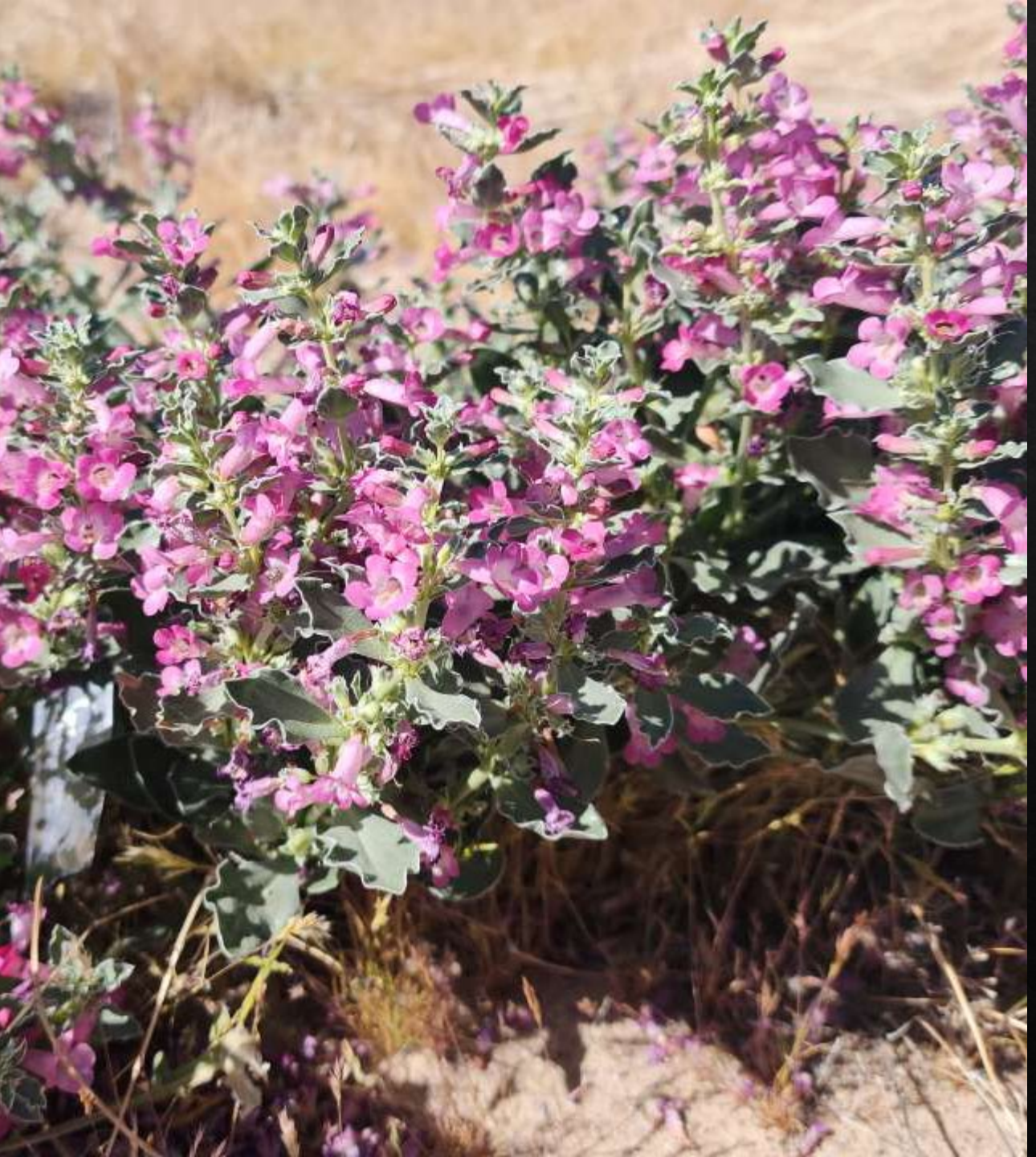


Inventory and demographic monitoring of white-margined penstemon *(Penstemon albomarginatus)*, Clark County, NV

Alice Miller

Pyramid Botanical Consultants, Inc.

August 2026

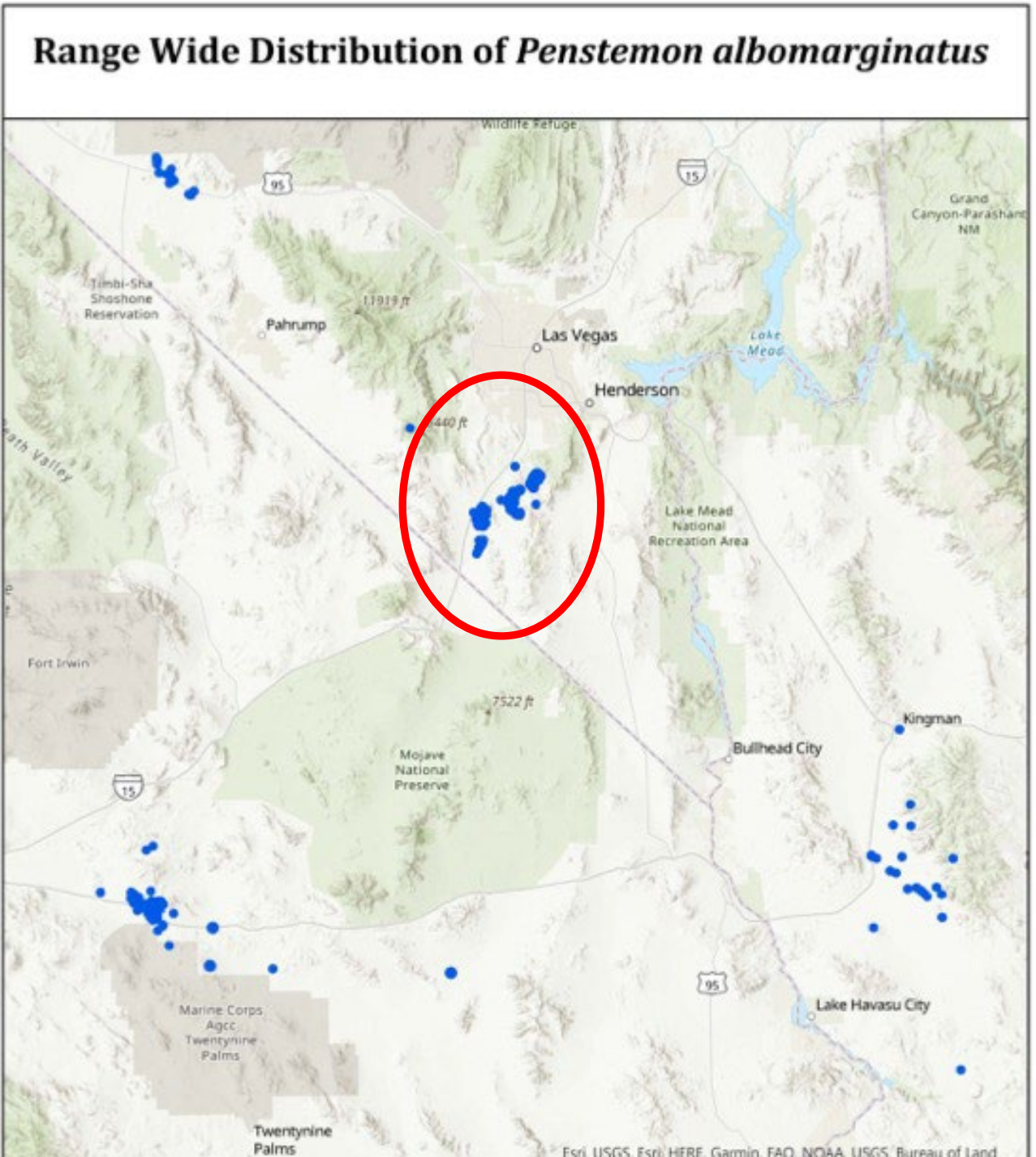


White-margined penstemon

Rare Mojave Desert Endemic

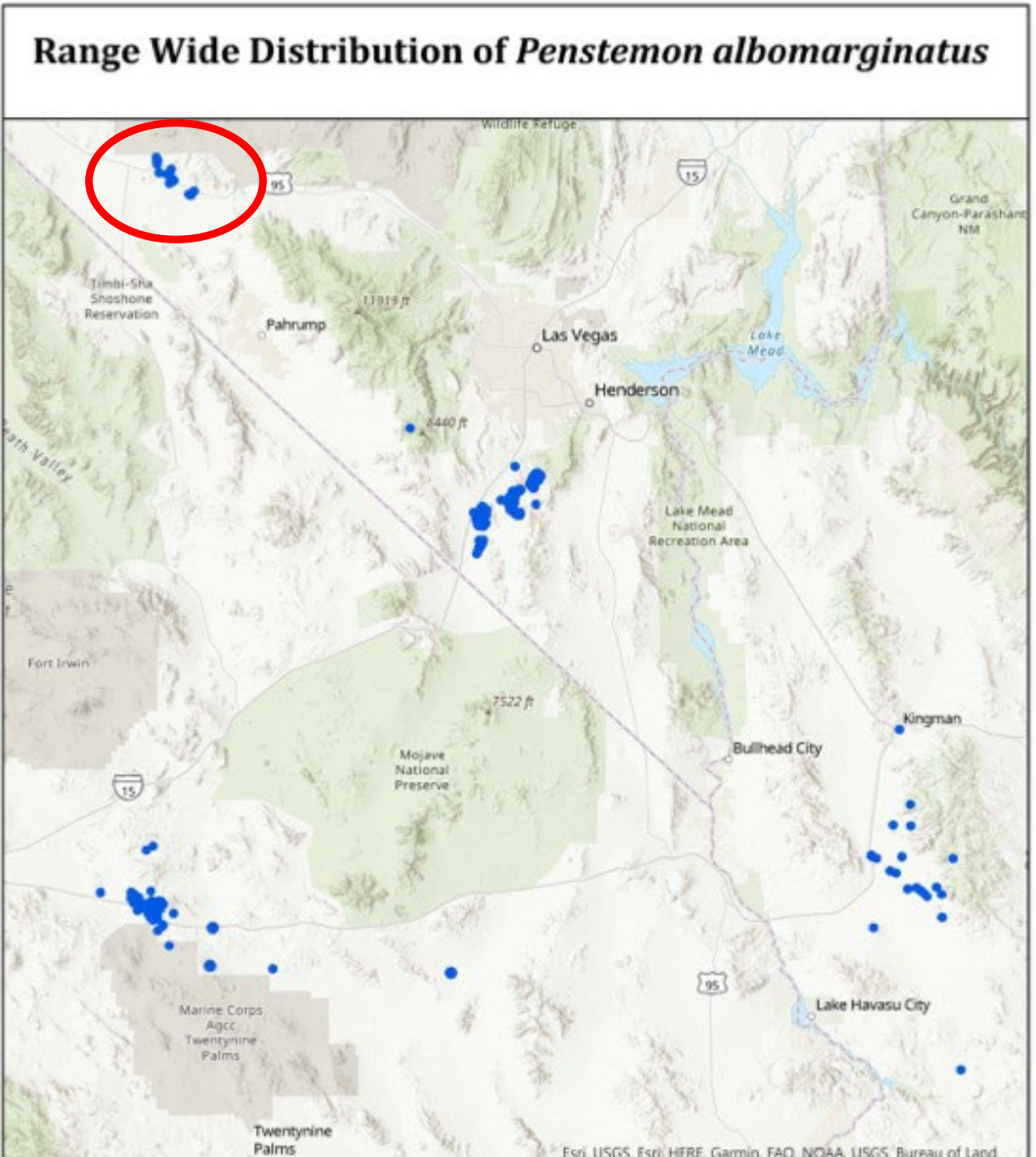
Found in a range of sandy desert shrublands

Summer dormant and may remain dormant for 6+ years with emergence triggered by winter precipitation



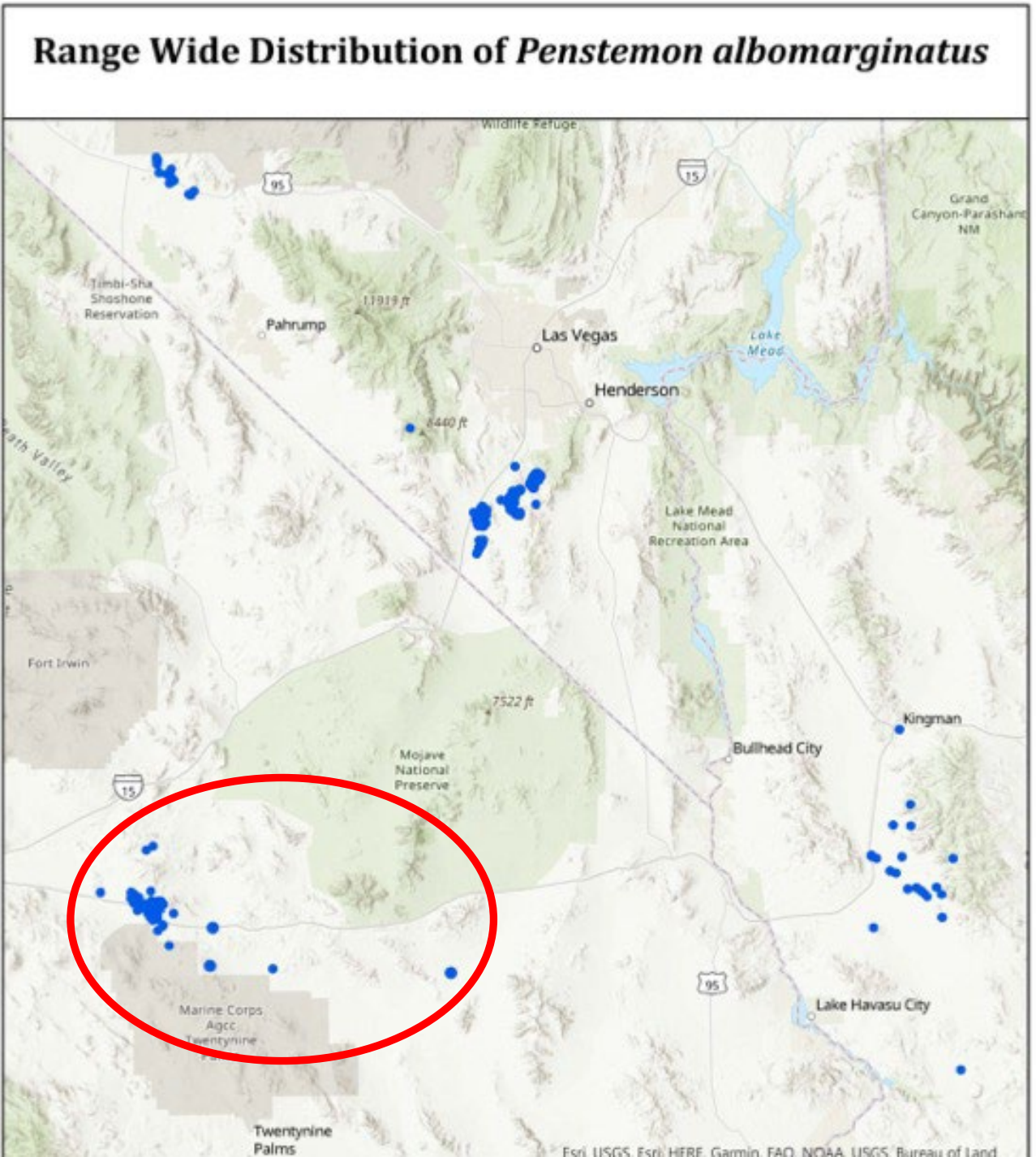
4 Disjunct Population Centers

- Clark County, NV



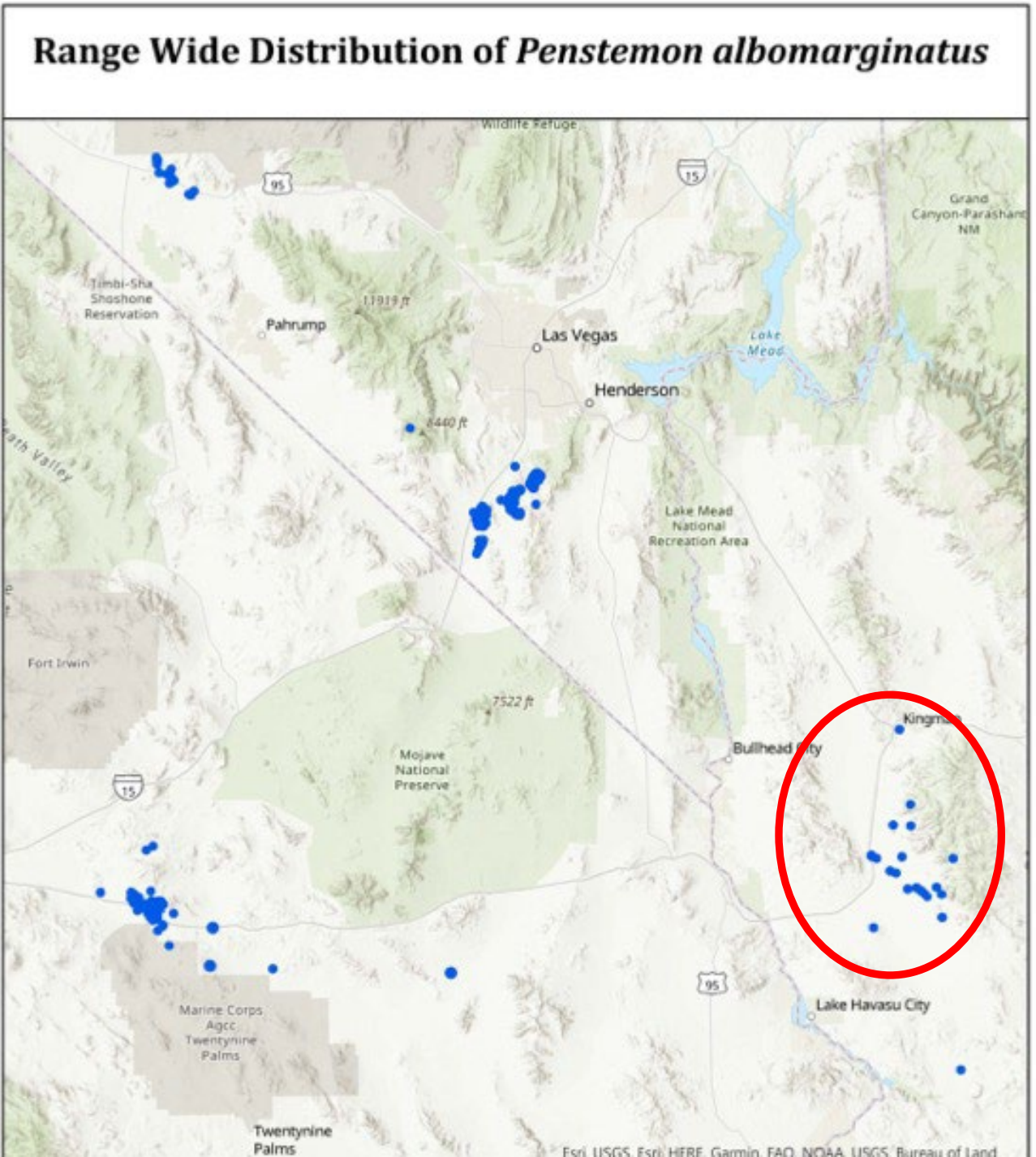
4 Disjunct Population Centers

- Nye County, NV



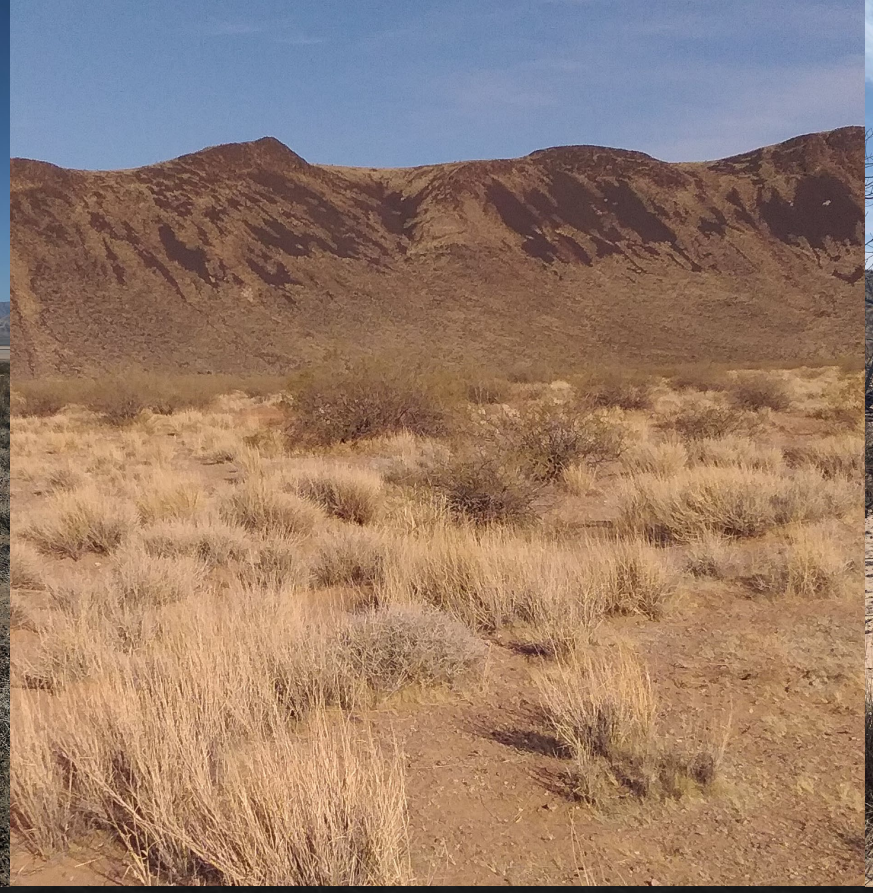
4 Disjunct Population Centers

- Pisgah Crater, CA



4 Disjunct Population Centers

- Dutch Flat, AZ


Clark County





Nye County





Pisgah Crater, CA





Dutch Flat, AZ

Candidate species for listing under ESA

- Petitioned for listing in 2023, approved for review in January 2024
- Globally Imperiled
- Critically Imperiled in California and Arizona, Imperiled in Nevada

2021 range wide survey and monitoring

- Emergent plant abundance much lower than any previously recorded
- Declining population growth rates in Clark County and Pisgah Crater, with probability of extinction higher with increasing drought frequency
- Catastrophic herbivory with reproductive failure across entire range
- Multiple additional stressors on top of climate impacts





Habitat loss

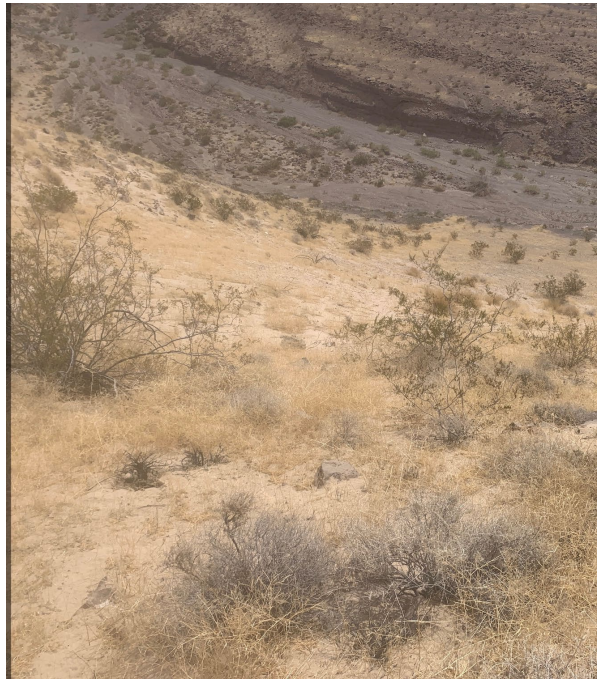
Habitat degradation

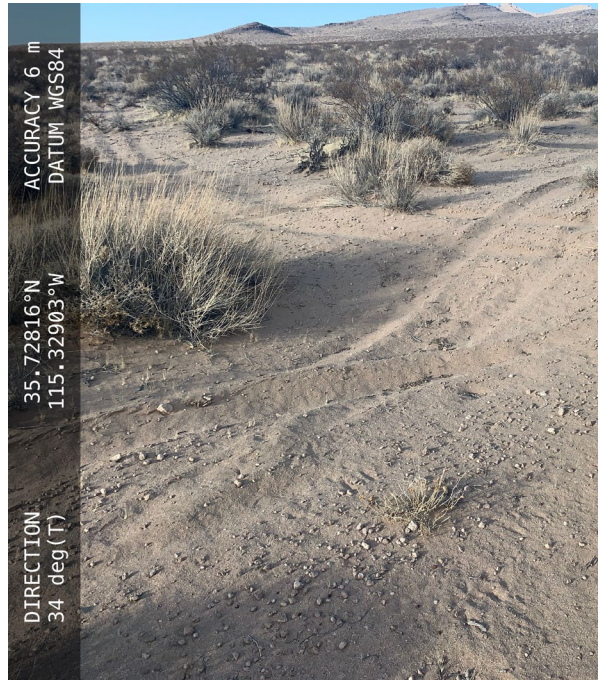
OHV

Roads

Invasive Species

Grazing









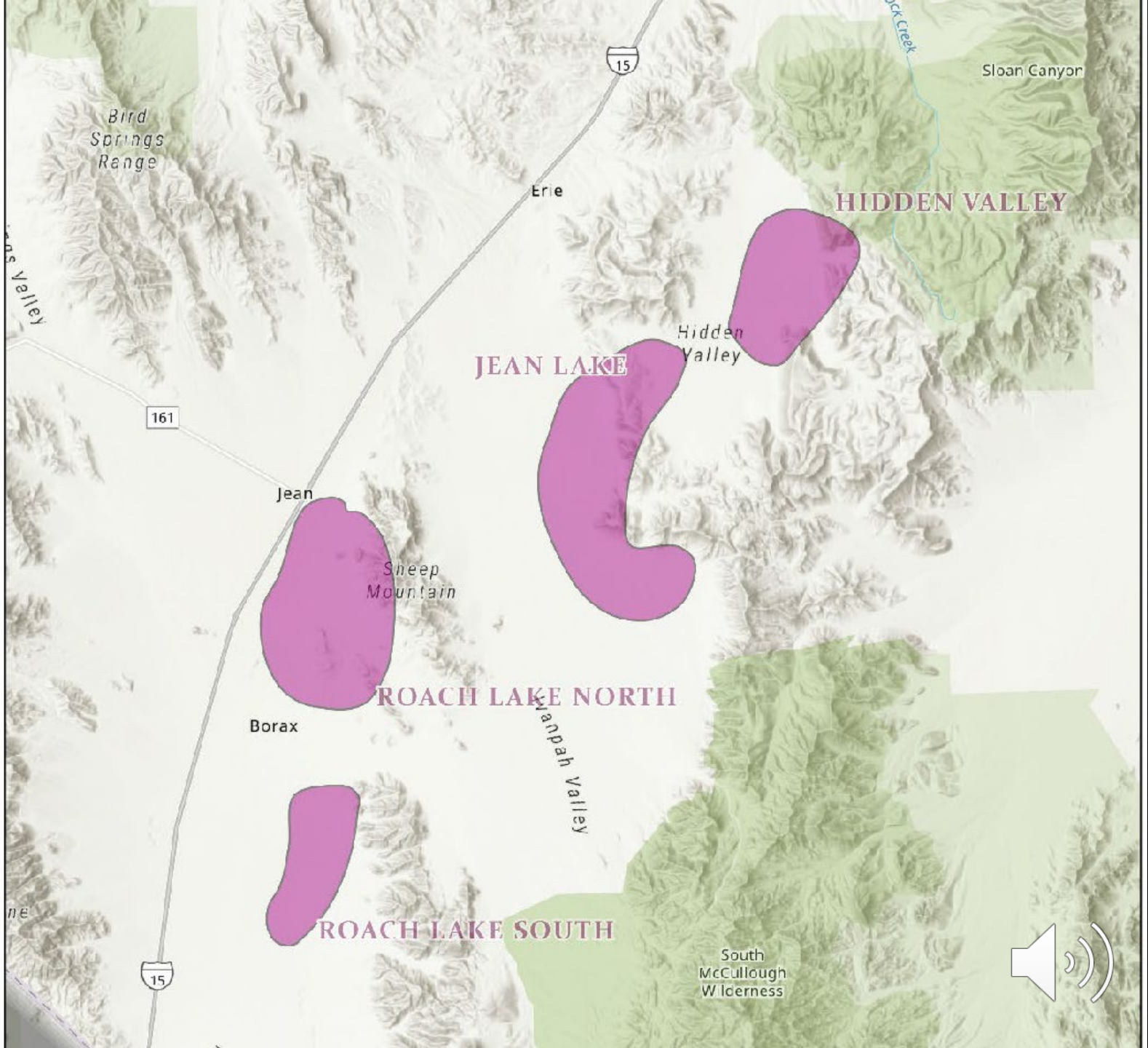
Objectives

1. Collect data on population boundaries, abundance estimates, habitat conditions and threats
2. Demographic monitoring at all major population areas within Clark County



Clark County Population

4 Main Subpopulations



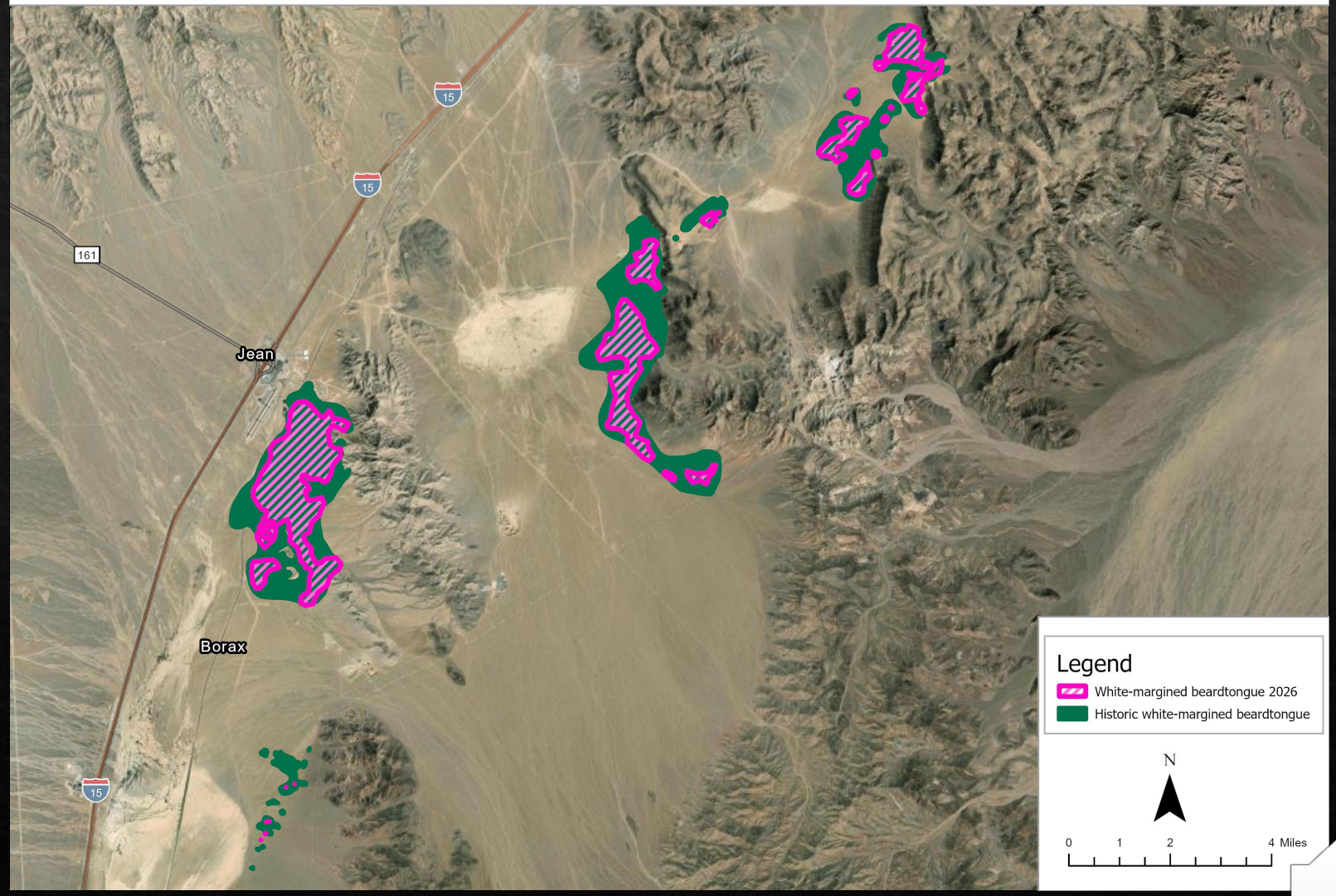
Clark County Population Abundance Trends

Study	Year	Abundance
Sheldon	1994	8,775
Smith	2001	25,964
Etyemezian	2010	125,825
PBC	2021	33,735

Historic NDNH:
5,965 acres

2026 Survey:
2,701 acres

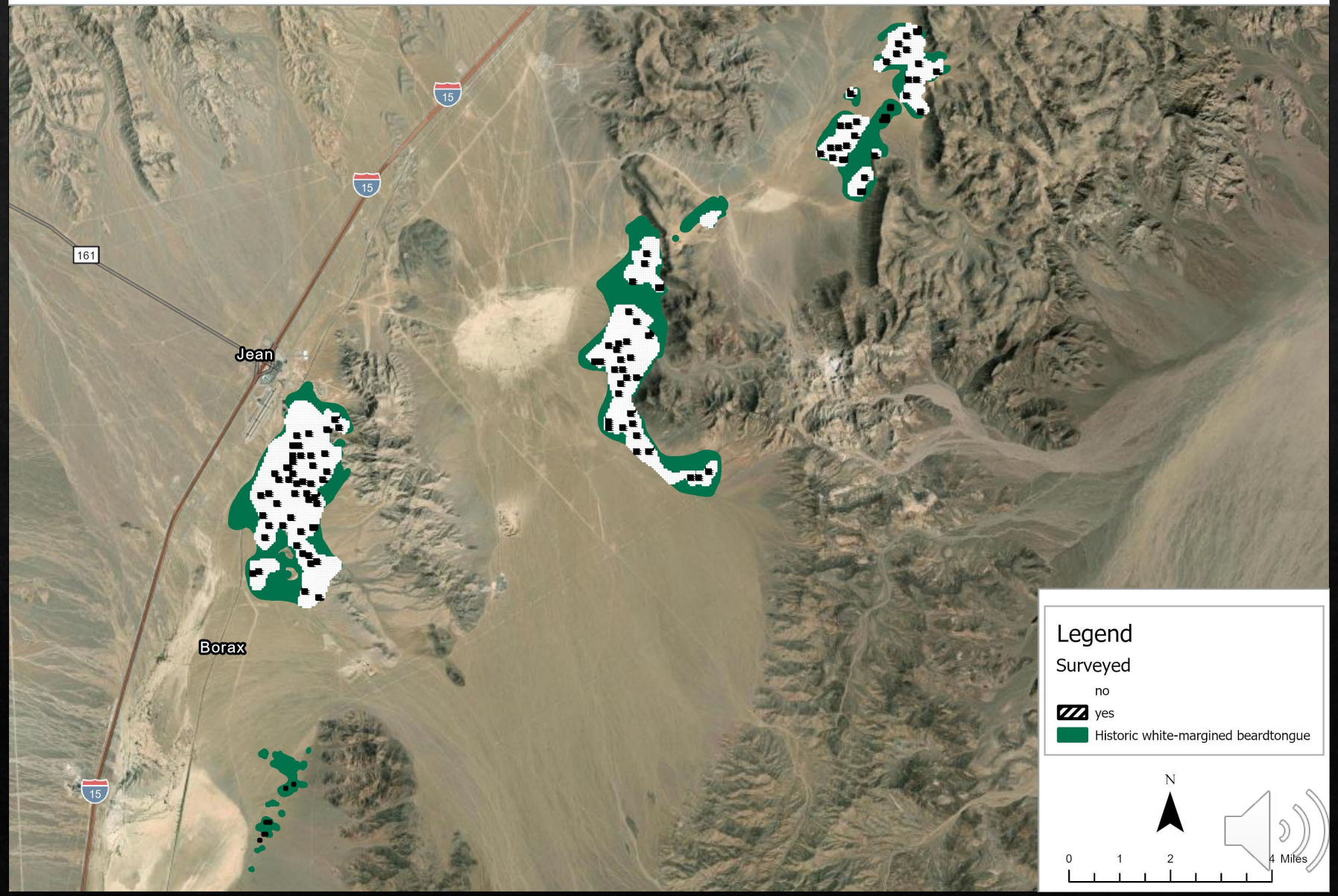
White-margined beardtongue (Penstemon albomarginatus)
Historic versus 2026 Population boundaries



631 acres surveyed within population boundaries

5.85-acre blocks composed of 9 51 x 51 m grid cells

White-margined beardtongue (Penstemon albomarginatus) Survey Areas



Abundance and density

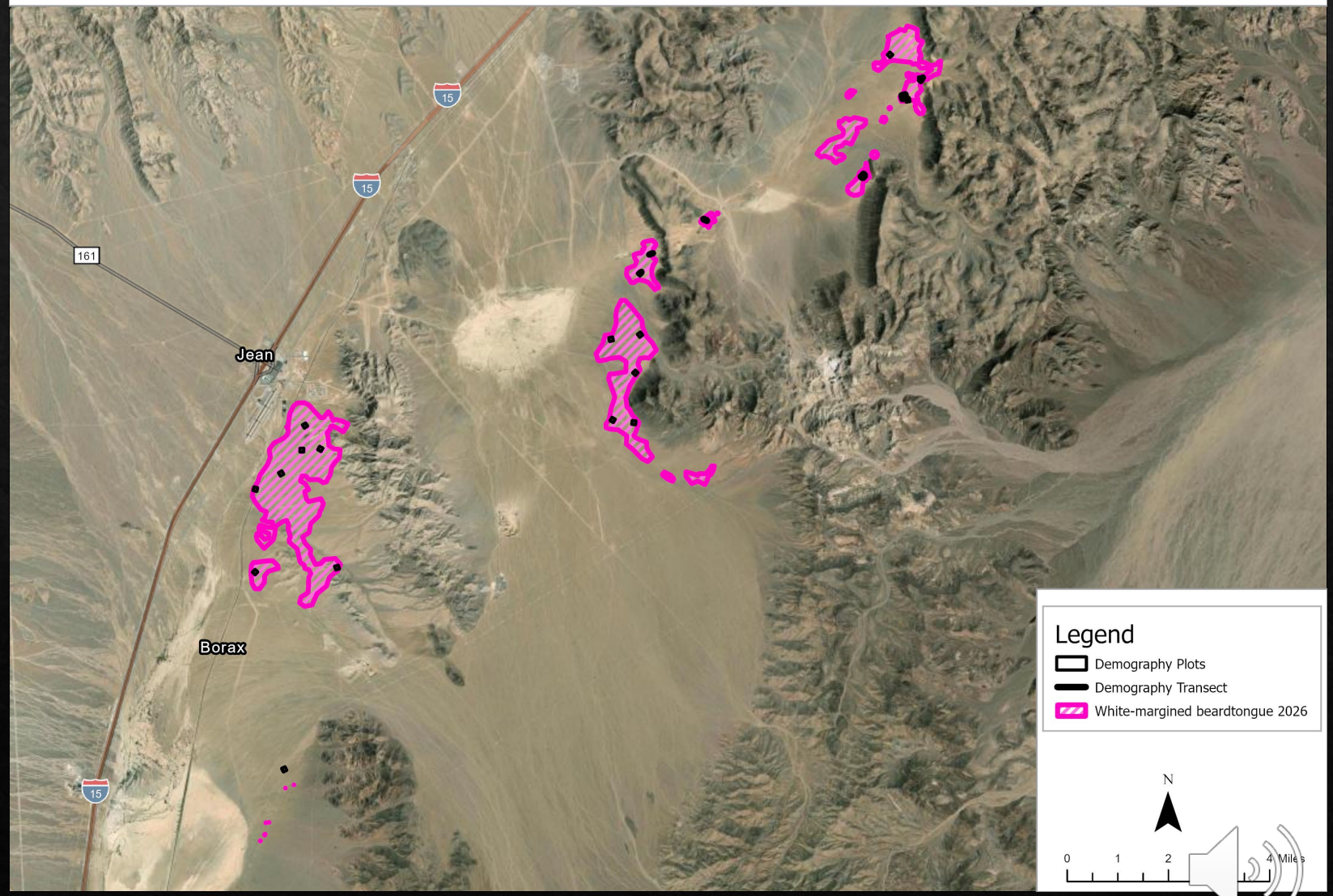
	Hidden Valley	Jean Lake	Roach Lake North	Roach Lake South
Total area 2026 (acres)	718.1	1,212	1,717.4	5.2
Surveyed area (acres)	161.5	186.5	278	5.2
Total plants	536	317	275	10
Mean density (plants/acre)	3.3	1.7	1.0	1.9
Total estimated plants	**2,370**	**2,060**	**1,717**	**10**
Total Clark County 2026			6,157	
2021 estimate			33,735	
2010 estimate			125,825	

12 Demography monitoring transects

(530 plants)

- Main monitoring in April
- Fruit maturation and seed counts in May

White-margined beardtongue (Penstemon albomarginatus) Survey Areas



67% had initiated reproduction in April, but 19% had dried buds/flowers and/or aborted fruit and 13% were completely desiccated

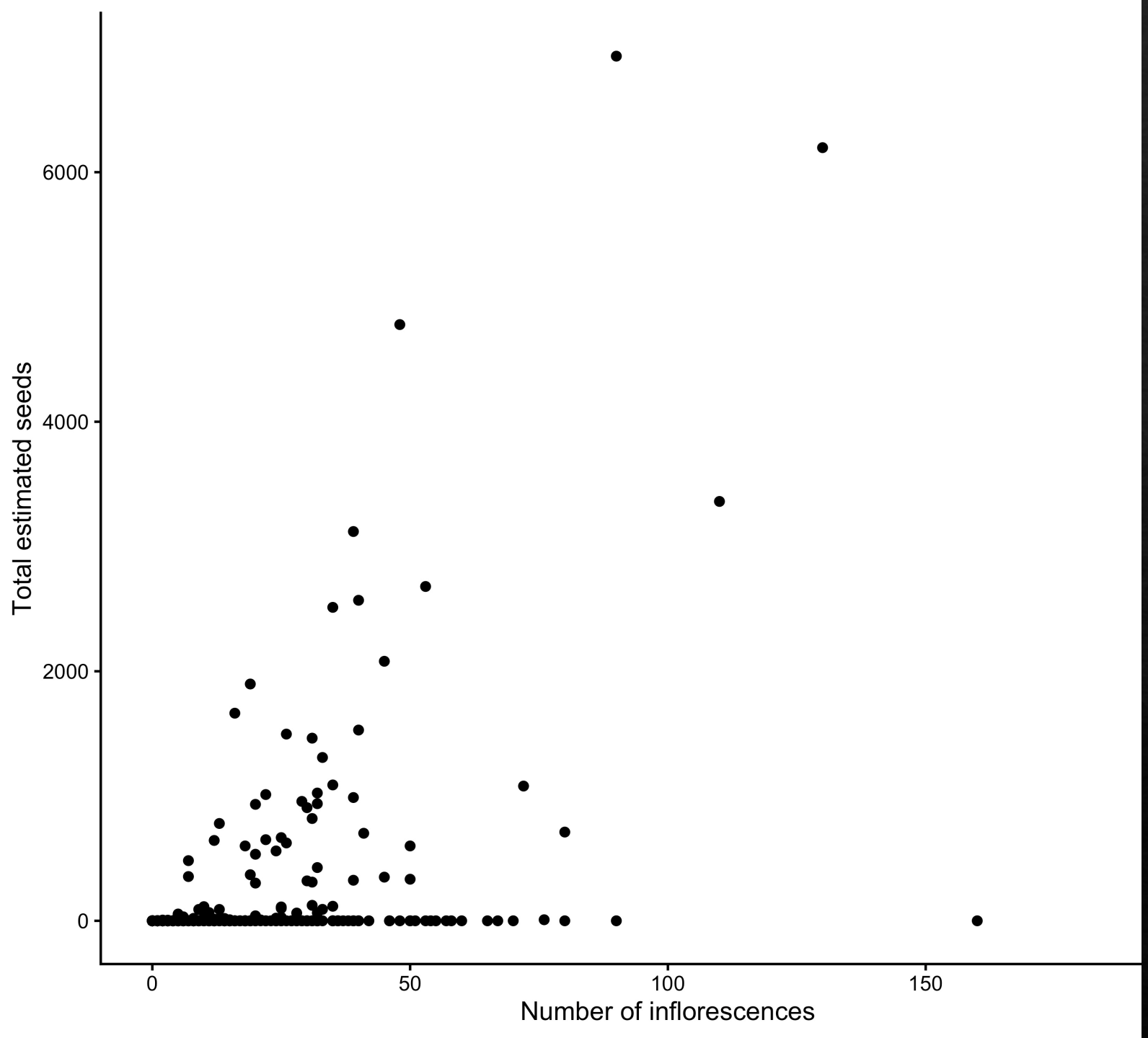
7 possible seedlings







74% senescent by May
14% with mature fruit



Total estimated seed production per number of inflorescences





Threats – Invasive Grasses

Impacting ~ 52% of population

Threats –OHV

Impacting ~ 51% of demography plants







Threats – Heat and Drought

Impacting ~ 85% of demography plants







Threats –Herbivory

Impacting ~ 11% of demography plants





Threats –Herbivory

Scale insect ~ 8.5% of demography plants

Summary

- Enormous white-margined penstemon declines in abundance and area occupied across Clark County
- Declines higher in the southern subpopulations, which are both warmer and more disturbed
- While winter precipitation was relatively good in 2025/2026, emergence and growth was far below what was expected
- Winter heatwave resulted in many plants senescing before setting seed
- This species urgently needs protection and is at real risk of extinction

Acknowledgements

- Clark County Desert Conservation Program for funding
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- Wendy Boes, GIS and fieldwork
- Matt Berger, Matt Reala and John McLaughlin fieldwork

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