Metrics Dashboard & Ecological Integrity

SDMMP Coordination Meeting

April 2022

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SDMMP

Applying science to conservation through collaboration

The SDMMP's mission is to coordinate science-based biological management and monitoring of lands in San Diego that have been conserved through various conservation planning and mitigation efforts.

MSP Portal

Management & Monitoring Strategic Plan: Goals, Objectives & Actions
The Management & Monitoring Strategic Plan provides goals, objectives and actions for species, vegetation communities, and threats/stressors. Use the MSP Portal to search this information spatially, by keywords, or by progress/status.

Enter portal

Projects

Project Profiles & Associated Reports, Data, and Maps
Numerous management and monitoring efforts are taking place across the South Coast Ecoregion. Search Projects to obtain more information on these efforts and view and download associated project reports, data, and maps.

View projects

Metrics Dashboard

State of the Regional Preserve System
The Metrics dashboard provides information on the state of regional preserve system through metrics related to vegetation communities, indicator species, and threats

View metrics

Library & Maps

Reports & Other Documents
Reports and documents describing conservation efforts in San Diego County and the region, and the plants and animals of conservation concern. We also include various tools that allow users to interact with various spatial layers.

Library | GIS viewer

San Diego Management & Monitoring Program

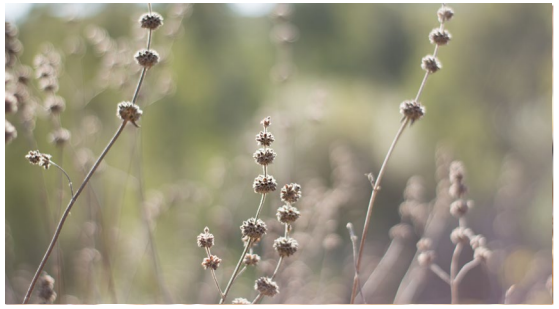
Metrics

The Metrics Dashboard is a toolbox for accessing information about the State of the Regional Preserve System Report. This report includes information on the regional preserve system assembly, measurable metrics and trends for metrics related to vegetation communities, indicator species, and threats.

Indicator search

View background information and metric rationale by indicator. Indicator categories include vegetation, species, threats

Search indicators



Interactive metrics dashboard

View live data on maps and graphs with metric condition, trend, and confidence information by Indicator

View dashboard

Metrics reports

Download the full State of the Preserve Report

Download report

Indicator search

Filters | Taxon... | Indicator Categories... | Quick filter | Type here...

	Indicator name	Overall Condition	Overall Trend	Overall Confidence
	Chaparral	Caution	Unknown	Moderate
	Coastal Sage Scrub	Concern	Unknown	Moderate

Coastal Sage Scrub

Why is this Indicator included?

[P]Coastal sage scrub (CSS) is the second most extensive vegetation community in San Diego County (CalFire 2015; County of San Diego 2021). CSS habitat supports a large variety of species, including 39 MSP species (14 animals and 25 plants) that inhabit only CSS or use CSS as well as other vegetation types (SDMMP and TNC 2017). A couple of obligate CSS species are coastal cactus wren and coastal California gnatcatcher. The health of CSS is an essential element to the health of the overall system. [/P] [P]CSS and the coastal California gnatcatcher ([I]Polioptila californica californica[/I]) are major foci of southern California's NCCPs. CSS is considered a fragile and rapidly declining habitat, and habitat loss and fragmentation are among the largest threats to this community (Westman 1981b; Minnich and Dezzani 1998). Connectivity between remaining patches is crucial to regional biodiversity. Inter-connected preserve areas can support California gnatcatchers and coastal cactus wrens and allow a full spectrum of native species to move between natural areas. [/P] [P]CSS was selected as an indicator because it provides important habitat to many species, including species of high conservation priority, and the health of CSS is a critical element to the health of the regional preserve system. [/P]

Stressors

Climate Vulnerability

CSS shrubs are adapted to semi-arid conditions, although there can be considerable shrub mortality during intensive and prolonged droughts (Minnich and Dezzani 1998; Keeley and others 2009; Kimball and others 2014).

Urbanization

Loss, fragmentation, and degradation due to urban and agricultural development is a threat to CSS (Westman 1981; Minnich and Dezzani 1998). Brush management in the Wildland Urban Interface and along roadsides has also reduced and degraded CSS.

Metrics Included

Metric 1: Percent Conserved

Time period evaluated:1995-2020

[P]Conservation is an essential first step to maintaining healthy CSS habitat. The MSCP targeted 62 percent (70,702 acres) of the 1995 mapped CSS and maritime succulent scrub for conservation (City of San Diego, 1998; table 5-5) and the MHCP has a conservation goal of 62 percent (6,193 acres; AMEC and others 2003; table 3.3). Two other conservation plan areas in San Diego County have uncompleted plans so conservation targets are unknown. [/P] [P]While conservation is important, it does not guarantee that the land continues to function as CSS habitat into the future. This change is not captured in this metric. This metric simply measures the first step required for management which is legal protection from development. Metrics 2 and 3 address the quality of the habitat after that conservation and identify a key threat (fire) as well as measure the ecological integrity. This metric only uses 1995 baseline mapping so a measure of lost CSS is not provided here. [/P]

Conditions	Caution
Trend	Improving
Confidence	Moderate

Metric 2: Ecological Integrity

Time period evaluated:2014

[P]For this metric, ecological integrity is defined as the degree to which a habitat's structure, composition, and function operate within the bounds of historical variation (Lawson and Keeley 2019). Studies have determined that the percent cover of functional groups aligns with habitat goals for biodiversity, are good indicators of fire and annual nonnative grass disturbance and are easily understood and measured by managers and scientists (Diffendorfer and others 2004, 2007; Lawson and Keeley 2019). [/P] [P]Nonnative grass cover is one indicator of vegetation type conversion from CSS to nonnative grassland that can occur after frequent fire and other disturbances (Diffendorfer and others 2004, 2007; Lawson and Keeley 2019). Invasive, nonnative grasses frequently follow fire and expand in areas as repeat fires burn at higher intervals. Shrub cover is negatively correlated with nonnative grass cover and can also be used to measure shrub loss or gain (Westman and O Leary 1986). Here, shrub cover within CSS is used as an indicator of ecological integrity. CSS areas were

Conditions	Significant Concern
Trend	Unknown
Confidence	Moderate

Metric 3: Fire Frequency

Time period evaluated:1965-2019

Fire is a natural process in CSS ecosystems, with many shrub and herbaceous understory plants dependent on fire for seed germination and recruitment (Keeley 1986). An altered fire regime, with a shortened fire return interval of less than 10 15 years (Keeley and others 2011) can result in vegetation type conversion from CSS to nonnative annual grassland (Keeley and Brennan 2012). This conversion process is partially the result of an altered fire regime with too frequent fire (Keeley and others 2005; Keeley and Brennan 2012). There were extremely large human-caused Santa Ana wind-driven wildfires in the MSPA in late October 2003 and 2007. Compared with the historical fire frequency, much of the County has burned too frequently since 2000, especially in

Conditions	Significant Concern
Trend	Declining

San Diego Management & Monitoring Program

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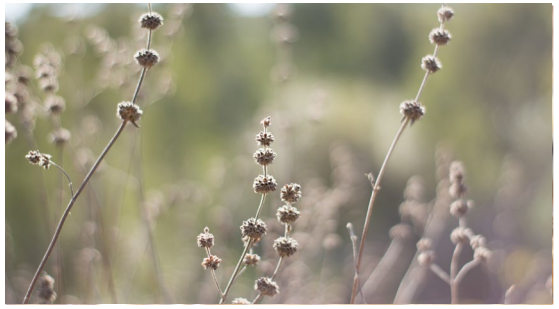

Interactive metrics dashboard

View live data on maps and graphs with metric condition, trend, and confidence information by Indicator

View dashboard

Metrics reports

Download the full State of the Preserve Report

Download report

Metrics Dasboard

- 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 | Metric 1 | Metric 2 | Metric 3 | MSP Objectives

Overall Condition	Overall Trend	Overall Confidence
Caution	Unknown	Moderate

Metric and Desired Condition	Metric Condition	Metric Trend	Metric Confidence
Percent Conserved Time period evaluated:1995-2020 Percent of baseline chaparral conserved	Good	Improving	Moderate
Ecological Integrity Time period evaluated:2014 Integrity based on percent shrub cover in chaparral	Concern	Unknown	Moderate
Fire Frequency Time period evaluated:1965-2019 Number of times burned on conserved chaparral	Caution	Declining	Moderate

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
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Least Bell's vireo
San Diego thornmint
Southwestern pond turtle
Mountain Lion
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Overview | Metric 1 | Metric 2 | Metric 3 | MSP Objectives

Percent Conserved

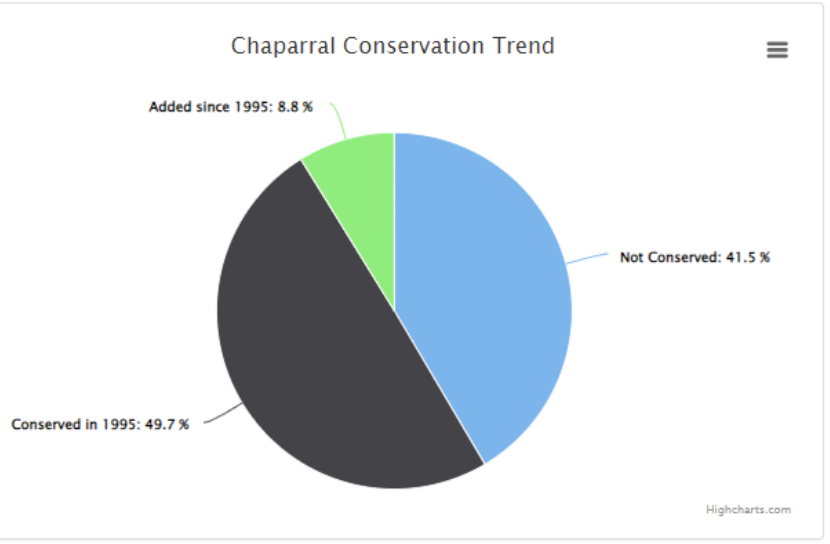
Condition	Trend	Confidence
Good	Improving	Moderate

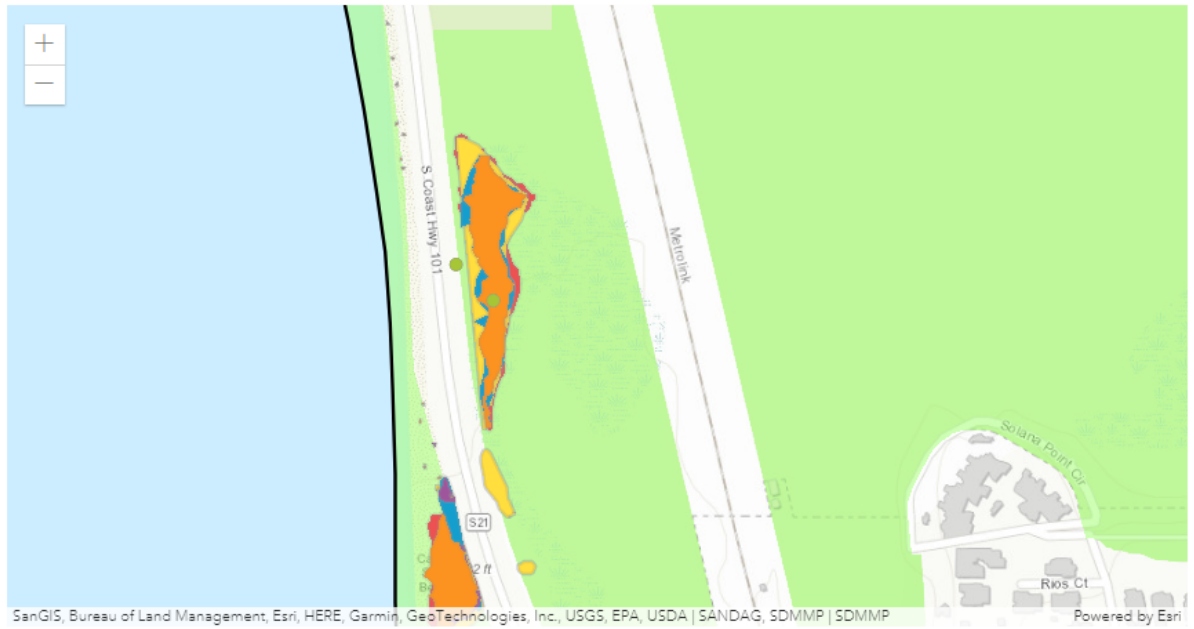
Time period: 1995-2020

Threshold rationale: Condition thresholds are based on known targets in the local conservation plans. While approved plans differ in targets and some plans are not yet approved, a Good condition would indicate meeting the baseline goal. These values will be refined as plans are adopted.

Threshold Value: 59.00

Good: *Between 50.00% and 100.00% conserved.*
Caution: *Between 30.00% and 49.99% conserved.*
Concern: *Between 15.00% and 29.99% conserved.*
Significant Conern: *Between 0.00% and 14.99% conserved.*





Projects and Data

2018 Modeling CSS and Chaparral vegetation life-forms

Author(s): Perkins, Emily

Metrics Dasboard

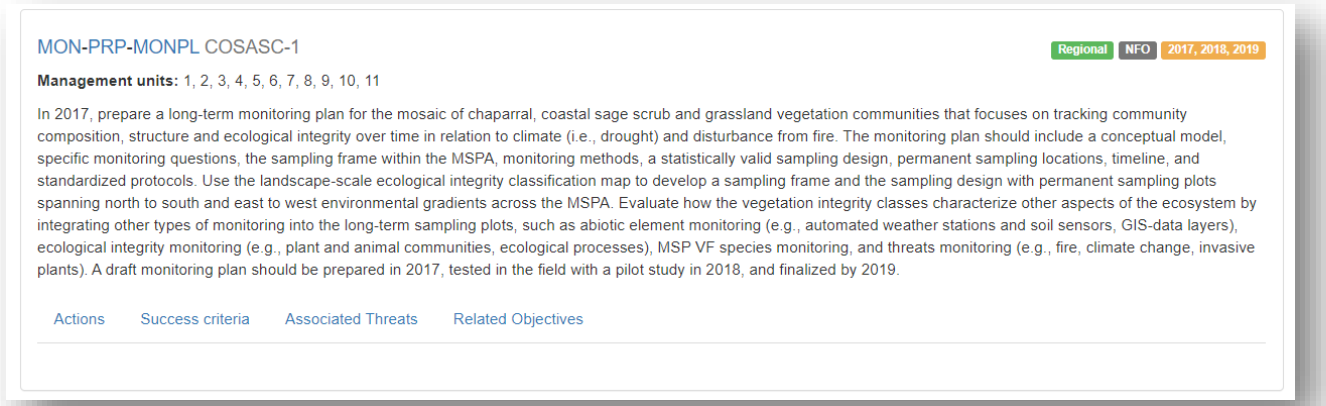
- Vegetation Communities
  - Chaparral
  - **Coastal Sage Scrub**
  - Oak Woodlands
  - Riparian Woodlands
- Threats
- Species

Overview | Metric 1 | Metric 2 | Metric 3 | MSP Objectives

COSASC-1
MON-PRP-MONPL
Prepare Monitoring Plan

COSASC-4
MGT-PRP-BMPPL
Test BMPs for invasive control

COSASC-5
MGT-DEV-BMPPL
Implement BMPs for invasive control



MON-PRP-MONPL COSASC-1

Regional | NFO | 2017, 2018, 2019

Management units: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

In 2017, prepare a long-term monitoring plan for the mosaic of chaparral, coastal sage scrub and grassland vegetation communities that focuses on tracking community composition, structure and ecological integrity over time in relation to climate (i.e., drought) and disturbance from fire. The monitoring plan should include a conceptual model, specific monitoring questions, the sampling frame within the MSPA, monitoring methods, a statistically valid sampling design, permanent sampling locations, timeline, and standardized protocols. Use the landscape-scale ecological integrity classification map to develop a sampling frame and the sampling design with permanent sampling plots spanning north to south and east to west environmental gradients across the MSPA. Evaluate how the vegetation integrity classes characterize other aspects of the ecosystem by integrating other types of monitoring into the long-term sampling plots, such as abiotic element monitoring (e.g., automated weather stations and soil sensors, GIS-data layers), ecological integrity monitoring (e.g., plant and animal communities, ecological processes), MSP VF species monitoring, and threats monitoring (e.g., fire, climate change, invasive plants). A draft monitoring plan should be prepared in 2017, tested in the field with a pilot study in 2018, and finalized by 2019.

Actions | Success criteria | Associated Threats | Related Objectives

Next steps

- Finalize design and content
- Volunteers can test design
- Tentative release in September

Ecological Integrity

Ecological Integrity Mapping

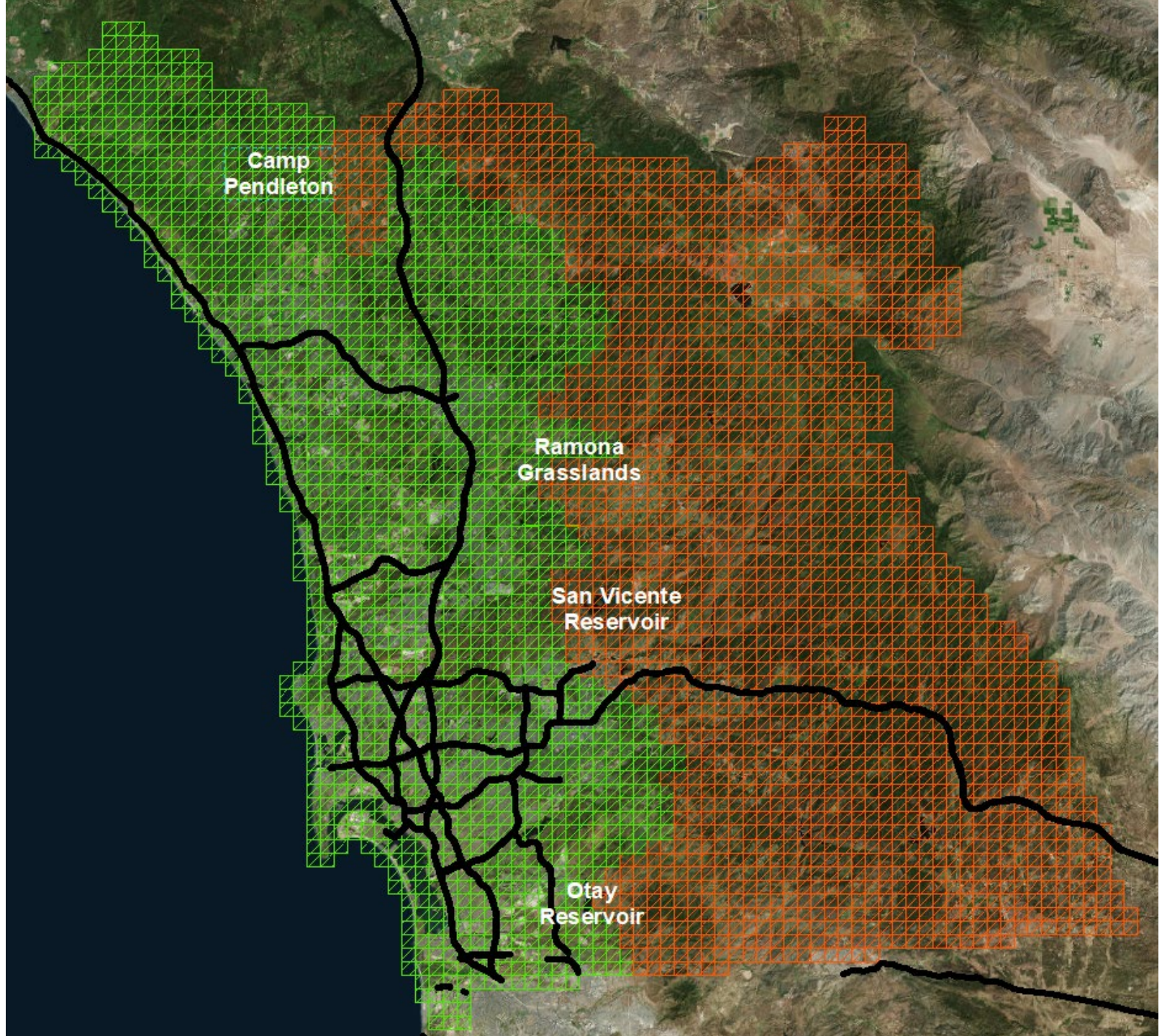
- “The ability of an ecological system to support & maintain a community of organisms that has species composition, diversity & functional organization comparable to those of natural habitats within a region.” - Karr & Dudley 1981, Parrish et al. 2003

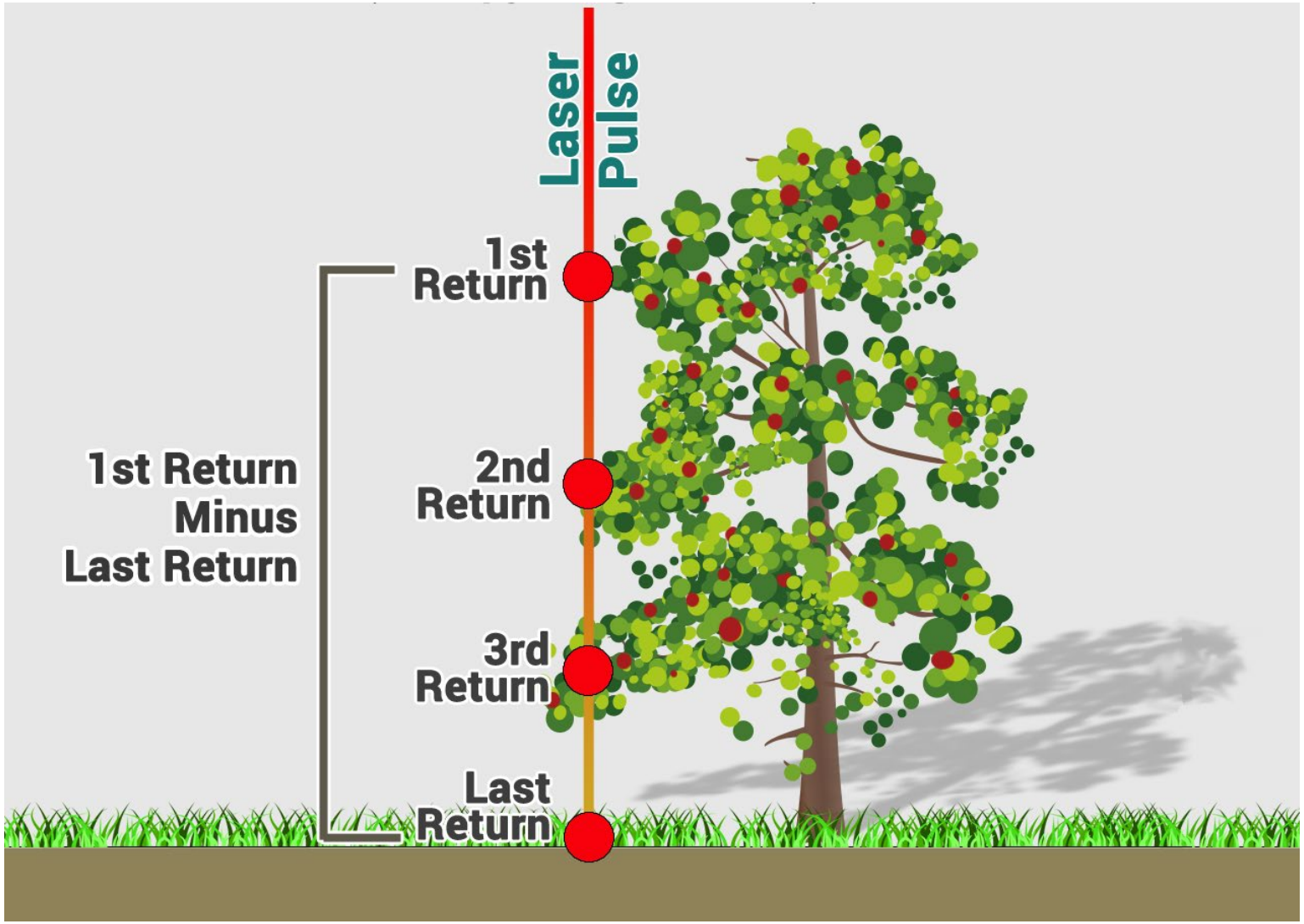
Guiding Questions

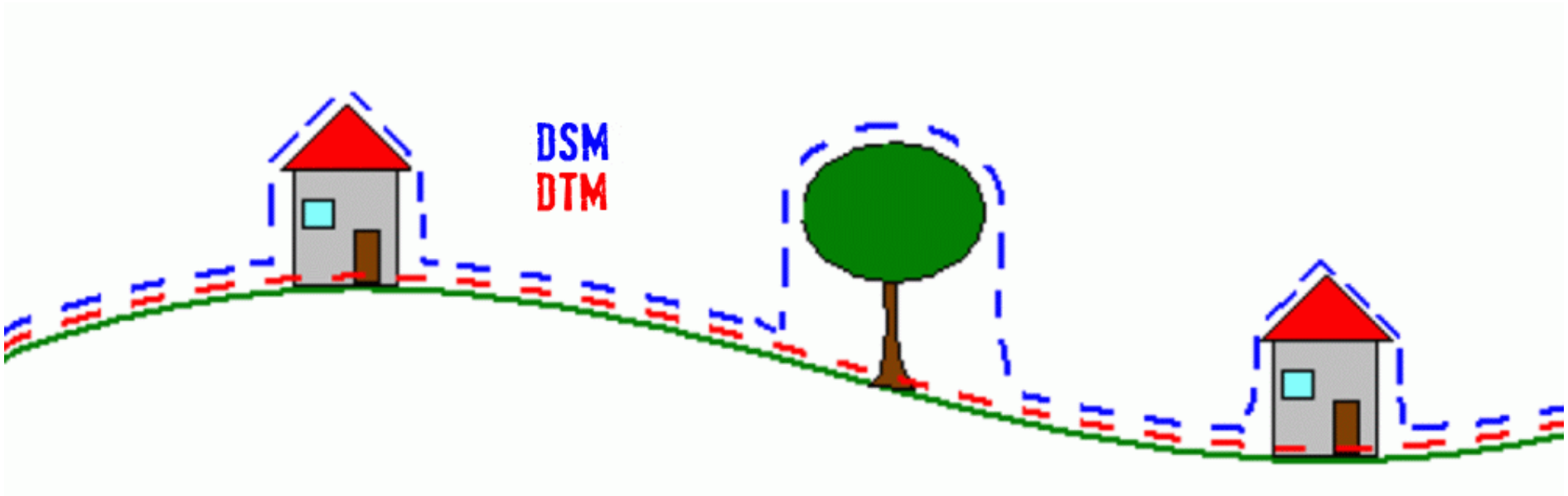
1. What is the ecological integrity of oak and riparian vegetation communities in San Diego County?
   - Define variables for ecological integrity using historical data
   - Model variables across San Diego using remote sensing
   - Validate model with ground data and refine ecological integrity variables
2. Is it changing?
   - Identify areas of change from aerial imagery (historical and future)
   - Use ground data to validate imagery and identify the type of change occurring
   - Update remote sensing model and ground data at regular intervals into the future
3. Why?
   - Use covariates (fire, climate, etc) to explain and predict changes

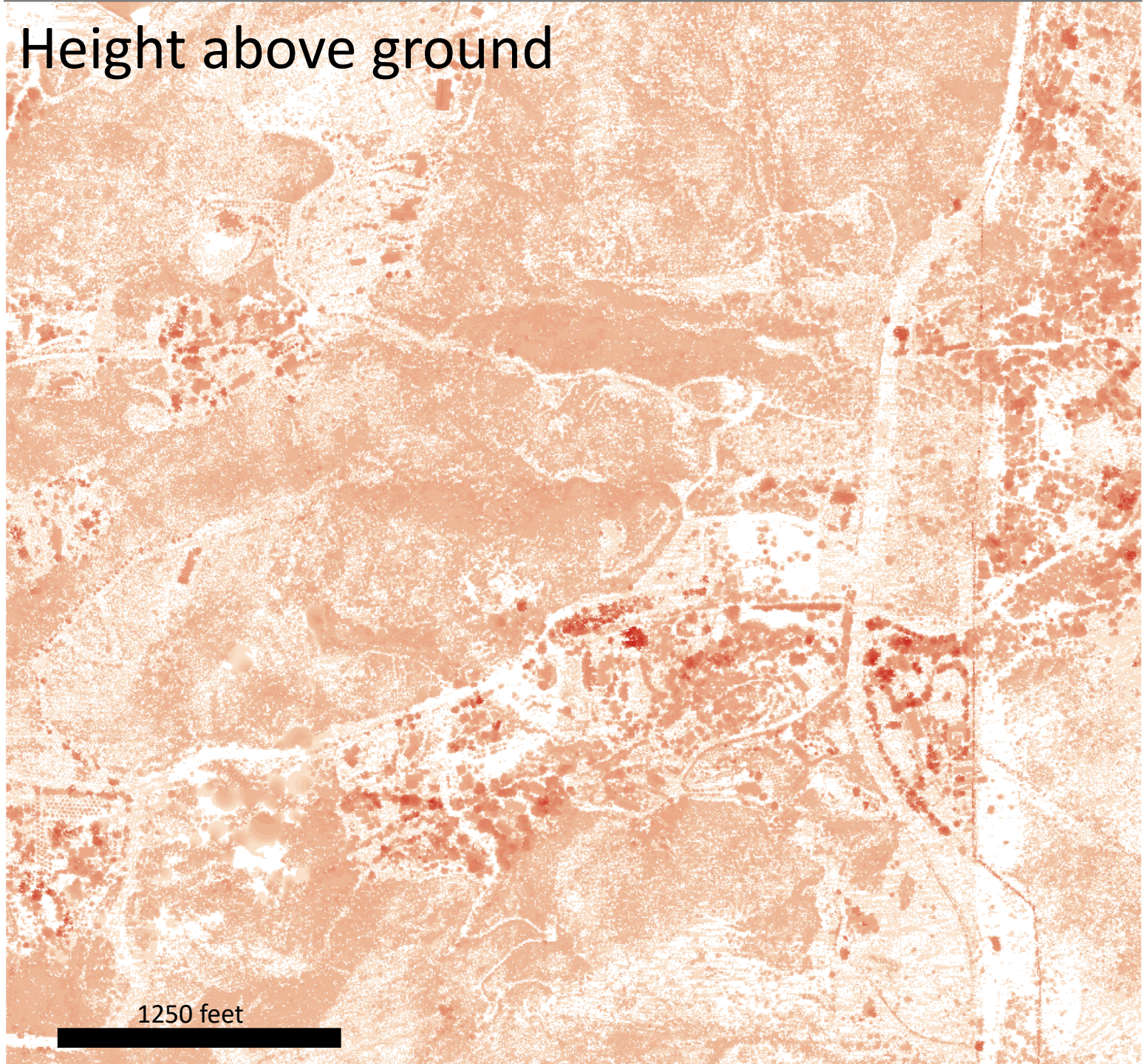
Ecological Integrity variables

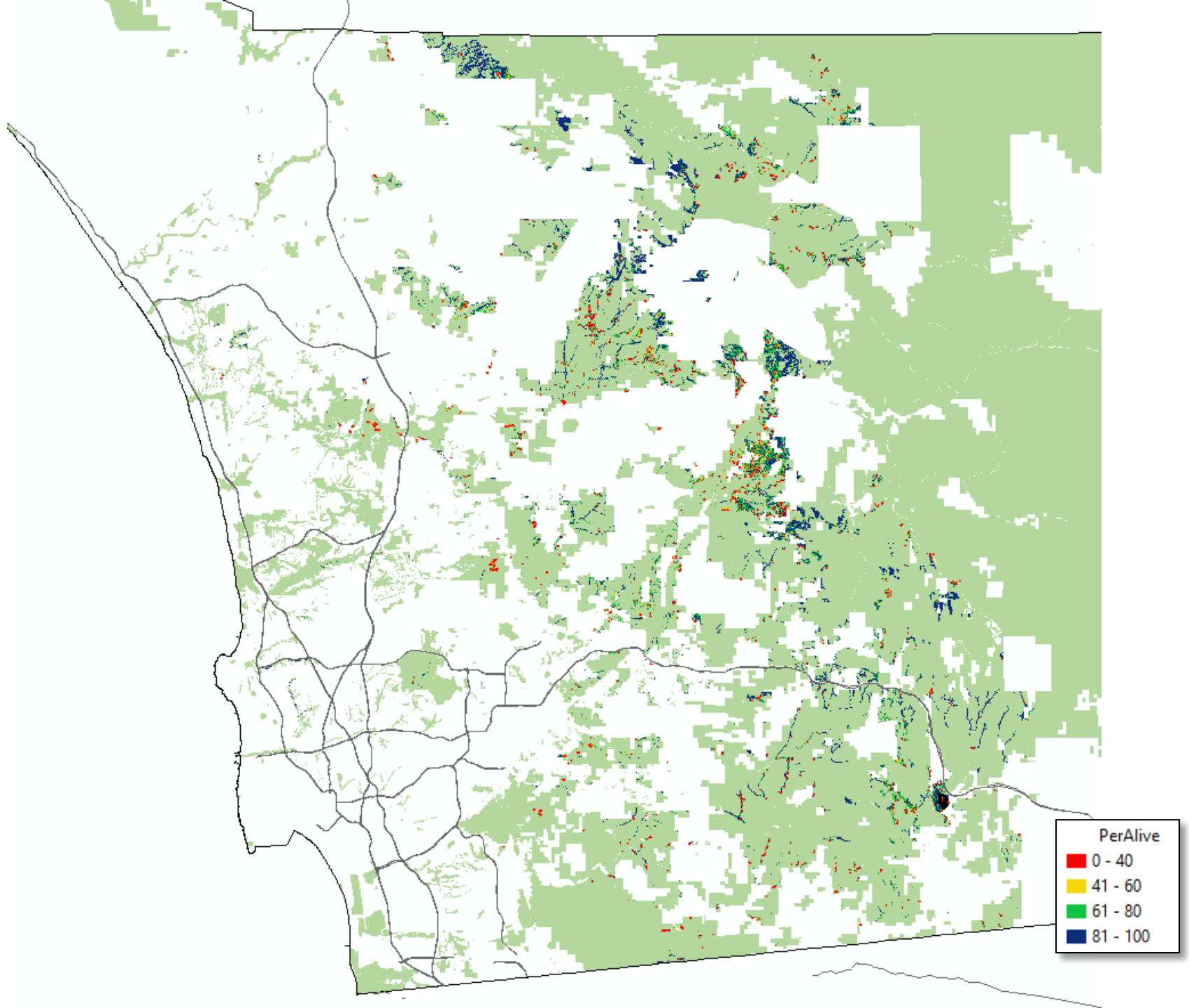
- Ecological integrity for oak and riparian are percent of live trees
- Multiple methods will be used to collect this information
  - Remote sensing
    - Lidar to map trees
    - NAIP NDVI for tree health
  - Field data collection (future)

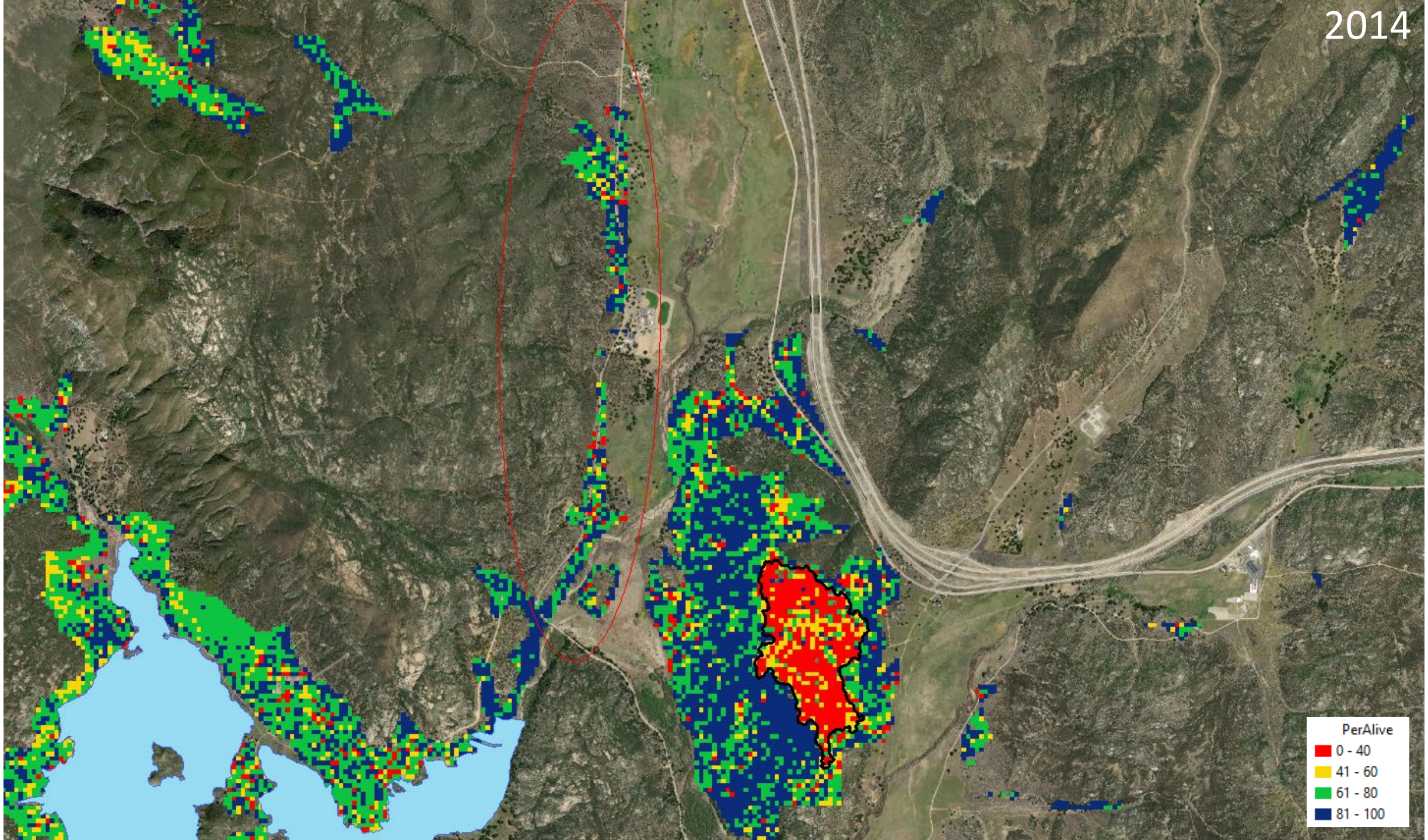

Camp
Pendleton
Ramona
Grasslands
San Vicente
Reservoir
Otay
Reservoir


Laser Pulse
1st Return
2nd Return
3rd Return
Last Return
1st Return Minus Last Return


DSM
DTM


Height above ground
1250 feet


PerAlive
0 - 40
41 - 60
61 - 80
81 - 100


2014
PerAlive
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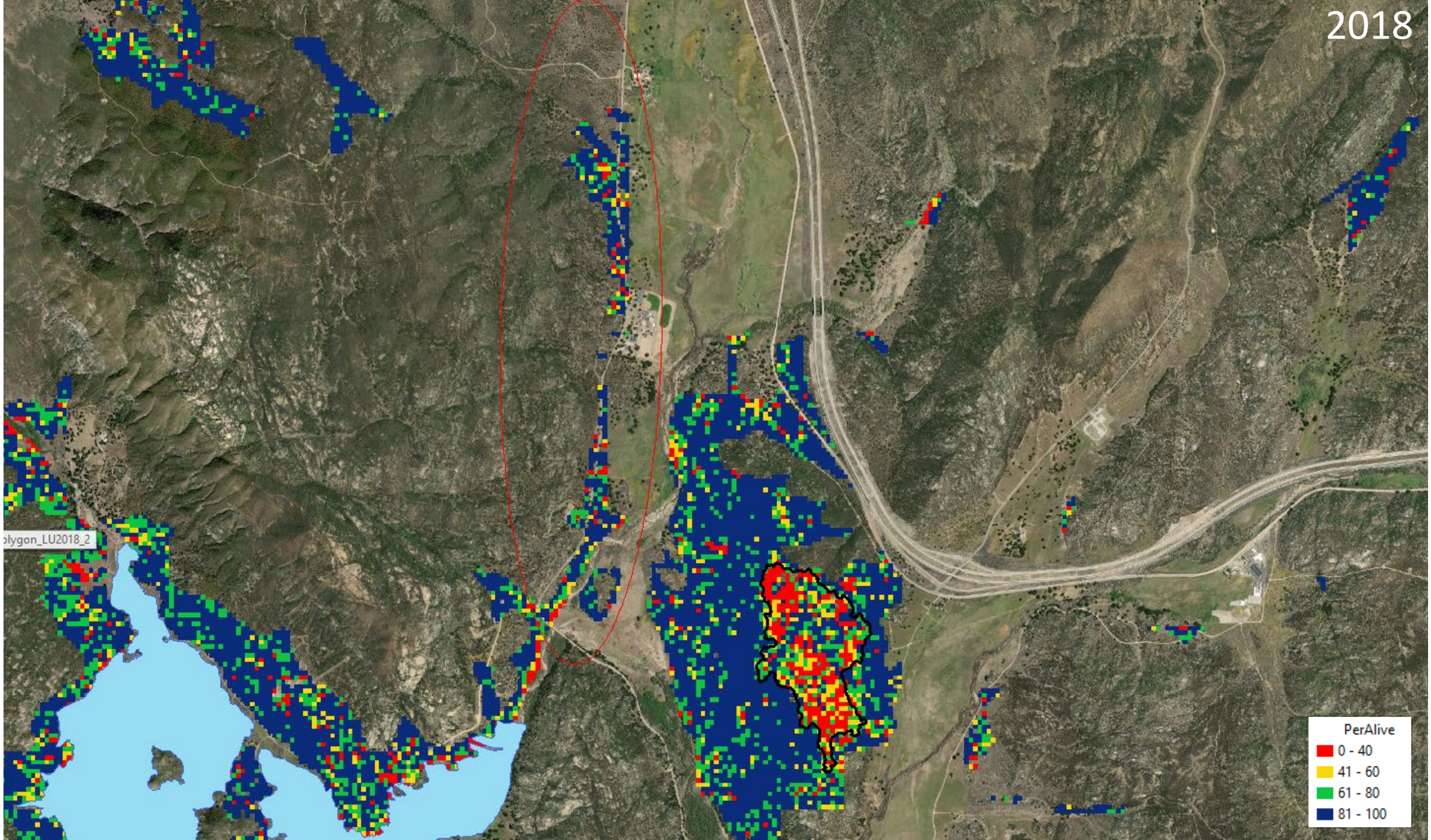
41 - 60
61 - 80
81 - 100


2018
olygon_LU2018_2
PerAlive
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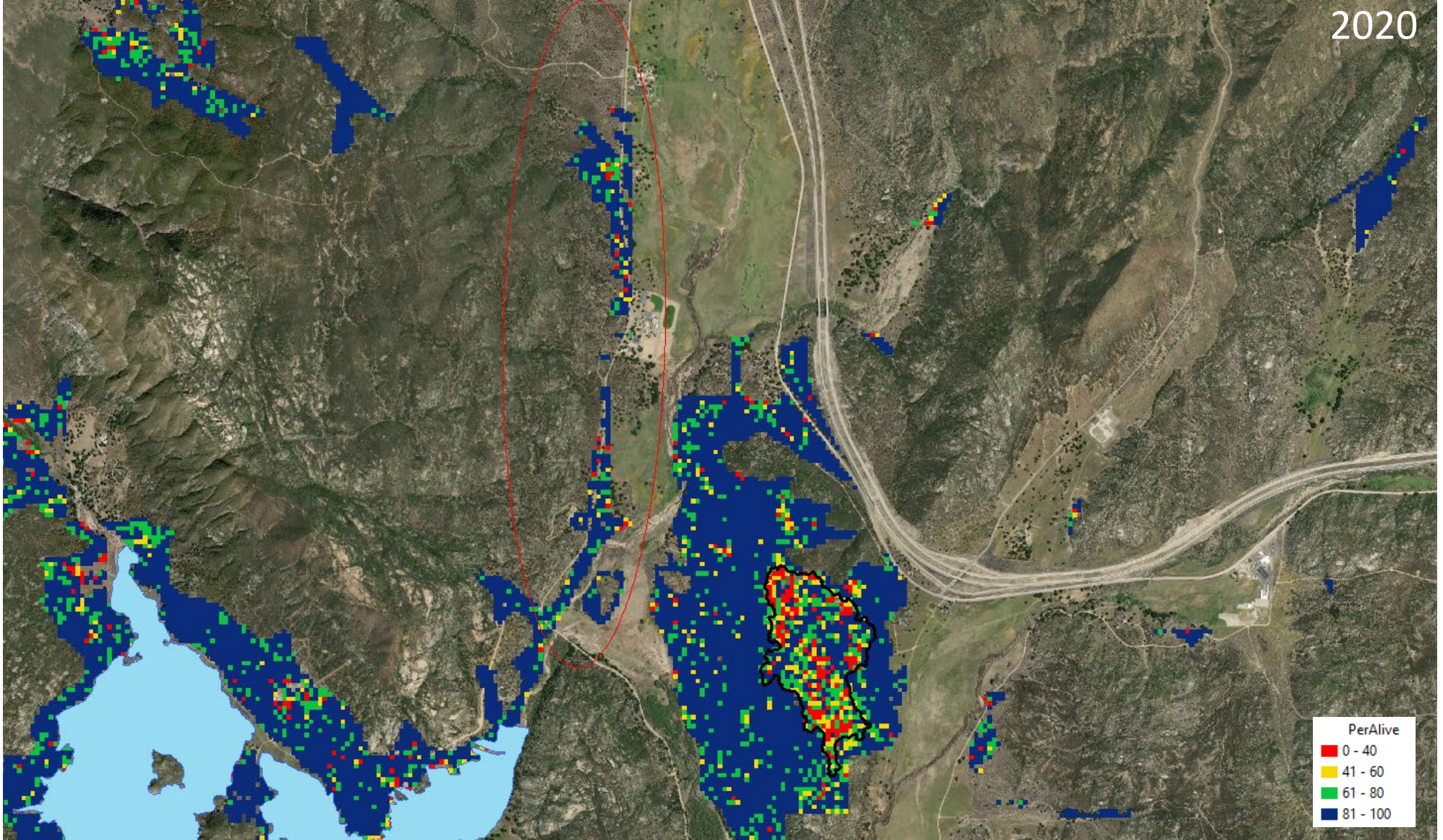
41 - 60
61 - 80
81 - 100


2020
PerAlive
0 - 40
41 - 60
61 - 80
81 - 100

Questions