



**Providing Scientific Information
& Analyses to help inform the
Desert Renewable Energy Conservation Plan
and promote protection of desert biodiversity**

**John M. Randall
Associate Science Director
The Nature Conservancy
jrandall@tnc.org**



Mitigation Hierarchy

Avoid

Minimize

Restore

Compensate

Ecoregional Conservation Plans

Full suite of biological diversity

Systematic, regional planning approach

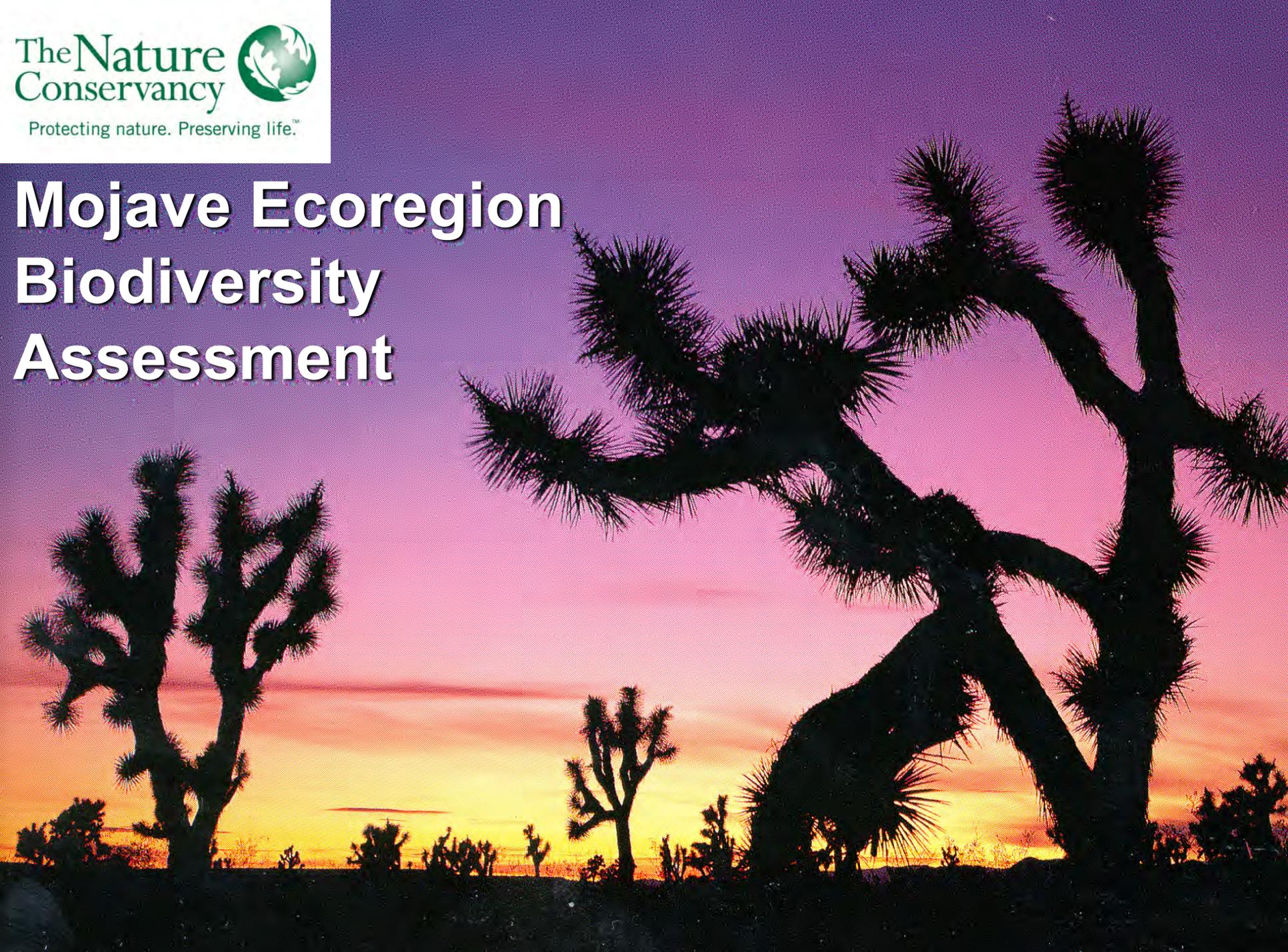
Explicit goals and assumptions

Peer reviewed and applied around the world





Mojave Ecoregion Biodiversity Assessment



Goals of the Assessment

- 1. Characterize distribution of conservation values and threats across the Mojave Ecoregion.**
- 2. Inform renewable energy development siting & mitigation decisions to protect biodiversity.**
- 3. Provide a common platform for partners & stakeholders in agencies, NGOs & industry and contribute to a culture of data sharing.**

Goals of the Assessment

4. Incorporate:

- a. expert knowledge;
- b. spatially explicit data on threats;
- c. projections of climate change & habitat suitability.

Steps in the Assessment

1. Identify need and scope
2. Identify experts and data sources
3. Select targets (Species, Vegetation Types, Special Features)
4. Gather & assemble data
5. Establish quantitative goals for targets
6. Conduct initial Marxan scenarios

Steps in the Assessment

- * 7. Review results, adjust goals & cost weightings, identify data gaps, re-run Marxan
- 8. Map conservation values based on Marxan results and additional data layers
- 9. Report and explain results

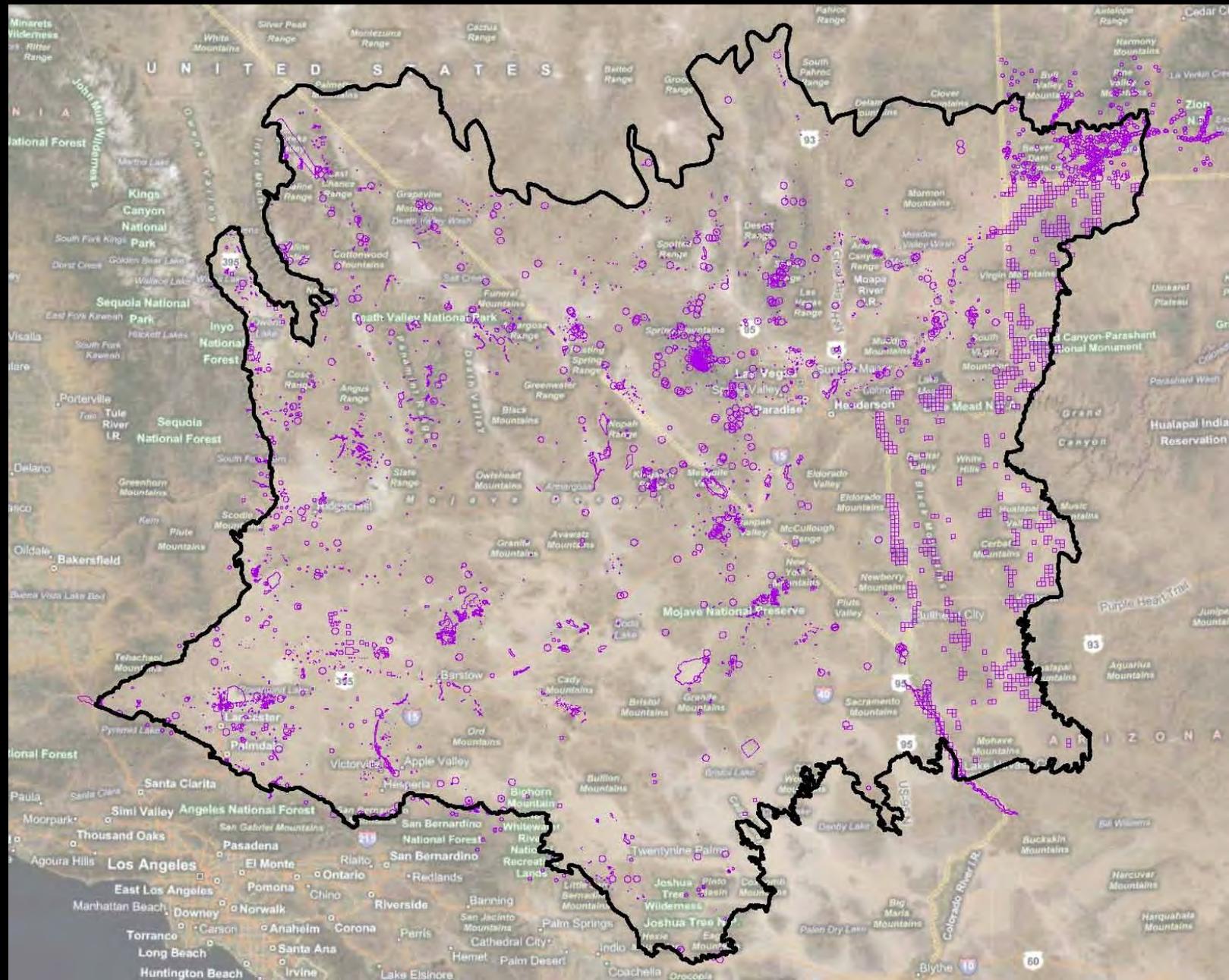
Conservation Targets

- **All mapped vegetation types**
 - LandFire cover types (38)
 - e.g. Creosotebush-White Bursage Desert Scrub
 - Mesquite Upland Scrub
- **Priority Species (>500)**
 - All G1 & G2 plant and animal species
 - e.g. *Amargosa nitrophila* (*Nitrophila mohavensis*)
 - S1 & S2 species
 - e.g. San Bernardino aster (*Symphyotrichum defoliatum*)
 - Other species of concern (area sensitive, declining)
 - e.g. Desert iguana (*Dipsosaurus dorsalis*)
- **Waterways**





Target occurrences from NDDDB



Goals

How Much is Enough to Sustain Targets?

- Matrix Vegetation (Creosotebush-White Bursage Scrub) 25%
- Large Patch Type (Pinyon-Juniper woodland) 40%
- Small Patch Type (Desert pavement) 80%

- G1 & G2 Species 90%
- S1/G3 Species 60%*

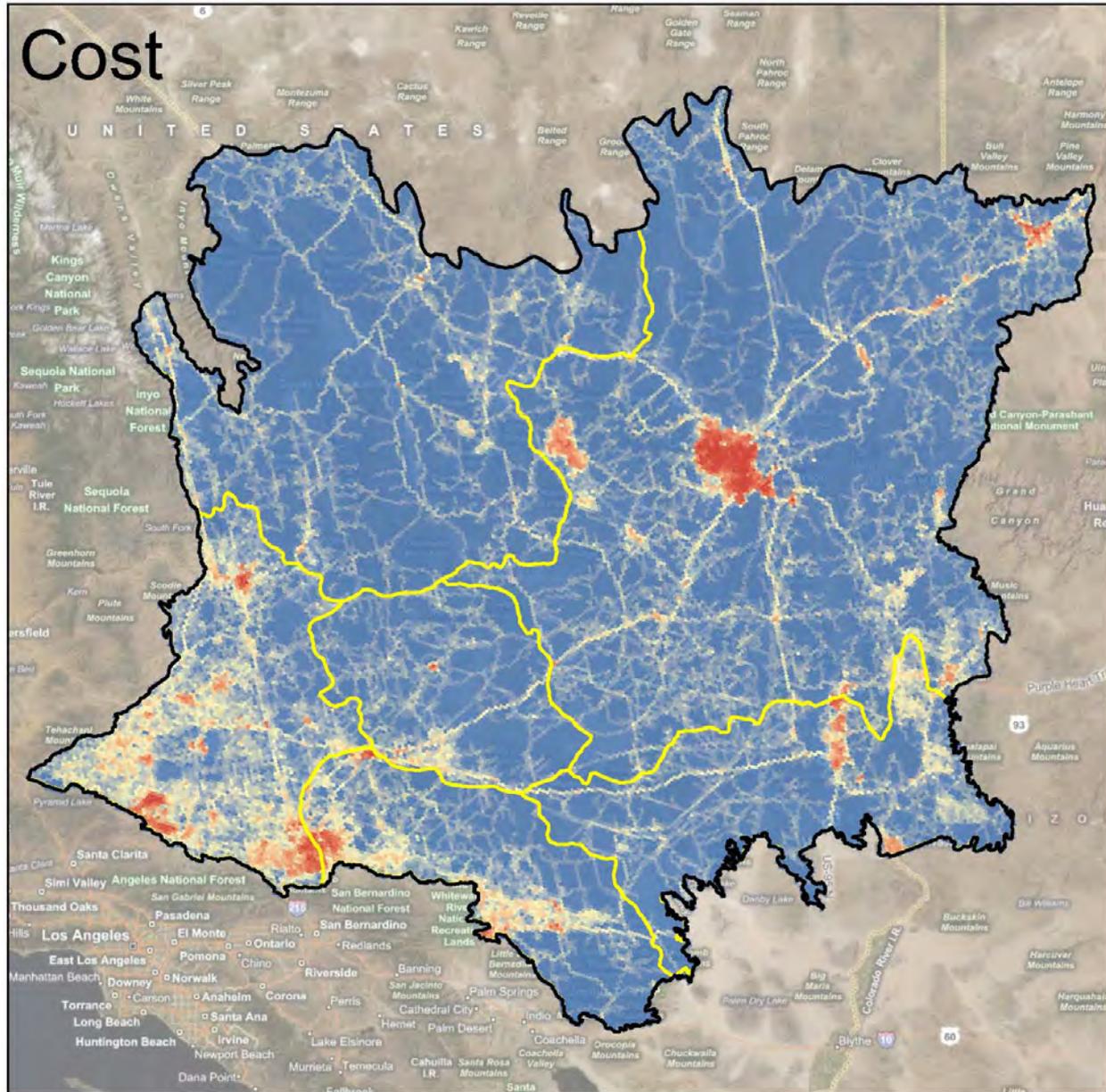
Data & Information Sources

- Natural Diversity DataBase (species occurrences)
- LandFire Vegetation Cover Layer
- USGS Desert Tortoise Habitat Model
- Expert Interviews (>50 in California)
- South Coast Wildlands Linkage Evaluation
- *USFWS Desert Tortoise Threats Layer
- UC Riverside Nitrogen Deposition Layer
- Land Management Status
- Satellite imagery (urban & ag areas, roads)
- USGS National Hydrography Dataset
- BLM Plans - WEMO, NEMO, NECO
- Clark County MSHCP

Cost Layer

- Meant to reflect variation in most impacting anthropogenic disturbances
- Weighted to reflect relative irreversibility of threats
- Uses road density and human-dominated land uses (urban, agriculture)

Preliminary cost analysis (roads, urban, ag)

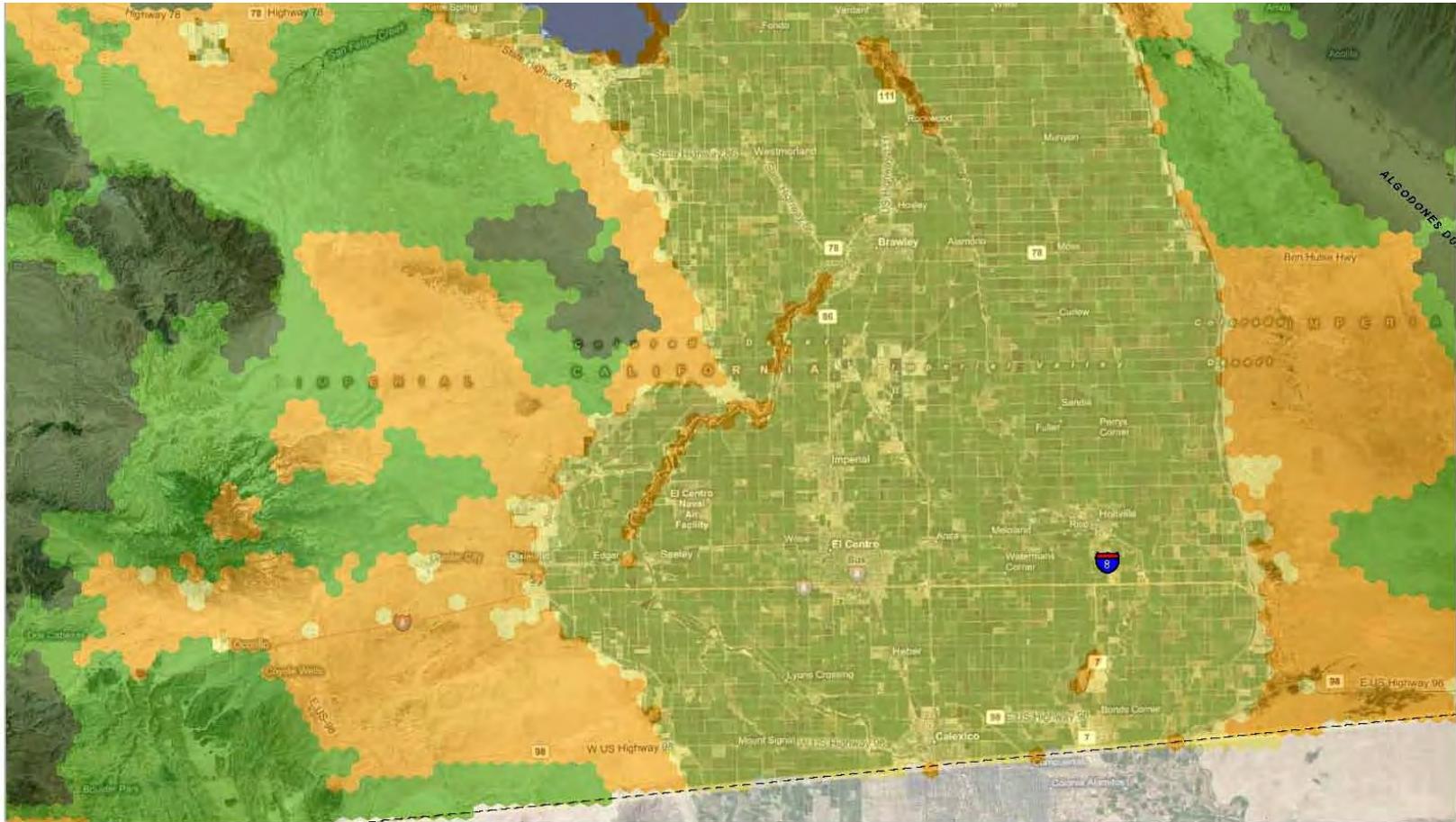




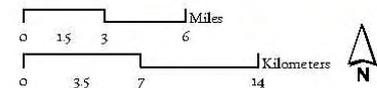
**Conservation Planning Software
used to identify the most efficient suite
of sites to protect targets**

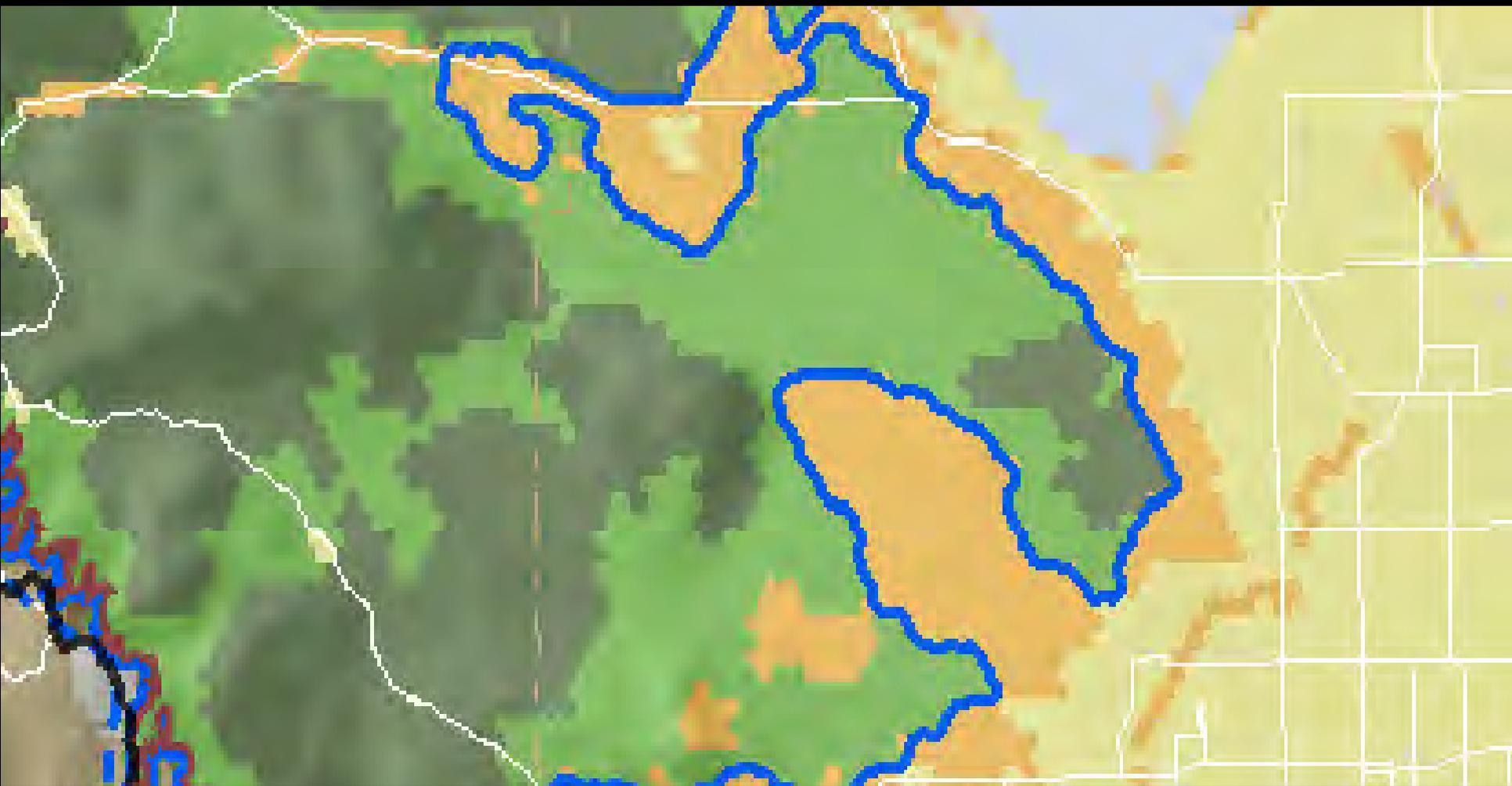
<http://www.uq.edu.au/marxan/>

Conservation Categories from Framework for Sonoran Desert Conservation



Conservation Categories





Energy by Design Analysis
Optimal mitigation at regional scale



The Mission
of
The Nature Conservancy



**To preserve the plants, animals
and natural communities
that represent the diversity of life on Earth
by protecting the lands and waters
they need to survive.**

The Conservation by Design Approach

1. SETTING PRIORITIES

Ecoregional Planning

2. DEVELOPING STRATEGIES

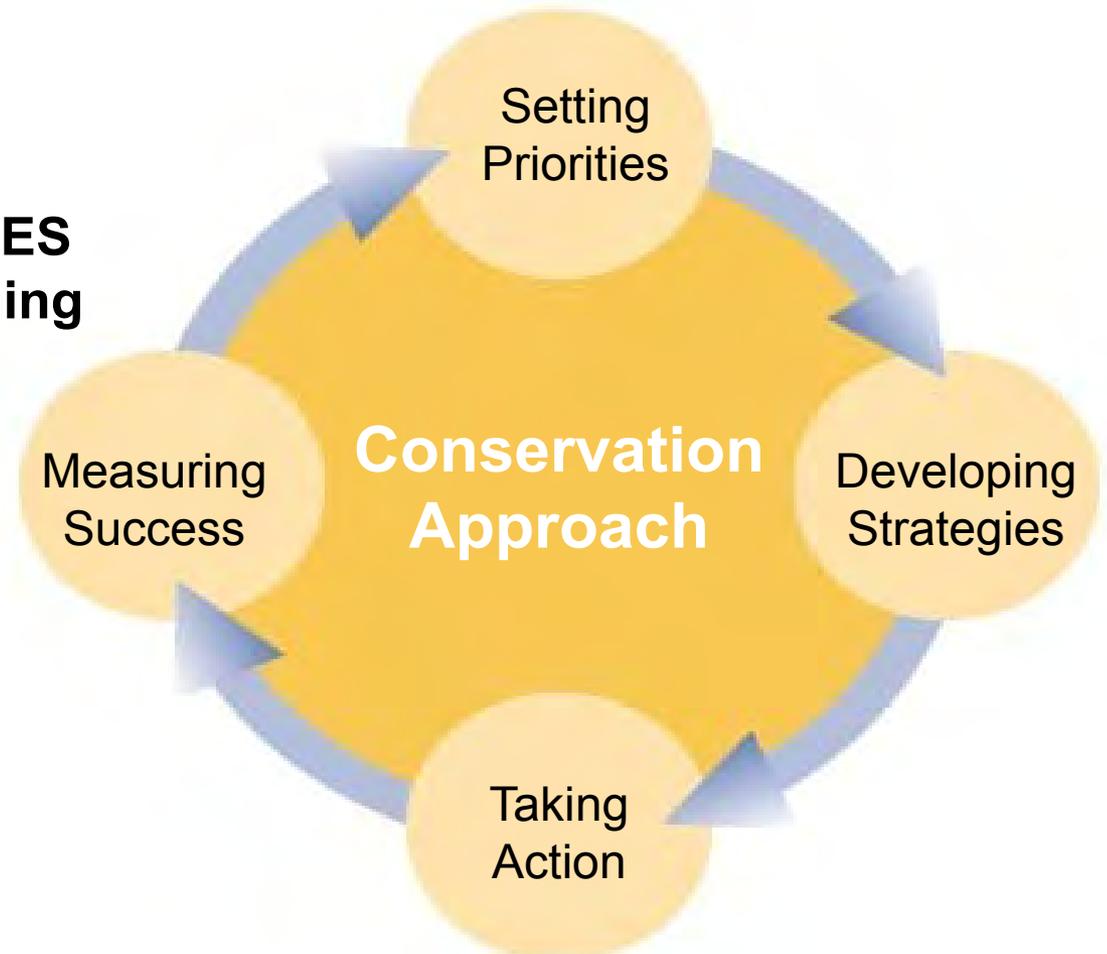
Conservation Area Planning

3. TAKING ACTION

Implementing strategies

4. MEASURING SUCCESS

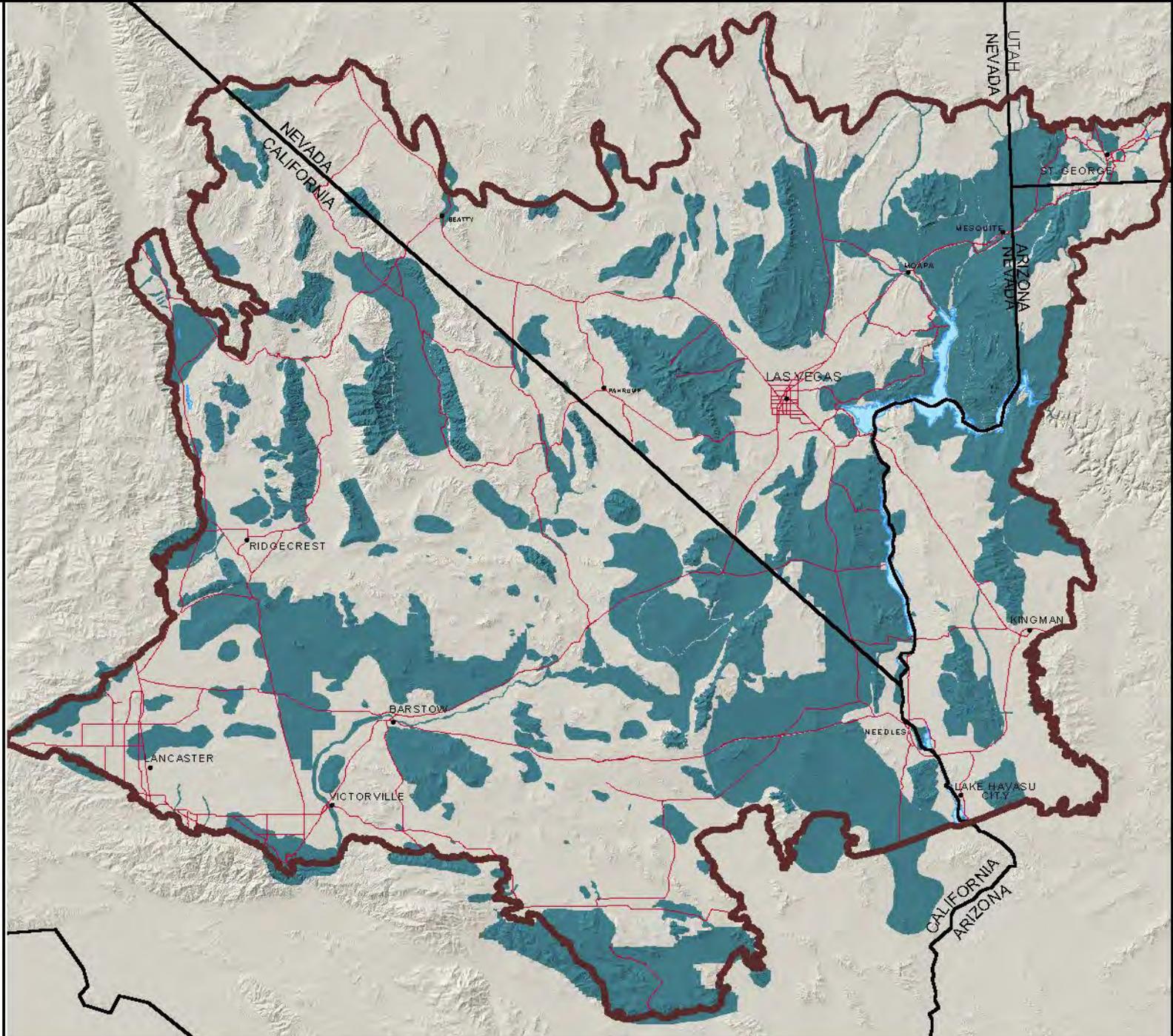
How are we doing?



MOJAVE DESERT ECOREGIONAL PORTFOLIO



- LEGEND**
- Portfolio Site
 - Ecoregional Boundary
 - State Boundary
 - Rivers and Streams
 - Highways
 - Lakes





Features

- **Explicit target selection**
- **Quantitative goals**
 - **Clarifies trade-offs**
- **Uses explicit, simple method to identify Conservation Value**
- **Incorporates spatially explicit information on targets, threats, costs/suitability of sites to support biological diversity**



