Adaptive Grasslands Management
South San Diego County
Conserving costs through collaborative conservation

RESOURCES AGENCY CALIFORNIA DEPARTMENT FISH & GAME

U.S. FISH & WILDLIFE SERVICE

SWEETWATER AUTHORITY

City of San Diego PUBLIC UTILITIES Water & Wastewater

BLM

RECON Native Plants, Inc.

THE EARTH DISCOVERY INSTITUTE

LAND IQ

The Nature Conservancy Protecting nature. Preserving life.™

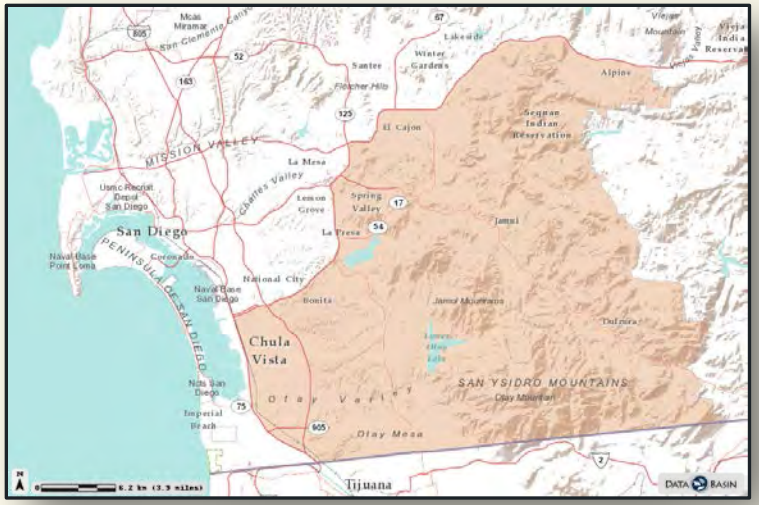
CONSERVATION BIOLOGY INSTITUTE

CAL FIRE SINCE 1885

Project Goal

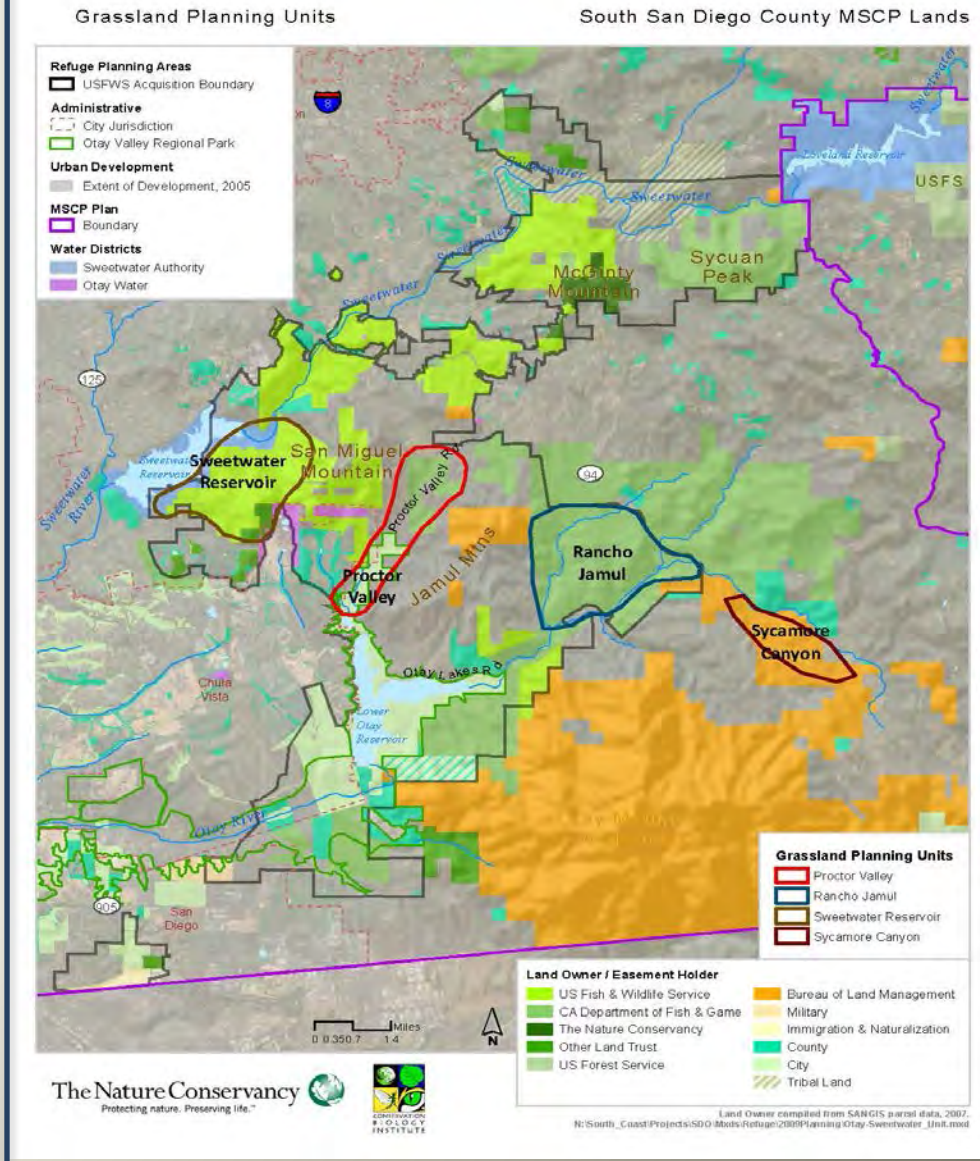
Develop landscape-scale, collaborative strategies for managing target grassland species in the South County MSCP

Study Area



4 sites

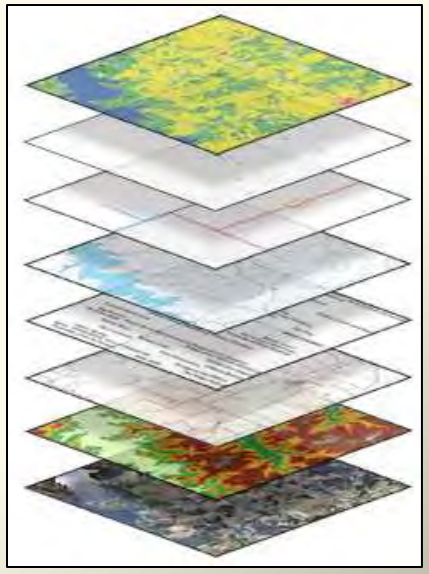
5 land owners



Phase I: 2011-2012

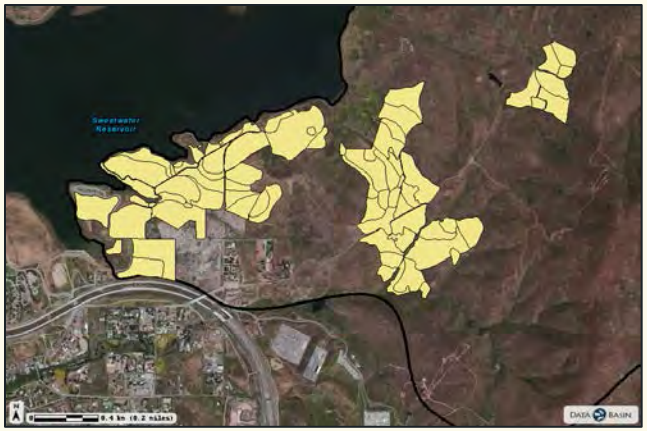
Habitat Assessments

- Abiotic Attributes
  - Slope
  - Elevation
  - Soil texture
- Biotic Attributes
  - Vegetation
  - Thatch
  - Host plants
  - Invasive species
  - Cryptobiotic crust
- Management Attributes
  - Disturbance history
  - Threats
  - Access



Restoration Strategies

Tier 1: (1°) Abiotic Factors



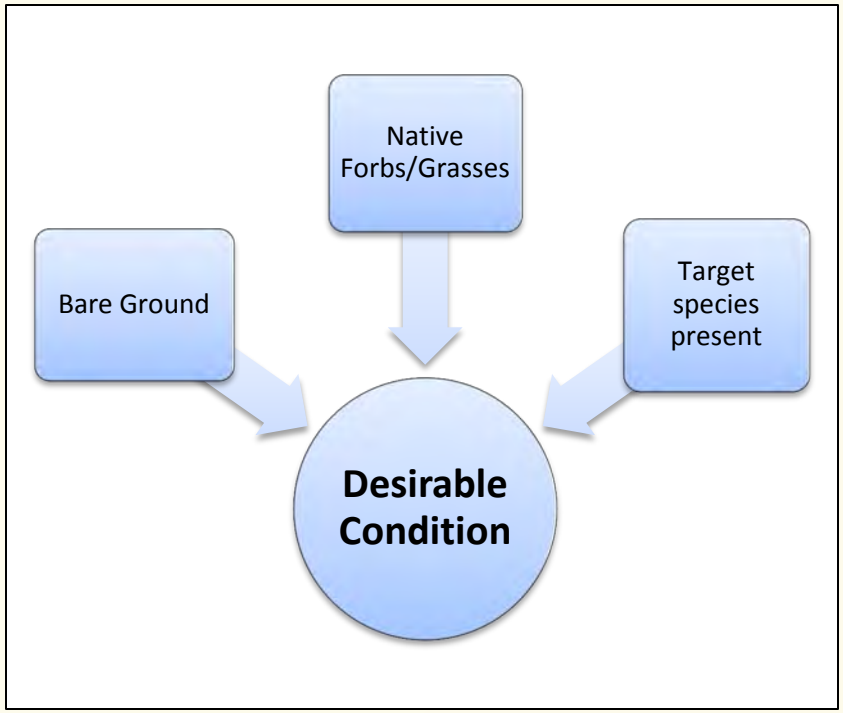
Native Grassland

Otay Tarplant

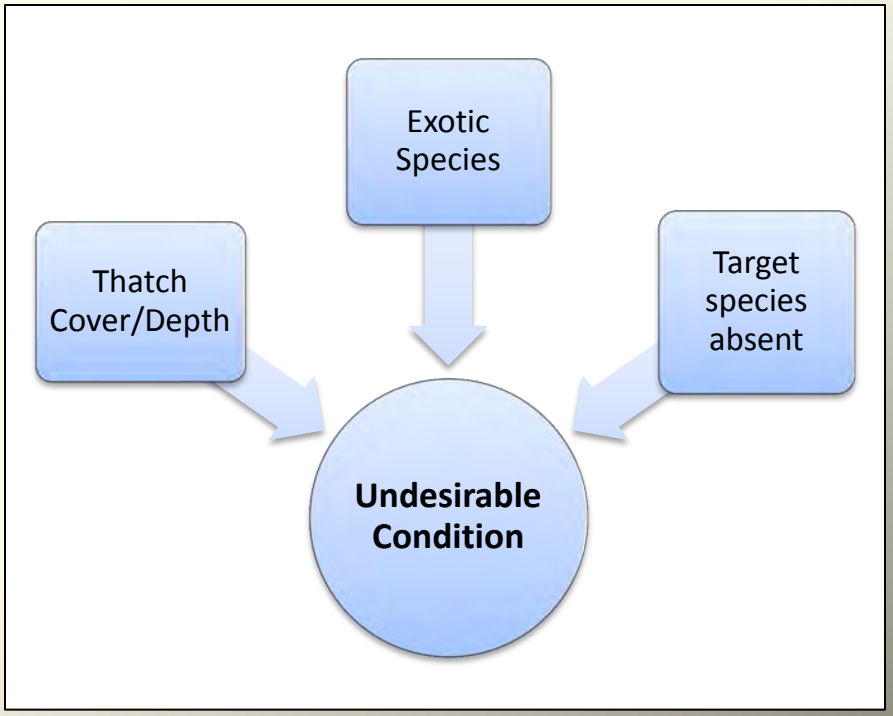
Burrowing Owl

Forbland

Tier 2: Biotic Factors

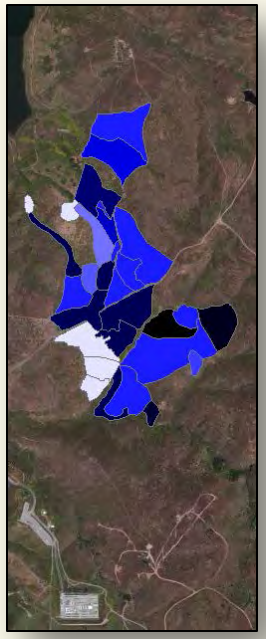


Potential for manipulation

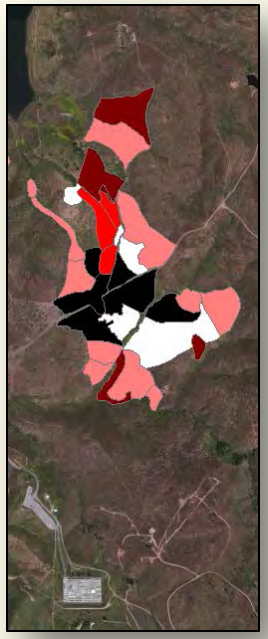


Otay Tarplant (Tier 1)

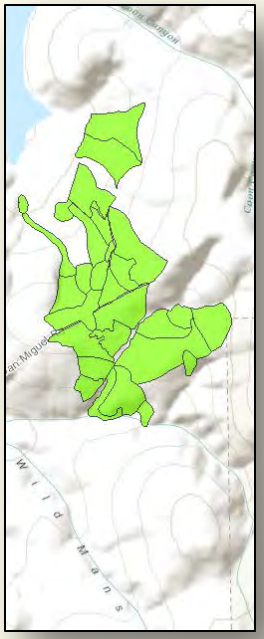
Data Inputs



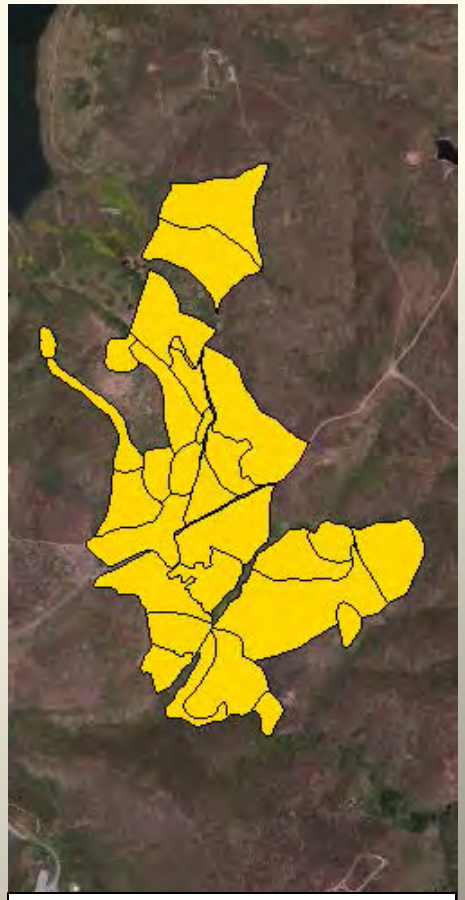
Soils



Shrub Cover

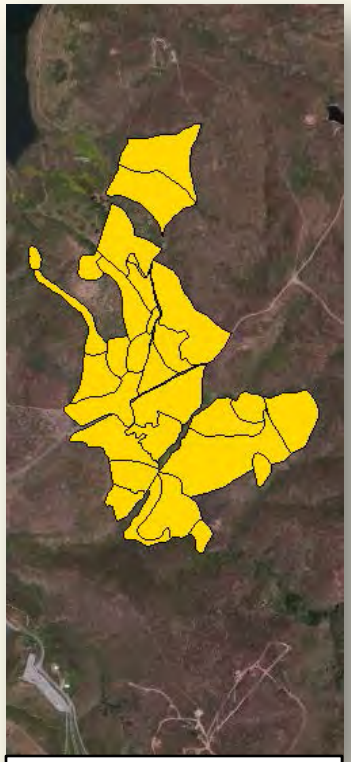


Elevation



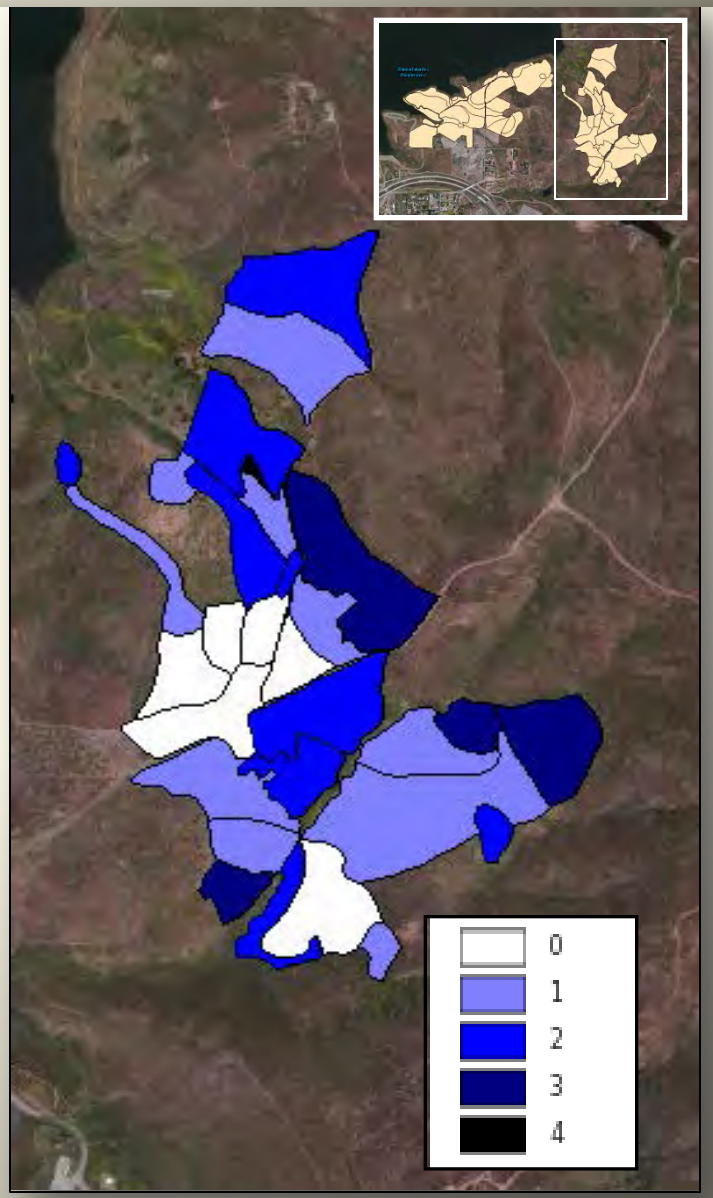
Minimum Habitat Requirements

Otay Tarplant (Tier 2)

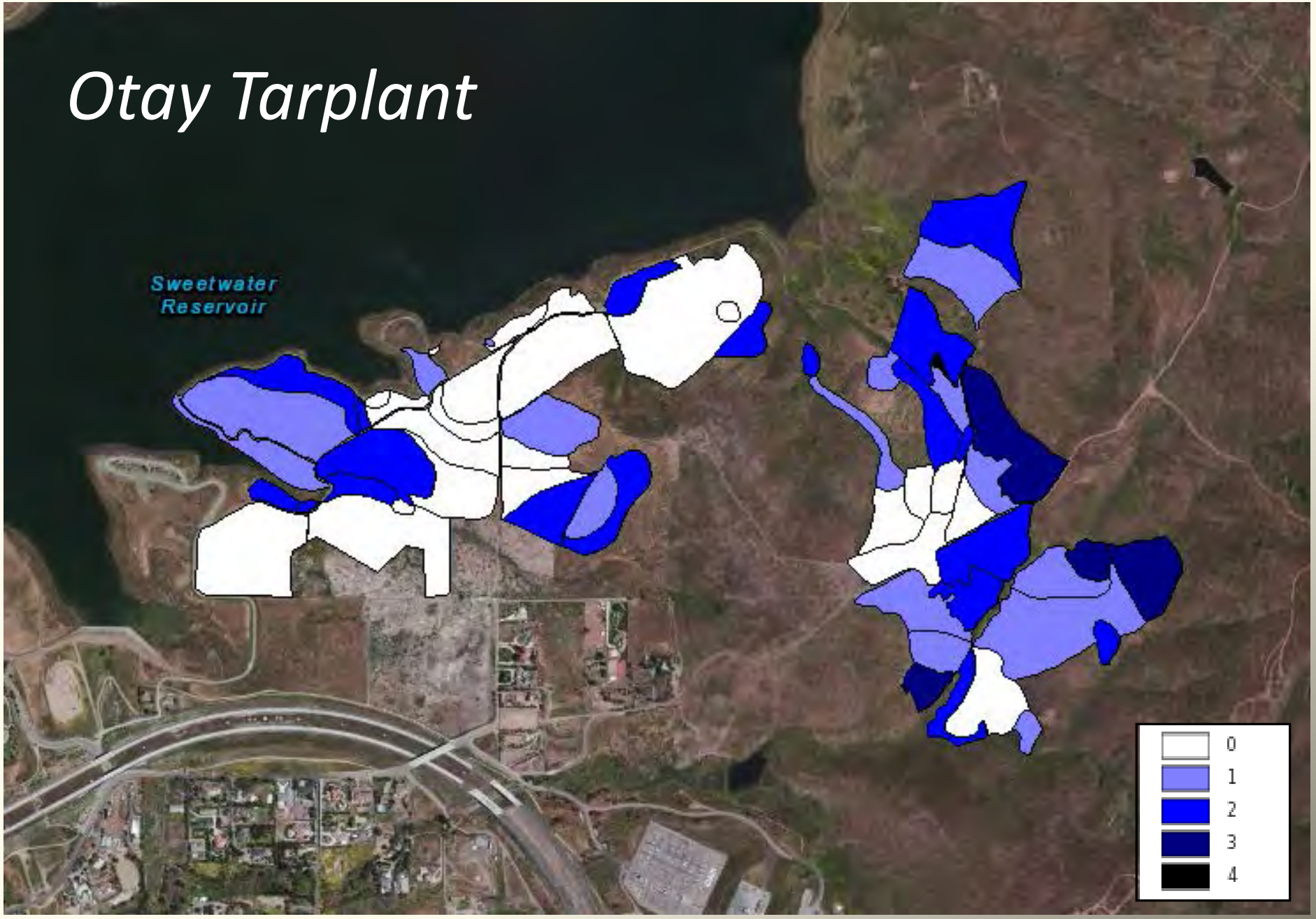


Minimum Habitat Requirements

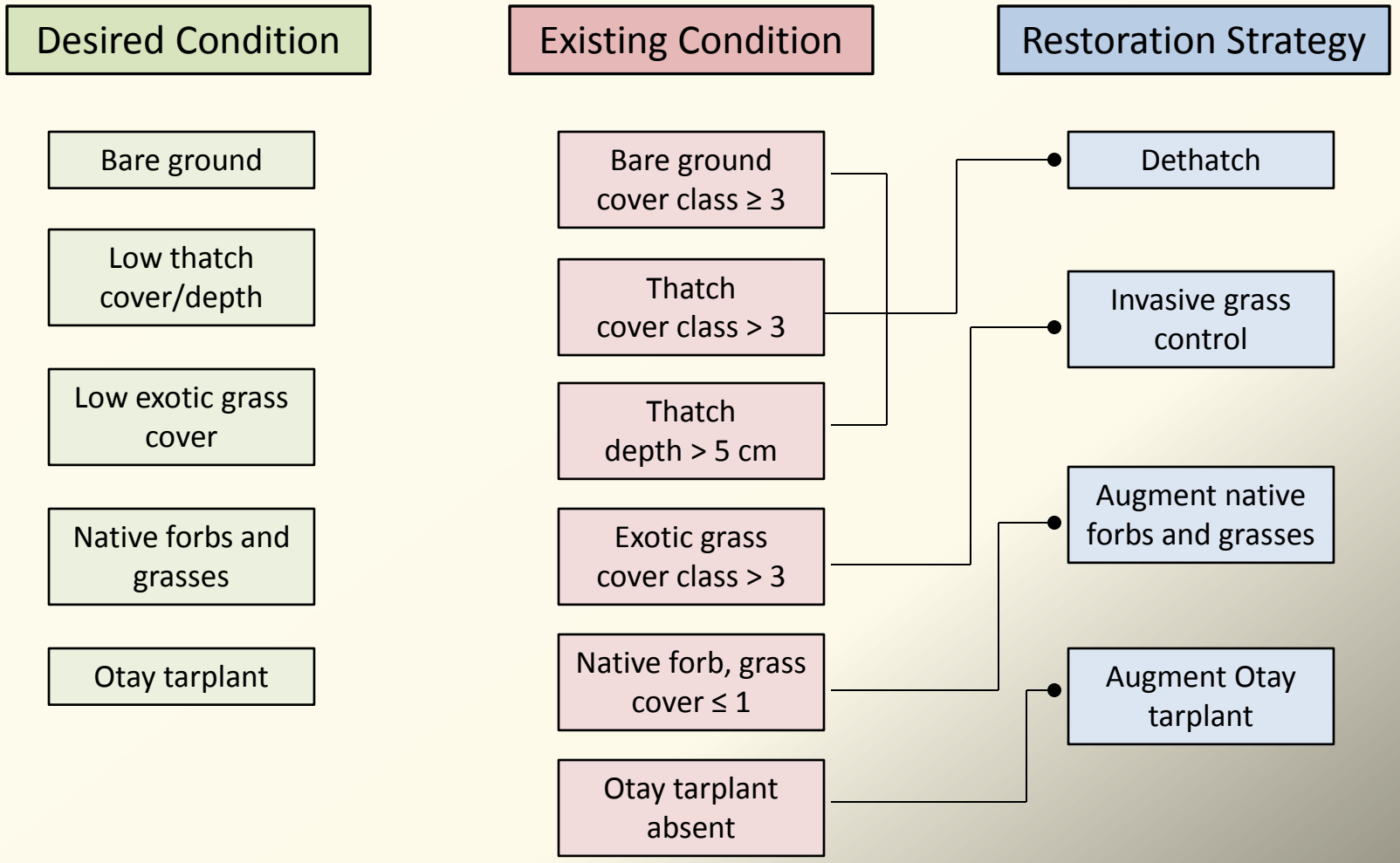
Biotic attributes



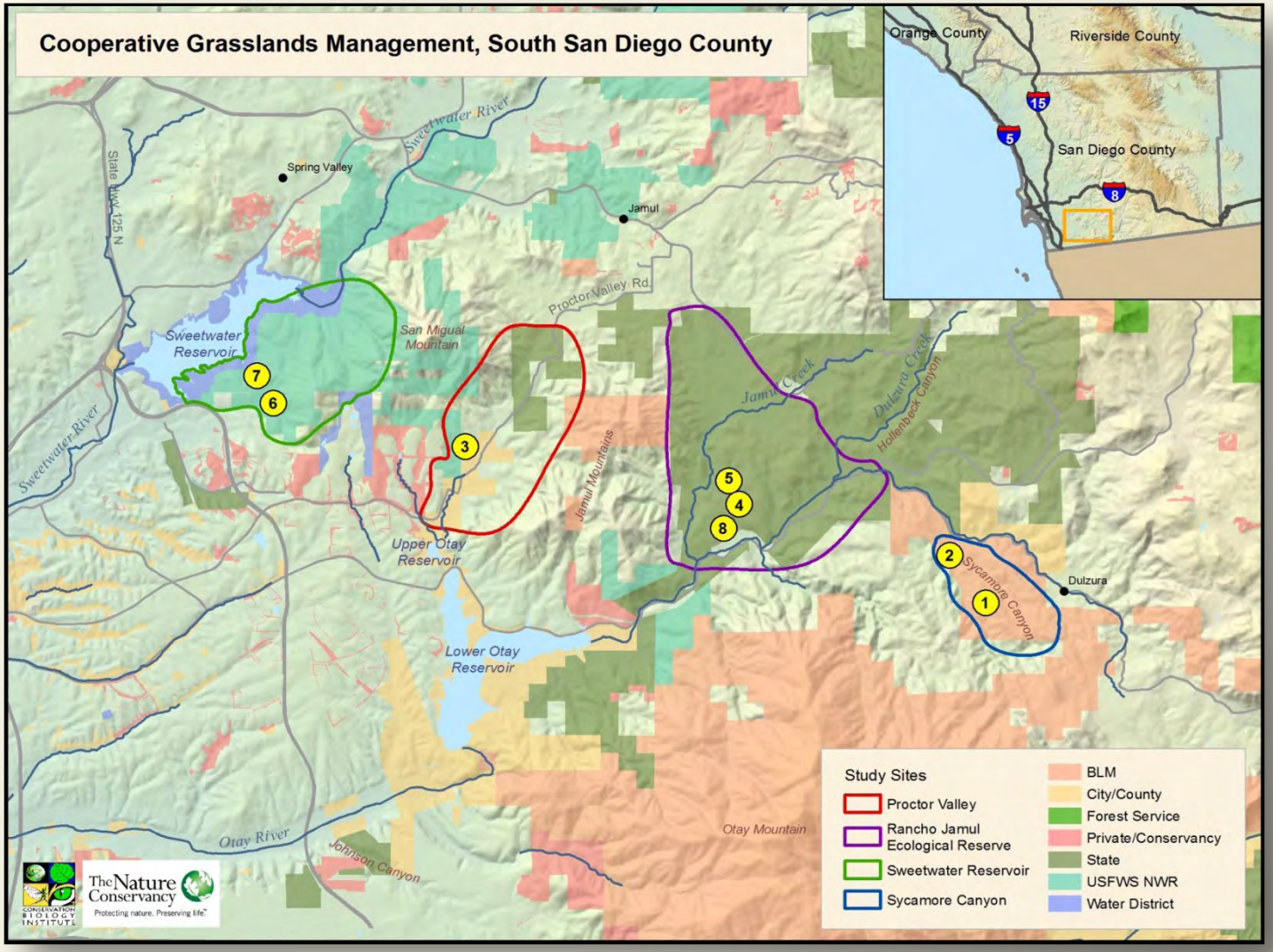
Otay Tarplant



Potential Restoration Strategies



Phase II: 2013-2015



Test methods for species, habitat restoration

Inform large-scale restoration

Quino Checkerspot Butterfly

Restoration Plan

Design

2 sites (PV, SC)
20 ft x 20 ft plots
(n=15)

Treatments

Dethatch
Weed control
Seeding – one mix, two techniques
Buffer

Questions

Site differences
Seeding methods

Forblands

Restoration Plan

Design

1 site (SC)
2 mechanized treatments
24 ft x 50 ft plots (n=20)

Treatments

Dethatch
Mowing, herbicide
Broadcast seed
Buffer

Questions

Control methods

Otay Tarplant, Grassland

Restoration Plan

Design

5 sites (SW, RJER)
2 mechanized treatments
24 ft x 50 ft plots (n=20)

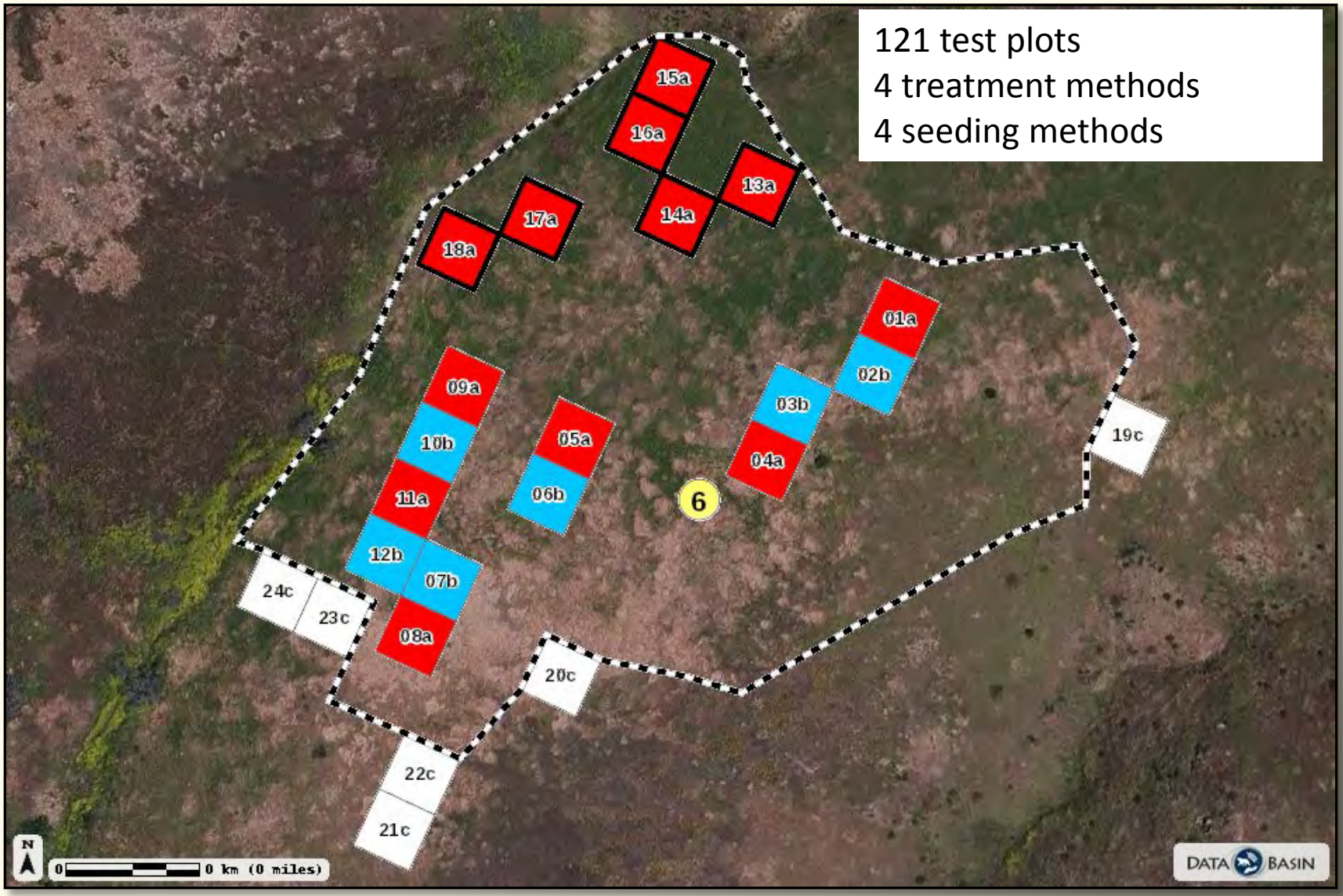
Treatments

Dethatch
Mowing, herbicide, burn
Broadcast seed
Buffer

Questions

Control methods
Seeding methods
Seeding mixes
Site history
Soil differences

Experimental Design



Site Preparation

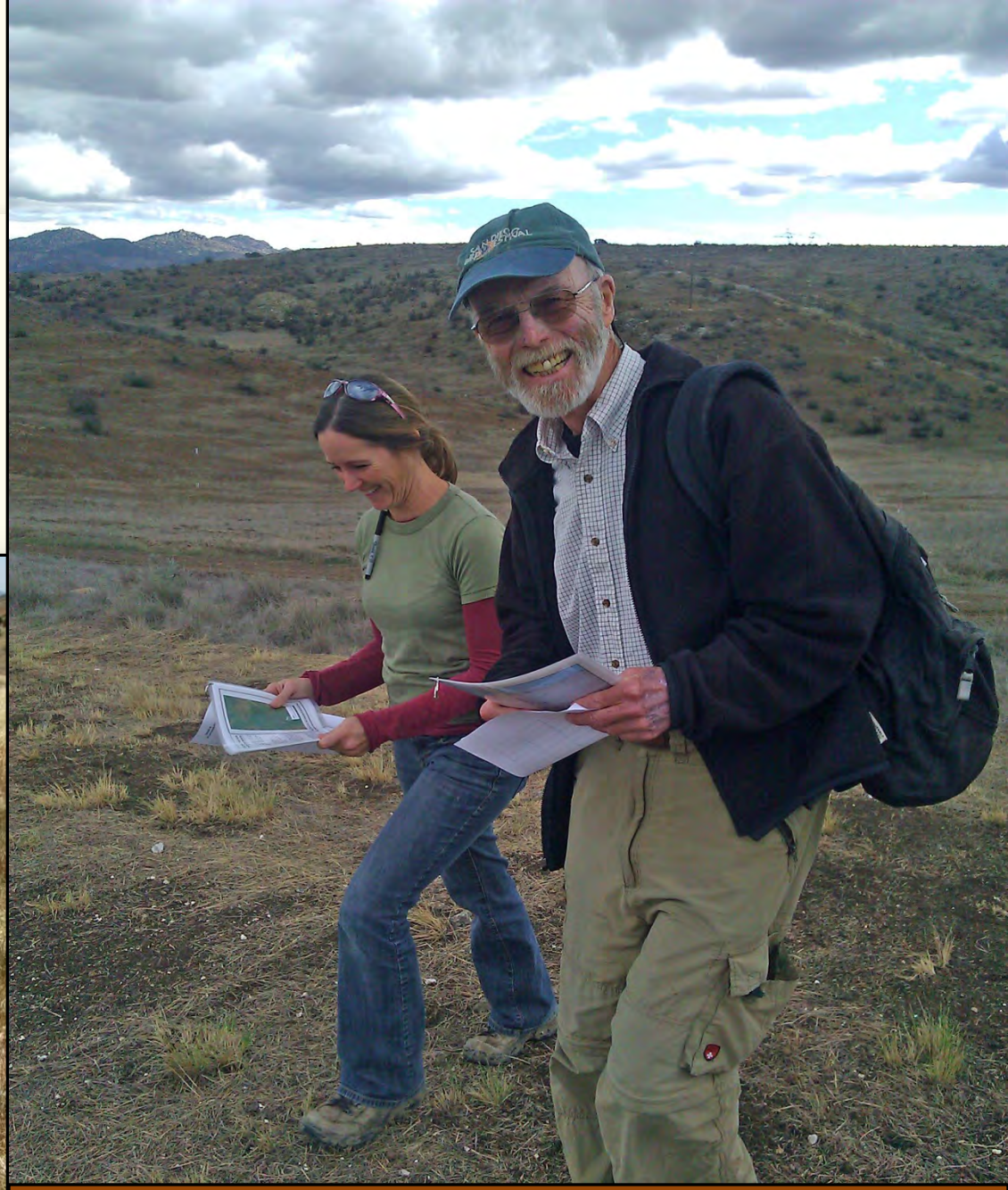
Experimental Treatments

Site 2 (Sycamore Canyon):

Site 6 (Sweetwater Reservoir):

Monitoring

Quantitative Monitoring
Photomonitoring



2013 Photomonitoring Workshop

Seed Collection

Volunteers
Professionals

Seed Storage – Otay Tarplant

Temporary collection

- 4 populations/8196 seeds
- Available for bulking

Conservation collection

- 5 populations/150 plants/4632 seeds
- Maternal lines (maximum breeding & recovery)
  - Active research collection (20%, RSABG)
  - Base collection (40%, long-term storage, RSABG)
  - Backup collection (40%, long-term storage, National Center for Genetic Resource Preservation)

Seed Testing – Otay Tarplant

Germination vs viability
Excise ungerminated seed
Dormancy testing

Accession	Sown (#)	Germ(#)	Germ (%)	Notes
RJER	13	3	23	5 dissected – 4/5 filled
RJER	12	1	8	5 dissected – 4/5 filled
SHIN	27	2	7	5 dissected – 1/5 filled
SHIN	16	4	25	5 dissected – 4/5 filled
RJER	11	1	9	5 dissected – 5/5 filled
GOBB	14	4	29	5 dissected – 5/5 filled

Sample/Treatment		Sown (#)	Germ (#)	Germ (%)
SHIN	Control	50	3	6
GOBB	Control	50	4	8
RJER	Control	50	3	6
SHIN	Scarify soak	50	7	14
GOBB	Scarify soak	50	5	10
RJER	Scarify soak	50	6	12
SHIN	Soak	50	15	30
GOBB	Soak	50	6	12
RJER	Soak	50	4	8
SHIN	Cold moist	100	15	15
GOBB	Cold moist	100	11	11
RJER	Cold moist	100	9	9
SHIN	GA3	50	2	4
GOBB	GA3	50	0	0
RJER	GA3	50	0	0

Seed Bulking

Otay tarplant
Needlegrass

Expected Results

1 Active Restoration

Treatment Plots

7.2 acres

- 0.22 acre QCB habitat
- 0.44 acre forbland
- 4.86 acres native grassland
- 1.72 acres OTP habitat

2 Weed Control

Buffer Zones

42.5 acres

- 0.22 acre QCB habitat
- 10.44 acres forbland
- 10 acres OTP habitat
- 21.8 acres native grassland

3 Management

Recommendations

- Cost/acre
- Success rates
- Concept plan

Fall 2014/Winter 2015 | Spring 2015 | Fall 2015 | Spring 2016

Weed control treatments

Qualitative monitoring, Seed bulking, Summary report

Seeding

Quantitative Monitoring