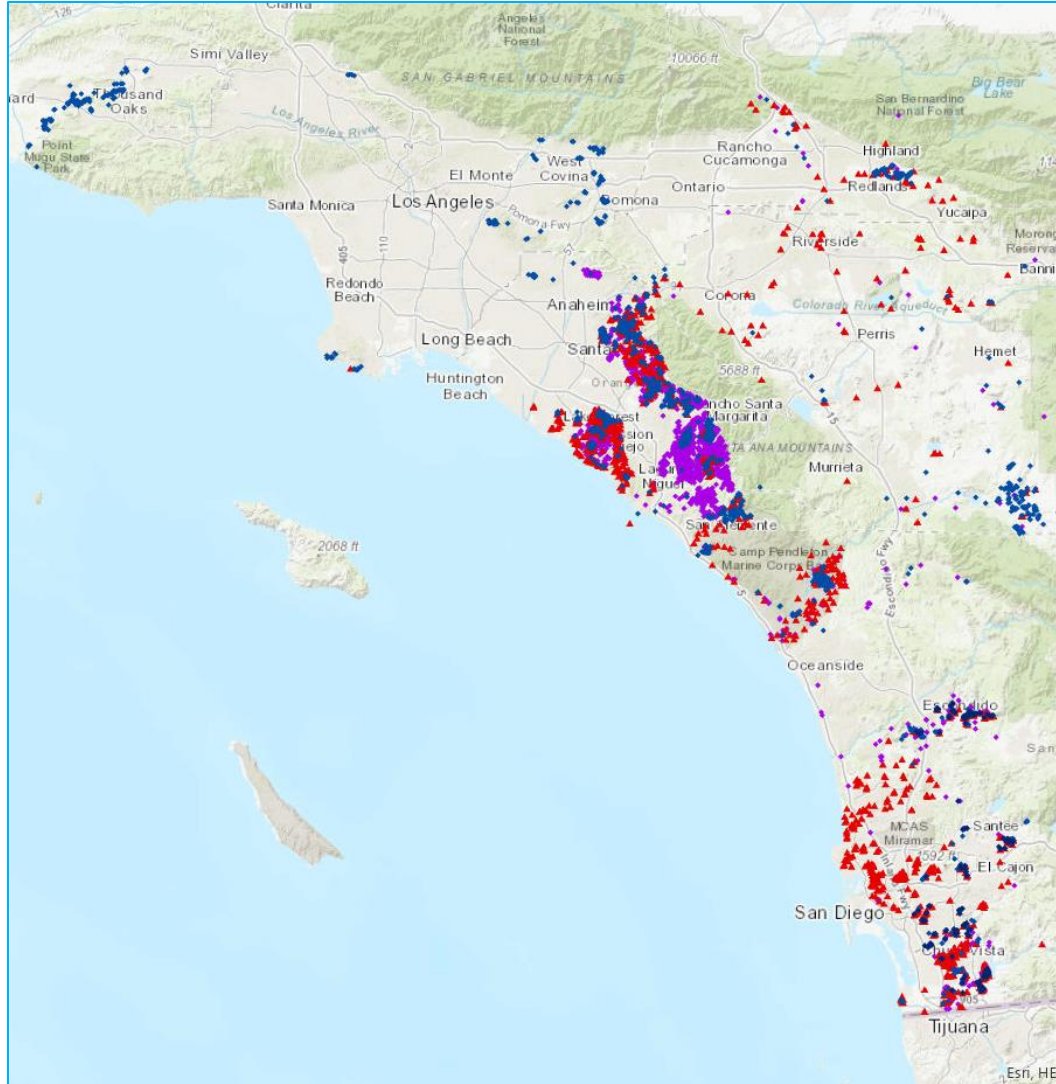


# Coastal Cactus Wren Decline



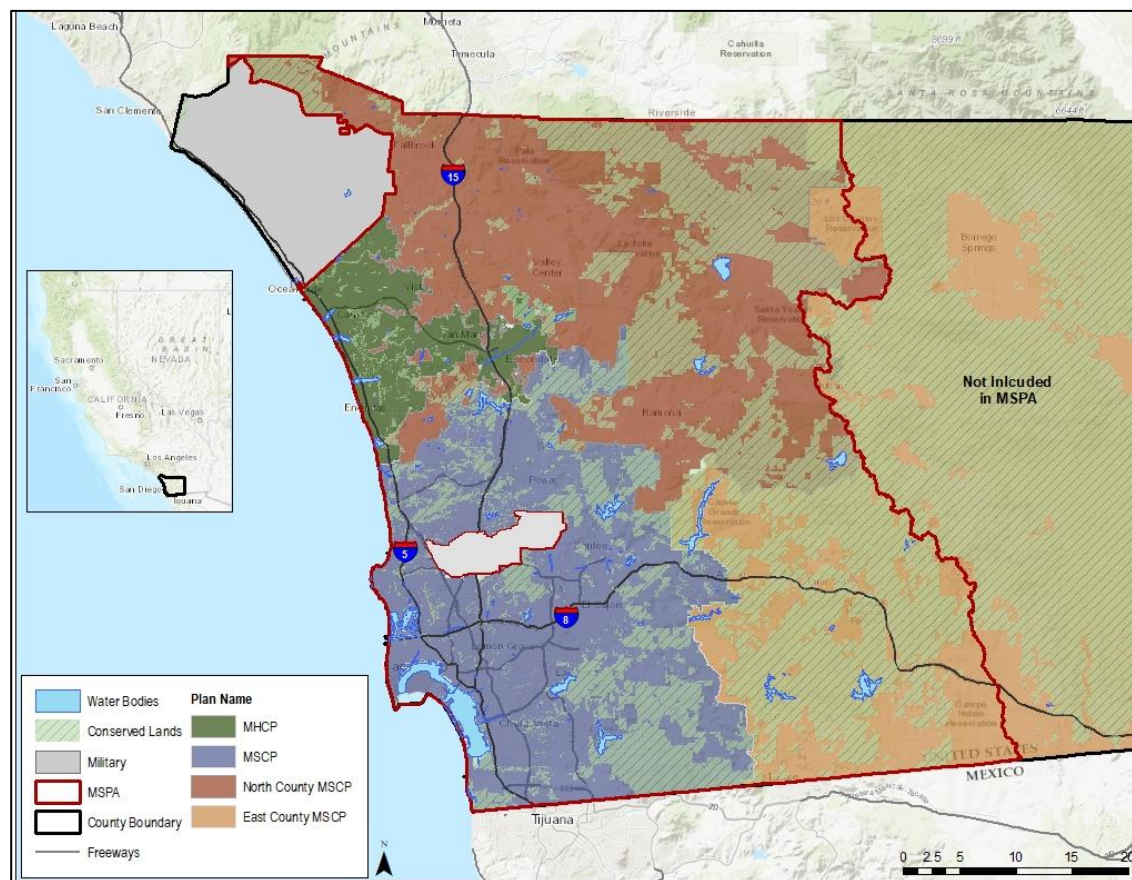
## Cactus Wren Decline

- Habitat loss from urbanization
- Mid 1980s disappeared from coastal San Diego County (Rea & Weaver 1990)
- Small populations vulnerable to extirpation (Rea & Weaver 1990, SDMMP & TNC 2015)

(Data sources: Coastal Cactus Wren Conservation Network 2014; Kus & Lynn 2024; CNDDDB 2014; USFWS 2011; REGSS 2002; Leatherman BioConsulting 2013)

# Cactus Wren Conservation & Management

- Target of multiple species conservation planning
- Priority for regional management & monitoring





# Management Goal

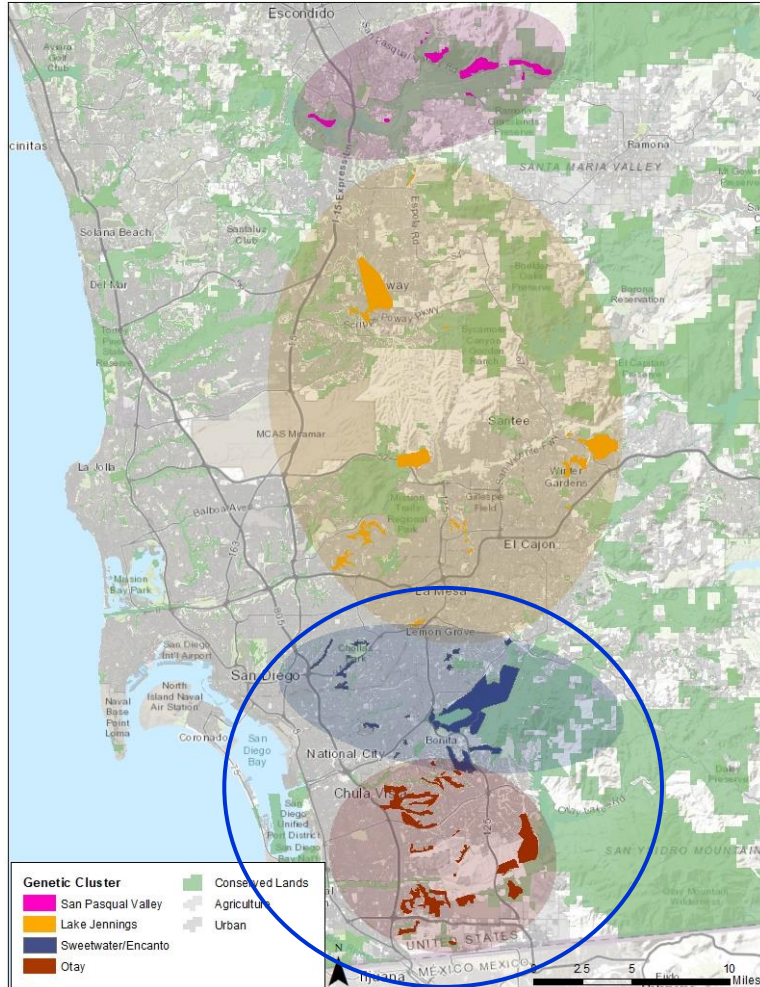
*“Protect, enhance, restore & expand suitable coastal sage scrub habitat for Coastal Cactus Wrens to increase effective population size in each genetic cluster at a short term sustainable level (e.g. 50–100 wrens), rehabilitate habitat destroyed by wildfire, improve habitat quality to maintain populations during drought, enhance connectivity within & between genetic clusters to increase genetic diversity & rescue small populations to ensure the long term persistence (>100 years) of Cactus Wrens on Conserved Lands in the MSPA.”*

MSP Roadmap: SDMMMP and TNC 2017



Preliminary Information: Subject to Revision  
Not for Citation

# Cactus Wren 2015 Management Plan



Barr, K.R., Kus, B.E., Preston, K.L., Howell, S., Perkins, E., and Vandergast, A.G., 2015, Habitat fragmentation in coastal southern California disrupts genetic connectivity in the cactus wren (*Campylorhynchus brunneicapillus*), *Molecular Ecology* 24(10):2349–2363.

## South San Diego County Coastal Cactus Wren (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan

Prepared for:  
San Diego Association of Governments



Prepared by:  
The Nature Conservancy  
In collaboration with  
San Diego Management and Monitoring Program

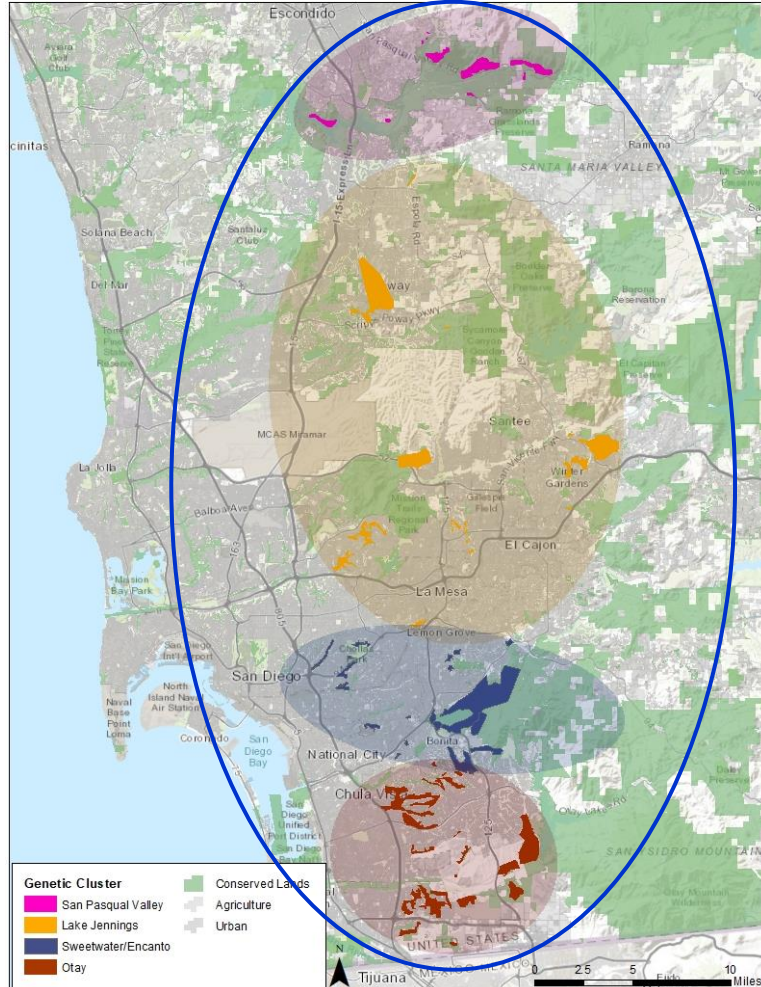
June 18, 2015



Preliminary Information: Subject to Revision  
Not for Citation



# Updated 2025 Cactus Wren Management Plan



Barr, K.R., Kus, B.E., Preston, K.L., Howell, S., Perkins, E., and Vandergast, A.G., 2015, Habitat fragmentation in coastal southern California disrupts genetic connectivity in the cactus wren (*Campylorhynchus brunneicapillus*), *Molecular Ecology* 24(10):2349–2363

## Coastal Cactus Wren (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan for Conserved Lands in Western San Diego County



Prepared for:  
San Diego Association of Governments Environmental Mitigation Program

[Month] 2025

By Kristine L. Preston<sup>1,2</sup>, Barbara E. Kus<sup>1</sup>, Trish Smith<sup>3</sup>, Elizabeth L. Roesler<sup>1,2</sup>, Suellen Lynn<sup>1</sup>, and Annabelle Bernabe<sup>1,2</sup>

<sup>1</sup>U.S. Geological Survey, Western Ecological Research Center, San Diego Field Station

<sup>2</sup>San Diego Management and Monitoring Program

<sup>3</sup>The Nature Conservancy, San Diego, California

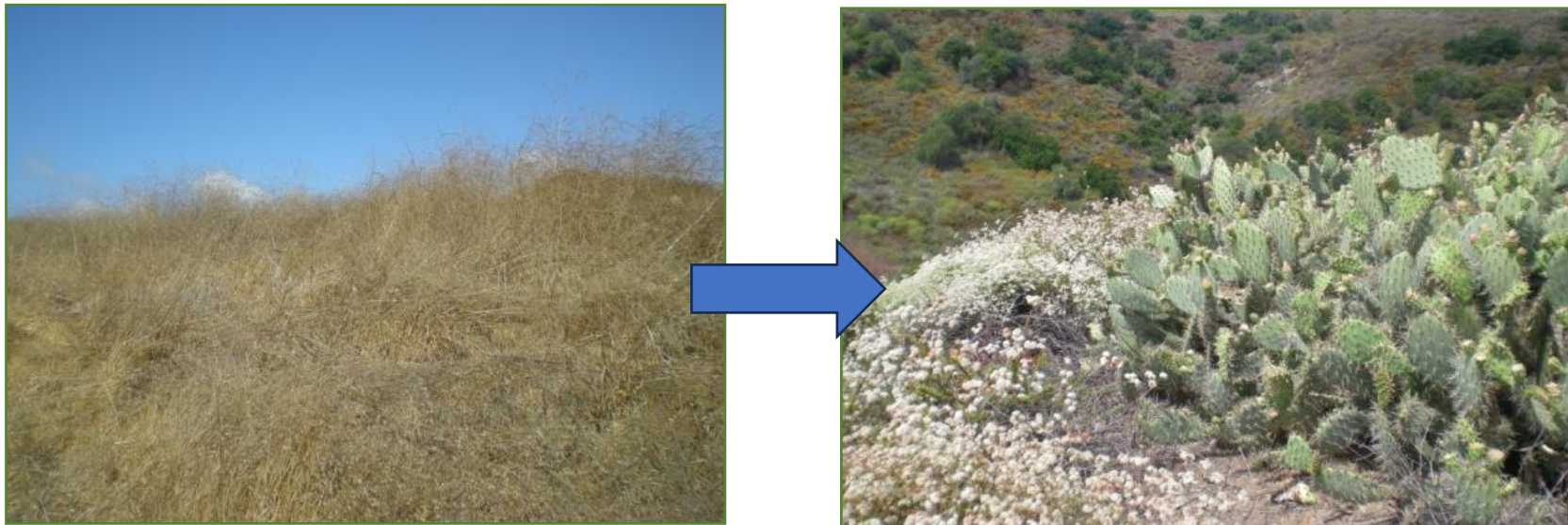


Preliminary Information: Subject to Revision  
Not for Citation

# Regional Cactus Wren Management Plan Strategy

- 1. Manage cactus scrub to expand existing populations**
- 2. Manage cactus scrub to improve connectivity**

Regional objectives implemented through TransNet Land Management Grant Program, other grant funding sources & land management funds

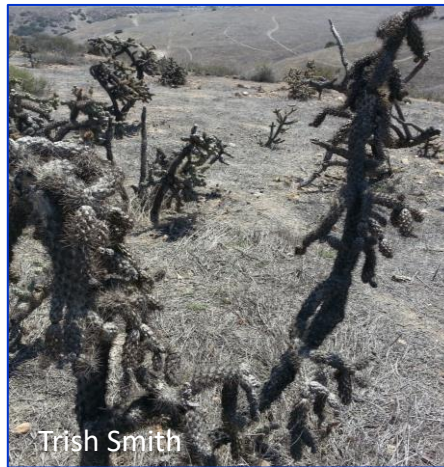




# High Quality vs Degraded Cactus Scrub

1. Large patches mature, healthy cactus
2. Native shrubs & forbs vs nonnative grasses and forbs
3. Patches of bare ground
4. Low shrub crowding/overgrowth

Lynn et al., 2022, Distribution and Demography of Coastal Cactus Wrens in Southern California, 2015-2019: U.S. Geological Survey Open File Report 2022-1044



Preliminary Information: Subject to Revision  
Not for Citation




# Cactus Scrub Restoration



- Takes many years for cactus to grow & become suitable for wrens
- Cactus scrub restoration benefits both wrens & federally-threatened California Gnatcatcher



# Types of Cactus Scrub Management

- 
- A person wearing an orange shirt, blue jeans, and a white hard hat is using a high-pressure hose to spray water onto a cactus scrub area. The background shows a dry, hilly landscape with various cacti and shrubs under a clear blue sky.
- Enhancement – improve habitat quality without planting (e.g., weed control, shrub thinning)
  - Restoration –enhancement + planting cactus & other native plants in existing & historic cactus scrub
  - Expansion – enhancement + planting cactus & other native plants in areas with no records of wrens or cactus scrub



# Best Practices

- Remove thatch before planting
- Control invasive nonnative grasses & forbs (before & after)
- Plant cactus & native shrubs, forbs & grasses
- Diverse plant community - ↑ arthropod prey (more resilient to drought)
- Important plants – sagebrush, elderberry, bunch grass, buckwheat
- Plant large patches of cactus
- Plant shrubs 3-5m away from cactus
- Irrigation to speed up growth or in drought
- Large salvaged cactus can create immediate habitat

Preston et al, in review, Coastal Cactus (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan for Conserved Lands in Western San Diego County



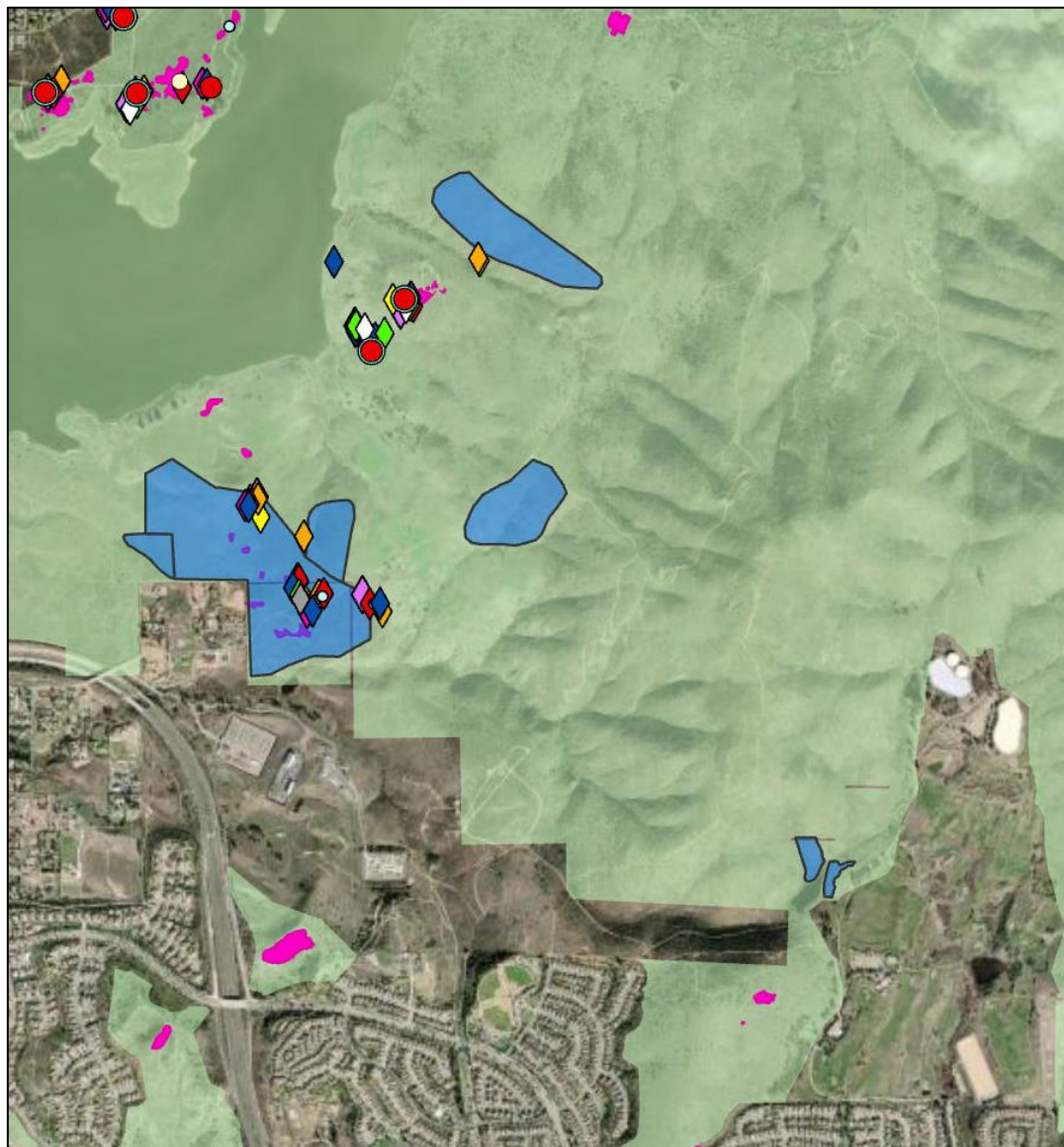
Preliminary Information: Subject to Revision  
Not for Citation





# Determining Cactus Wren Response to Management

- USGS monitoring established plots to track changes in existing population
- Used USGS, USFWS & contractor monitoring data from managed plots to determine new territories & existing territories that were managed



# Determining Cactus Wren Response to Management

## USGS - Annual Population Monitoring

- ψ 411 cactus patches
- ψ 0.1 – 3.9 acres in size
- ψ Surveyed 2x/year in 2015, 2017-2024
- ψ San Pasqual cluster surveyed in 2019, 2022-2024
- ψ Broadcast song
- ψ Searched for birds, nests

## Metric - Number of CACW territories

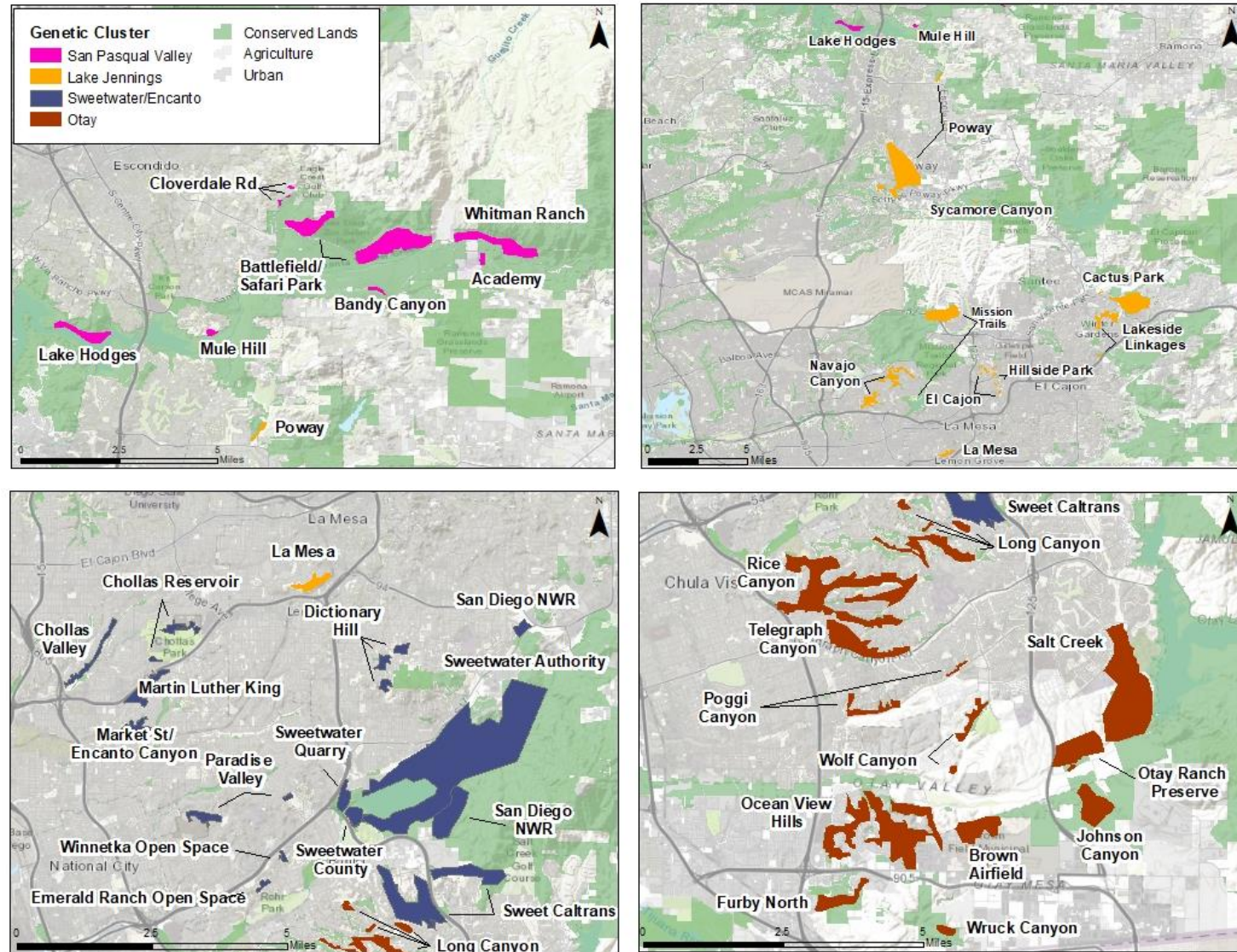
## Monitor Wren Use of Managed Habitat

- ψ Survey for new territories in cactus management plots
- ψ USFWS, USGS, Contractor & volunteer datasets

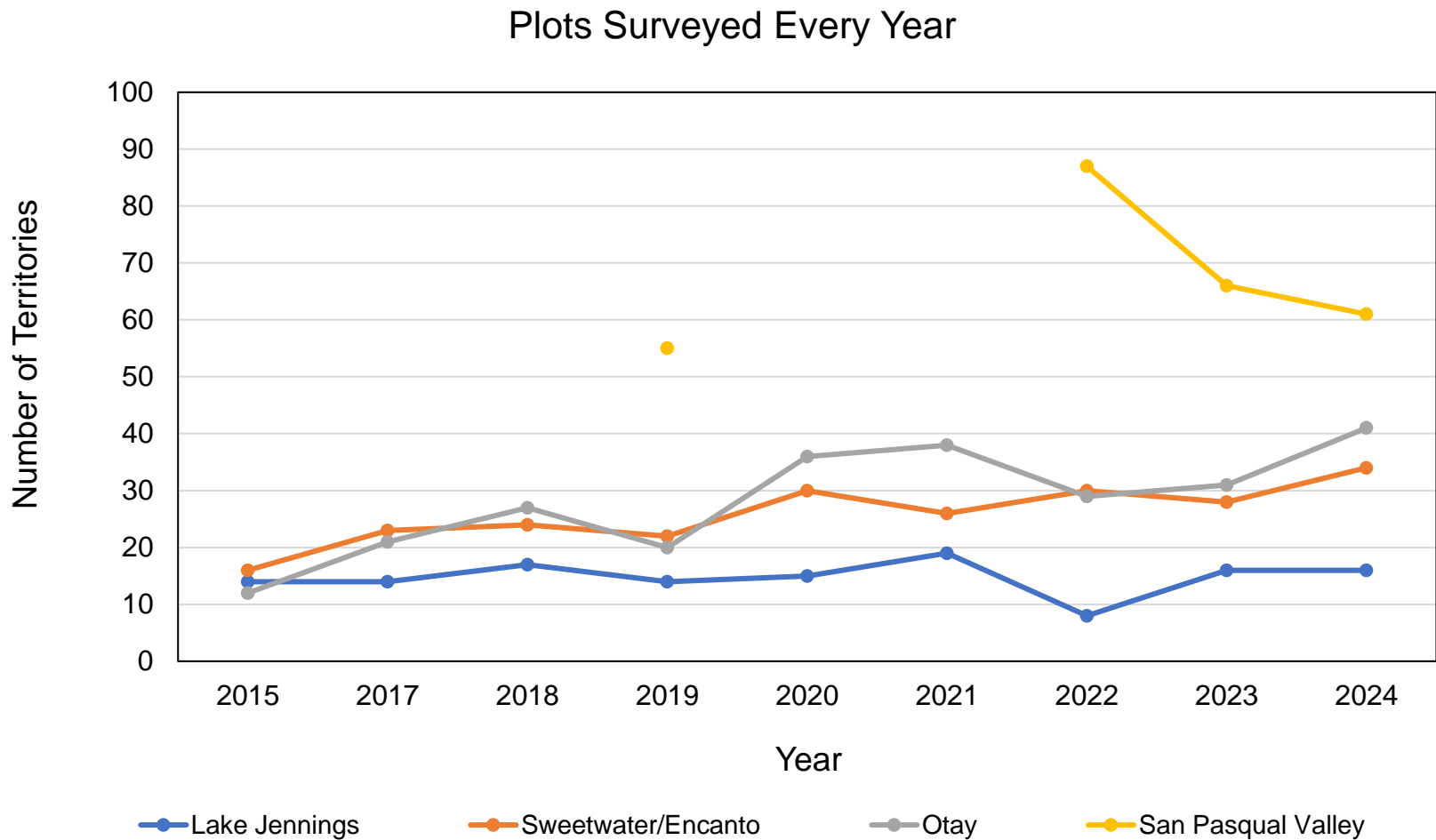




# CACW Survey Locations by Genetic Cluster



USGS - Annual  
Population  
Monitoring by  
Genetic Cluster



Data Sources:

- ‡ Preston et al, in review, Coastal Cactus (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan for Conserved Lands in Western San Diego County
- ‡ Lynn and Kus, 2024, Distribution, abundance and habitat characteristics of Coastal Cactus Wren in San Diego County, California – 2023 data summary: U.S. Geological Survey Data Report 1196, 14 p., <https://doi.org/10.3133/dr1196>
- ‡ Lynn and Kus, in review, Distribution, abundance and habitat characteristics of Coastal Cactus Wren in San Diego County, California – 2024 data summary: U.S. Geological Survey Data Report



Preliminary Information: Subject to Revision  
Not for Citation



# Evaluating Regional Cactus Scrub Management Projects

**What types & how much cactus scrub management has been undertaken?**

**Are cactus scrub management actions benefitting wren populations?**



# Cactus Scrub Management Evaluation Process

- TransNet Land Mgmt Grant funded cactus restoration projects (+1 CalTrans mitigation project)
- Review project reports
- Compile GIS project data (restoration areas & wren observations)
- Assemble historic, USFWS 2009-2011, and USGS 2015, 2016-2024 wren location data
- Develop restoration projects database
- Create map viewer to determine wren use of managed areas
- Summarize acres of habitat managed by management action type
- Determine number of new wren territories
- Results included in updated cactus wren management plan

Preston et al, in review, Coastal Cactus (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan for Conserved Lands in Western San Diego County





# Results



Joshua Sudock

# What types & how much cactus scrub management has been undertaken?

- **26 TransNet projects at 12 locations from 2008 to 2021**
- **> \$3 million to manage 906 acres**
- **156 acres restored or expanded, 753 acres enhanced**
- **Average of 4.5 years of management per location**
- Preston et al, in review, Coastal Cactus (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan for Conserved Lands in Western San Diego County



Kris Preston



# Are cactus scrub management actions benefitting wren populations?

- **49 new Cactus Wren territories**
- **Enhanced habitat at 41 existing territories**



# Are cactus scrub management actions benefitting wren populations?

Genetic Cluster	Location	Land Manager(s)	Management Period	Acres Enhanced	Acres Restored	Total Acres Managed	# of New Wren Territories	# of Existing Wren Territories Managed
San Pasqual	Lake Hodges - Bernardo Mountain	<ul style="list-style-type: none"> <li>• San Dieguito River Park</li> <li>• San Diego Zoo ICR</li> </ul>	2008-2014	52	23	75	7	2
	Safari Park	<ul style="list-style-type: none"> <li>• San Diego Zoo WA/City of San Diego PUD</li> </ul>	2010-2023	387	46	433	6	23
	Bandy Canyon	<ul style="list-style-type: none"> <li>• San Dieguito River Park/SDZ ICR</li> </ul>	2009-2016	0	10.0	10.0	1	0
Lake Jennings	Navajo Canyon	<ul style="list-style-type: none"> <li>• City of San Diego DPR</li> </ul>	2018-2020	0.3	2	0.8	1	2
	Lakeside Linkage	<ul style="list-style-type: none"> <li>• County of San Diego DPR</li> </ul>	2011-2020	63	7	69	2	0
Sweetwater/Encanto	Market Street	<ul style="list-style-type: none"> <li>• Groundworks/City of San Diego PRD</li> </ul>	2009-2020	0	9	9	1	4
	San Diego NWR	<ul style="list-style-type: none"> <li>• U.S. Fish and Wildlife Service</li> </ul>	2010-2014	162	3	165	7	0
Otay	Rice Canyon	<ul style="list-style-type: none"> <li>• City of Chula Vista</li> </ul>	2009-2014	9	1	10	2	0
	Salt Creek	<ul style="list-style-type: none"> <li>• County of San Diego DPR/City of Chula Vista</li> </ul>	2009-2019	24	48	72	12	10
	Otay River Valley	<ul style="list-style-type: none"> <li>• County of San DPR</li> </ul>	2016-2018	0	3	3	2	0
	Lonestar Ridge/Johnson Canyon	<ul style="list-style-type: none"> <li>• CALTRANS</li> </ul>	2008-2022	53	2	55	6	0

Preston et al, in review, Coastal Cactus (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan for Conserved Lands in Western San Diego County



Preliminary Information: Subject to Revision  
Not for Citation



# Is Cactus Scrub Management Effective?

**Yes!**



# Questions?





# Coastal Cactus Wren Viewer



[Portal](#) ▾ [Metrics](#) ▾ [Resources](#) ▾ [News](#) ▾ [About](#) ▾ [⚙️](#) [↔️](#)



## Cactus Wren Habitat Conservation and Management Plans

Umbrella Project

Originally, a Cactus Wren Habitat Conservation and Management Plan was prepared in 2015 to help fulfill MSP Roadmap Goals and Objectives established for management of the Coastal Cactus Wren in the Otay genetic cluster. This plan identified and prioritized management and restoration needs for the cactus wren in this genetic cluster, and also assessed connectivity to core habitat areas on Conserved Lands within the Sweetwater and Lake Jennings genetic clusters to further ensure persistence of the cactus wren in southern San Diego County over the next 100 years. In 2024, this plan was updated to review progress in managing cactus wrens, reassess management needs and priorities, and was expanded to include the San Pasqual Valley in north San Diego.

### Cactus Wren Habitat Conservation and Management Plan (2015)

The Cactus Wren Habitat Conservation and Management Plan was prepared in 2015 to help fulfill MSP Roadmap Goals and Objectives established for management of the Coastal Cactus Wren in the Otay genetic cluster. This plan identified and prioritized management and restoration needs for the cactus wren in this genetic cluster, and also assessed connectivity to core habitat areas on Conserved Lands within the Sweetwater and Lake Jennings genetic clusters to further ensure persistence of the cactus wren in southern San Diego County over the next 100 years.

### Cactus Wren Habitat Conservation and Management Plan (2024)

In 2024, the Cactus Wren Habitat Conservation and Management Plan (2015) was updated to review progress in managing cactus wrens, reassess management needs and priorities, and was expanded to include the San Pasqual Valley in north San Diego. This plan includes new monitoring data documenting cactus wren population status, habitat characteristics and threats, as well as results from demographic, foraging, and genetic studies. The management strategy has two priorities: 1) Bolster existing populations through habitat enhancement, restoration, and expansion, and 2) Improve connectivity by creating stepping stone linkages. The plan evaluates 46 locations on Conserved Lands that support or have the potential to support cactus wren territories. Each location is included in a threat matrix scored for different types of habitat threats; a decision tree prioritizing management; an evaluation of cactus scrub expansion opportunities; and identification of management actions that can benefit wrens. A Coastal Cactus Wren Management Plan Map Viewer accompanies the plan and includes annual monitoring data including cactus wren territories and cactus scrub survey plot habitat and threat assessments. The viewer also includes the locations where land managers have enhanced, restored, or expanded cactus scrub since 2008. Using the bird monitoring data, we have been able to identify new Cactus Wren territories as a result of habitat management. There are management areas prioritized for cactus scrub restoration and expansion based on evaluations of suitable habitat, configurations of existing habitat and wren territories.

# Project Page on SDMMP.com



## Cactus Wren Habitat Conservation and Management Plan (2024)

In 2024, the Cactus Wren Habitat Conservation and Management Plan (2015) was updated to review progress in managing cactus wrens, reassess management needs and priorities, and was expanded to include the San Pasqual Valley in north San Diego. This plan includes new monitoring data documenting cactus wren population status, habitat characteristics and threats, as well as results from demographic, foraging, and genetic studies. The management strategy has two priorities: 1) Bolster existing populations through habitat enhancement, restoration, and expansion, and 2) Improve connectivity by creating stepping stone linkages. The plan evaluates 46 locations on Conserved Lands that support or have the potential to support cactus wren territories. Each location is included in a threat matrix scored for different types of habitat threats; a decision tree prioritizing management; an evaluation of cactus scrub expansion opportunities; and identification of management actions that can benefit wrens.

A Coastal Cactus Wren Management Plan Map Viewer accompanies the plan and includes annual monitoring data including cactus wren territories and cactus scrub survey plot habitat and threat assessments. The viewer also includes the locations where land managers have enhanced, restored, or expanded cactus scrub since 2008. Using the bird monitoring data, we have been able to identify new Cactus Wren territories as a result of habitat management. There are management areas prioritized for cactus scrub restoration and expansion based on evaluations of suitable habitat, configurations of existing habitat and wren territories.

Project type: General Management

Category: Threats and Stressors

Current stage: in progress

Overview
Project Groups
Cactus Wren Habitat Conservation and Management PlansSDMMP43
Project Focus
Target species: Coastal cactus wren



# Viewer Layers

- Territories by Year
  - Sources: REGSS, USGS, RECON, City of San Diego
- Restoration and Enhancements
- Stinknet Treatment Locations
- Mapped Cactus
  - Source: USFWS
- Coastal Sage Scrub
- Management Areas identified in the Plan
- Cactus Wren Habitat Suitability Model
- 2022 Habitat Attributes from USGS Survey Plots
- Cactus Wren sites sorted by Genetic Cluster
- Conserved Lands

# Restoration and Enhancement Data

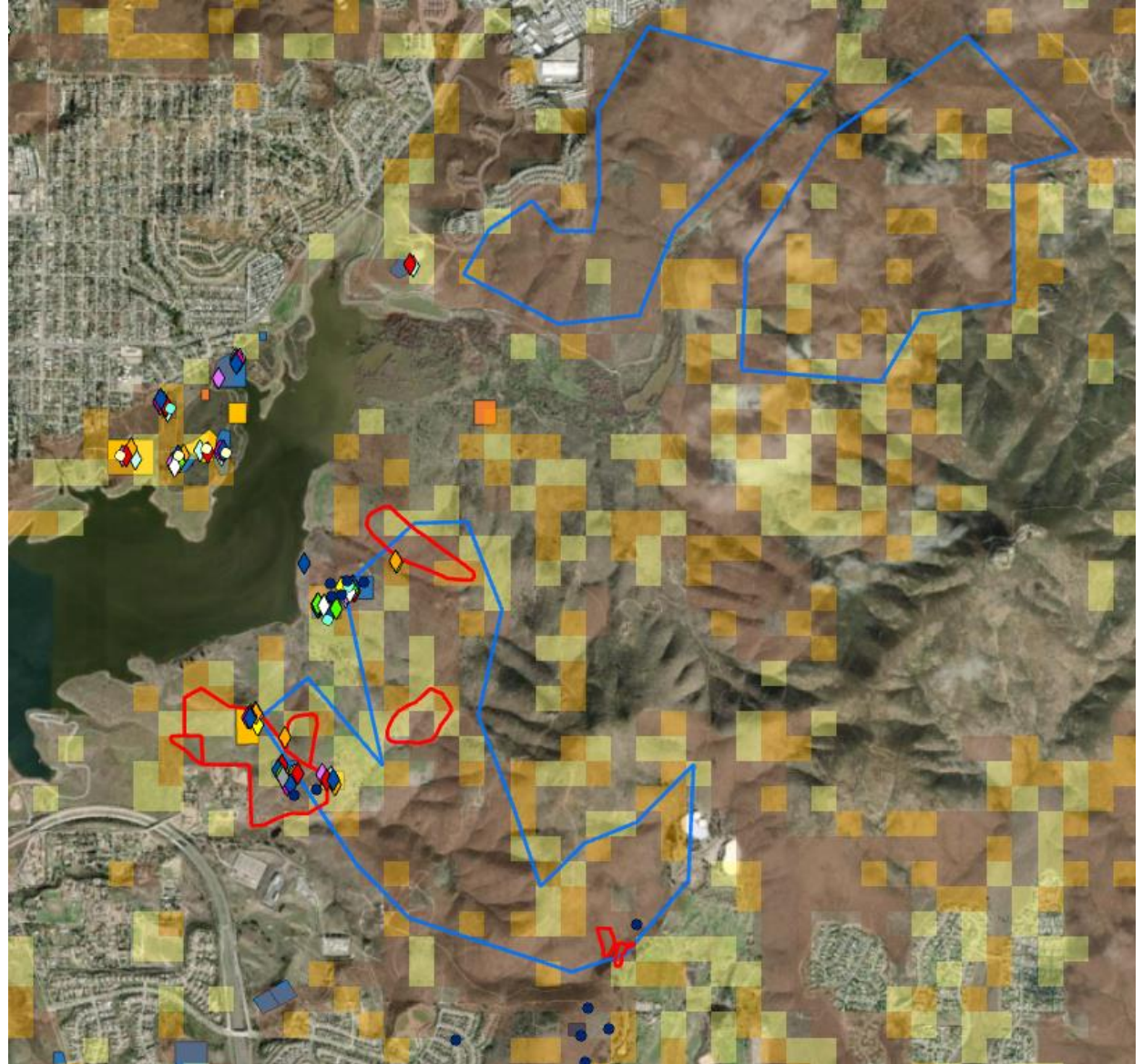
2022CACWSurveysAndHabitatForPlan			
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2	2	Polygon ZM	Otay
3	3	Polygon ZM	Lake Jennings
4	4	Polygon ZM	Sweetwater/E
5	5	Polygon ZM	Sweetwater/E
6	6	Polygon ZM	Lake Jennings
7	7	Polygon ZM	Lake Jennings
8	8	Polygon ZM	Sweetwater/E
9	9	Polygon ZM	Sweetwater/E
10	10	Polygon ZM	Sweetwater/E
11	11	Polygon ZM	Sweetwater/E
12	12	Polygon ZM	Sweetwater/E

← → ↶ ↷	Project	Maps	OfficialViewer	↻	⌵	Search OfficialViewer
Metadata Geography Table						
Summary						
Description of project treatments conducted in San Diego County for the restoration or enhancement of cactus scrub to benefit the coastal Cactus Wren.						
Description						
Table Attribute Definitions						
GeneticCluster: Location of restoration benefitting which cluster (San Pasqual Valley, Lake Jennings, Sweetwater/Encanto, Otay)						
Location: General location						
ProjectArea: Project Area Name from Source Report						
MgmtAction: Restoration or Expansion of cactus habitat						
ProjectTxDesc: Type of treatment conducted during project						
SANDAGGrantNo: Grant number						
ProjectDuration: Duration of SANDAG project						
SourceReport: Citation						
YearStartOfMgmt: Year start of project						
YearMgmtComplete: Year end of project						
MonthStartOfMgmt: Month start of project						
MonthMgmtComplete: Month end of project						
OngoingTxDesc: Type of treatment conducted post-SANDAG project						
Credits						

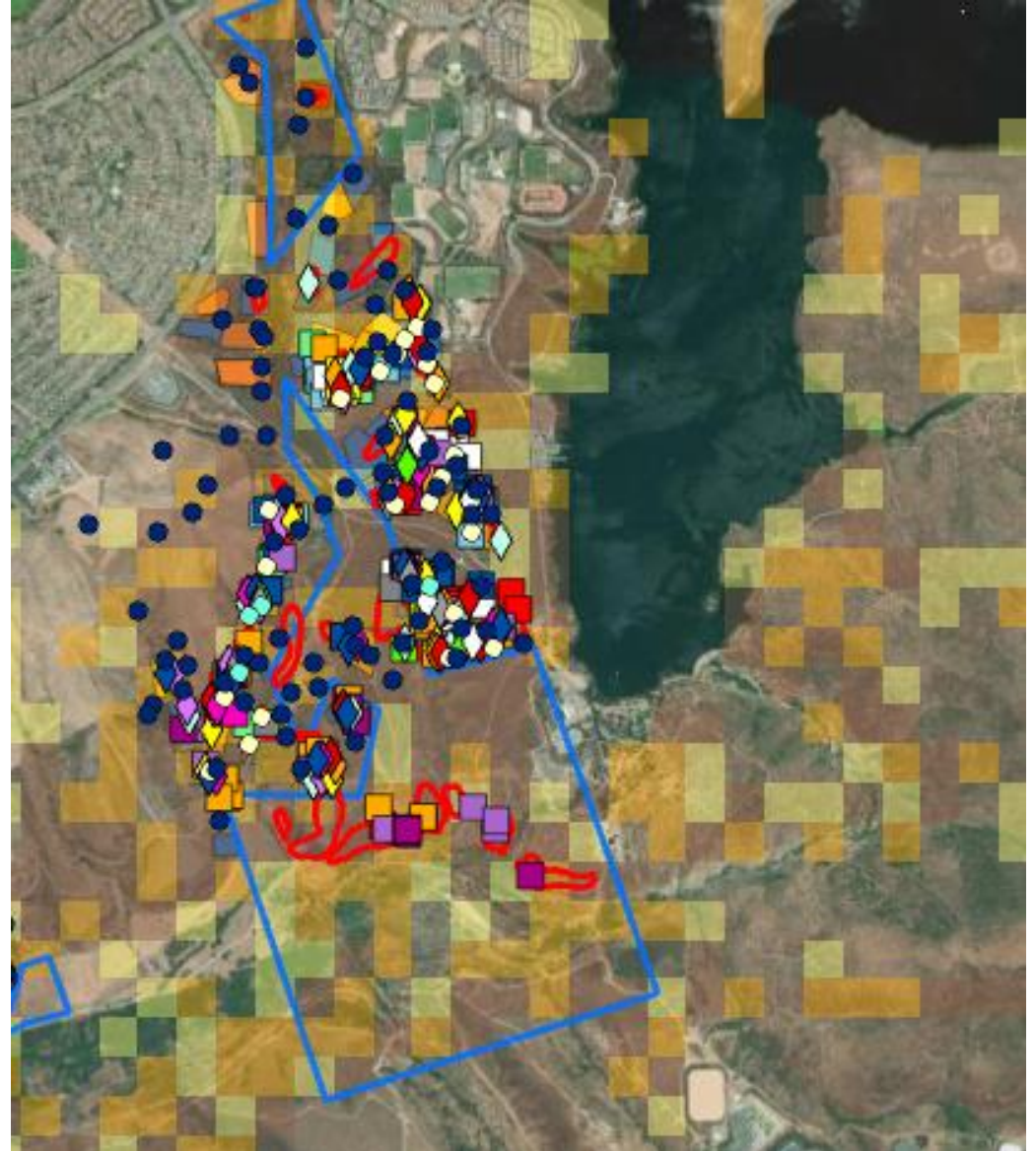
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ng	5 yrs	
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>	< Null>	<



# San Diego National Wildlife Refuge



# Salt Creek





# Market St./Encanto



# Call for Data

- Looking for:
  - Observations of wrens outside of the survey areas
  - Spatial data of restoration or enhancement for cactus scrub