population Genetic Analysis of 6 Rare Plant Species in San Diego County

The first phase (years 1-2) of this research task will focus on genetic and cytological screening to determine potential ploidy and population genetic differences among occurrences within species. Upon completion, we will convene an expert panel to review results of the genetic studies and then develop specific recommendations for each species relative to the MSP management objectives planned for that species. These recommendations may include designing appropriate common garden or reciprocal transplant studies to determine the fitness consequences of using seed from different populations to increase population size or establish new occurrences. The recommendations will also address MSP objectives involving seed banking and seed bulking needs for each species. The expert panel will also make recommendations on genetic management of populations, including whether genetic connectivity needs to be enhanced or restored to maintain or increase genetic diversity. Recommended and approved studies will be added in the second phase (beginning in year 3). The following questions will be specifically addressed in phase 1: 1. What is the status of documented occurrences? 2. Is there evidence of mixed ploidy levels among or within occurrences? 3. What is current genetic structure among and within occurrences in the MSPA? How vulnerable are the occurrences to genetic drift & loss of genetic diversity and is there gene flow between occurrences? 4. Are there signatures of genetic bottlenecks or lower genetic diversity in populations that have undergone recent reductions due to fire, drought, or other causes, or evidence of local adaptation? 5. Based on the cytological and genetic analysis, what are the recommendations for common garden and reciprocal transplantations, for collecting, bulking and distributing seeds for enhancing existing occurrences, and for establishing new occurrences?

## Current Distribution Rangewide

Reported as restricted to San Diego County [1,2]. Patchy along coast and occasionally interior areas [3]. Not documented as occurring in Mexico but possible given suitable habitat appears to exist there [3]. One of the rarest shrubs in Southern California [1]. In MSP area, reported in MU's 3 (Otay Mountain), 4 (Iron Mountain, Mount Woodson), and 6 (Del Dios Highlands Preserve, Elfin Forest Recreational Reserve, Elfin Forest Recreational Reserve, Escondido Creek Preserve, Oakcrest Park), and some private lands [4].

## List Status

FT, SE

## Habitat Affinities

Occurs in several types of chaparral habitats below 914m where maritime climate exists [3]. Reiser (1994) described primary habitat as low-growing chamise-dominated chaparral, with populations in Encinitas area occurring in association with Del Mar manzanita, mission manzanita, and Mojave yucca. Reported as associated with sandstone soils in Peninsular Ranges [5] and previously thought restricted to sandstone soils, but observed on additional soil types: Cieneba series, Corralitos loamy sand alluvial Huerhuero, San Miguel Exchequer, granitic, andesite rock outcrops, and soils derived from acid igneous rock (CNDDDB 2011 cited in USFWS 2011).

## Taxonomy and Genetics

Taxonomic classification and nomenclature of this species have not changed since described in 1980 [3]. A slender-stemmed shrub in the Asteraceae family, <2m tall from root crown, broom-like [6]. Distinguishable from other *Baccharis* by numerous, erect, glabrous stems; linear, entire leaves with only one principal vein; and delicate, narrowly tapered phyllaries (bracts that form inflorescence), which are reflexed at maturity [3, 7]. No studies focused on genetics [3].

**Indicator Citations**

- TaxaID (FK Indicators)
- Library ID (FK to library table)

**Indicators**

- TaxaID (PK)
- Why included
- Desired conditions
- Current conditions (long)
- Overall Condition
- Overall Trend
- Overall Confidence
- Info box (long)
- Introduction text (long)
- Internal notes

**Metrics**

- Metric ID (PK)
- TaxaID (FK Indicators)
- Short title
- Short description
- Overview
- Evaluation period
- Baseline
- 2027 progress
- 2050 progress
- Info gaps
- Threshold rationale
- Metric value
- Metric value units
- Condition 2021
- Condition 2021 text
- Trend 2021
- Trend 2021 text
- Confidence 2021
- Confidence 2021 text
- Map ID
- Internal Notes

**Metrics Thresholds**

- Metric ID (FK Metrics)
- Condition
- Min Value
- Max Value
- Rationale
- Sources
- Internal Notes

**Metrics Tracker Objectives**

- Metric ID (FK Metrics)
- Objective ID (FK tracker table)

**Metrics Projects**

- Metric ID (FK Metrics)
- Project ID (FK projects table)

**Metrics Trend Graph**

- Metric ID (FK Metrics)
- Chart type ('pie' 'column')
- X axis values
- X axis title
- Y axis values
- Y axis title



VEGETATION COMMUNITIES

- Chaparral
- Coastal Sage Scrub
- Oak Woodlands
- Riparian Woodlands


THREATS

- Altered Hydrology
- Invasive Plants
- Loss of Connectivity
- Natural/Altered Fire Regime


SPECIES

- Encinitas baccharis
- Arroyo toad
- Bats
- Hermes copper
- Coastal cactus wren
- Coastal California gnatcatcher
- Least Bell's vireo
- San Diego thornmint
- Southwestern pond turtle
- Mountain Lion
- Willowy monardella


# Overview



**Caution**  
Overall Condition












**Improving**  
Overall Trend



**Moderate**  
Overall Confidence

**Current Status**

The overall condition for the Encinitas Baccharis Indicator is Caution based on consideration of the three metric condition values. Despite the concerns about occurrence status and reproductive success in this species, there are encouraging signs with the discovery and conservation of new occurrences, including some with larger numbers of plants and moderate levels of threats at occurrences. At least two small occurrences increased in size class between 2016 and 2019. Additional metrics will be added as more information becomes available.

Metric and Desired Condition	Condition	Trend	Confidence
<b>Conserved Occurrences</b> Number of known, extant occurrences on conserved lands	 Good	 Improving	 Moderate
<b>Population Status</b> Number of occurrences increasing in size over time	 Significant Concern	 Unknown	 Low
<b>Threats to Occurrences</b> Percent of occurrences with significant threats	 Caution	 Unknown	 High

# Conserved Occurrences



Good

Overall Condition



Improving

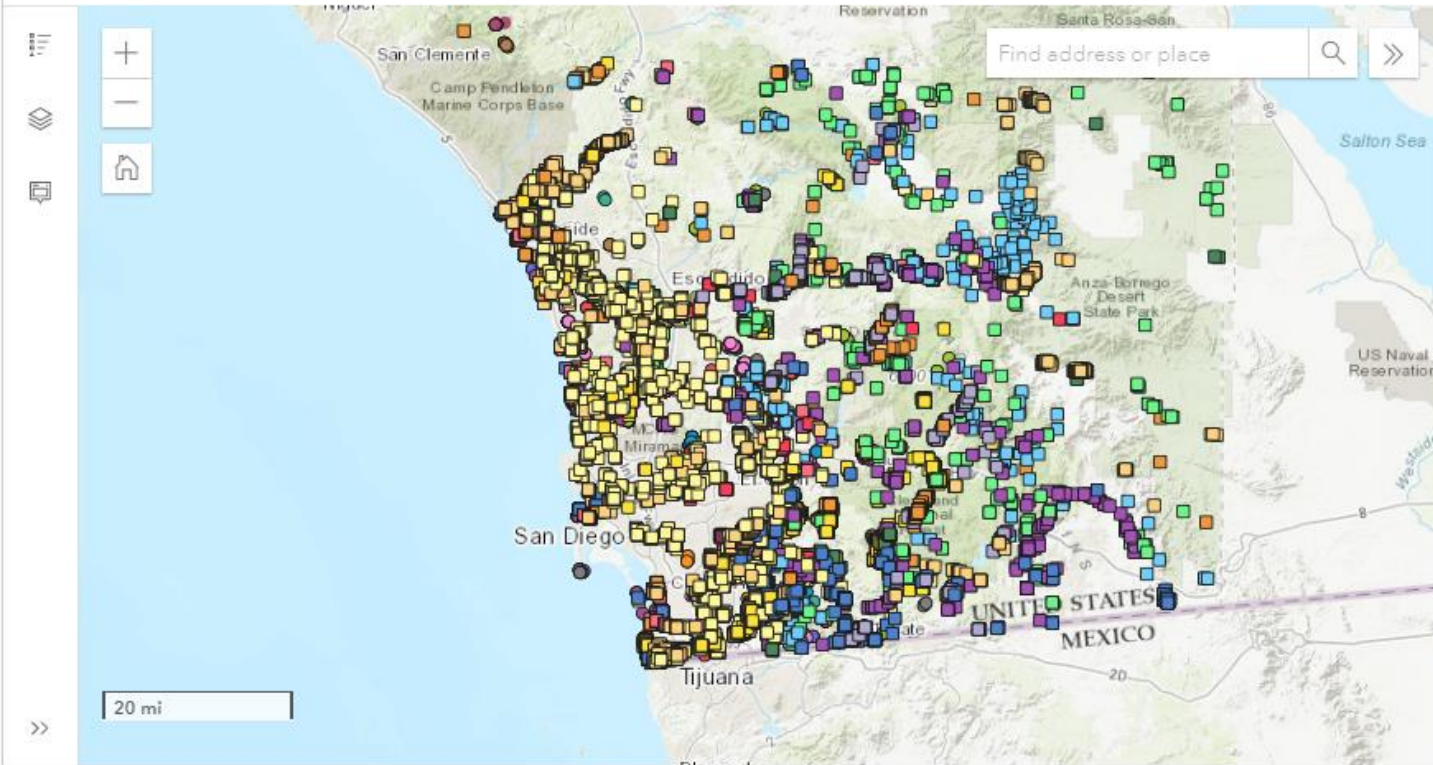
Overall Trend



Moderate

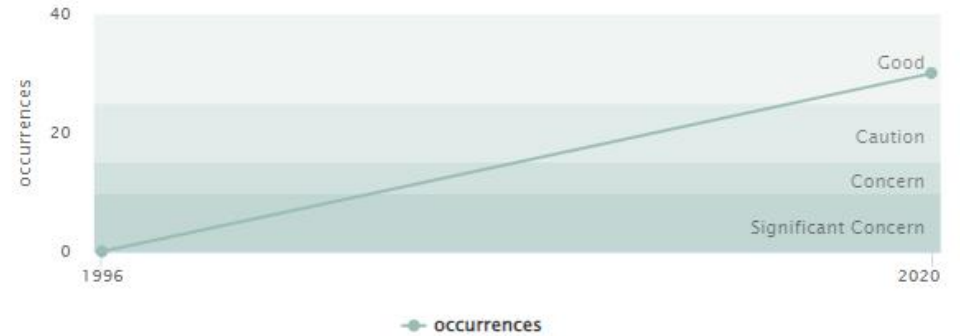
Overall Confidence

## TEST- Sidebar SDMMP Environmental Dataset Viewer

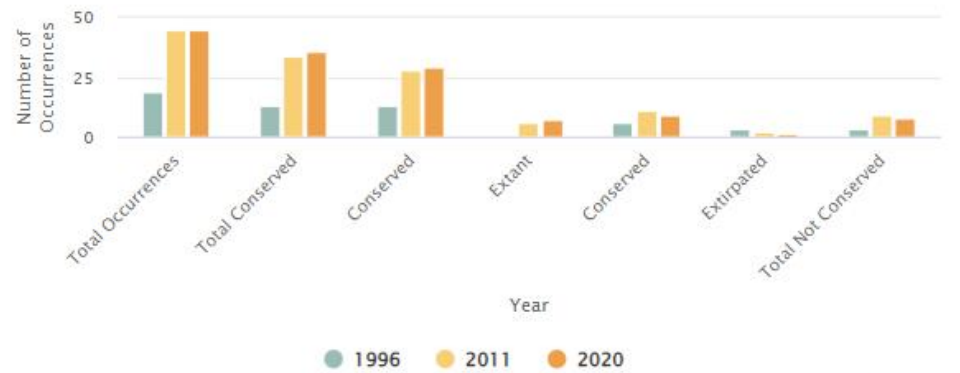


### Conserved Occurrences

Number of known, extant occurrences on conserved lands



### Number of occurrences and conservation status



# Additional Resources

## Related Projects

Project Names	Metrics
MSCP Linkage Evaluation Study - San Pasqual Camera Monitoring	<a href="#">CHAP1</a>
Post-Fire Monitoring - Herpetofauna sampling	<a href="#">CHAP3</a>
Post-Fire Monitoring - Terrestrial Biodiversity Vegetation Transects	<a href="#">CHAP3</a>
Post-Fire Monitoring -Small Mammal Sampling	<a href="#">CHAP3</a>
Vegetation Mapping & Classification - Part 1	<a href="#">CHAP1</a>
Vegetation Monitoring Methods - Part 1	<a href="#">CHAP1</a>

## Related Objectives

Objectives	Metrics
APHBLI-1: Implement Inspect and Manage	<a href="#">CHAP1</a> <a href="#">CHAP3</a>
APHBLI-2: Implement Inspect and Manage	<a href="#">CHAP2</a> <a href="#">CHAP3</a>
APHBLI-3: Survey Species	<a href="#">CHAP3</a>
CHAPAR-1: Prepare Monitoring Plan	<a href="#">CHAP2</a> <a href="#">CHAP3</a>
CHAPAR-2: Develop Classification map	<a href="#">CHAP2</a>
CHAPAR-3: Implement Monitoring Plan	<a href="#">CHAP3</a>

## Selected Citations

Citation Name	Leading Author	Year
Grouping and Prioritizing Natural Communities for the San Diego Multiple Species Conservation Program	Janet Franklin	2006
Developing Conceptual Models to Improve the Biological Monitoring Plan for San Diego's Multiple Species Conservation Program	Lauren Hierl	2007
Baseline Biological Survey Report for the Sage Hill Preserve County of San Diego		2010
Post-fire Monitoring and Management Strategy for Blossom Valley Habitat Conservation Area	E Kellog	2005
Improving Statistical Sampling and Vegetation Monitoring for Open Space in Central	Douglas	2008

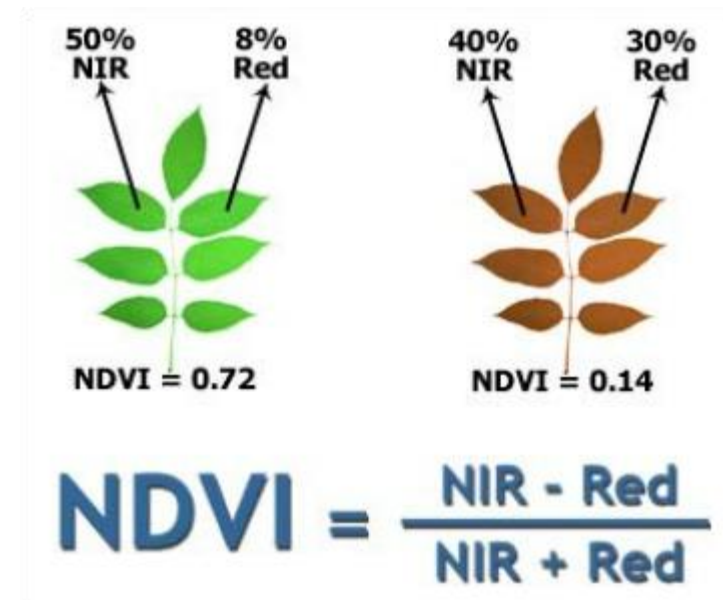
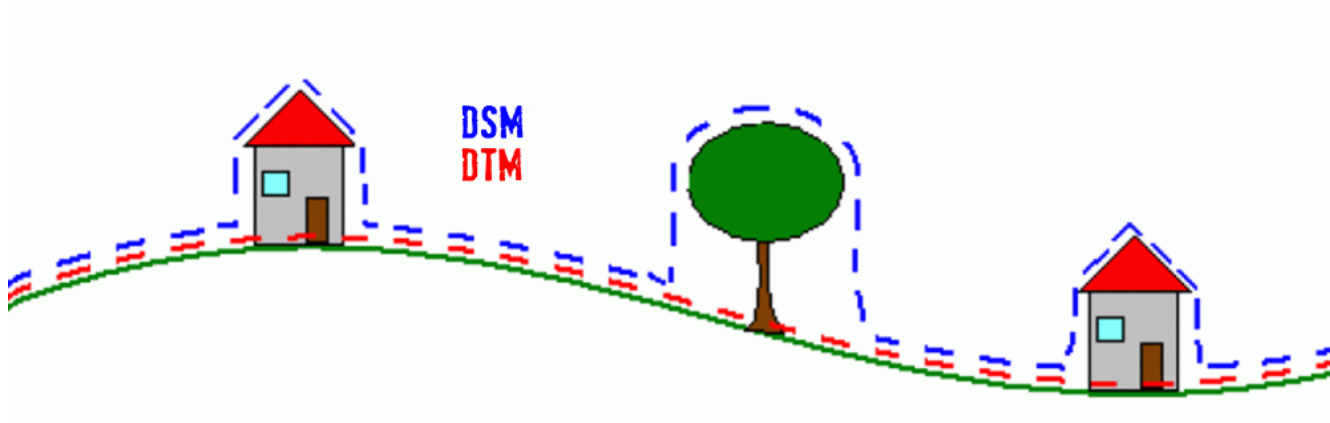


# Ecological Integrity

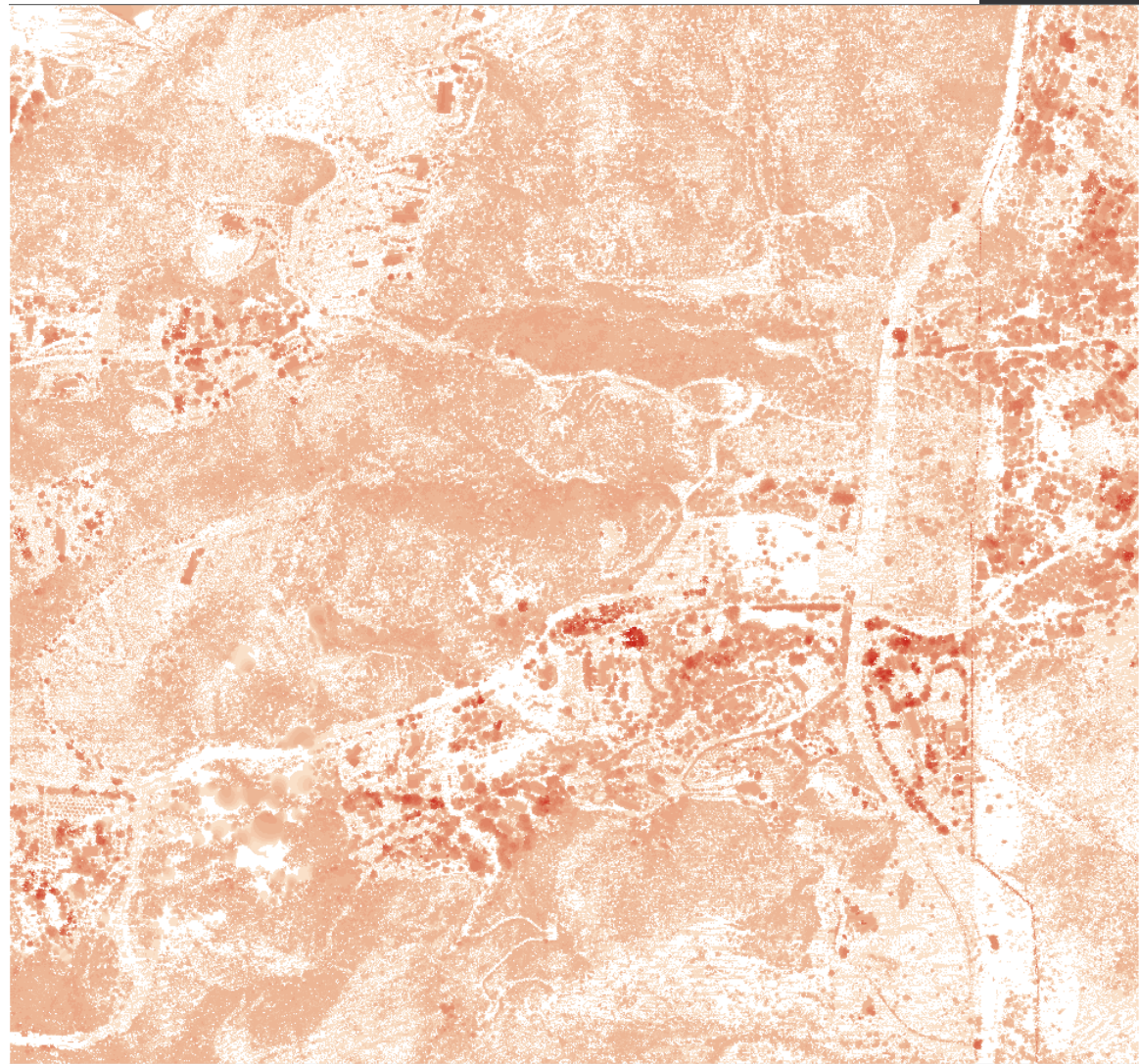
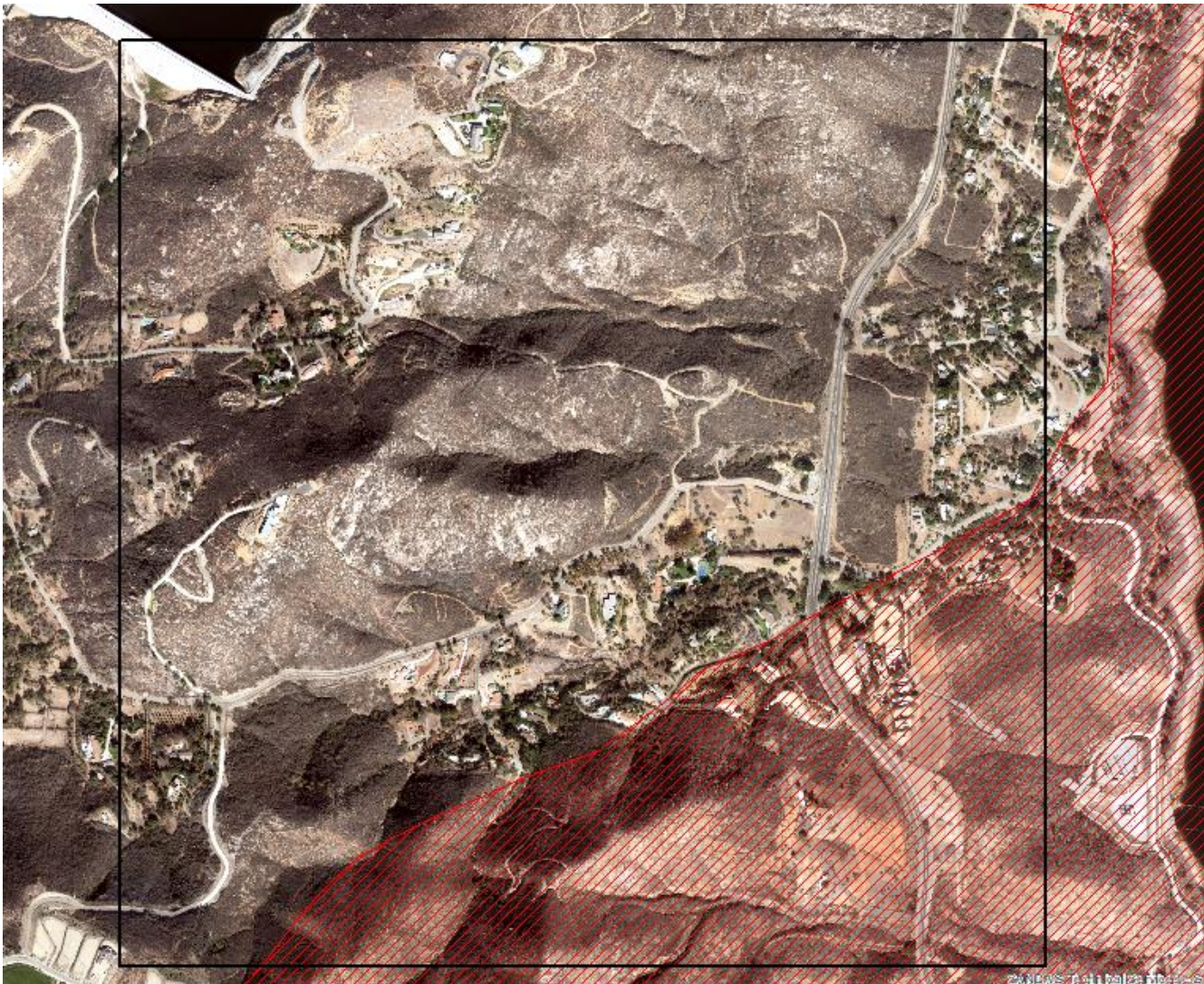
- For shrubland communities (chaparral and coastal sage scrub), calculated the percent of shrub cover & percent of grass cover
- For tree communities (oak and riparian), calculated the percent of healthy trees (not dead)

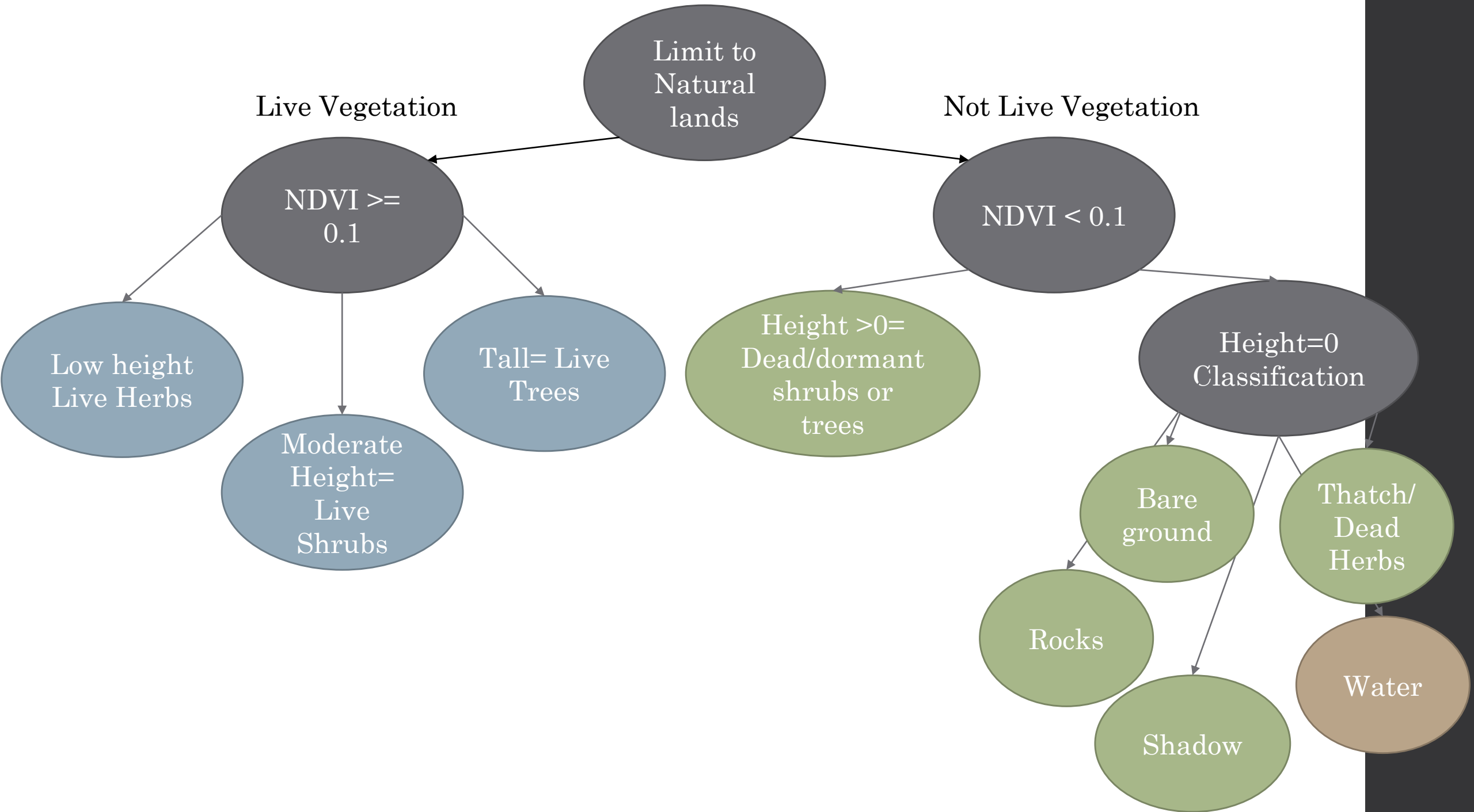
# Overview of methods

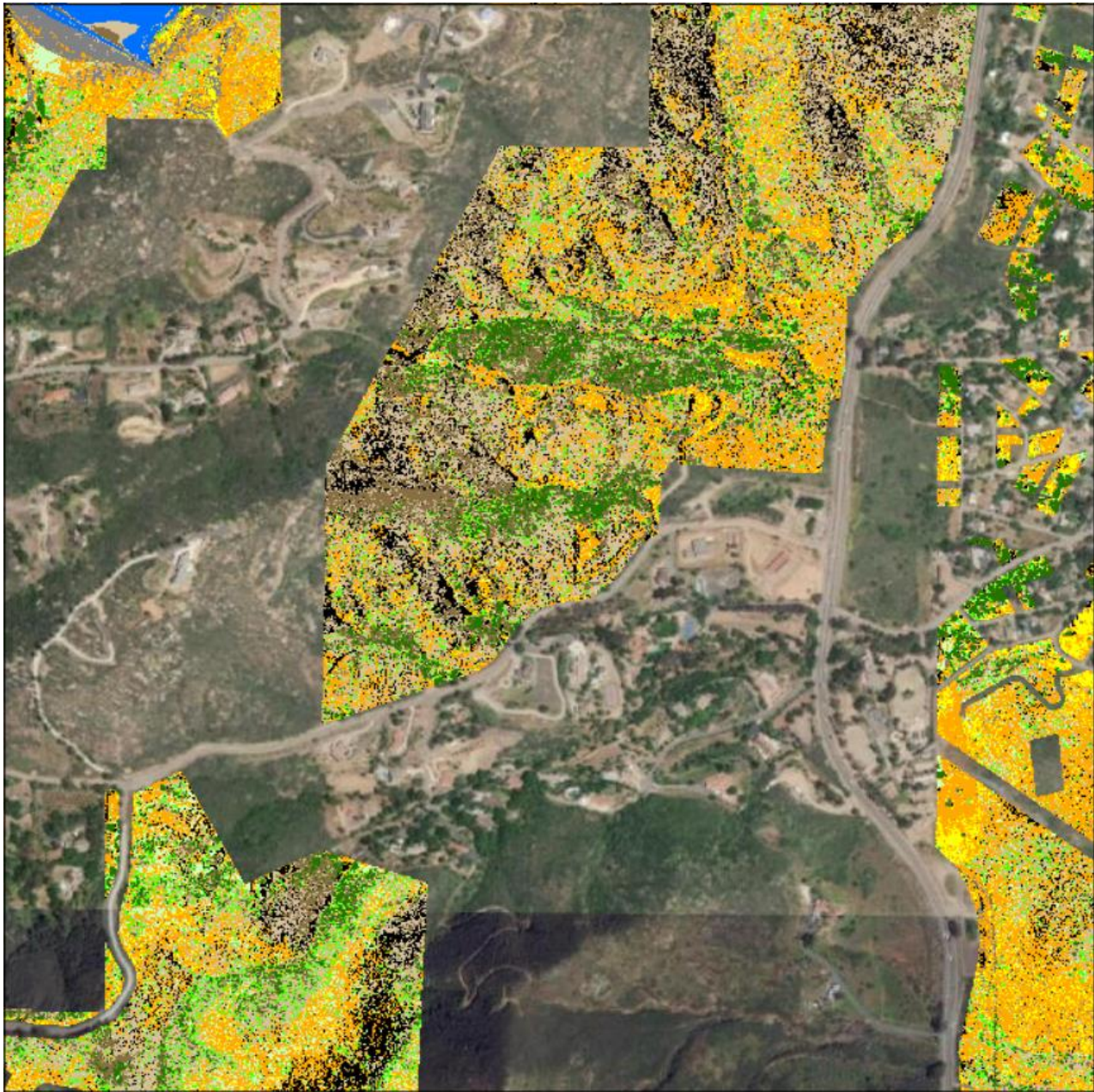
- Lidar point cloud 2014/2015 was used to create a DEM and DSM
- Subtracted the DSM and DEM to get height above the surface
- Restricted extent to non-urban areas
- Calculated NDVI using NAIP 2014











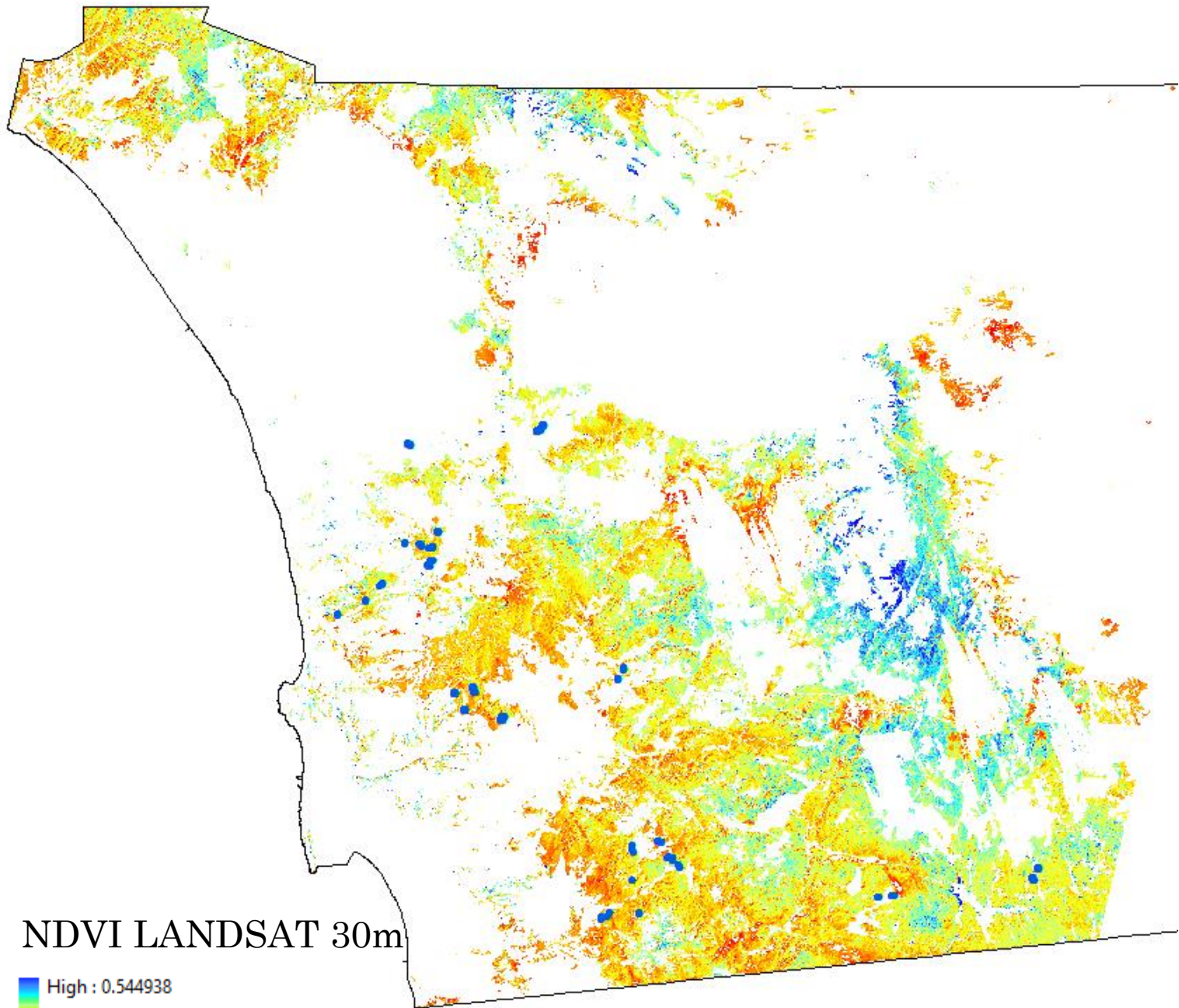
# Drone imagery



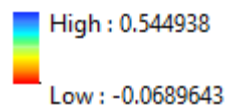
**AECOM**



**AECOM**



NDVI LANDSAT 30m



# Conclusion

- SDMMMP is a central location to store:
  - Conserved lands data
  - Species information
  - Remote imagery
  - Other ecological data (climate, soils)
  - Project information





Bushnell

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