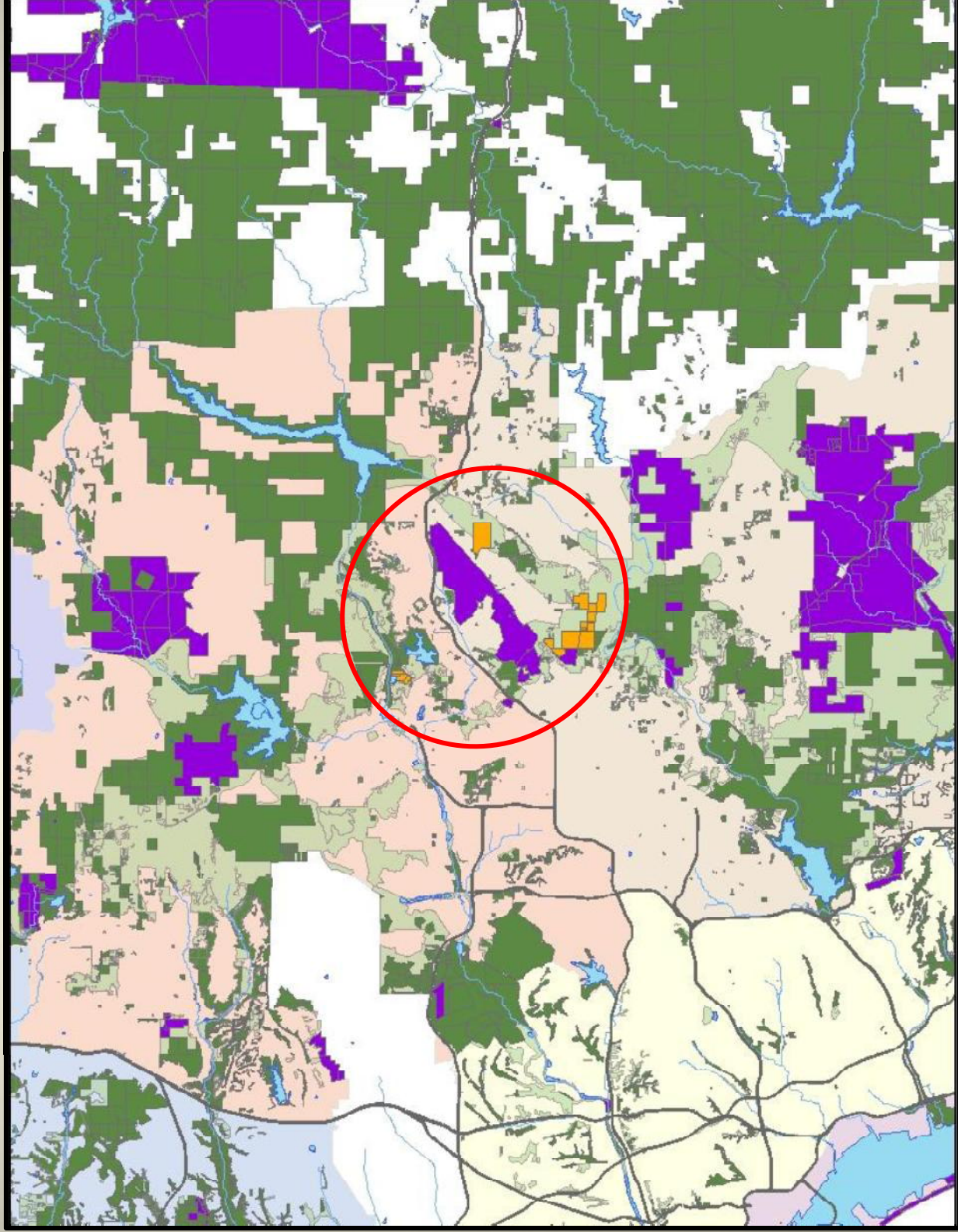


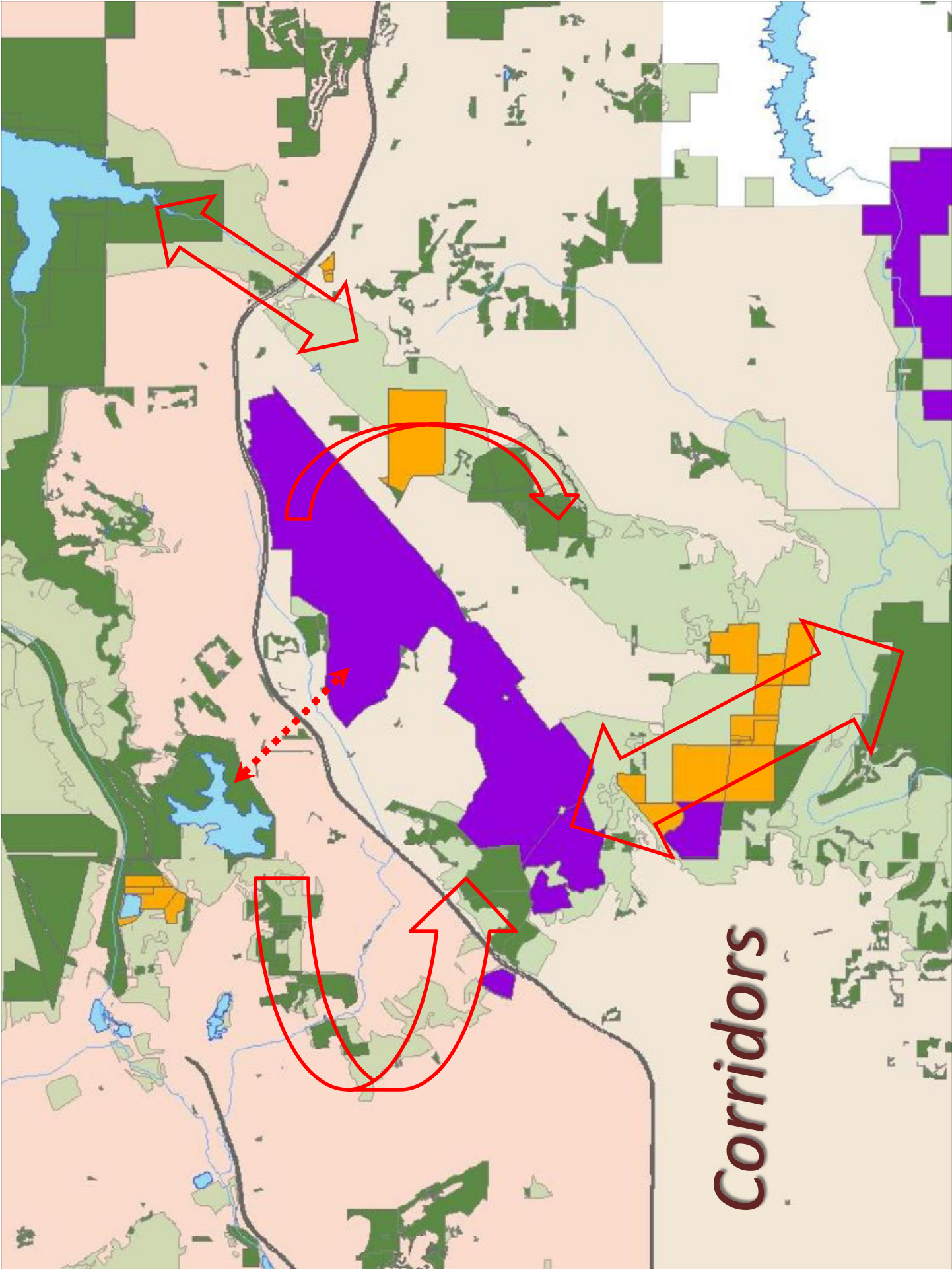
Crestridge Ecological Reserve Complex

Nucleus of the MSCP



Nucleus of the MSCP





Corridors

Geography and Conservation Values

- Key connection between MSCP north and south
- 13 covered species
- Core area for Lakeside ceanothus, Hermes copper butterfly, Engelmann oak woodlands
- Movement corridor for birds, mammals, insects, and plant dispersal
- Genetic link for Quino checkerspot butterfly, Hermes copper butterfly, San Diego thornmint



Management, Monitoring, and Community Outreach

- Model for collaboration between agencies, land managers, science, and public outreach
- Management issues created by being totally surrounded by residential community
- Land manager presence on site and volunteer patrol
- First strategic science-informed adaptive monitoring and management program in MSCP



Earth Discovery Institute

- Public interface to recreational users and neighbors
- Biologically sound education and outreach efforts driven by the management plan
- Communication with law enforcement and fire agencies
- Community eyes on the reserve



Public Outreach and Education

- Volunteer Stewardship
 - Reserve Rangers
 - Neighbors
- Education
 - Maps, target species list
 - Invasive species fact sheets
 - Assistance with control

Cynara cardunculus

Artichoke Thistle, Cardoon

How is it identified?

Large perennial herb to 2.5 meters (7.5 feet) tall; gray-green leaves; bright purple flower heads 5-8 centimeters (2-3 inches) in diameter; stout spines on leaves, stems, and flowering bracts.

When does it flower?

April – July.

Where is it found?

Disturbed areas, fallow or abandoned fields, grasslands, riparian woodlands, openings in coastal sage scrub and chaparral; does well in heavy clay soils.



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Why is it a problem?

Outcompetes native vegetation for light, water, and nutrients; dense stands displace native vegetation and wildlife, impede wildlife movement.



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References:
Di Tomaso, J.M. and E.A. Healy, 2007. Pages 302-305 in *Weeds of California and other western states*, Vol. 1 – *Aliaceae-Fabaceae*. University of California Press, Berkeley, CA.
Kelly, M. Pages 139-145 in *Bowand, C.C., J.M. Randall, and M.C. Hochberg, eds. Invasive plants of California's wildlands*. University of California Press, Berkeley, CA. 360 pp.



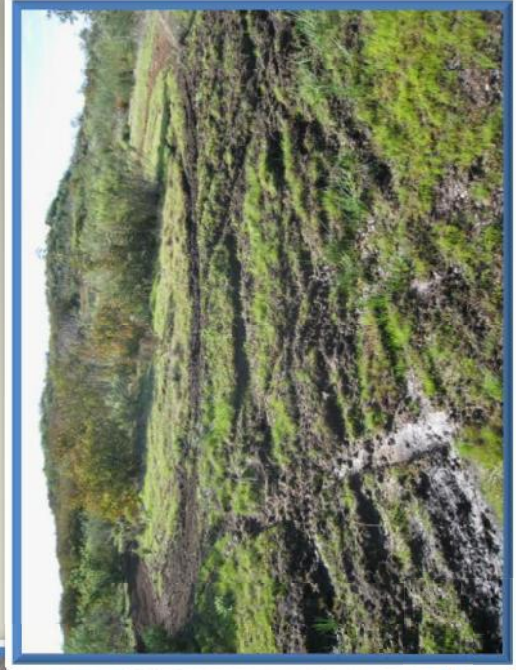
Environmental “Service-Learning”



Driven by the habitat management plan and state science curriculum standards



Monitoring and Preventing Vandalism



Through
community
outreach and
volunteer patrols
(49 incidents in
2012)



Training Volunteers

- Native plant demonstration garden
- Sign installation
- Hand weeding
- Trash pickup
- Non-native plant patrol
- Trail brushing
- Seed collection



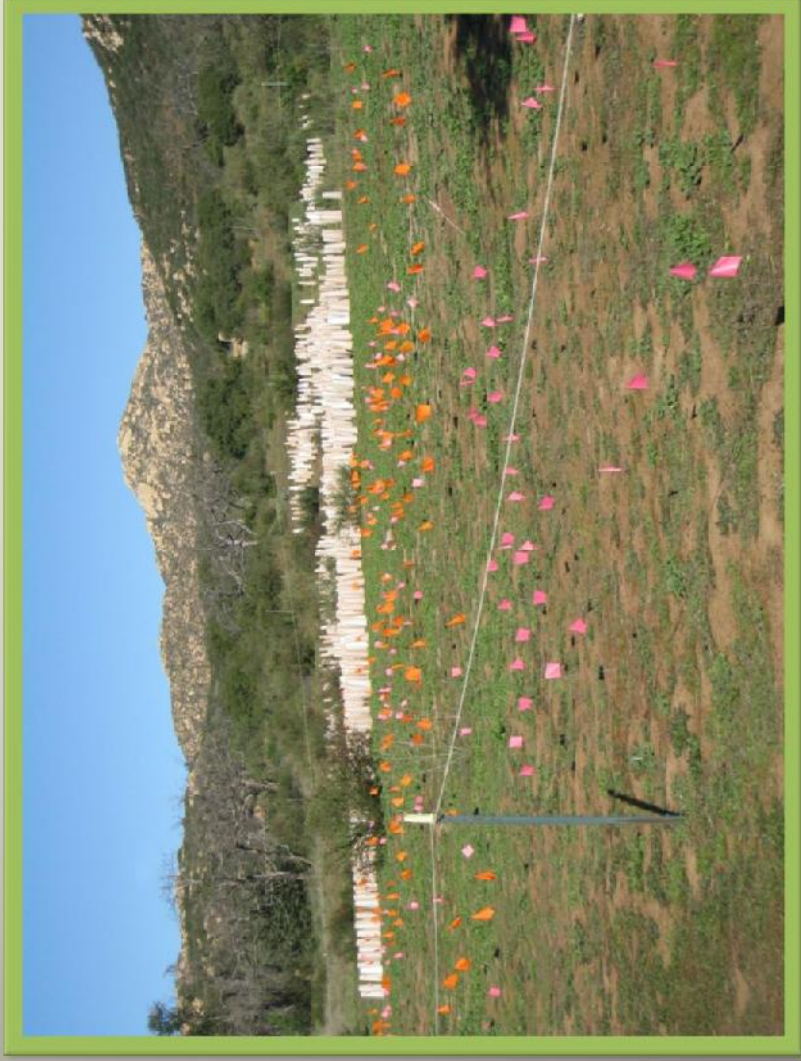
Community Service



Informational kiosk
and trail repair



Habitat Restoration through Community Stewardship



Seed collection &
restoration:

- 10 acres CSS
- 10 acres
grasslands
- 16,000+ plants



Earth Discovery Institute

- Helps land managers meet conservation goals
- Increases cost-effectiveness through training of volunteers
- Creates community support for conservation
- Minimizes public liability through signage, communication, and fire safety



EDI by the Numbers. In 2012...

- Volunteer patrol members reported 26 incidents such as vandalism, illegal vehicles, etc.
- CER weekly volunteers contributed 150+ hours toward habitat management goals
- Students visiting CER on school science field trips planted 1,800 native grasses in support of the grasslands restoration program
- Volunteers improved or maintained 3+ miles of trails
- Volunteers installed 30+ rules, trail, and interpretive signs in the CER complex
- Volunteers removed 3 relic vehicles from CER

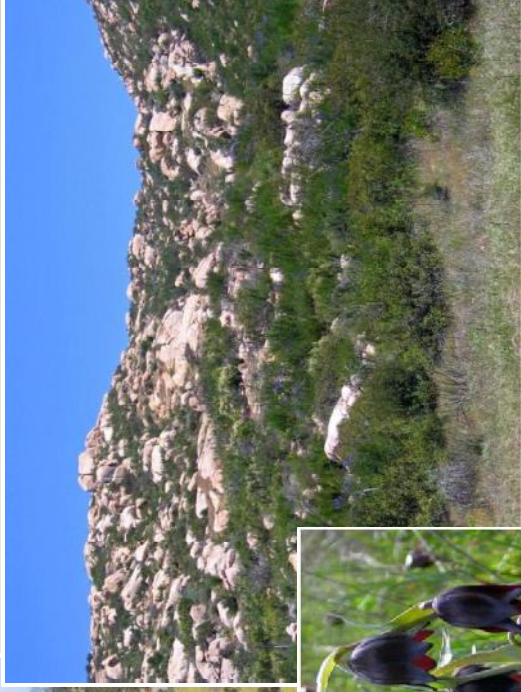


CBI—Science Partner

- Covered species monitoring and adaptive management
 - Funding: Endowment, SANDAG EMP grants (\$459,905 [2010-2013])
- Science-based protocols and templates for management
- Data collaboration (local, regional, state)
- Environmental education



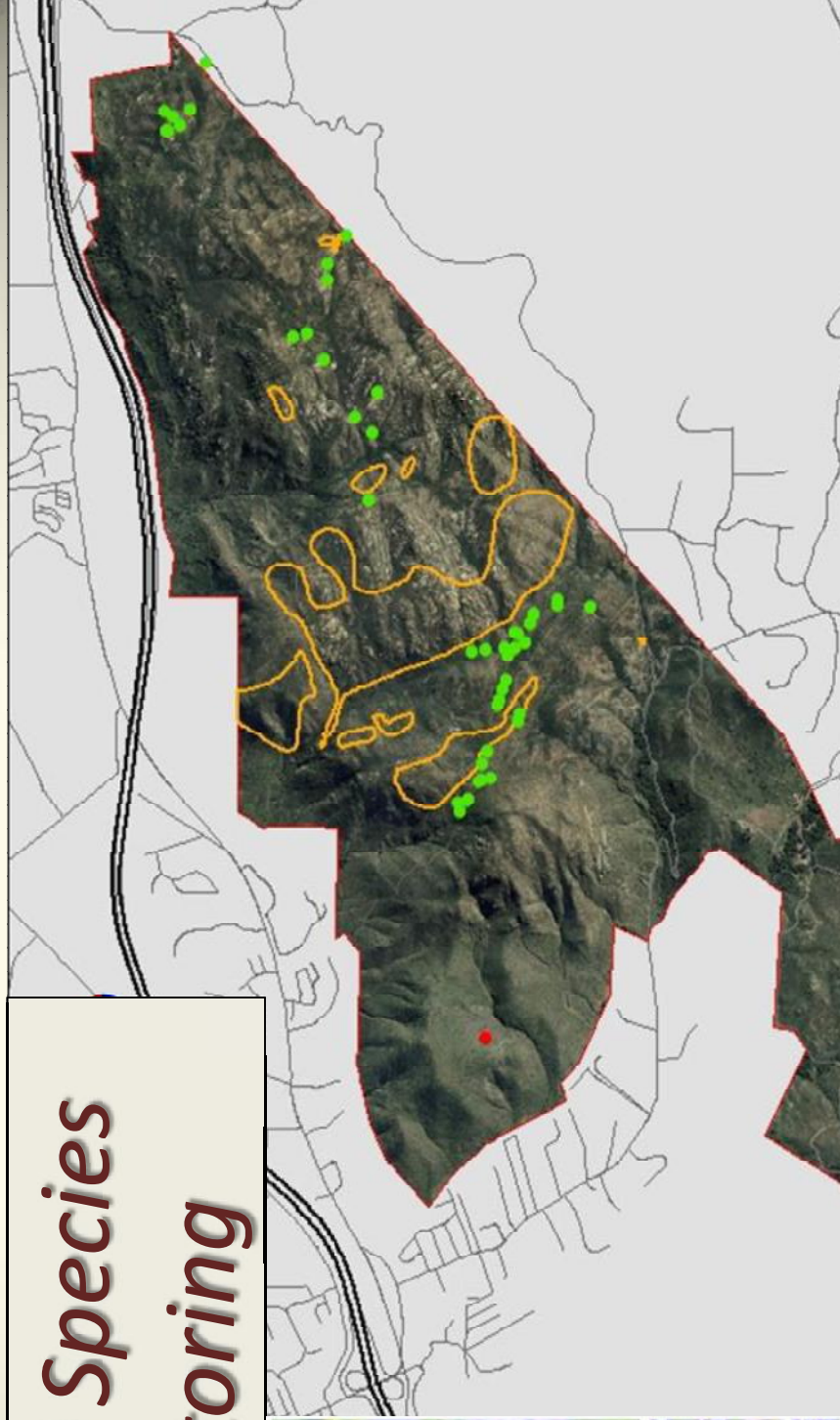
Science-based Monitoring



- Surveys and monitoring
- Oak tree inventories
- Invasives control
- Habitat restoration
- Pollinator studies
- Wildlife movement/corridors studies



Covered Species Monitoring



• Major population

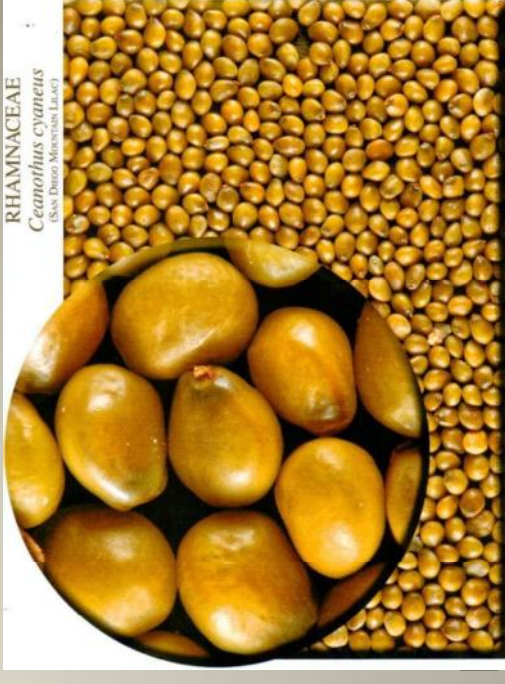
- Obligate seeder
- Flowering, pollinators, no disease, few invasives
- Reduced spatial distribution/population size (?)
- Fire frequency

Lakeside Ceanothus



Conservation Seed Collection

- Preserve genetic diversity
- Capture temporal and spatial variability
- Provide source material (restoration/research)
- Multiple repositories
 - Rancho Santa Ana Botanic Garden
 - National Center for Genetic Resource
 - Institute for Conservation Research



Regional Implications

- Informs regional management/monitoring strategy
 - Protocols (monitoring, seed collection)
 - Species status (post-burn data)
- Establishes seed bank
 - Proactive conservation measure
 - Model for management unit/regional seed bank



Invasive Species Mapping

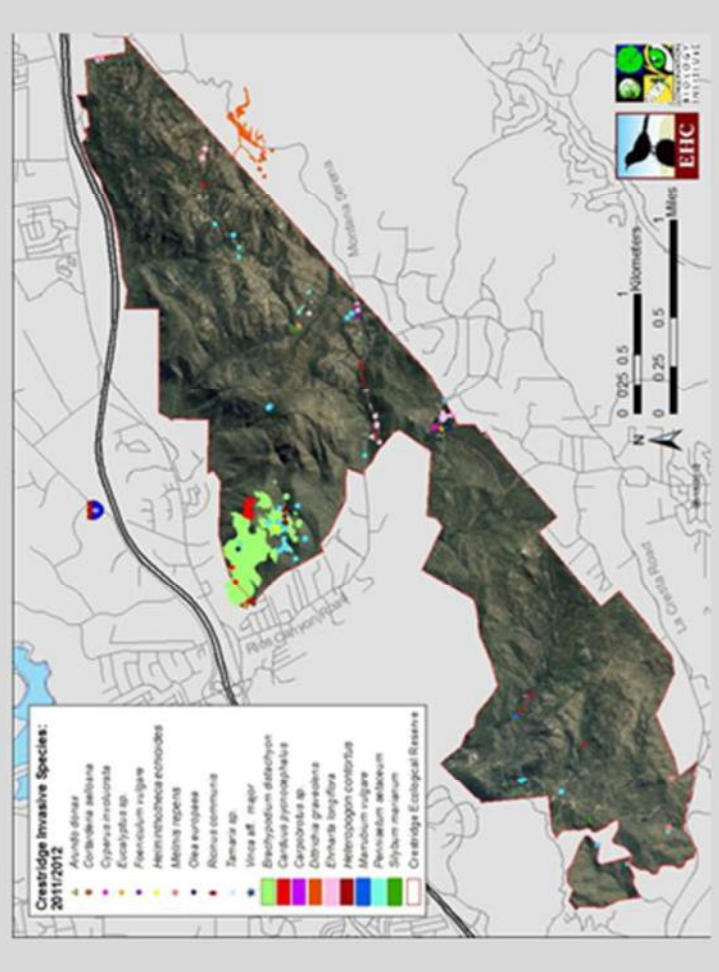
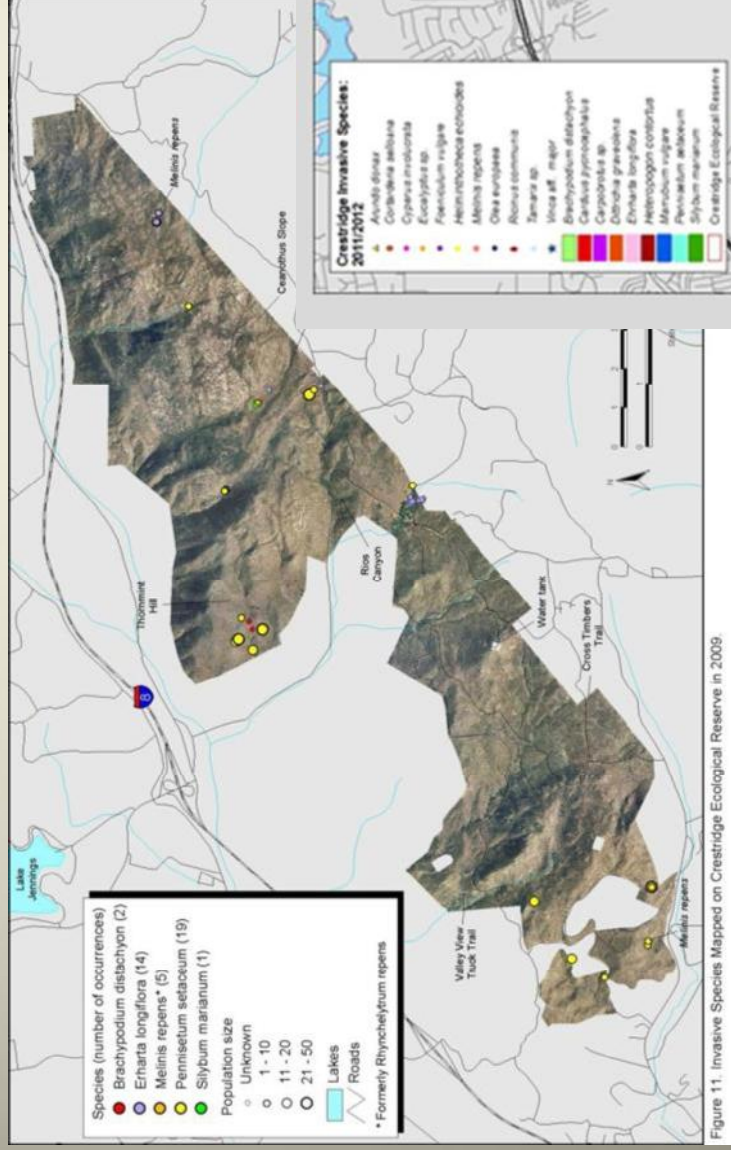


Figure 11. Invasive Species Mapped on Crestridge Ecological Reserve in 2009.

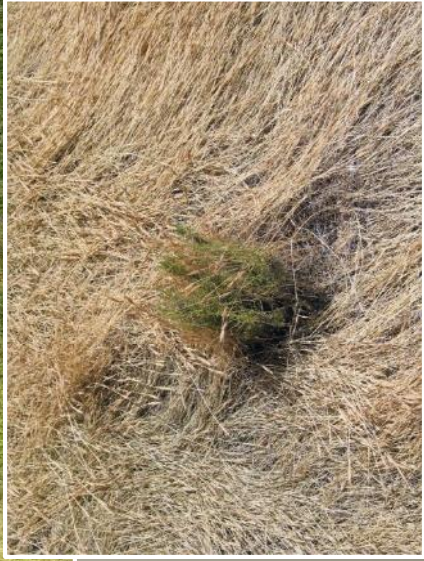
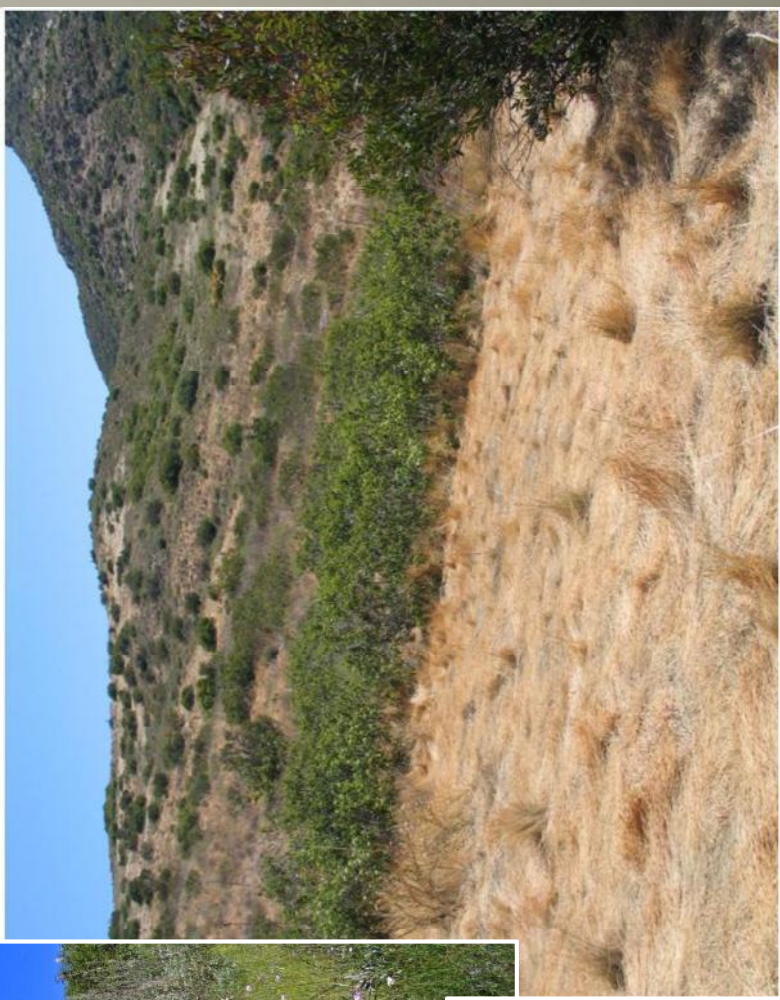


Invasives Management Program

- Regional Invasive Species Framework
 - Risk assessment
 - Treatment strategy
- Preserve-level Prioritization
 - Impact, extent, threats to conservation targets
 - Targeted invasives control
 - Model for preserve-level implementation of regional invasive species strategy



High Priority Invasive Species



Brachypodium distachyon

- Clay and gabbro soils
- Rapid post-fire spread; copious seed production; high seed viability, low dormancy
- Displaces other species
- May alter fire frequency, soil nutrient cycling, soil moisture, etc.

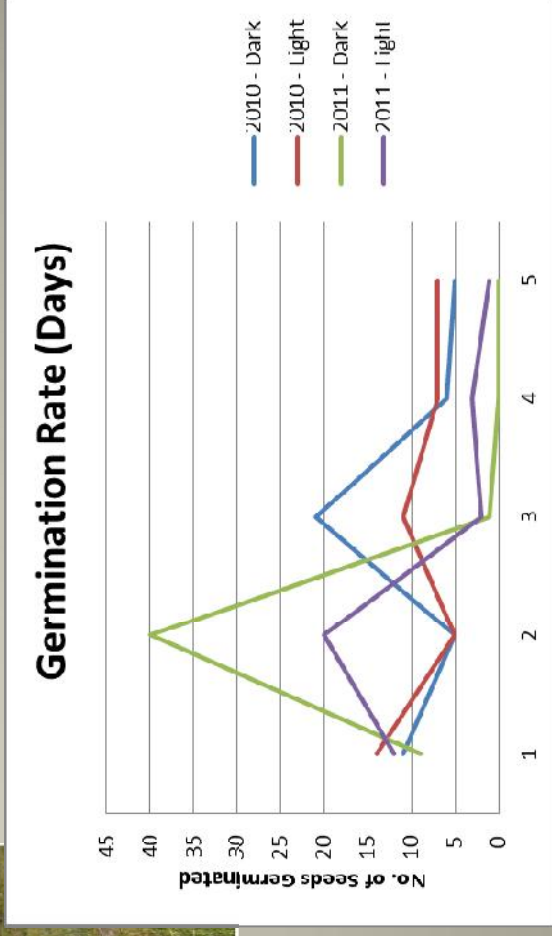


Species Research

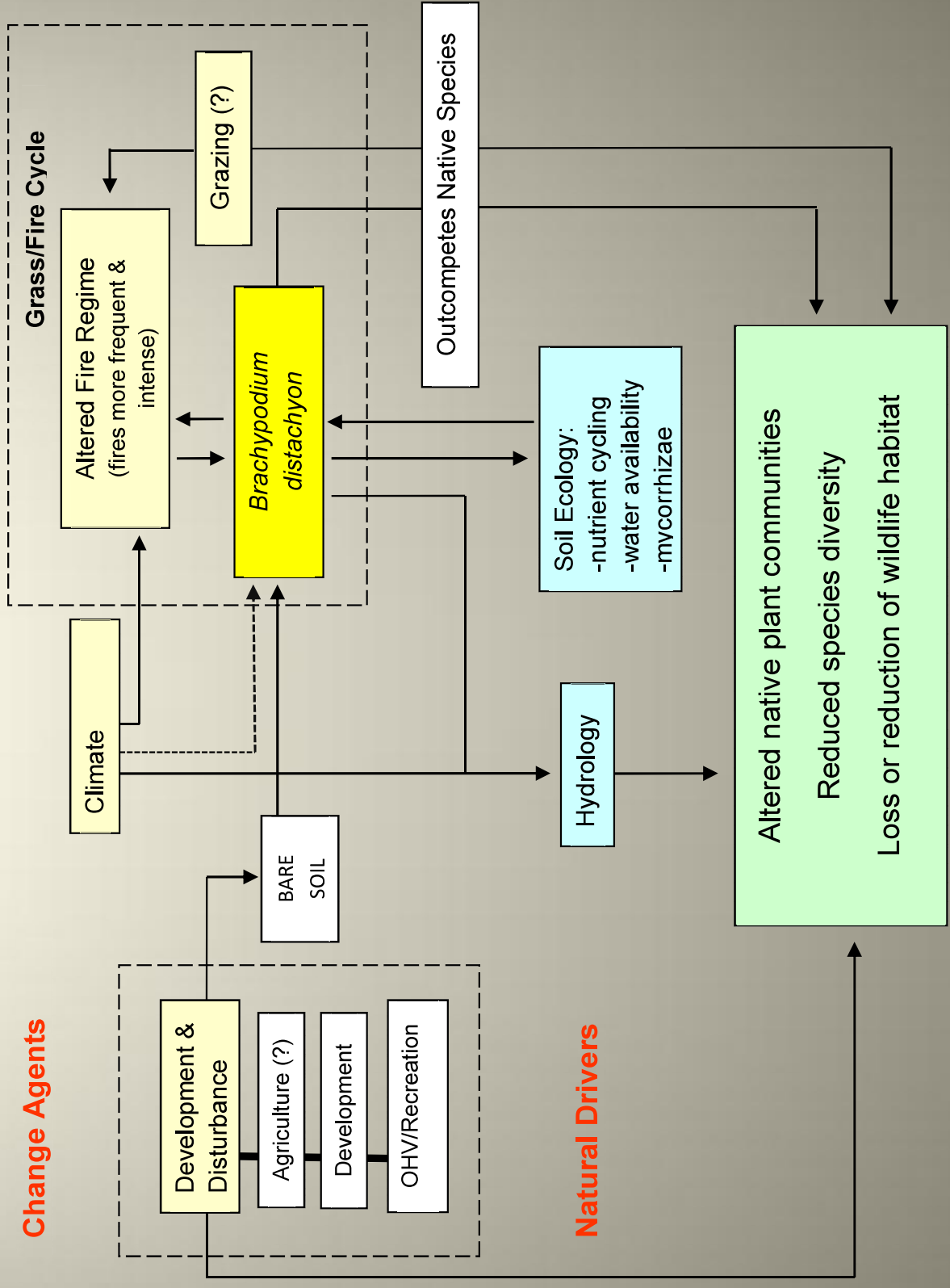


Experimental Pilot Program

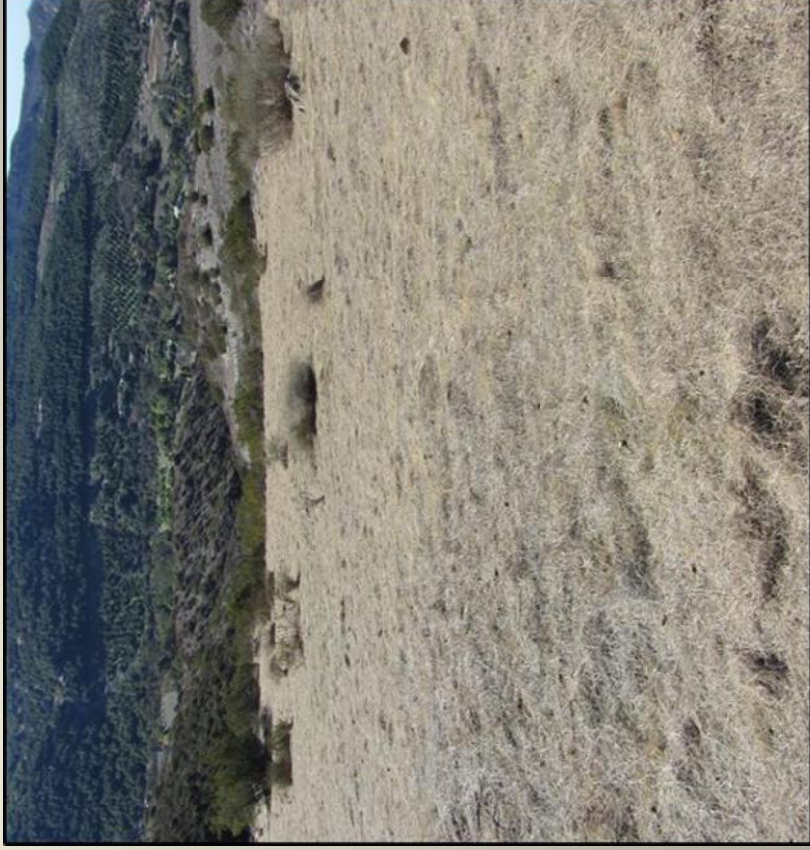
Seed Germination Studies



Conceptual Models



Scaled-up Treatment/Restoration



Regional Implications

- Preserve-, management unit, and regional level issue
- Regional management plan
 - effective treatment/restoration strategies
- Data collaboration and analysis
 - predictive modeling
 - risk assessments
 - prioritize funding for control



Research and Other Studies

- Long-term vegetation monitoring (SDSU)
- Regional vegetation classification (AECOM/CDFW)
- Invasive species research (UC Riverside)
- Genetic studies (University of Florida)
- Invasive species mapping
 - Regional invasive species strategic plan
 - State level risk assessments and climate change modeling (Cal-IPC)



Updated Habitat Management Plan

- Incorporate South Crest, Lakeside Archipelago, and Harbison Canyon into management unit
- Covered species monitoring/management
- Habitat restoration/species augmentation
- Vegetation map refinement
- Animal surveys
 - California gnatcatcher
 - Hermes copper butterfly
 - Quino checkerspot butterfly



- 1999 @ 2,400 acres
- 2007-2012 @ 4,000 acres (9 properties)
- 2013 (2 properties in process--blue)
- 5 properties in queue
- 20XX @ ~5,000 acres

