

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

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Western Ecological Research Center



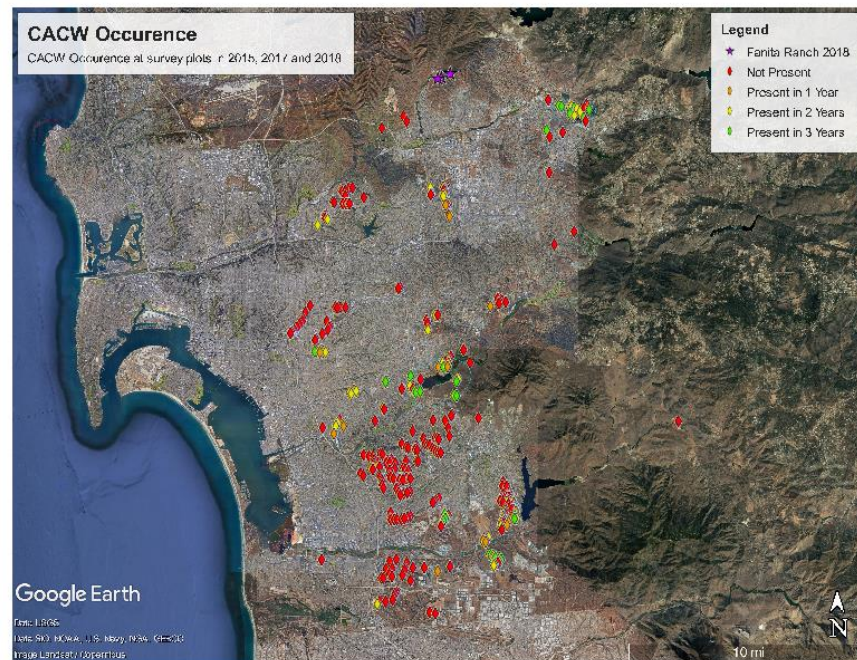
In cooperation with **SANDAG** and The Nature Conservancy



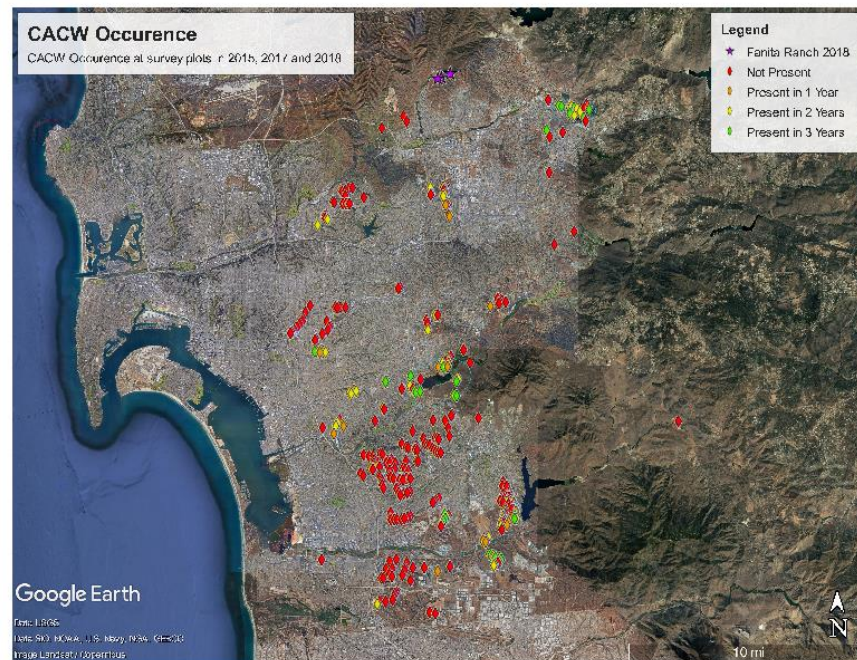
Coastal Cactus Wren



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Cactus scrub habitat:

- Fragmented
- Small patches
- Disturbed

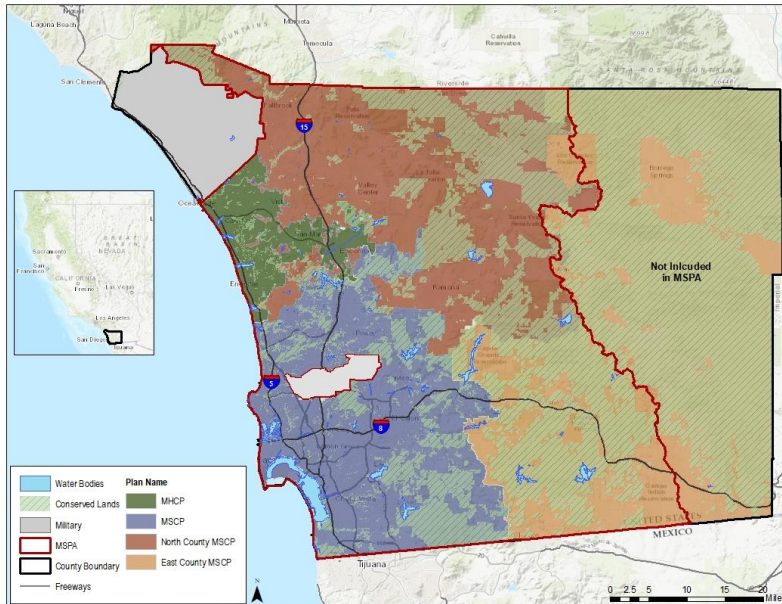
Cactus Wren populations:

- Small
- Isolated

Threats:

- Fire
- Drought

Background



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

Prepared for:
San Diego Association of Governments



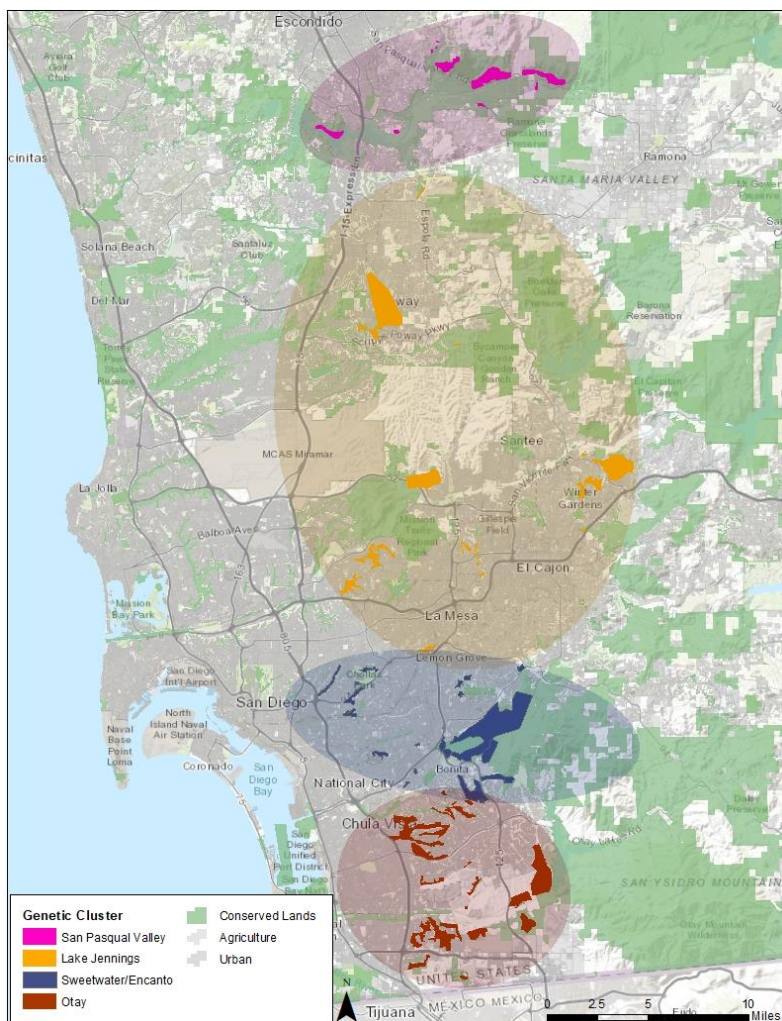
Prepared by:
The Nature Conservancy
In collaboration with
San Diego Management and Monitoring Program

June 18, 2015



Preliminary Information: Subject to Revision
Not for Citation

Background



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June 18, 2015

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.



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Background

Identified and prioritized management and restoration needs to benefit Cactus Wrens in southern San Diego County

- Develop habitat suitability model to:
 - Identify potential cactus scrub restoration sites to augment habitat availability
 - Identify and prioritize sites for restoration/enhancement to increase genetic connectivity within and between genetic clusters
- Conducted surveys to:
 - Document CACW occupancy and abundance
 - Assess cactus scrub habitat conditions
 - Characterize threats to CACW and cactus scrub
 - Evaluate restoration efforts and outcomes to update BMPs
 - Identify sites for cactus salvage for transplantation or nursery propagation

South San Diego County
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Preston, K.L., Perkins, E.E., and Kus, B.E., 2020, Coastal cactus wren habitat suitability model for southern California (2015): U.S. Geological Survey data release, <https://doi.org/10.5066/P9K3PXQ3>.

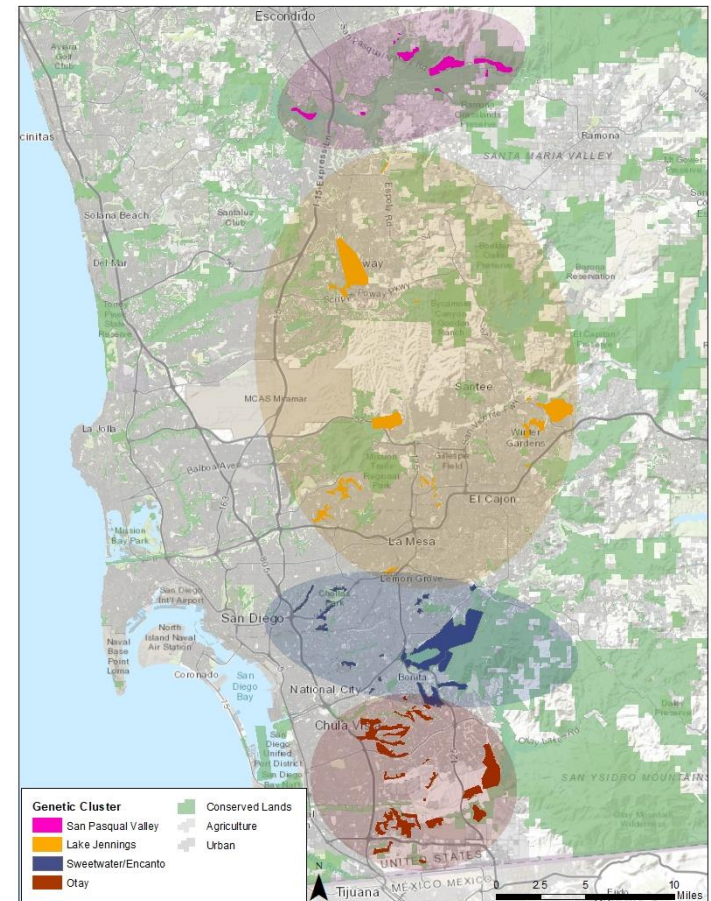


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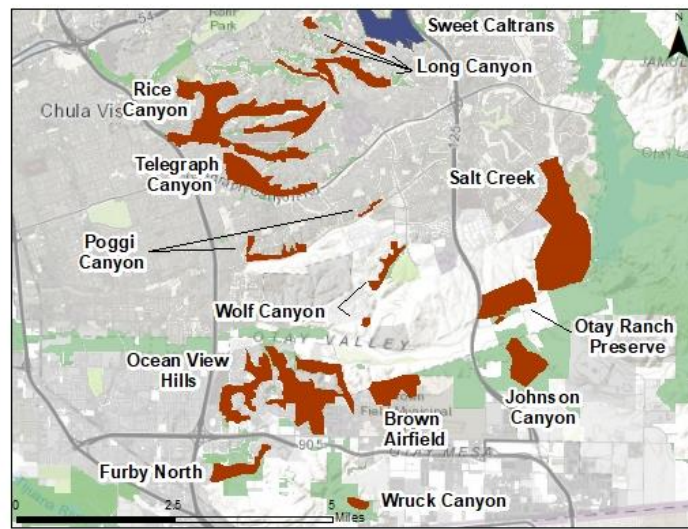
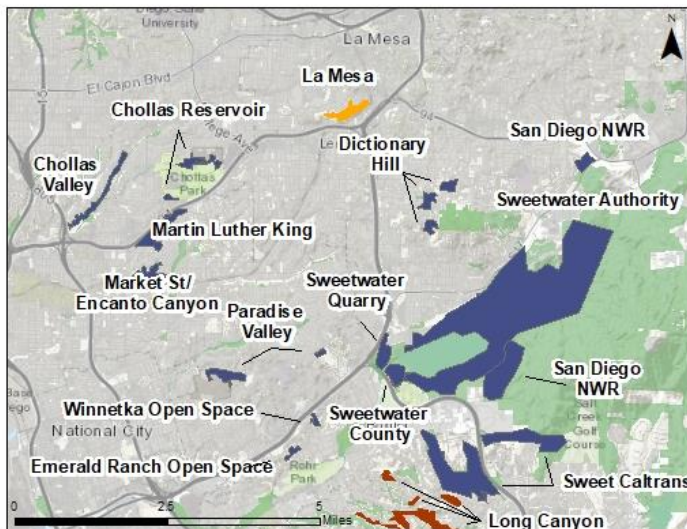
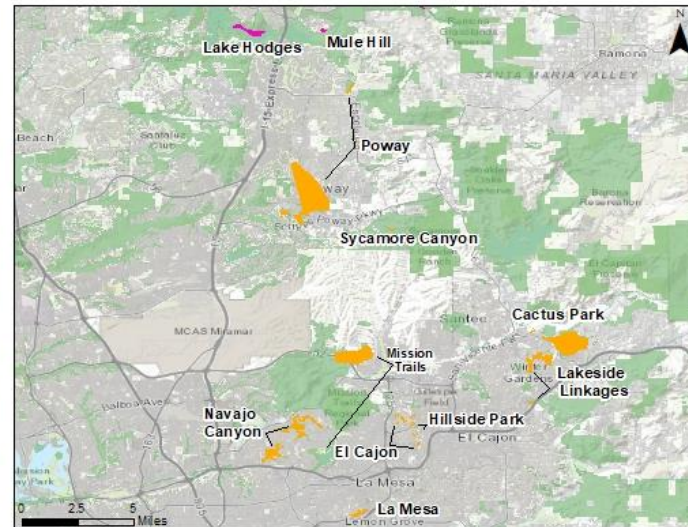
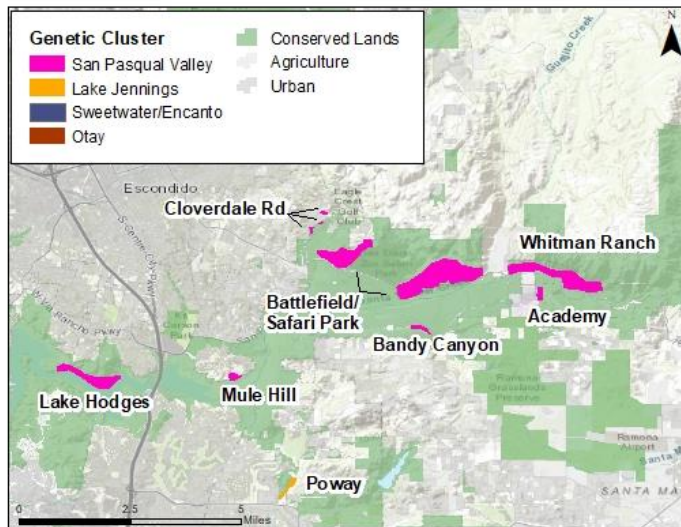
Management Plan Update



- Integrates results of recent research and monitoring
- Updates management needs, opportunities, and prioritizations
- Expands plan area to include San Pasqual Valley genetic cluster



CACW Survey Locations by Cluster



Plan Organization

Factors affecting Cactus Wren Dynamics

Cactus Wren Occupancy, Distribution, and Abundance

Cactus Wren Productivity, Survival, and Dispersal

Cactus Wren Diet and Food Availability

Population Genetic Structure and Diversity

Cactus Scrub Habitat Condition

Management Strategy



Alex Houston

Plan Organization

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Cactus Scrub Habitat Condition

Management Strategy



Alex Houston

Occupancy

Cactus Wren Surveys

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

Metrics

- ψ Proportion of plots occupied
- ψ Number of CACW territories

Occupancy and Abundance

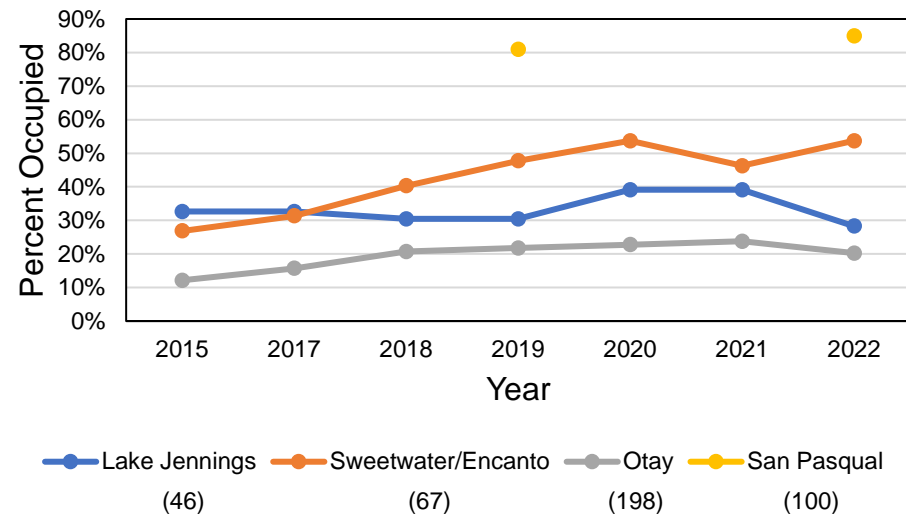
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Occupancy



Occupancy and Abundance

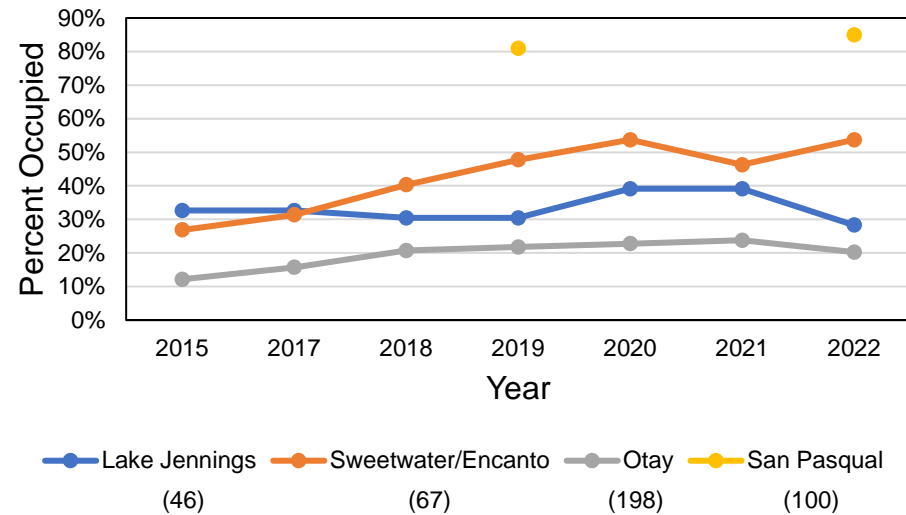
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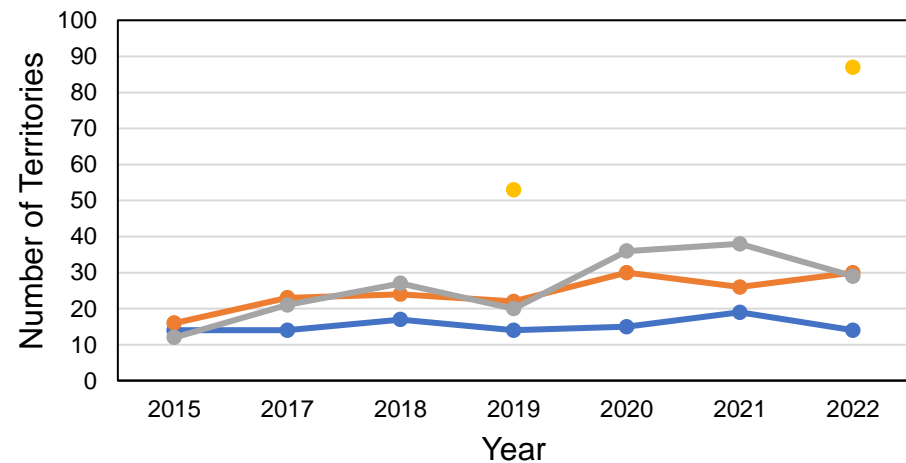
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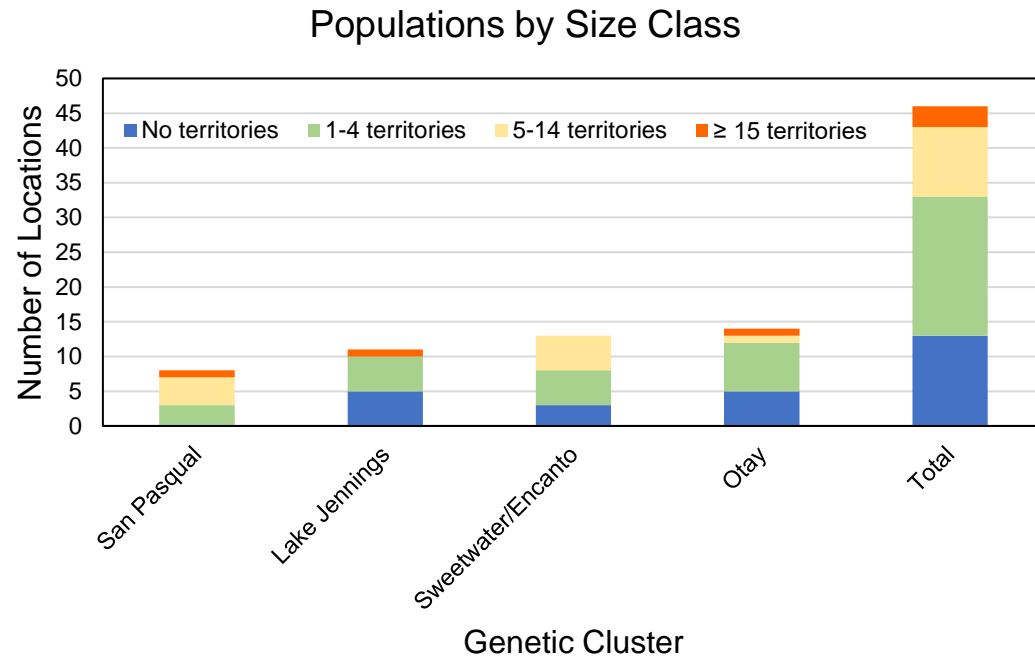
Occupancy



Abundance



Population Size



Habitat Condition

Metrics

- ψ Dominant native shrubs/trees
- ψ Presence of blue elderberry
- ψ Shrub crowding
- ψ Non-native annuals
- ψ Unhealthy cactus
- ψ Dead cactus

Cover Classes

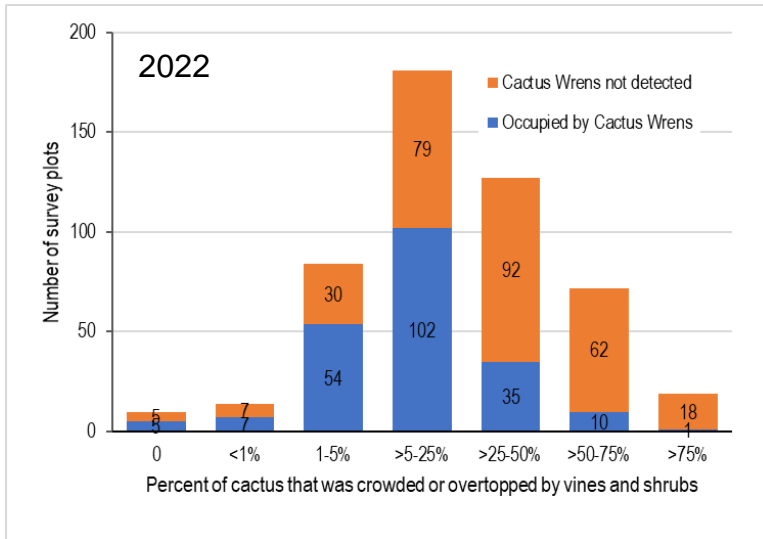
≤5%	5-25%	26-50%	51-75%	>75%
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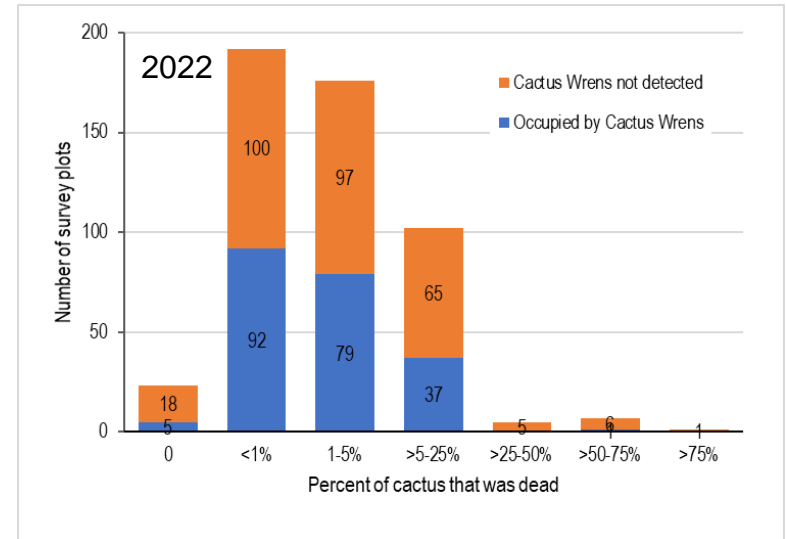
Coastal prickly pear at North San Diego County Cactus Nursery showing symptoms of *Alternaria* fungal infection in April 2020. Photo by Kim Wehinger, City of San Diego PUD.

Cactus Wren Condition

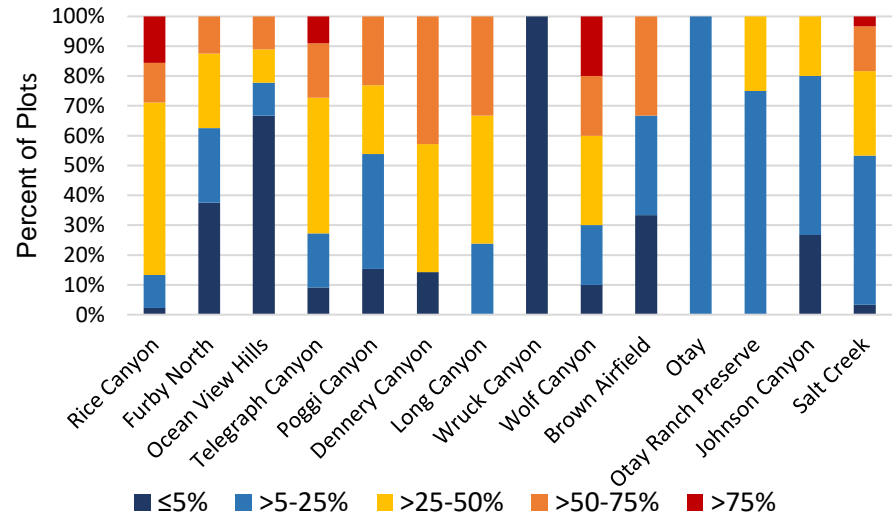
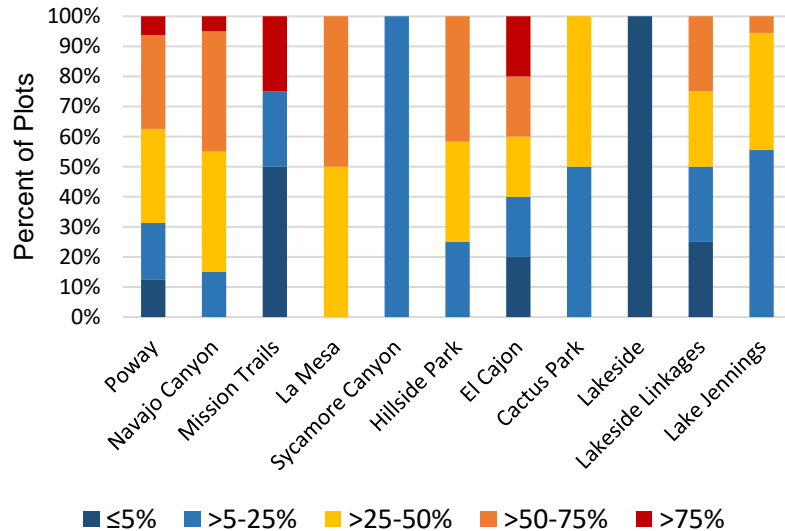
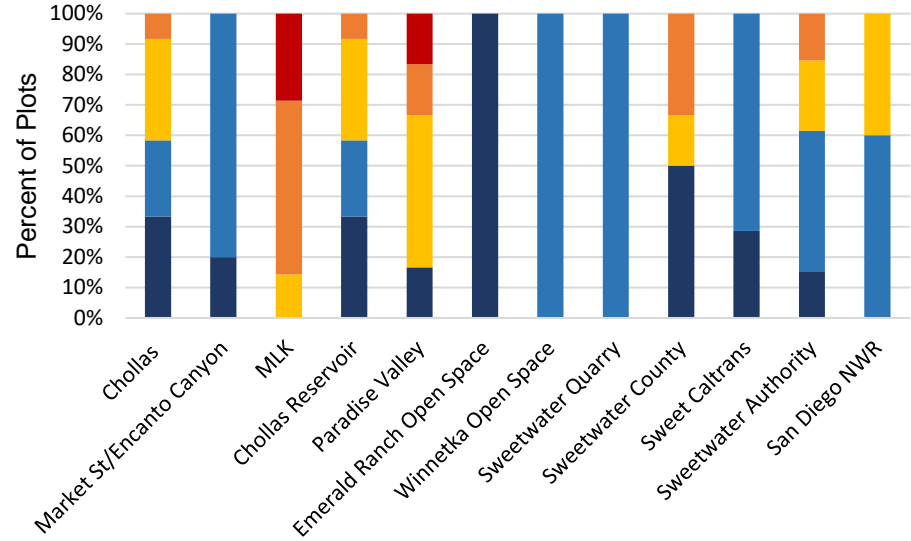
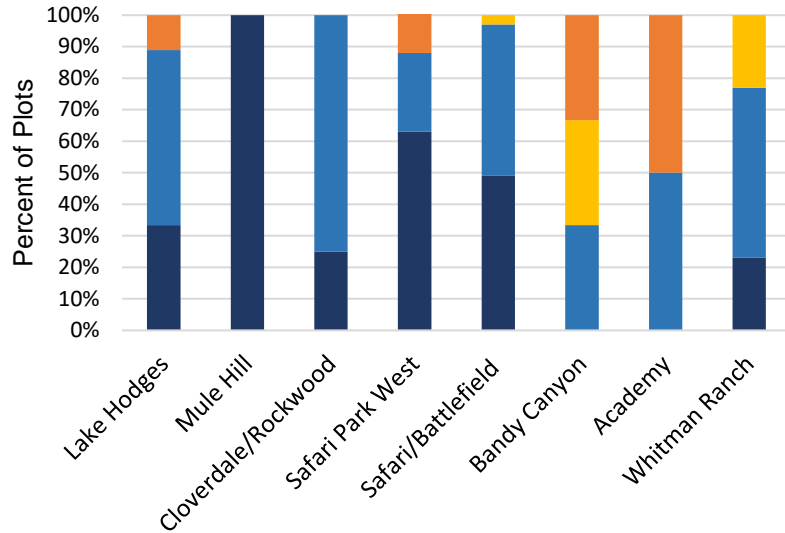
Shrub Crowding



Dead Cactus



Threat Assessment: Shrub Crowding



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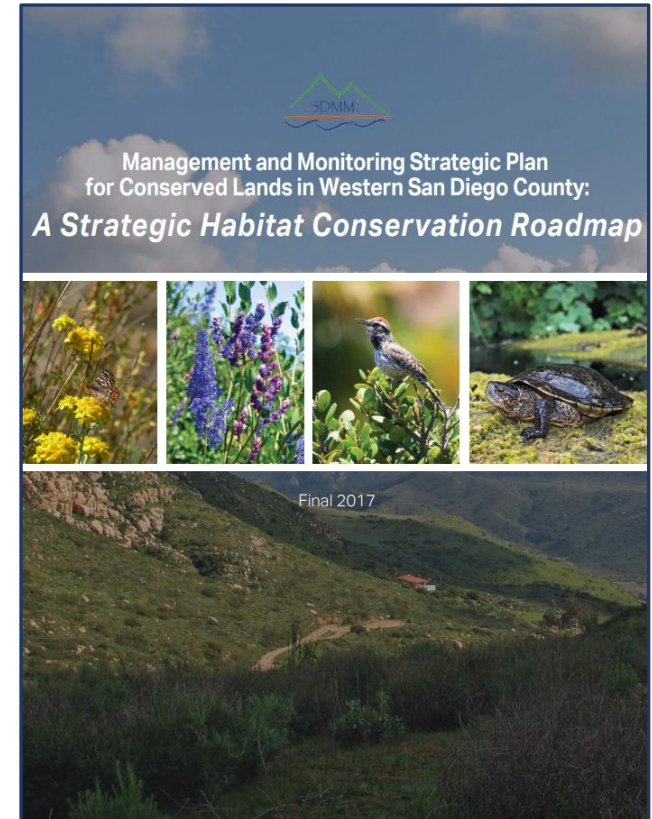
Management Strategy



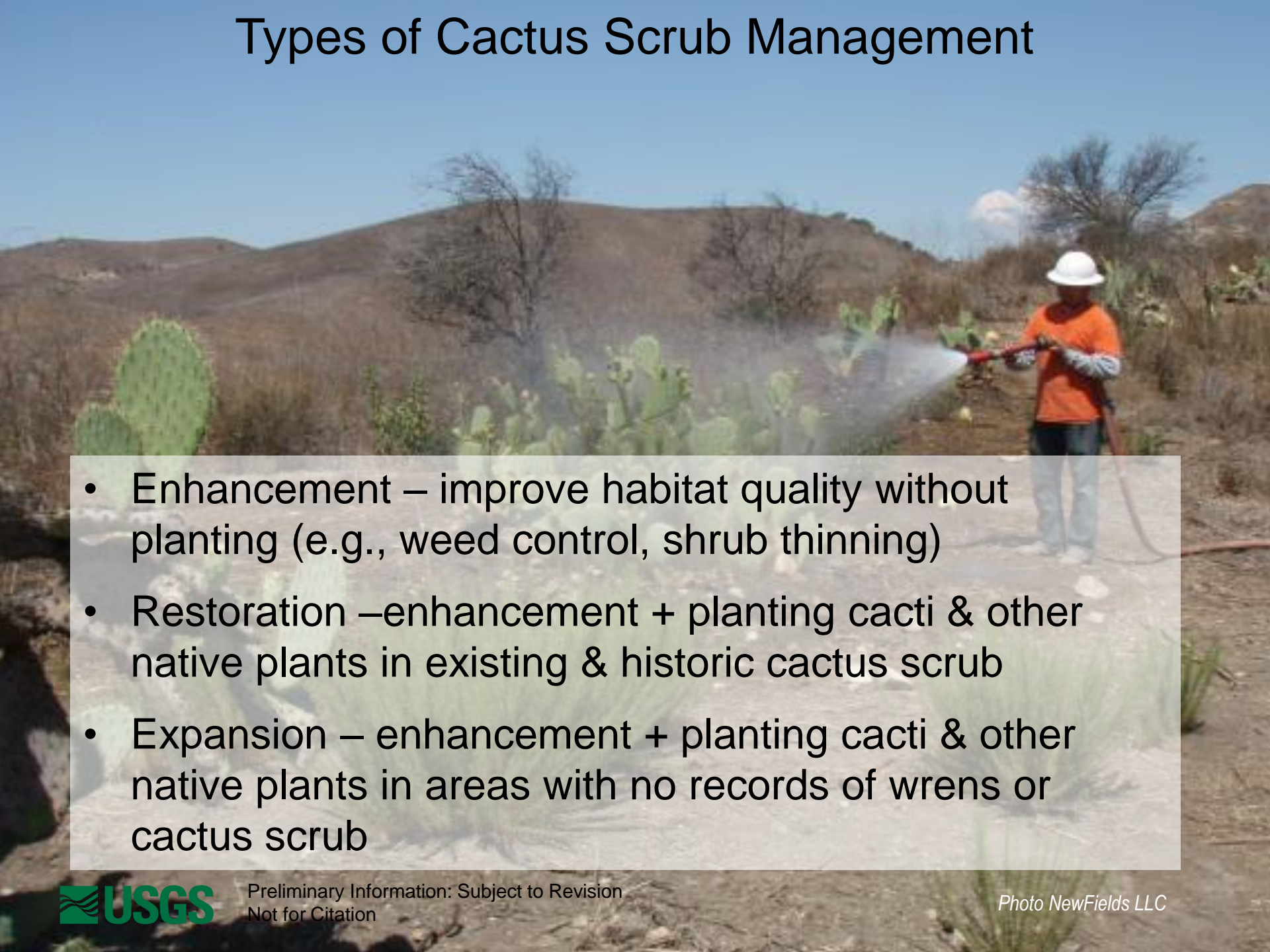
Management Goal

“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: SDMMP and TNC 2017



Types of Cactus Scrub Management

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

Is Cactus Scrub Management Effective?

14 regional restoration & expansion projects - SD Co (2005-2022)

- ~300 acres of cactus scrub enhanced, restored or created
- 36 new territories in created habitat (+ existing territories)
- Ave. project duration = 7 years (range: 3-14)



Management Strategy

Manage cactus wrens through cactus scrub enhancement, restoration & expansion

1. Bolster existing populations
2. Improve connectivity with stepping- stone linkages
3. Maintain cactus nurseries



Bolster Populations

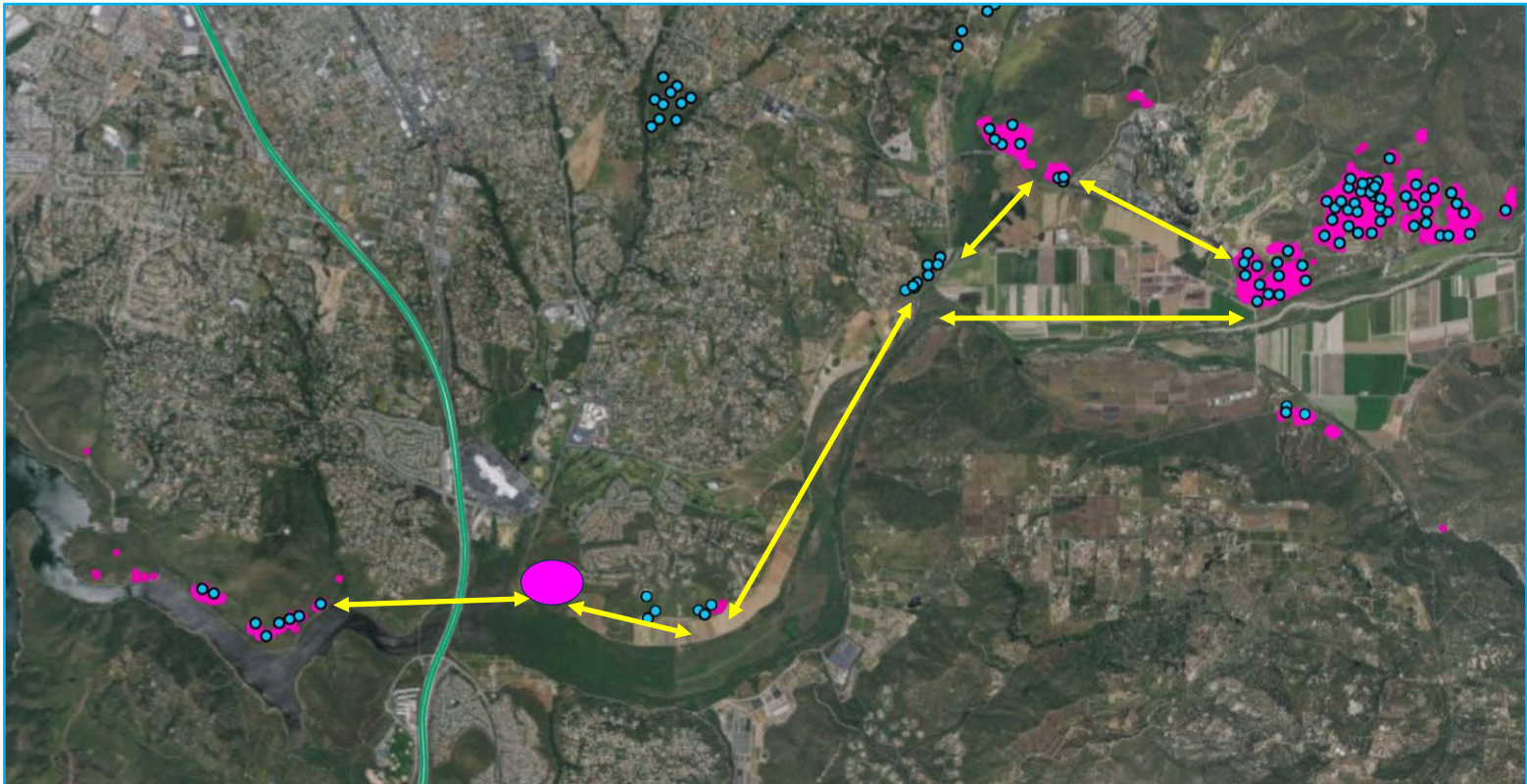
Management objective:

Manage cactus scrub supporting Cactus Wrens to maintain high occupancy ($>50\%$) at locations with ≥ 25 acres of cactus scrub & to increase small (<5 territories) & medium (5-14 territories) populations at locations with <25 acres of scrub

Improve Connectivity

Management objective:

Establish natural habitat linkages with stepping-stone patches of cactus scrub ≥ 25 acres supporting minimum of 5 Cactus Wren territories and spaced at most 2 miles apart between populations prioritized for enhanced connectivity.



Cactus Nurseries

Management objective:

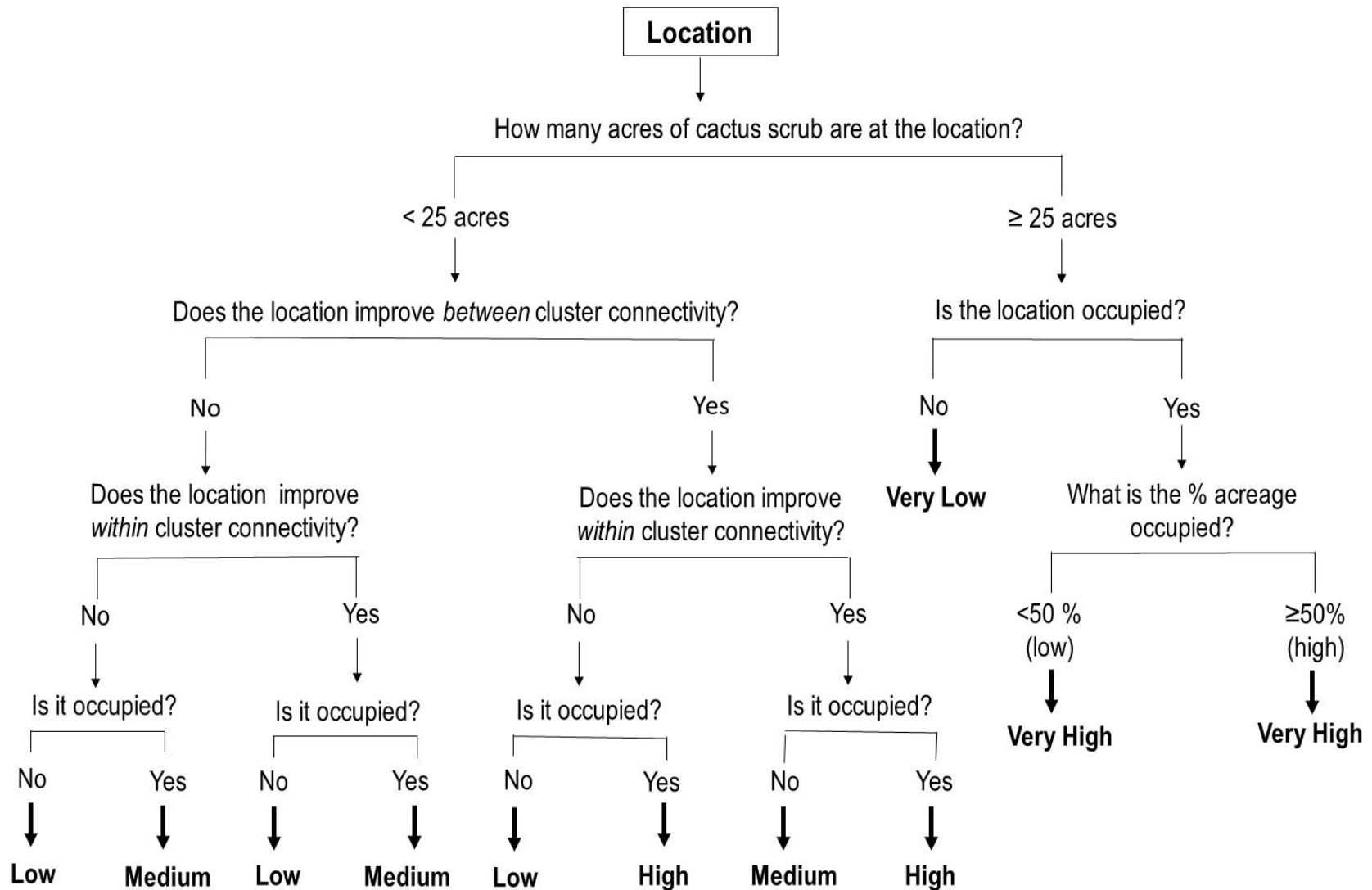
Establish cactus nurseries in north & south San Diego County to receive rooted cactus plants, segments & pads to grow cactus plants & propagules for restoration & creation of new cactus scrub within that genetic cluster.



Management Plan Components

- Management Prioritization Decision Tree
- Threat Matrix
- Opportunities for Cactus Scrub Expansion
- Location Specific Management Actions to Benefit Wrens

Management Prioritization Decision Tree



Management Priorities

Cluster	Location	Shrub Over-topping	Non-native Annuals	Unhealthy Cactus	Dead Cactus	Overall Threat Ranking	Connectivity Between Clusters	Connectivity Within Clusters	Ever Occupied	Survey Area (Acres)	% Acreage Occupied	Management Priority
San Pasqual	Lake Hodges	Medium	Medium			High			Y	26.1	96%	Very High
	Mule Hill	Low	Medium			Low	Y	Y	Y	0.6	52%	High
	Cloverdale/ Rockwood	Low	Low			Low	N	N	Y	8.3	100%	Medium
	Safari Park West	Medium	Low			Low			Y	34.2	84%	Very High
	Safari/ Battlefield Park	Medium	Low			Low			Y	234.8	94%	Very High
	Bandy Canyon	High	Low			Medium	N	N	Y	13.0	57%	Medium
	Academy	High	Low			Medium	N	N	Y	16.0	55%	Medium
	Whitman Ranch	Medium	High			Medium			Y	42.0	73%	Very High
Lake Jennings	Poway	High	Medium			High			N	367.4	0%	Very Low
	Navajo Canyon	Very High	Medium			High			Y	98.6	2%	Very High
	Mission Trails	High	Very High			Very High			N	31.9	0%	Very Low
	La Mesa	Very High	Low			High	N	N	N	0.5	0%	Low
	Sycamore Canyon	Low	Low			Medium	Y	Y	Y	2.5	100%	High
	Hillside Park	High	Medium			Medium	N	Y	Y	17.8	44%	Medium
	El Cajon	High	Low			Medium	N	Y	Y	7.9	49%	Medium
	Lakeside	Low	Low			Low	N	N	N	8.4	0%	Low
	Cactus Park	Medium	Low			Low	N	N	N	1.0	0%	Low
	Lakeside Linkages	High	Medium			Medium	Y	N	Y	7.4	57.7%	High
	Lake Jennings	High	High			Medium			Y	102.6	61%	Very High



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Management Priorities

Very High, High Occupancy	Very High, Low Occupancy	High	Medium	Low	Very Low
Lake Hodges	Navajo Canyon	Mule Hill	Cloverdale/ Rockwood	La Mesa	Poway
Safari/ Battlefield Park	Rice Canyon	Sycamore Canyon	Bandy Canyon	Cactus Park	Mission Trails
Whitman Ranch	Wolf Canyon	Lakeside Linkages	Academy	Emerald Ranch Open Space	Sweet Caltrans
Lake Jennings	Salt Creek	San Diego National Wildlife Refuge	Hillside Park	Winnetka Open Space	Ocean View Hills
Market St/ Encanto Canyon			El Cajon	Sweetwater Quarry	Telegraph Canyon
Paradise Valley			Chollas Valley	Wruck Canyon	Poggi Canyon
Sweetwater County			Martin Luther King		Long Canyon
Sweetwater Authority			Chollas Reservoir		
Otay Ranch Preserve			Furby North		
Johnson Canyon			Dennerly Canyon		
			Brown Airfield		



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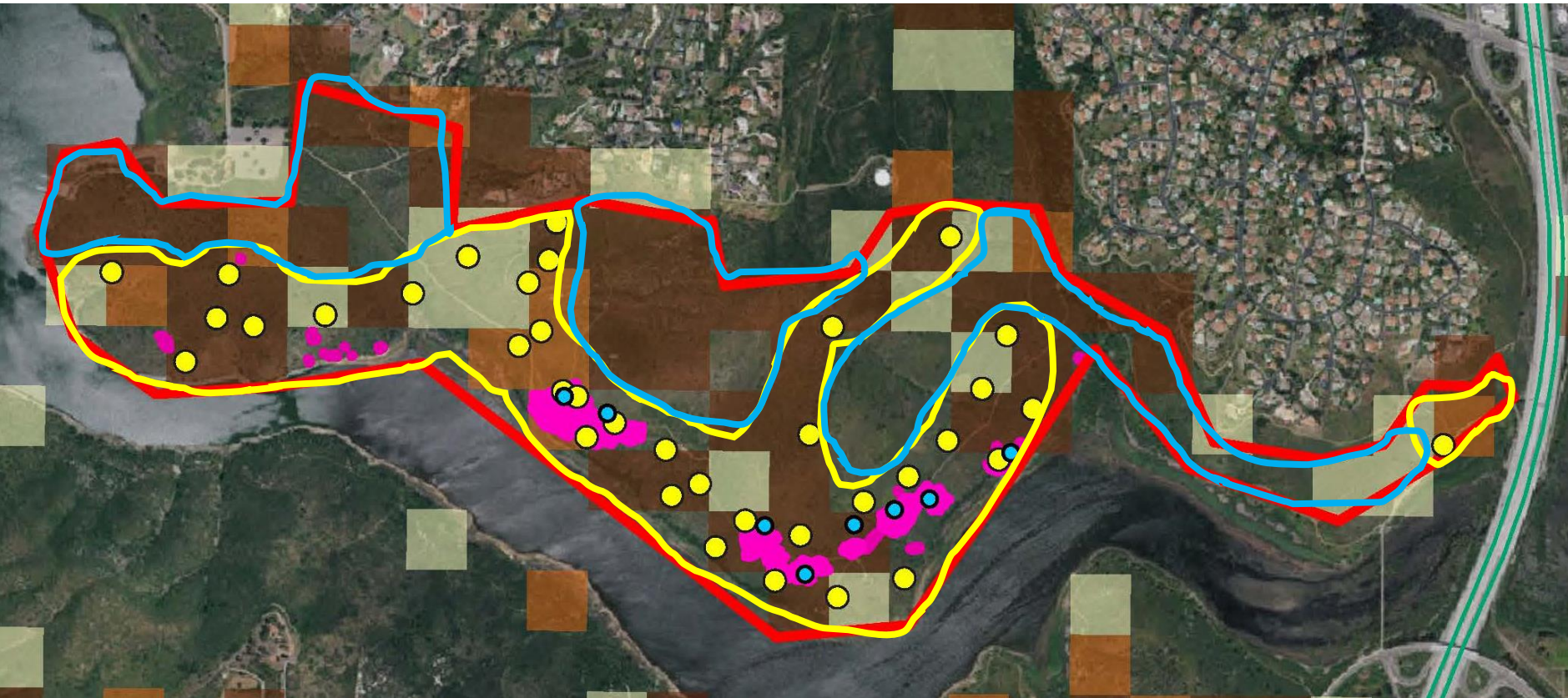
Cactus Scrub Expansion Opportunities

- Locations too small in area or without wrens – not a regional priority
- Locations with <5 territories & <25 acres cactus scrub prioritized for expansion, higher priority if improve connectivity
- Locations with medium (5-14 territories) or large (≥ 15 territories) prioritized at key locations to build larger populations for genetic diversity & dispersers to other locations
- Fire refugia locations prioritized for expansion to support medium or large wren populations

Cactus Scrub Expansion Opportunities

San Pasqual Cluster			
Room to expand?	Expansion Prioritization Rationale	Potential Expansion Area Size (Acres)	Decision Tree Priority/ Expansion Priority
Yes	<p>Formerly a medium size population with 24 adult birds in 1996 (Christianson et al. unpub. data), this location burned severely in the 2007 Witch Fire leading to a loss of wrens and cactus scrub. From a postfire low of two territories in 2008 (Hamilton 2009), the population expanded to eight territories in 2022 (Kus and Lynn 2022). Over 80 acres of cactus scrub burned in the fire has been restored (restoration table). Extensive areas of historic cactus scrub destroyed by the fire could be restored. Large areas of modeled high habitat suitability not known to previously support wrens or cactus scrub are also available to create new cactus scrub near existing and historic cactus scrub (expansion figure). Currently, wrens occupy about 50% of the area that had wrens in the 1990s. Expanding cactus scrub could increase population stability and adding cactus in the east could enhance connectivity with wrens east of I-15. Priority for expansion is Very High to increase population size to pre-fire status and for greater stability and genetic diversity.</p>	467	Very High/ Very High
Yes	<p>Ranked as a Very High priority for creation of new cactus scrub, this location is important for establishing a stepping stone population (>5 territories) to improve connectivity between the Lake Hodges location and wren locations to the east and to the Lake Jennings genetic cluster to the south. This location supports one pair of wrens (Kus and Lynn 2022) with limited cactus scrub. Habitat suitability is modeled as high to very high for about 65% of this location (expansion figure). A small amount of cactus scrub creation has been initiated (restoration table).</p>	97	High/ Very High

Cactus Scrub Expansion Opportunities



Red = Management Area, Yellow = Restoration Area, Blue = Cactus Scrub Creation Area

Entire Area = 476 Acres



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Best Practices

- Remove thatch prior to planting
- Control invasive nonnative grasses & forbs (before & after planting, takes years)
- Plant cacti & native shrubs, forbs & grasses
- Diverse plant community - ↑ arthropod prey (more resilient to drought)
- Important plants – sagebrush, elderberry, bunch grass, buckwheat
- Plant large patches of cacti (e.g., 10 m²)
- Plant shrubs 3-5m away from cactus patches
- Irrigation to speed up growth or in drought
- Large salvaged cacti can create immediate habitat



Photo RECON 2012



Photo NewFields Co



Cactus Wren can nest in large cactus soon after transplant

Location Specific Management actions

Cluster	Location	Management Priority	Overall Threat Ranking	Expansion Priority	Restore	Enhance	Specific Enhancement Actions
San Pasqual	Lake Hodges	Very High	High	Very High	X	X	CAN, MUC, RDC, TOS
	Mule Hill	High	Low	Very High	X		CNA
	Cloverdale/ Rockwood	Medium	Low	NAP			
	Safari Park West	Very High	Low	High		X	TOS
	Safari/Battlefield Park	Very High	Low	Low		X	CAA, TOS
	Bandy Canyon	Medium	Medium	Medium		X	TOS
	Academy	Medium	Medium	Low		X	CAA, TOS
	Whitman Ranch	Very High	Medium	Medium	X	X	CAA, CNA, TOS
Lake Jennings	Poway	Very Low	High	NAP			
	Navajo Canyon	Very High	High	Medium	X	X	CAA, CNA, TOS
	Mission Trails	Very Low	Very High	NAP			
	La Mesa	Low	High	NAP			
	Sycamore Canyon	High	Medium	Very High	X	X	MUC, RDC
	Hillside Park	Medium	Medium	NAP		X	CAA, CNA, TOS
	El Cajon	Medium	Medium	Medium		X	CAA, TOS
	Cactus Park	Low	Low	NAP			
	Lakeside Linkages	High	Medium	High		X	CNA, TOC
	Lakeside	Low	Low	NAP			
	Lake Jennings	Very High	Medium	Very High	X	X	CAA, CNA, TOS



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Questions?



Robb Hamilton