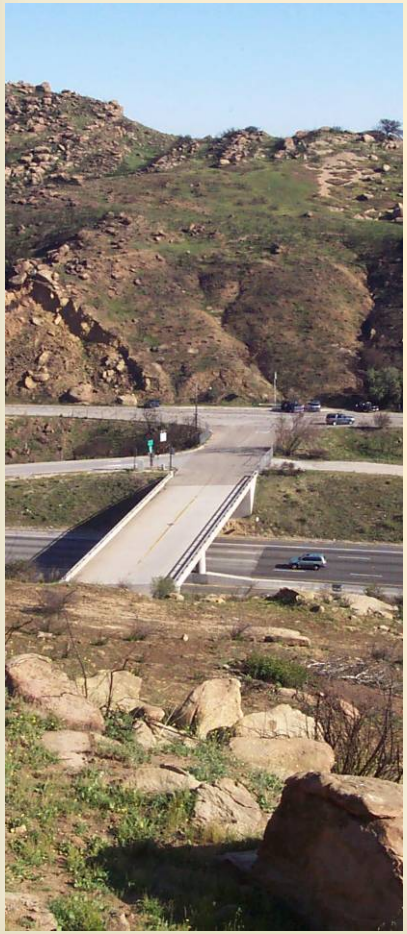


CALIFORNIA ESSENTIAL HABITAT CONNECTIVITY PROJECT

Kristeen Penrod, Conservation Director, SC Wildlands

California Essential Habitat Connectivity Project

Products

- A statewide map depicting areas essential for habitat connectivity.
- A matrix summarizing biological values of the linkages to inform conservation decisions.
- A strategic plan that outlines an approach for finer-scale analyses and local or regional connectivity plans, which are to be performed outside the scope of this statewide assessment.

Project Work Flow

Caltrans

CALIFORNIA DEPARTMENT FISH&GAME

The Dangermond Group
Creative Project Planning & Design

CONSERVATION BIOLOGY INSTITUTE

SC Wildlands

Engage Multidisciplinary Team
- evaluate habitat connectivity and prioritization methods
- reach consensus

Team Meeting #1
Introduce Project & Approach

Develop Work Plan with Multidisciplinary Team

Team Meeting #2
Criteria Development, Prioritization, and Consensus Building

Statewide Connectivity Map
- Compare with existing Conservation Plans

18 Month Project
completion anticipated February 2010

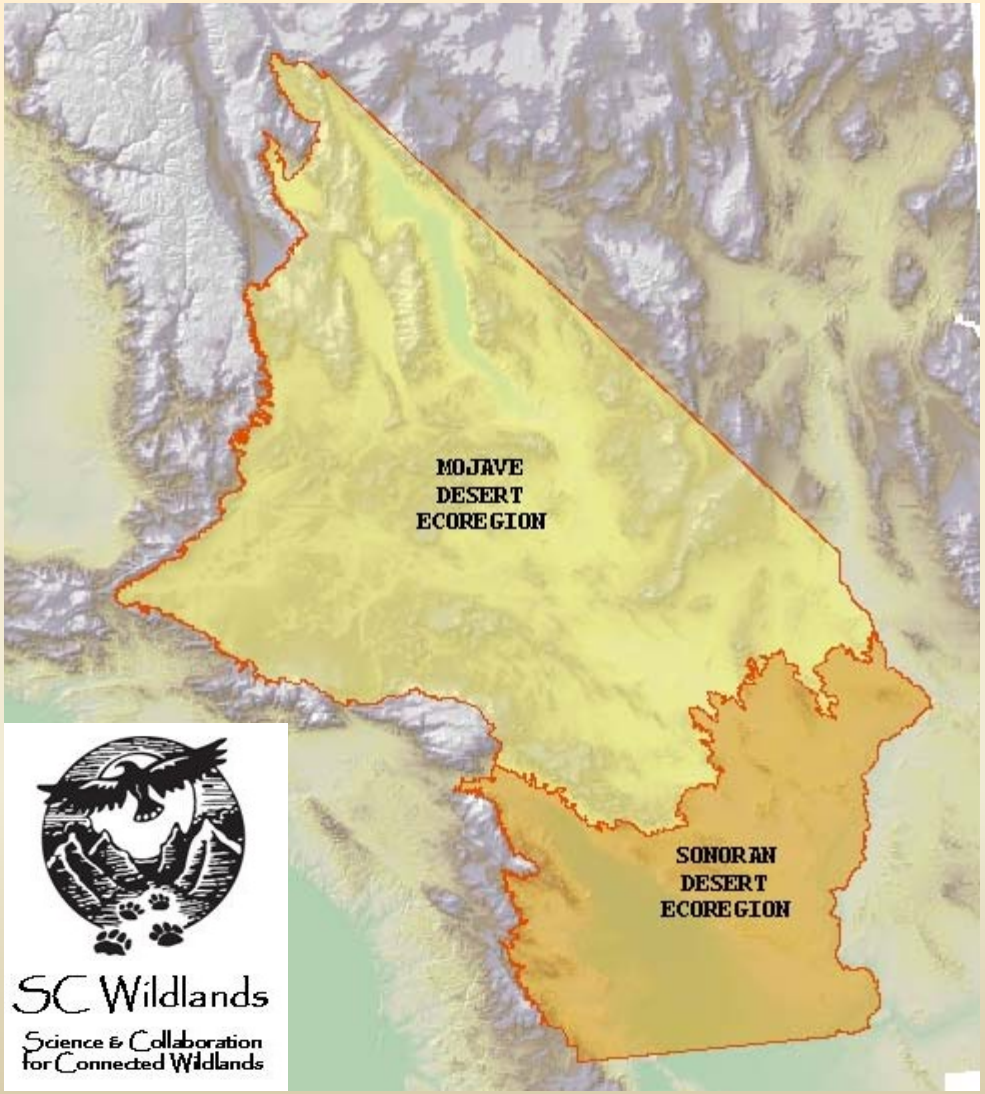
Prioritization Analysis

Develop Strategic Plan
- guide future regional connectivity analysis, planning, and implementation

Team Meeting #3
Review Draft Maps/Strategic Plan

Team Meeting #4
Review Final Maps/Strategic Plan

California Desert Wildland Network



South Coast Ecoregion
(*South Coast Missing Linkages Project*)

- Philosophy:
  - Collaborate broadly: include implementers in the planning process.
  - Use transparent, repeatable methods.
  - "No species left behind."
- Cores: Defined as large protected areas.
- Linkage Prioritization: Based on consensus scores for each linkage:
  - Biological importance
  - Threat level
- Linkage Design Process:
  - Identify diverse focal species (up to 34 per linkage) with different habitat and movement needs.
  - Perform landscape permeability analysis for a subset of focal species (3 to 9 species per linkage).
  - Combine (union) species-specific corridors into multi-species linkage.
  - Perform habitat suitability, patch size, and configuration analyses for all focal species (up to 34 per linkage) to ensure sufficient live-in and move-through habitat.
  - Refine Linkage Design based on configuration analysis and field assessment.

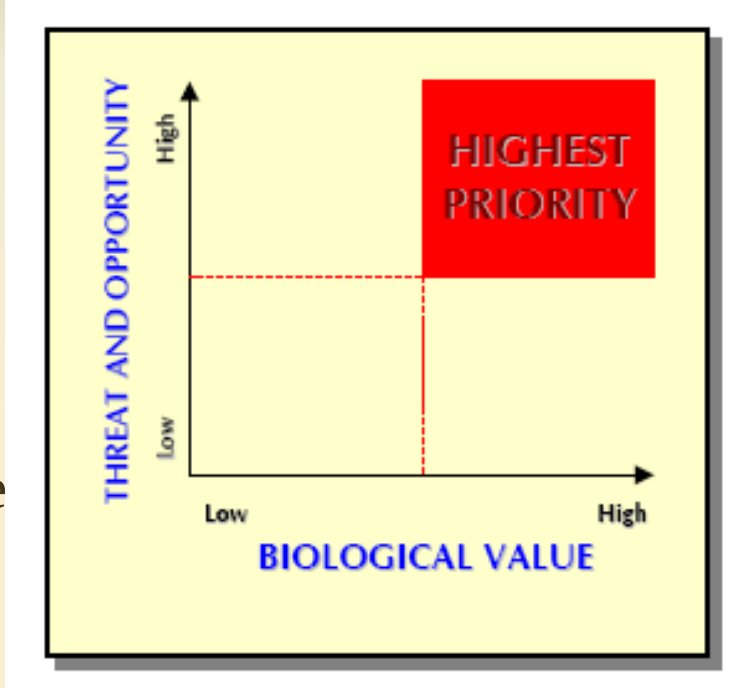
South Coast Wildland Network:
Implementable Linkage Designs

http://scwildlands.org/
Linkage Design
Conservation Lands
Department of Defense Lands
South Coast Ecoregion
Highway
Major River or Stream
County Boundary
South Coast Missing Linkages:
A Wildland Network for the
South Coast Ecoregion
1:1,350,000
Kilometers
Miles
Los Angeles
San Diego
Sierra Madre Ranges
Santa Monica Mountains
San Gabriel Mountains
San Bernardino Mountains
Little San Bernardino Mountains
Chocolate Mts
Cady Mountains
Bristol Mountains
Old Mountains
Granite Mountains
Kingston Mountains
Mojave National Park
Joshua Tree National Park
Edwards Air Force Base
Cleghorn Pass
Santa Rosa Mountains
Chocolate Mountains Aerial Gunnery Range
Salton Sea
Cuyamaca Rancho State Park
Lake Mathews
Lake Elsinore
Lake Perris
Lake Cuyamaca
Lake Henshaw
Lake Hodges
Lake Skinner
Lake Morena
Lake Cachuma
Lake Casitas
Lake Piru
Lake Pyramid
Lake Palmdale
Lake Hughes
Lake Castaic
Lake Sherman
Lake Tulare
Lake Cahuma
Lake Nacimiento

Linkage Identification & Prioritization July 22, 2009

Biological Irreplaceability defined by:

- size of wildlands connected
- quality of habitat in the smaller wildland
- (restorable) quality of habitat in the linkage
- contribution to other linkages in a chain

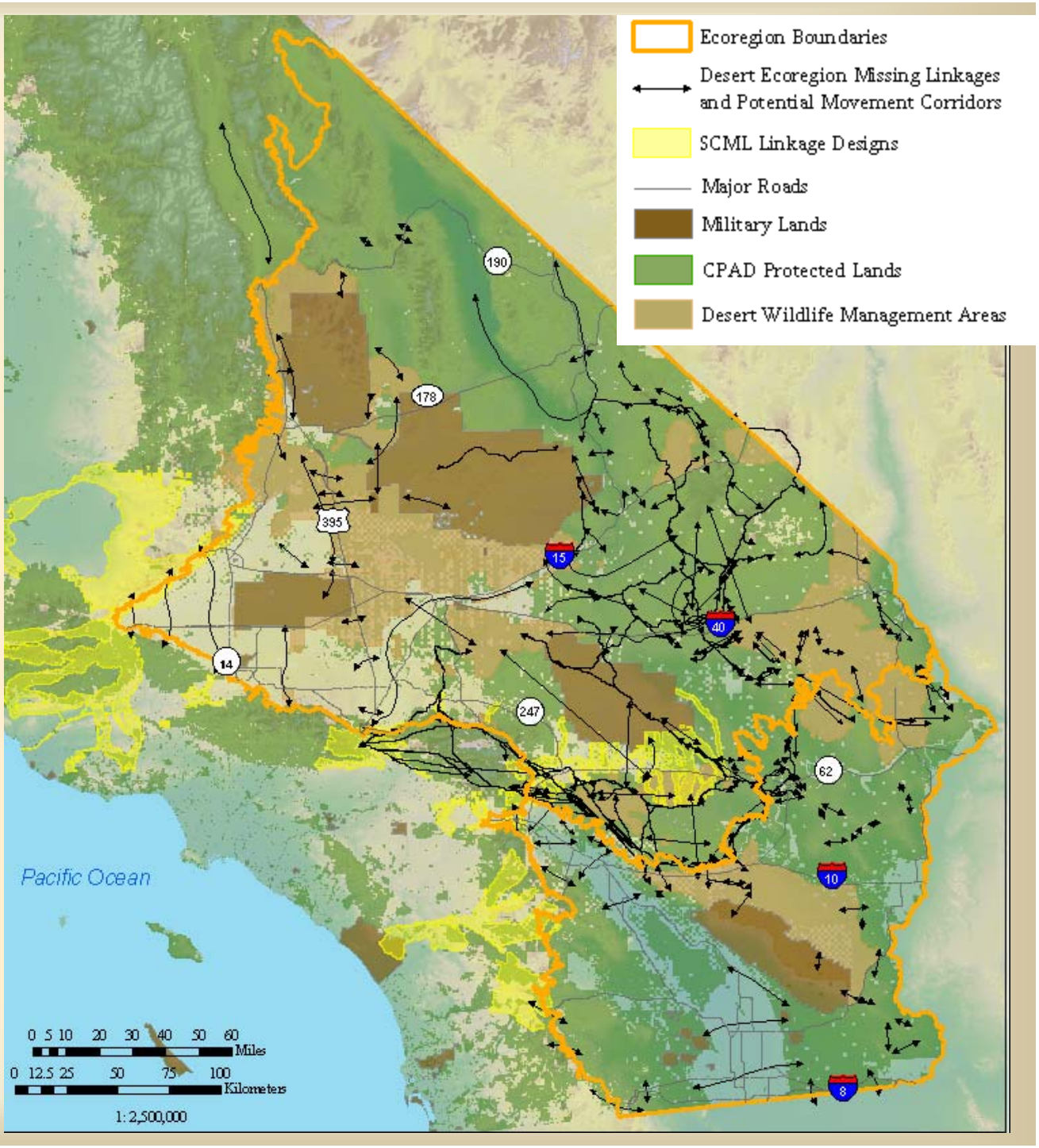


(Pressey et al. 1994, Pressey and Taffs 2001, and Noss et al. 2002)

Threat and opportunity defined by:

- Risk that roads or development (e.g., urbanization, energy projects) will sever the linkage if we do not act now.
- active conservation effort (e.g. NCCP)

Known & Predicted Movement Corridors for Multiple Species and Ecological Processes to be Evaluated during the July 22nd Workshop

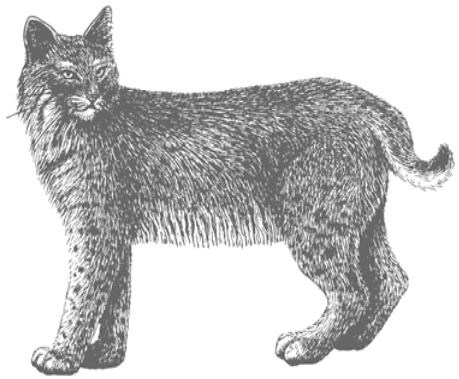


NOTE: Not comprehensive, for illustrative purpose only. More to be added prior to and at workshop.

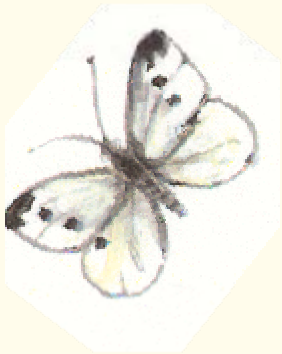
Select Diversity of Species

Plants

Birds



Mammals

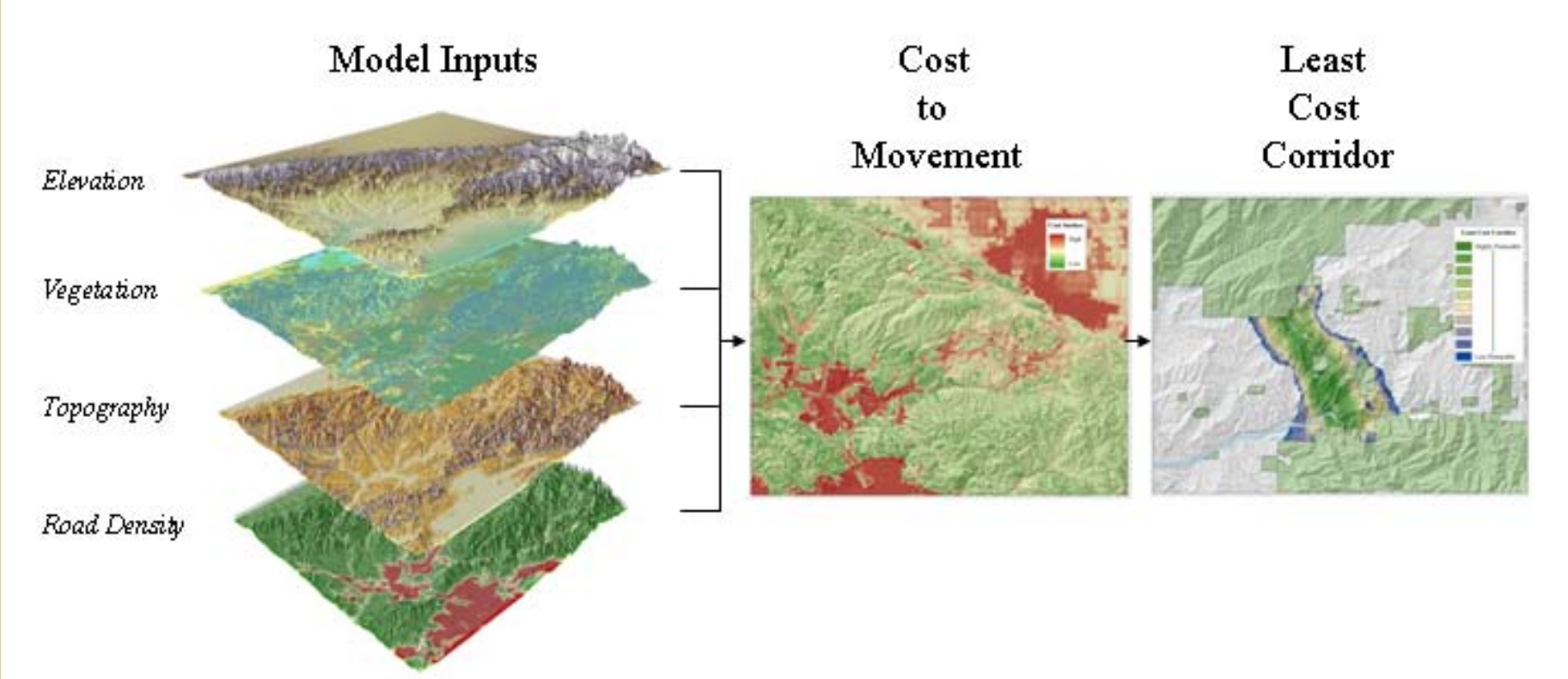


Invertebrates

Fish, Amphibians, Reptiles

Illustrations by Toni Inman, David Lee

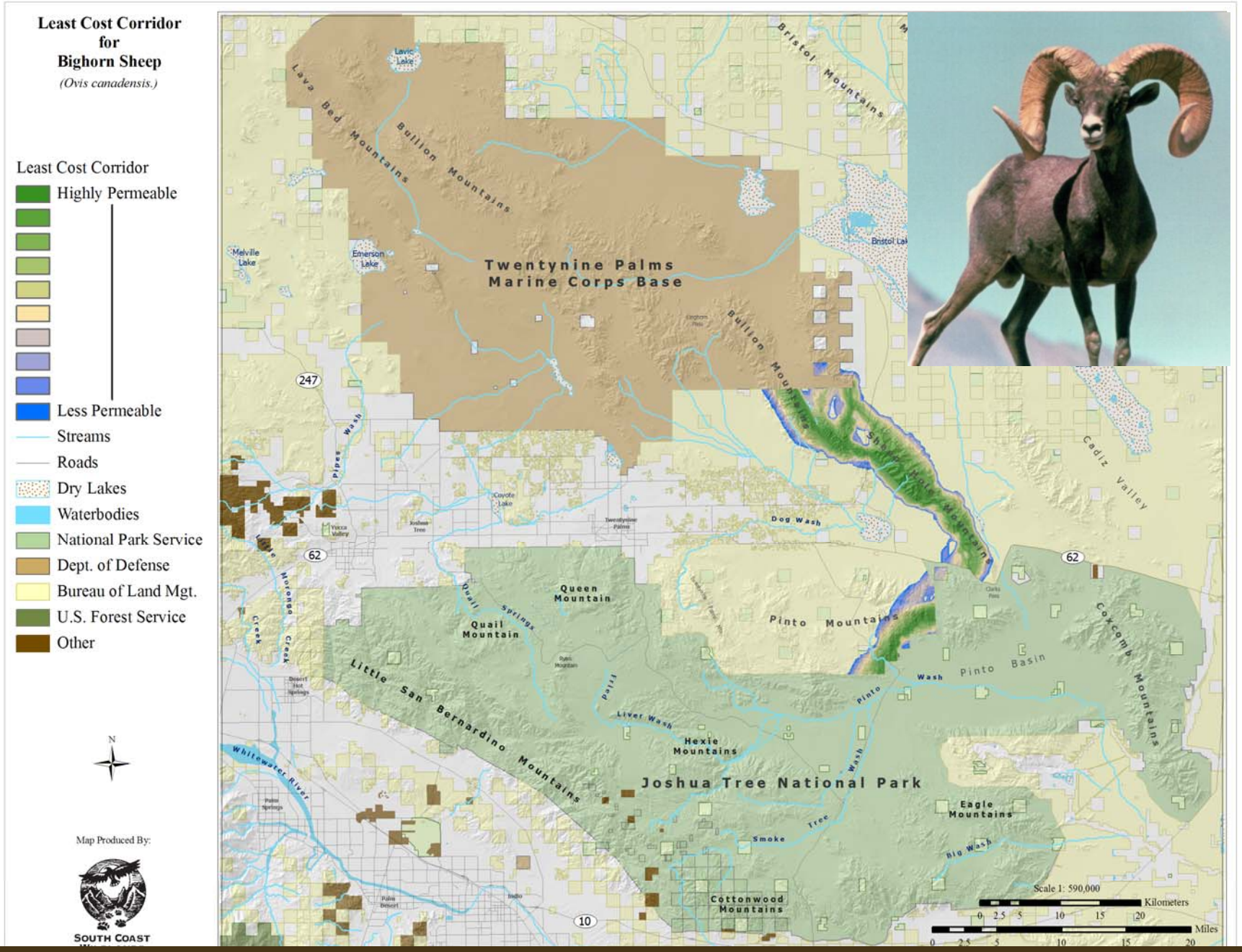
Landscape Permeability Analysis



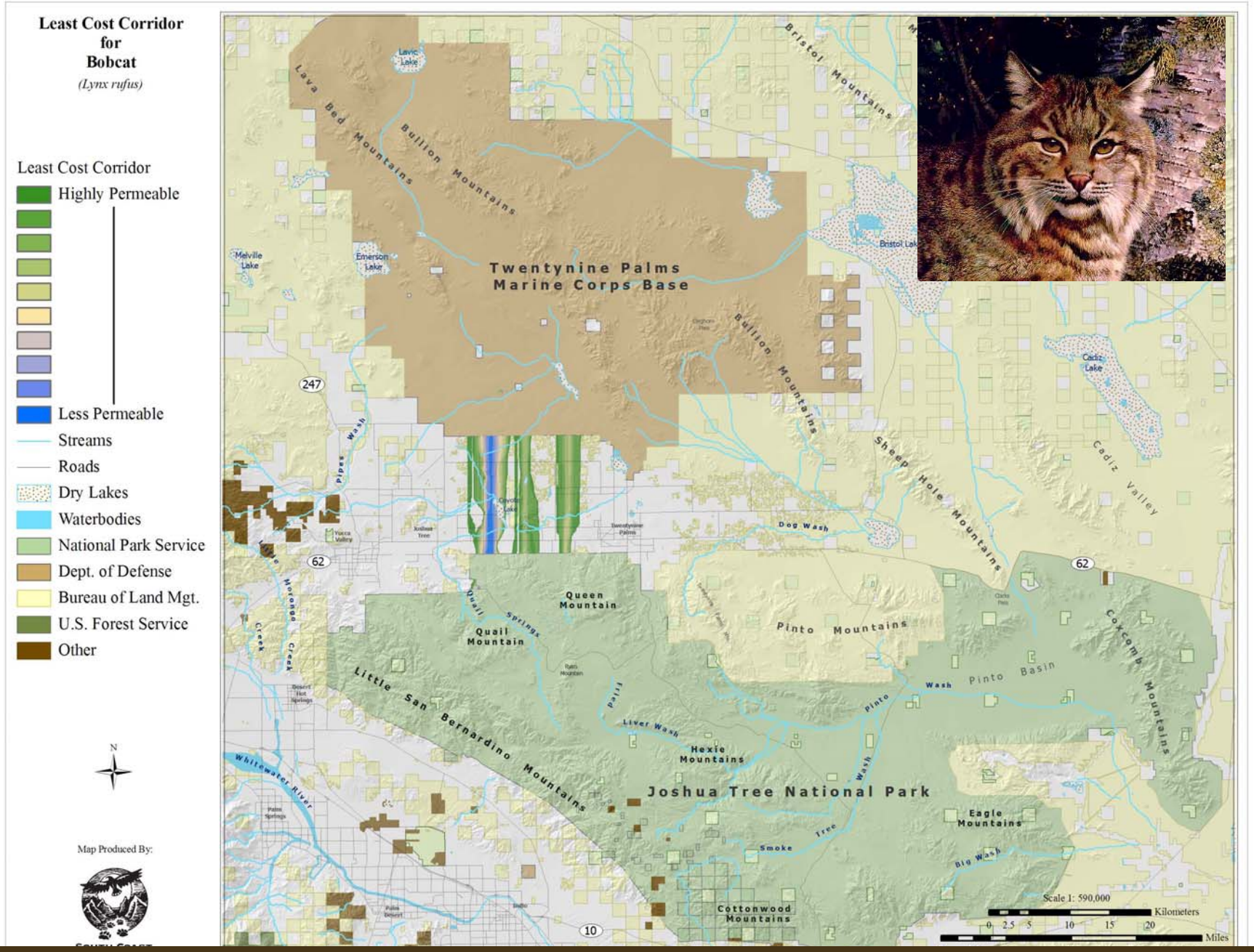
Goal: **Define area with lowest relative cost of travel for focal species between protected core areas**

Method: **GIS (Geographic Information System) Technique**

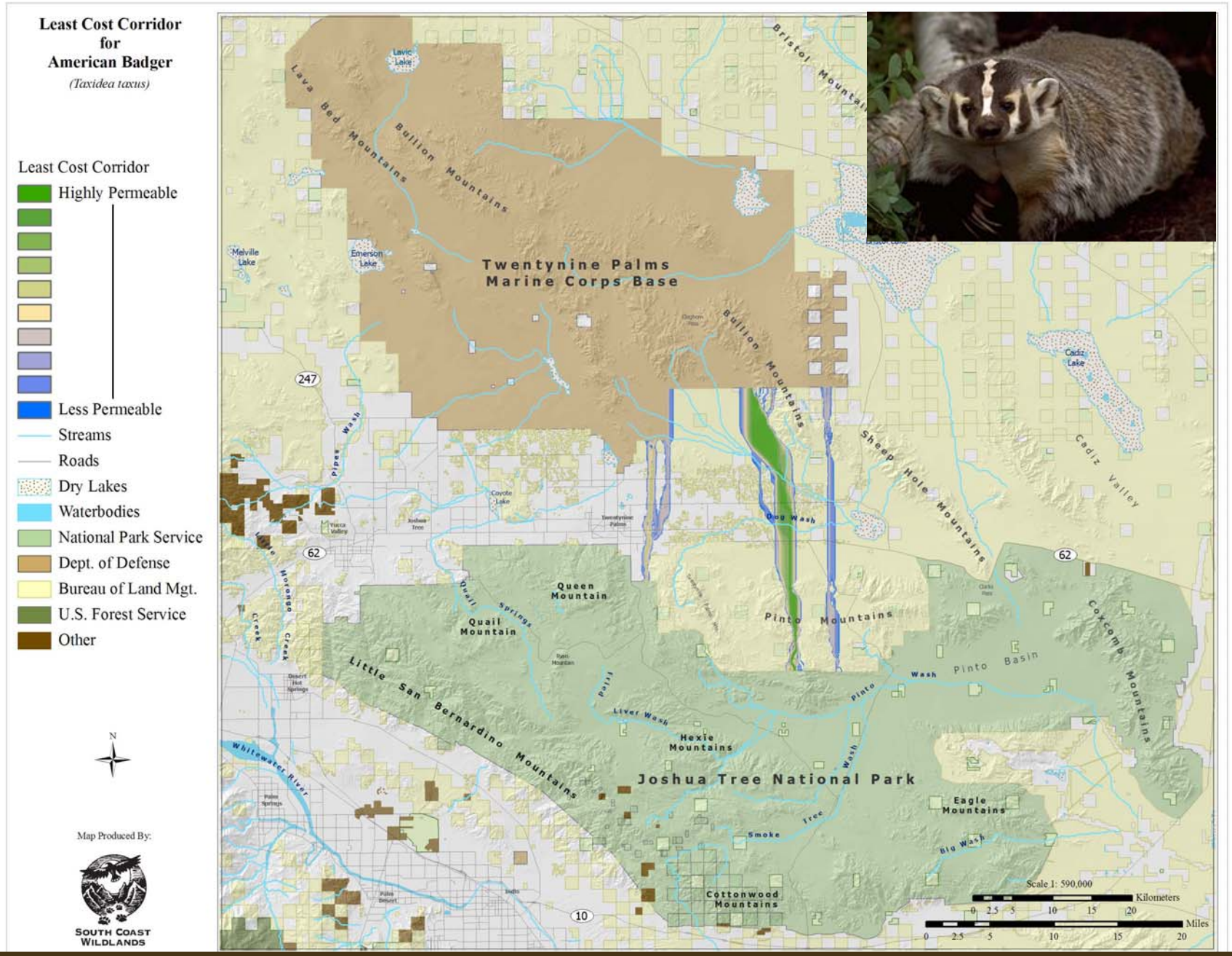
Walker and Craighead 1997
Craighead et al. 2001
Singleton et al. 2002



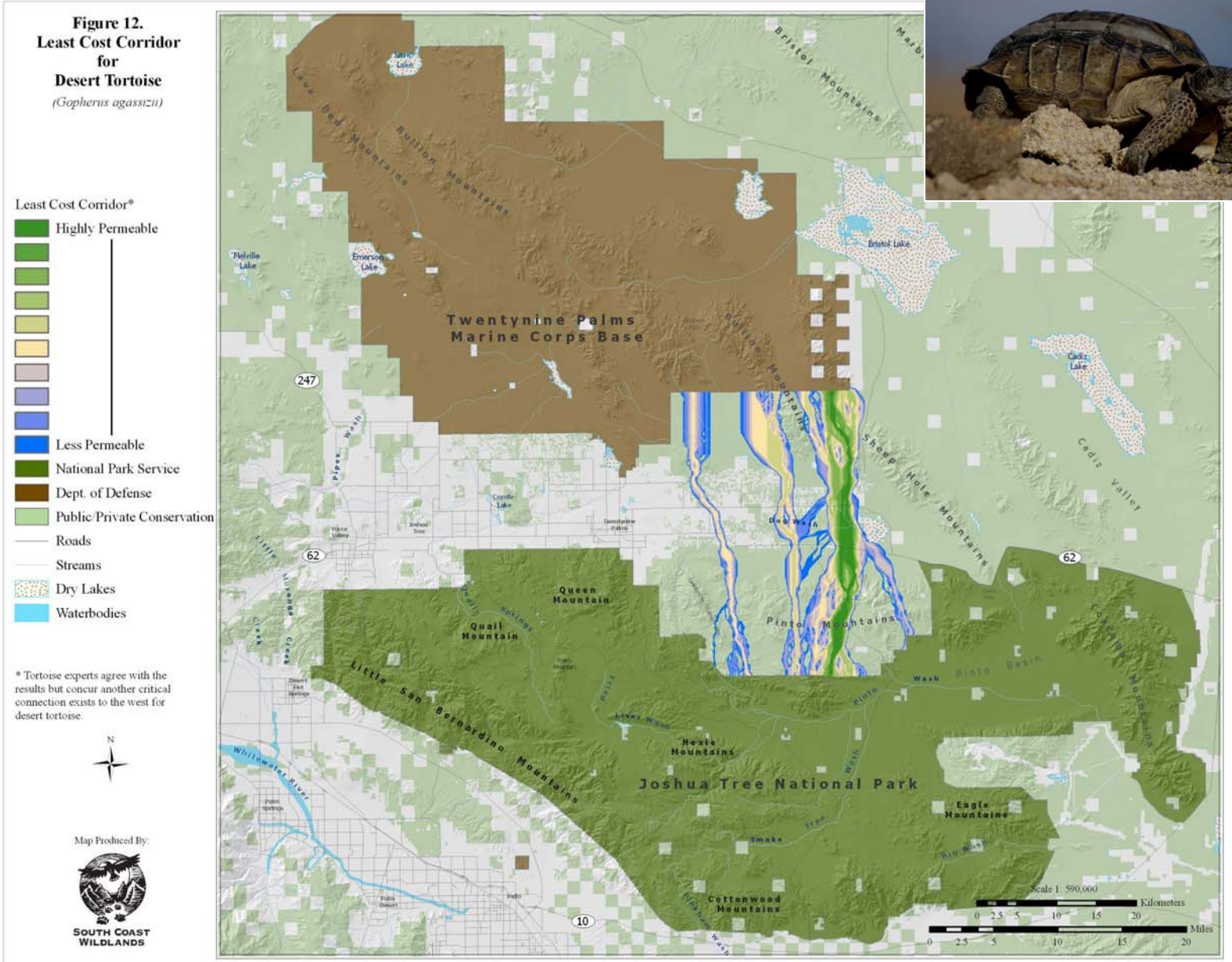
(Vegetation * 0.40) + (Topography * 0.40) + (Road Density * 0.20)



(Vegetation * 0.40) + (Topography * 0.30) + (Road Density *0.30)



(Vegetation * 0.55) + (Elevation * 0.10) + (Topography * 0.20) + (Road Density *0.15)

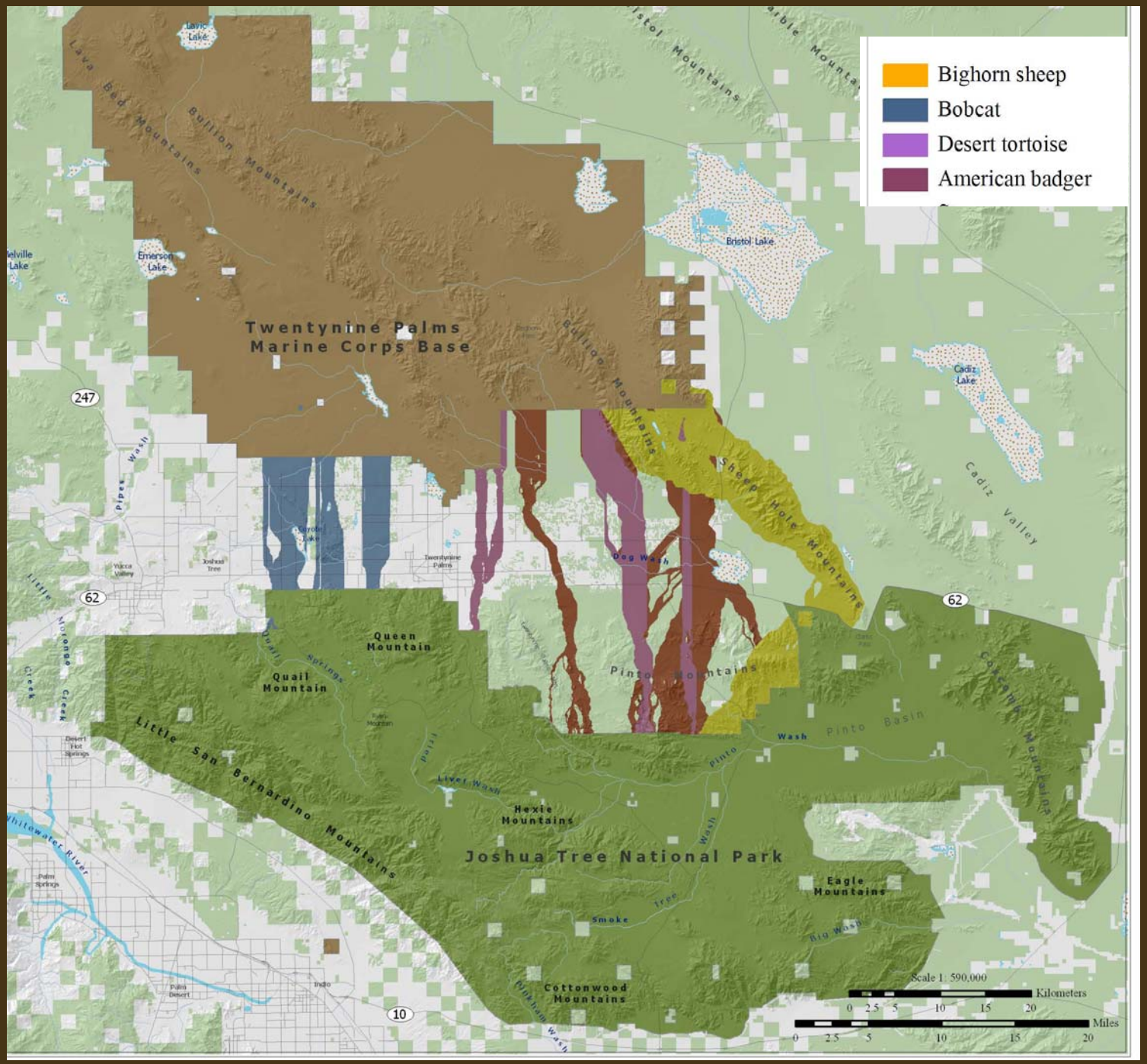


(Vegetation * 0.30) + (Elevation * 0.05) + (Topography * 0.35) + (Road Density *0.30)

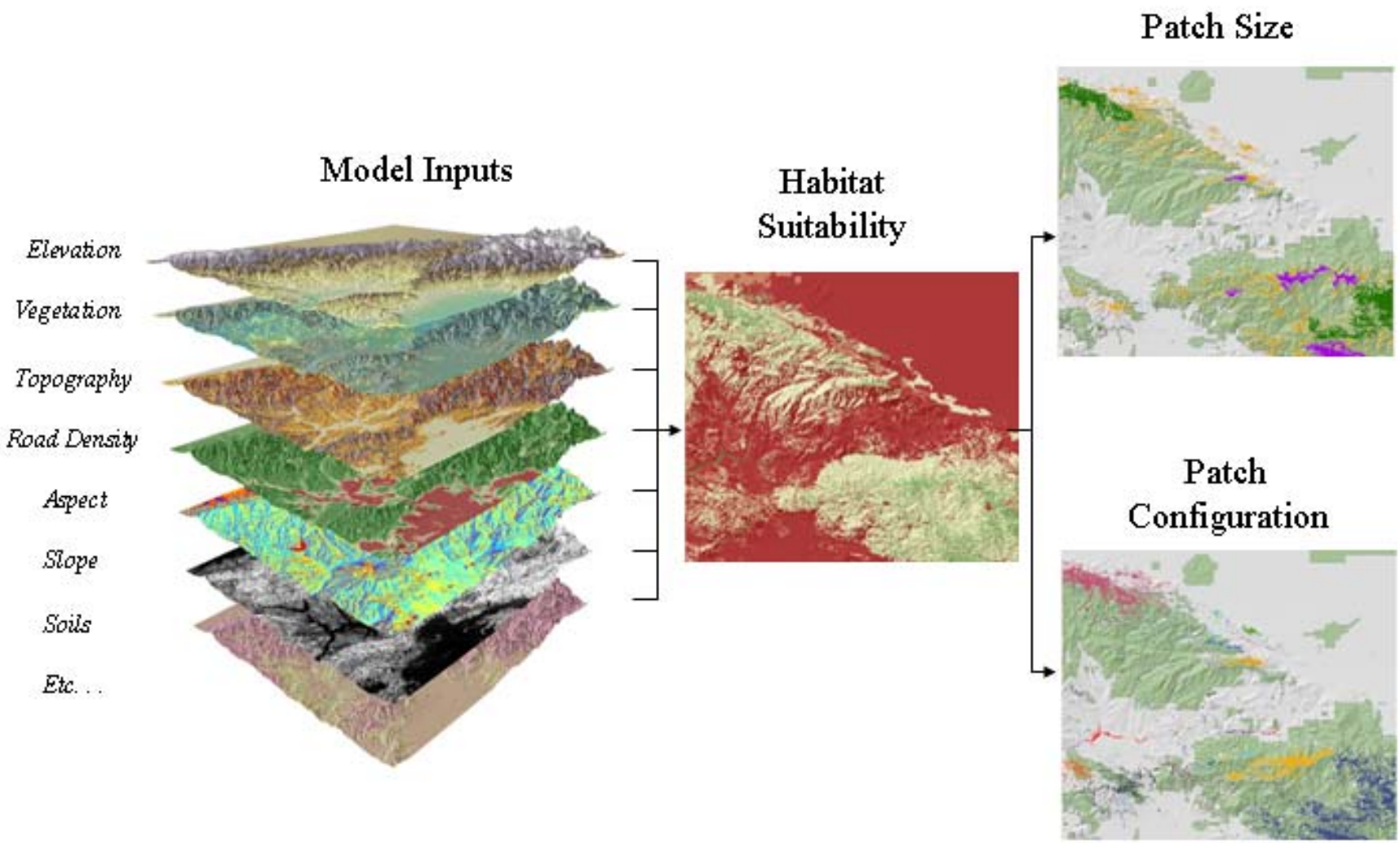
Combine the output for all species subject to landscape permeability analysis to delineate the

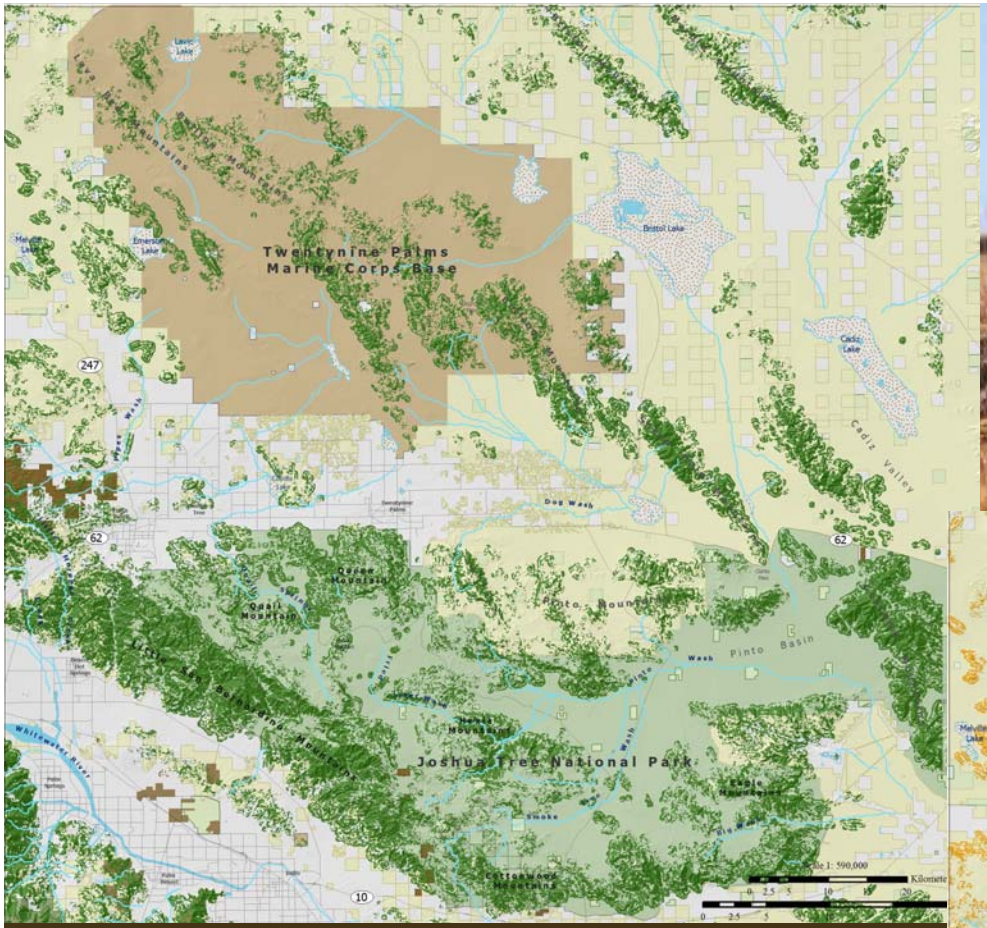
Least Cost Union:

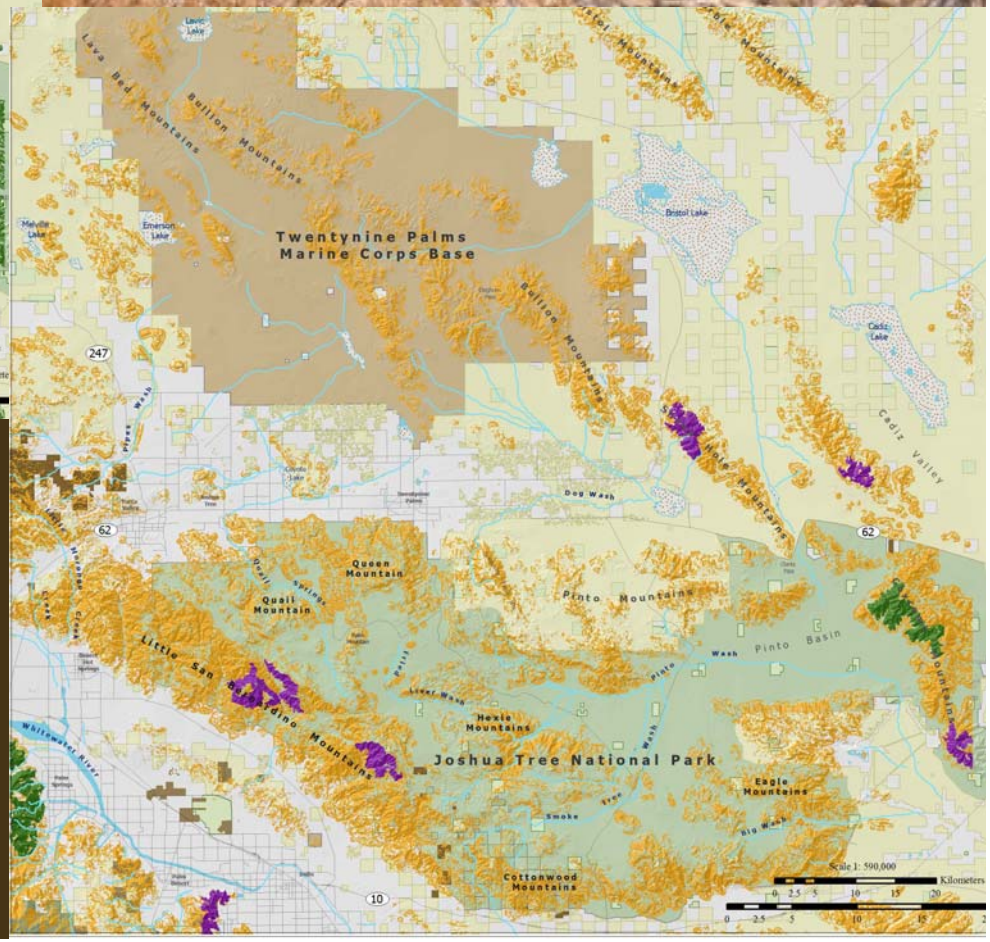
Initial Linkage Design



Habitat Suitability, Patch Size, and Configuration Analyses





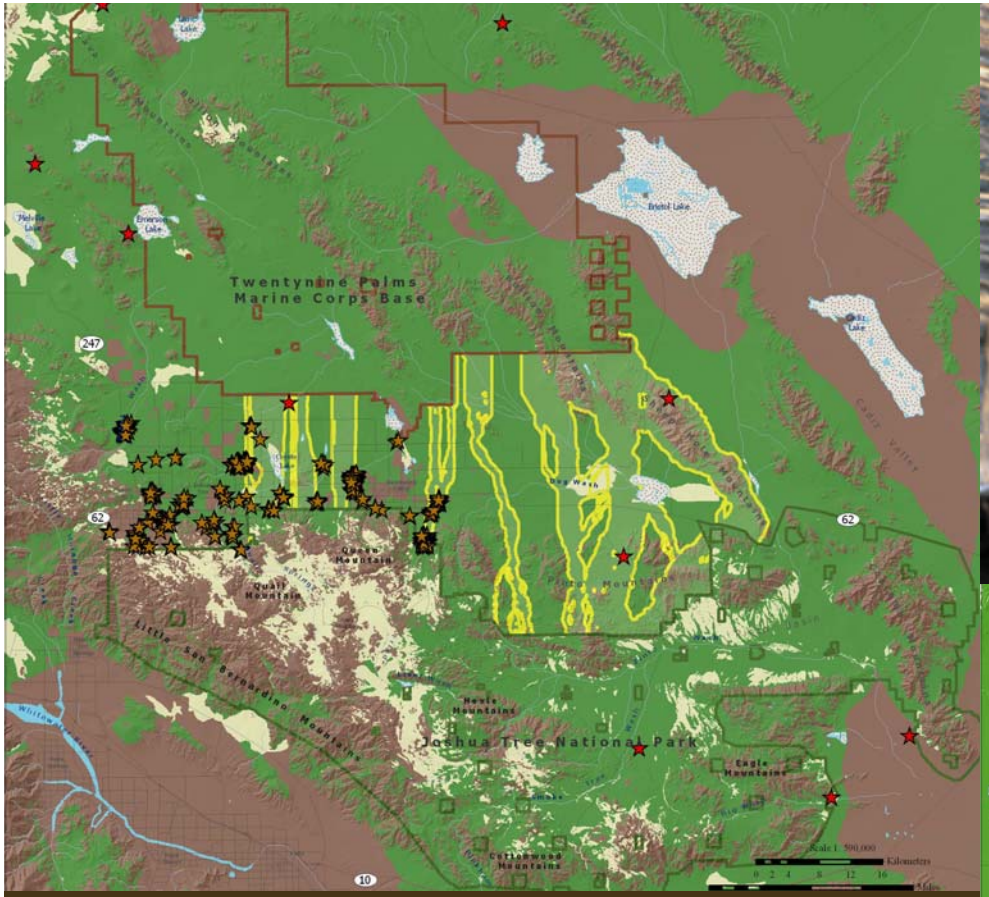


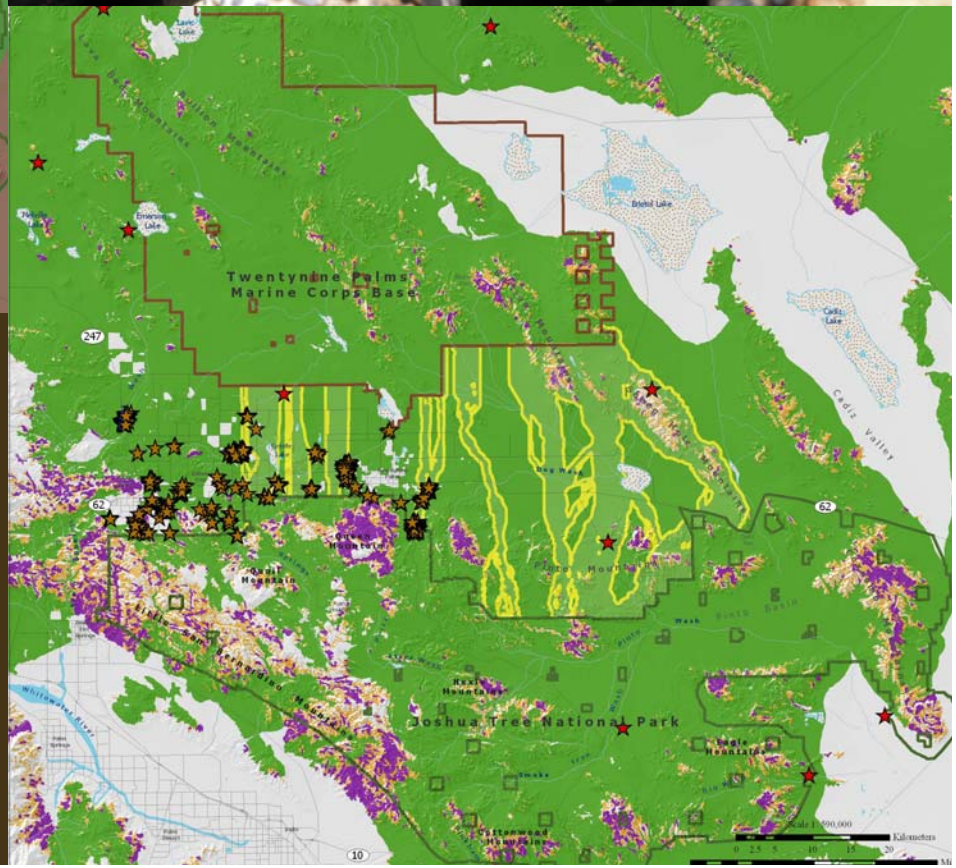
Habitat Suitability & Patch Size Analyses for Bighorn Sheep

Core was defined as $\geq$ 300 km^2

Patch size $\geq$ 13 km^2 but < 300 km^2

Dispersal distance 112km





Habitat Suitability & Patch Size Analyses for Desert Tortoise

Core areas defined as ≥ 1272 ha

Patch size ≥ 4.05 ha but < 1272 ha

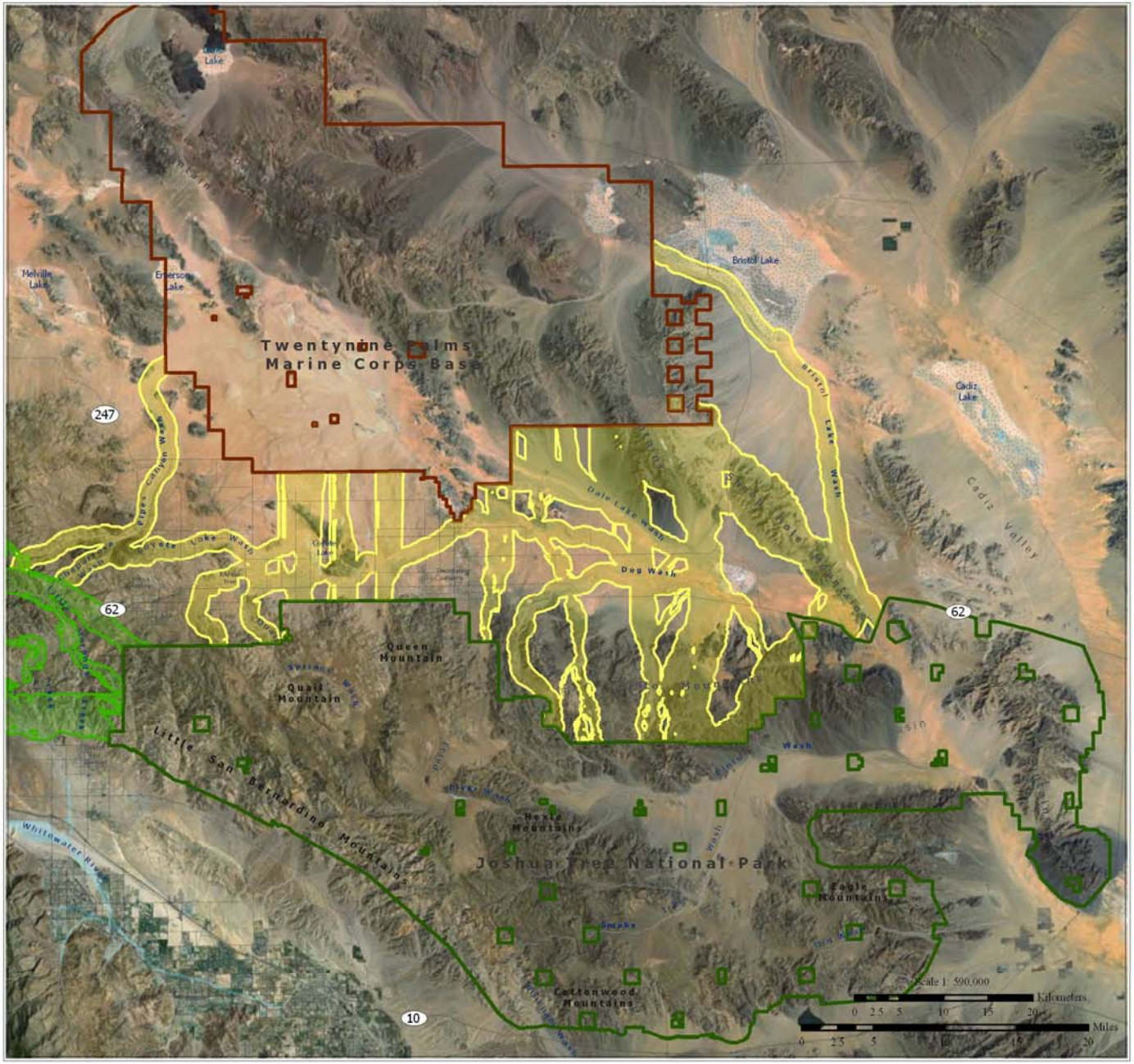
Dispersal distance defined as 32.19 km

Fieldwork

Assess habitat quality, movement barriers and filters, and restoration opportunities.

Figure 55.
Linkage Design

- Linkage Design
- SB-LSB Linkage
- Dept. of Defense
- National Park Service
- Roads
- Streams
- Dry Lakes
- Waterbodies



Map Produced By:

SOUTH COAST WILDLANDS

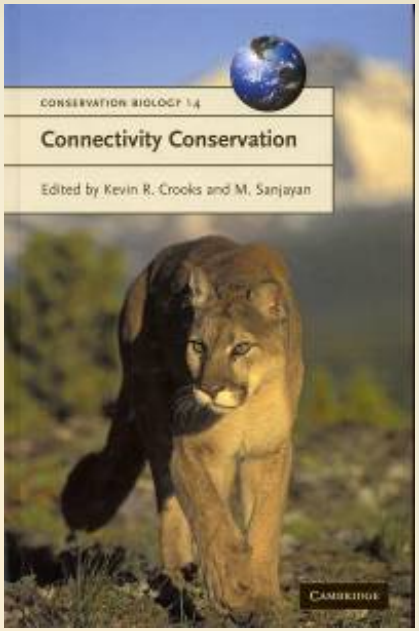
Lessons Learned from SCML Project

- **Collaboration works! Over 250,000 acres already conserved!**

- **Plans being implemented via:**
  - **Regional Comprehensive Plans**
  - **National Forest Management Plans**
  - **Bureau of Land Management Plans**
  - **City and County General Plans**
  - **Natural Community Conservation Plans**
  - **Local jurisdiction acquisitions**
  - **Conservancy acquisitions**

- **Transparency & repeatability are key.**

- **No species left behind!**
  - **Use diverse focal species.**
  - **Consider ecosystem processes.**
  - **Don't preclude linkage designs due to existing barriers.**
  - **Factor in climate change.**



For more information: Beier et al. 2006. South Coast Missing Linkages: Restoring Connectivity to Wildlands in the Largest Metropolitan Area in the USA. In Crooks and Sanjayan, Connectivity Conservation. Cambridge University Press.

http://scwildlands.org/

Any Questions?