SAN DIEGO REGION RESOURCES AND CONSERVATION

Thomas Oberbauer
Formerly County of San Diego
Now AECOM

Biodiverse

San Diego County one of the most biologically diverse Counties in US.

For Example Botanically 1573 native 26 endemic many near endemics. New native species ongoing. More than all New England

More bats than any county, 23 species half species in entire country

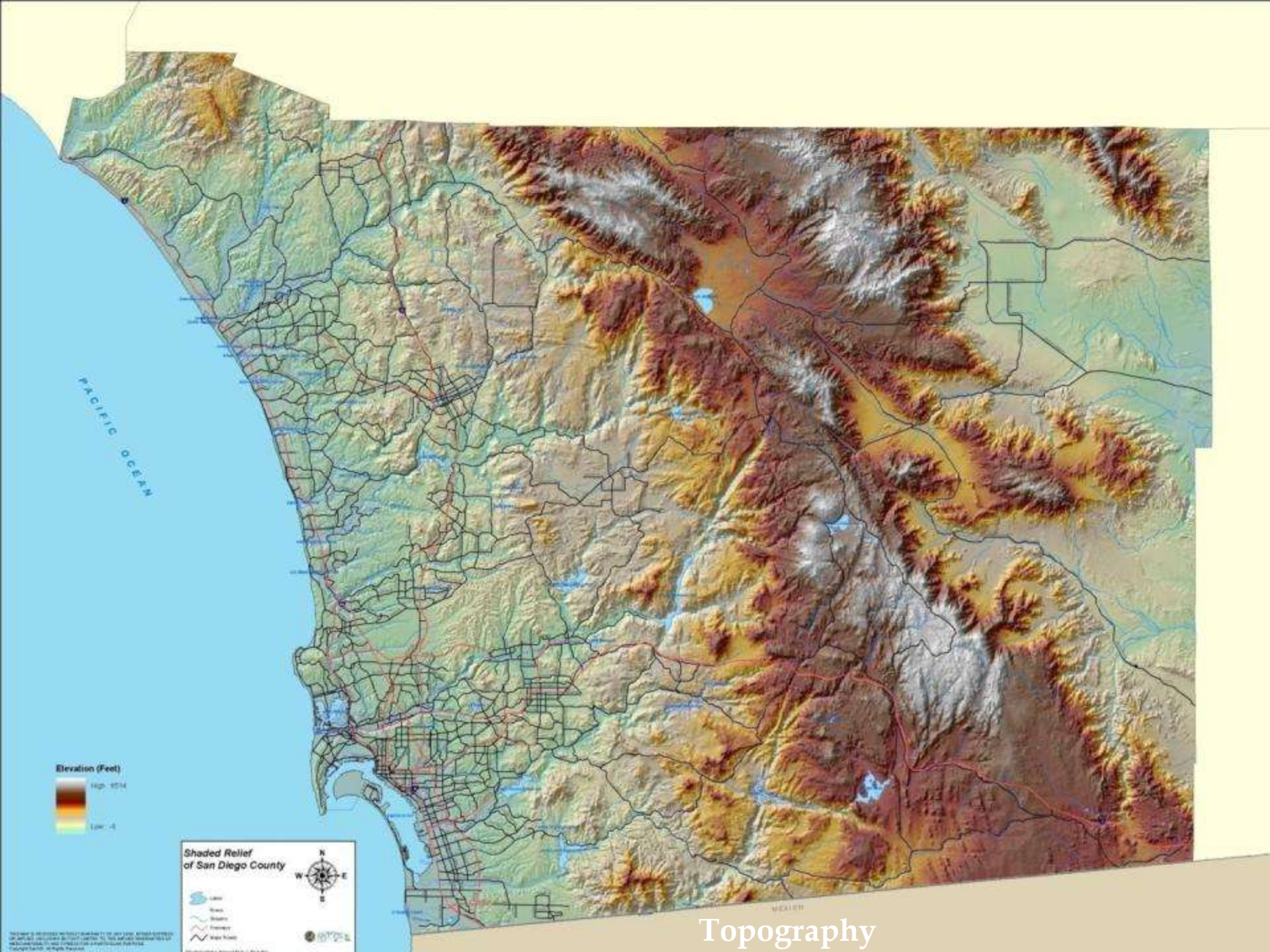
More land mollusks

Size of Connecticut

More people than 19 states including Iowa

Outline

- Physical features of San Diego County
- Unique vegetation and some associated species
- Fire events from last 12 years
- Multiple Species Conservation Program successes
- General photographs of interesting areas
- Baja California mainland and islands


PACIFIC OCEAN
Elevation (Feet)
Shaded Relief
of San Diego County
N
W
E
S

Topography

Geologic History

Cretaceous Andes Style Mountains 15-19,000 feet high

Otay, Black and San Miguel Mountains remnants Metavolcanic metamorphosed by heating from batholith

Coastal terraces composed of Sonoran River rock and sediments that have been uplifted.

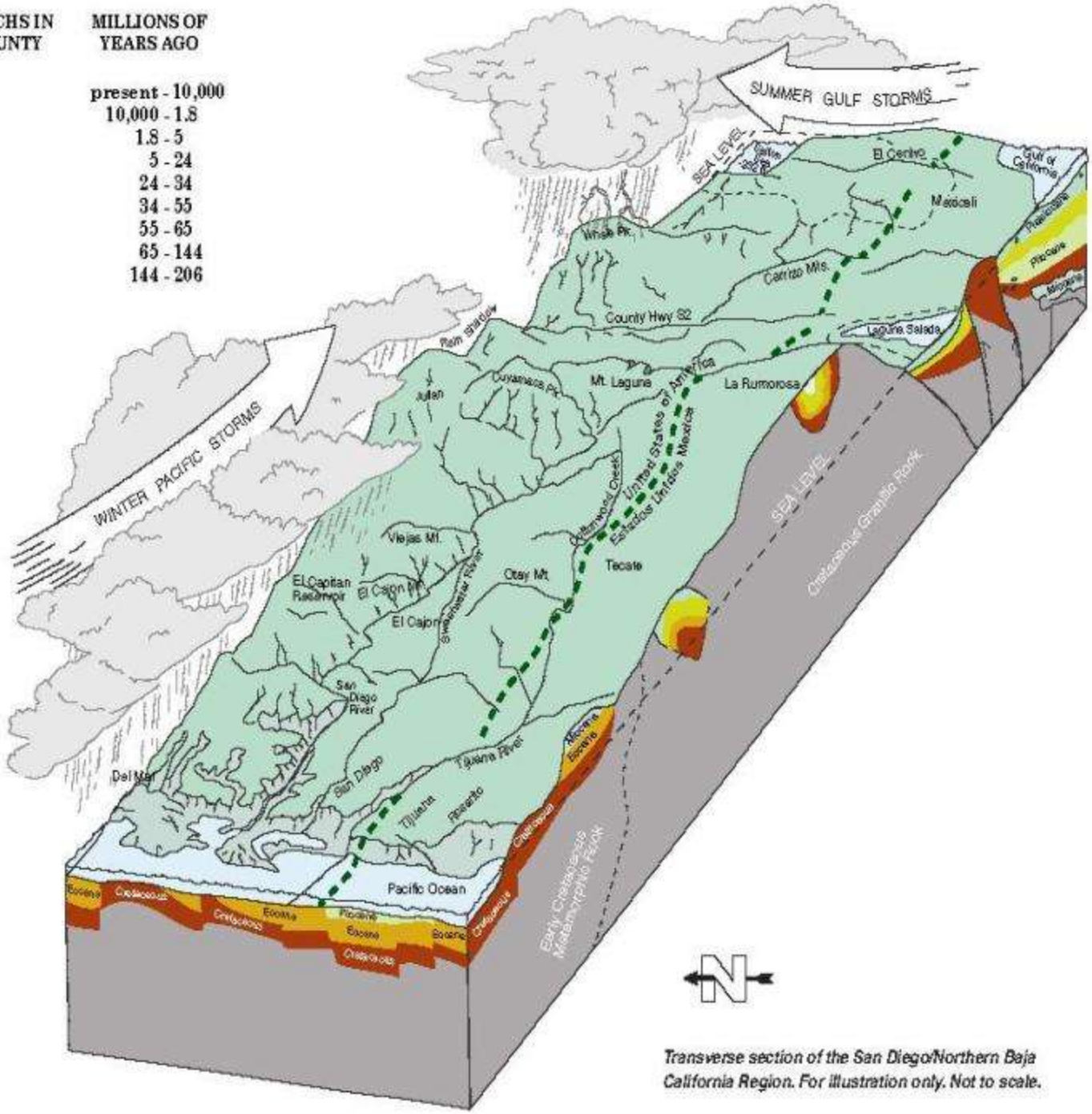
Granitic Mountains rose 2 million years ago

Paleogeologic History

Mio-Pleistocene– Woodrat middens and based on current species distribution

- Montane Coniferous forest through the area
- Sierra San Pedro Mártir forest in the higher elevations
  - **Quaking Aspen and Douglas tree squirrels**
  - **Lodgepole Pine at higher elevations**
- Piñon Pines down to desert edge
- Closed Cone forest on mesas

GEOLOGIC EPOCHS IN SAN DIEGO COUNTY	MILLIONS OF YEARS AGO
Holocene	present - 10,000
Pleistocene	10,000 - 1.8
Pliocene	1.8 - 5
Miocene	5 - 24
Oligocene	24 - 34
Eocene	34 - 55
Paleocene	55 - 65
Cretaceous	65 - 144
Jurassic	144 - 206



Transverse section of the San Diego/Northern Baja California Region. For illustration only. Not to scale.

Precipitation

- Cabrillo Monument
  - Upper 12 in (30cm)
  - Lower 6 in (15.24cm)
- San Diego 10.2 in (26 cm)
- Ramona 15.8 in (40.1)
- Cuyamaca Lake 34 in (86 cm)
- Palomar Mountain 40 in (101 cm)
- Pine Valley 21 in (53cm)
- Mount Laguna 25 in (63 cm),
- Campo 17 in (43cm),
- Jacumba 9 in (23 cm)
- Ocotillo 2.5 in (6.3 cm)

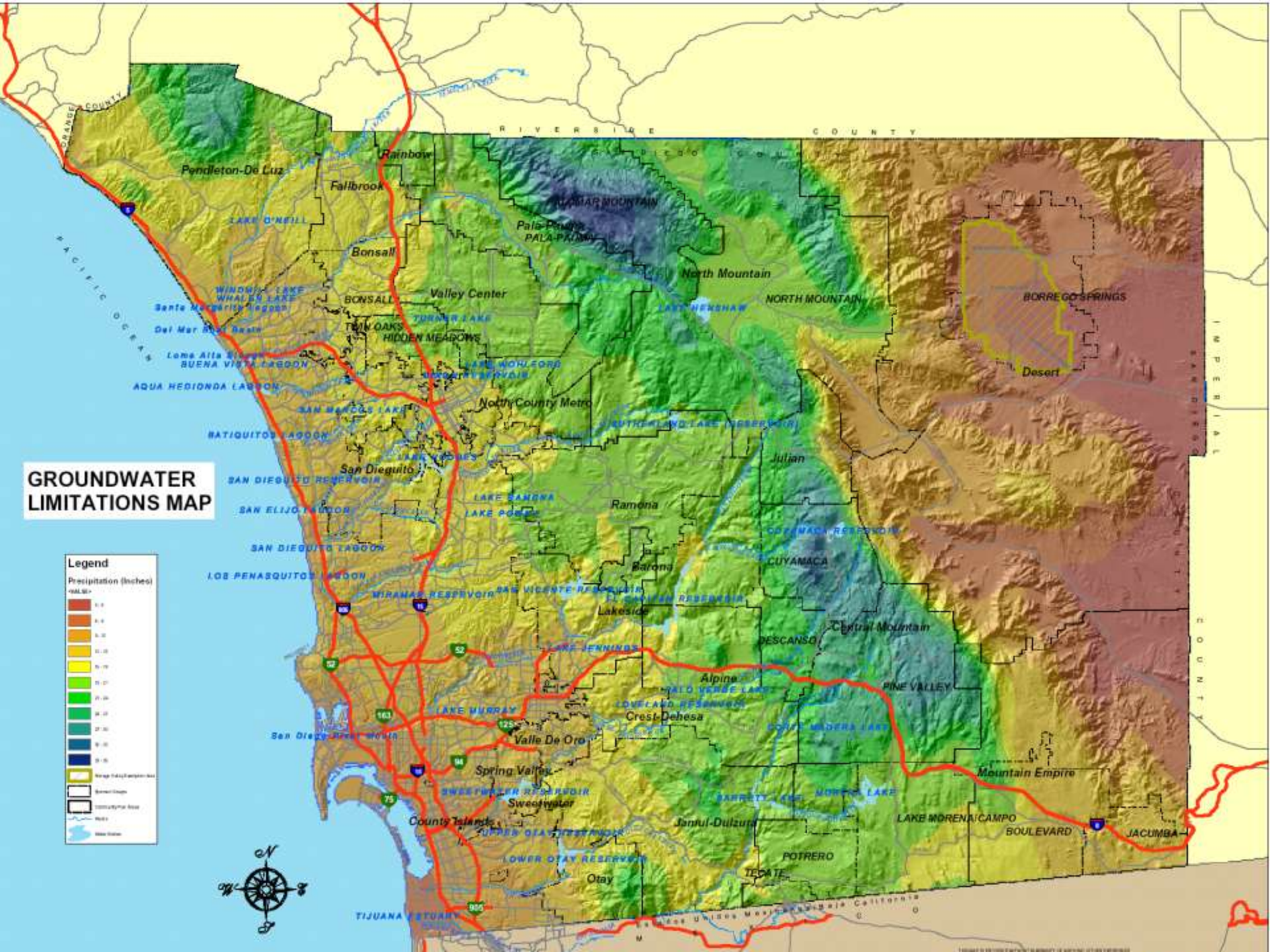
Climatic Variation

- Campo – one day temp can range from below freezing to 100 degrees F.
- Summer thunderstorms can be severe. In 1880's Campo received 11.5 in (29.2 cm) of rain in 80 minutes one August afternoon
- Aug 1992 6.5 in (16.5 cm) Palomar Mountain in 90 min.
- 1976 Hurricane Kathleen dropped torrential rains in the area, Desert areas up to 6-7 in (15-17 cm), Mt. Laguna 10 in (25 cm) in 12 hours

Climatic Variation

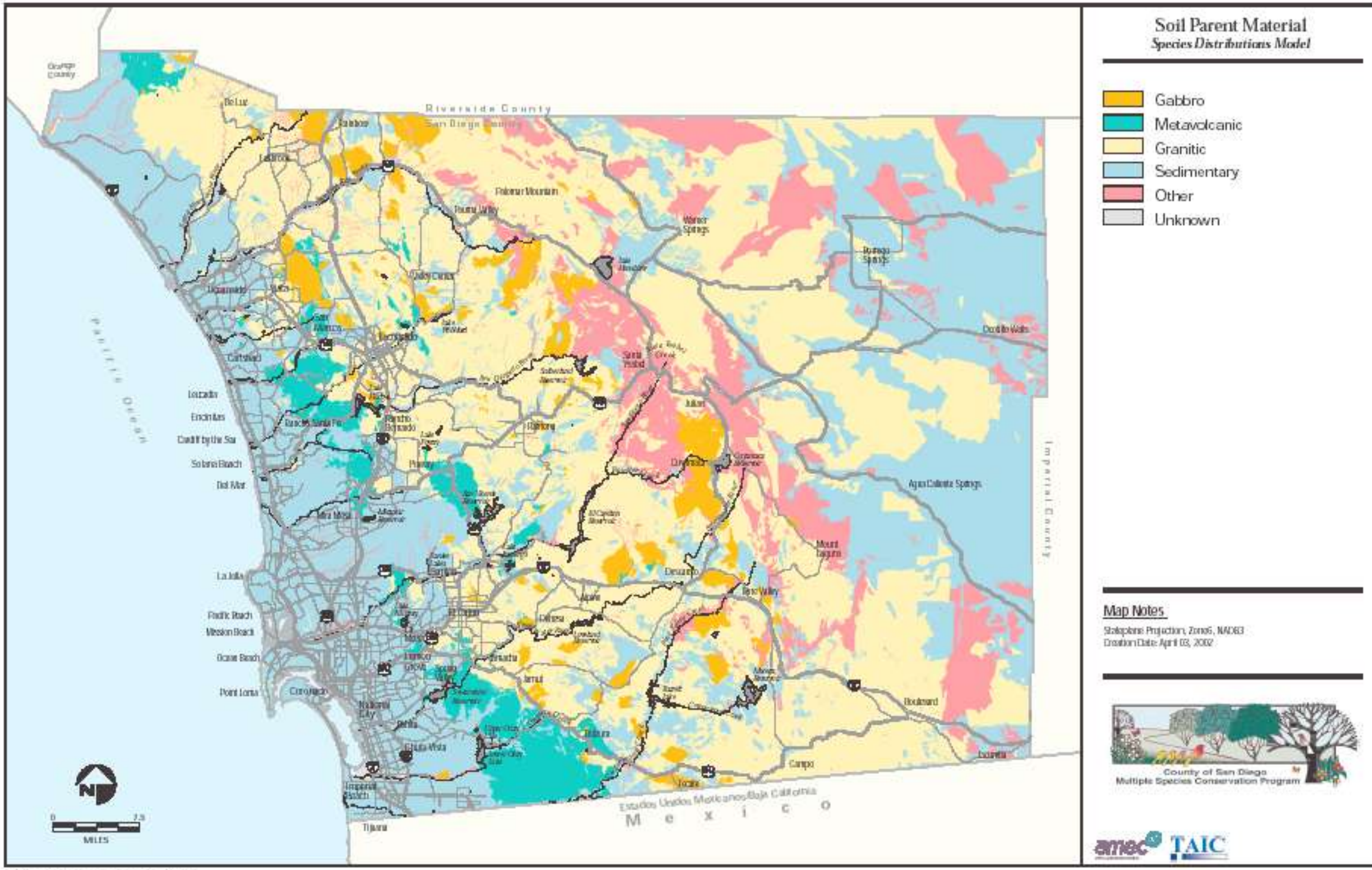
- 1993 Palomar Mountain 97 in (246 cm)
- 1880s Cuyamaca 100+ in (254cm) flooded mines
- 1891 Descanso 33 in (84cm) in 60 hours

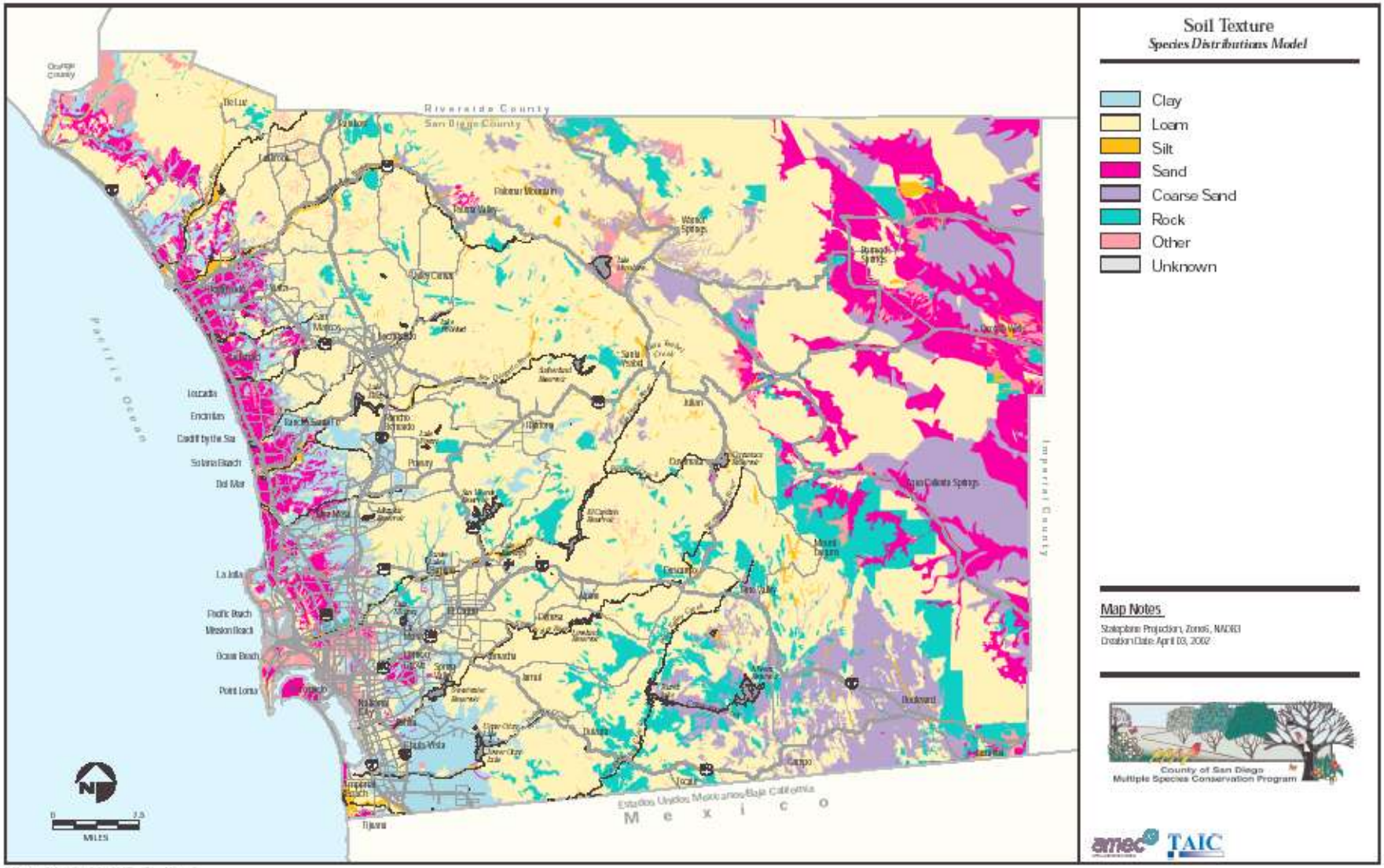
- August 4, 2011 Oceanside Harbor 66, San Diego 73, Ramona 94, Campo 100 with low of 52, Mt. Laguna 81 and Borrego Springs 114. 48 degree temp range.
- August 24, 2011 Oceanside Harbor tied record lowest high for date at 67, but Borrego Springs broke record high for date of 116. 49 degree range
- September day in 2011, Lindbergh Field .13 in. and 97 deg.
- October 12, 2015 3 PM, Oceanside 81, Campo 88, Lindbergh 94, Brown Field 97, Borrego 95 and Mount Laguna 66.
- Sept day 2013 car thermometer Earthquake Valley 99 and raining, Ocotillo 107 and Mount Laguna 65 and raining.


GROUNDWATER LIMITATIONS MAP
Legend
Precipitation (Inches)
Pendleton-De Luz
Rainbow
Fallbrook
Bonsall
Valley Center
Pala Pauma
PALA-PAUMA
PALOMAR MOUNTAIN
North Mountain
NORTH MOUNTAIN
BORREGO SPRINGS
Desert
Julian
North County Metro
Ramona
Barona
CUYAMACA
Lakeside
Central Mountain
DESCANSO
Alpine
PINE VALLEY
Crest-Dehesa
Valle De Oro
Spring Valley
Mountain Empire
Sweetwater
County Islands
Jamul-Dulzura
LAKE MORENA/CAMPO
BOULEVARD
JACUMBA
POTRERO
TECATE
Otay
TIJUANA ESTUARY
LAKE O'NEILL
Santa Margarita Lagoon
Del Mar Mesa Basin
Loma Alta Slough
BUENA VISTA LAGOON
AQUA HEDIONDA LAGOON
SAN MARCOS LAKE
BATIQUITOS LAGOON
SAN DIEGUITO RESERVOIR
SAN ELIJO LAGOON
SAN DIEGUITO LAGOON
LOS PENASQUITOS LAGOON
MIRAMAR RESERVOIR
LAKE HODGES
LAKE SAN VICENTE RESERVOIR
EL CAPITAN RESERVOIR
LAKE JENNINGS
LAKE MURRAY
San Diego River Mouth
SWEETWATER RESERVOIR
LOVELAND RESERVOIR
HALO VERDE LAKE
BARRETT LAKE
MORENA LAKE
UPPER OTAY RESERVOIR
LOWER OTAY RESERVOIR
TURNER LAKE
WINDMILL LAKE
WHALEY LAKE
TWIN OAKS
HIDDEN MEADOWS
LAKE WOHLFORD
LAKE HENSHAW
SUTHERLAND LAKE RESERVOIR
LAKE RAMONA
LAKE POWAY
CUYAMACA RESERVOIR
LAKE MORENA
DOANE VALLEY LAKE
PACIFIC OCEAN
ORANGE COUNTY
RIVERSIDE COUNTY
IMPERIAL COUNTY
SAN DIEGO COUNTY
Estados Unidos Mexicanos
Baja California
N
W
E
S

Drought

- 2001-2002 Season San Diego 3.02 inches
  - Cuyamaca 10.8 inches
- Driest in 150 years of recordings
- 2006-2007 also very dry
- Only 2 years above normal rainfall in last 17


Soil Parent Material
Species Distributions Model
Gabbro
Metavolcanic
Granitic
Sedimentary
Other
Unknown
Map Notes
Stateplane Projection, Zone6, NAD83
Creation Date: April 03, 2002
County of San Diego
Multiple Species Conservation Program
TAIC
Riverside County
San Diego County
Palomar Mountain
Pacific Ocean
Imperial County
Oceanside
Carlsbad
Leucadia
Encinitas
Cardiff by the Sea
Solana Beach
Del Mar
La Jolla
Pacific Beach
Mission Beach
Ocean Beach
Point Loma
Coronado
Chula Vista
Escondido
Ramona
Julian
Descanso
Alpine
El Cajon
Jamul
Campo
Boulevard
Tecate
Tijuana
Mount Laguna
Agua Caliente Springs
Borrego Springs
Ocotillo Wells
Warner Springs
Pauma Valley
Valley Center
Rainbow
De Luz
Poway
Dulzura
Jacumba
Estados Unidos Mexicanos/Baja California
M e x i c o
MILES


Soil Texture
Species Distributions Model
Clay
Loam
Silt
Sand
Coarse Sand
Rock
Other
Unknown
Riverside County
San Diego County
Imperial County
Estados Unidos Mexicanos/Baja California
M e x i c o
Oceanside
Encinitas
Cardiff by the Sea
Solana Beach
Del Mar
La Jolla
Pacific Beach
Mission Beach
Ocean Beach
Point Loma
Tijuana
Map Notes
Stateplane Projection, Zone6, NAD83
Creation Date: April 03, 2002
County of San Diego
Multiple Species Conservation Program
MILES

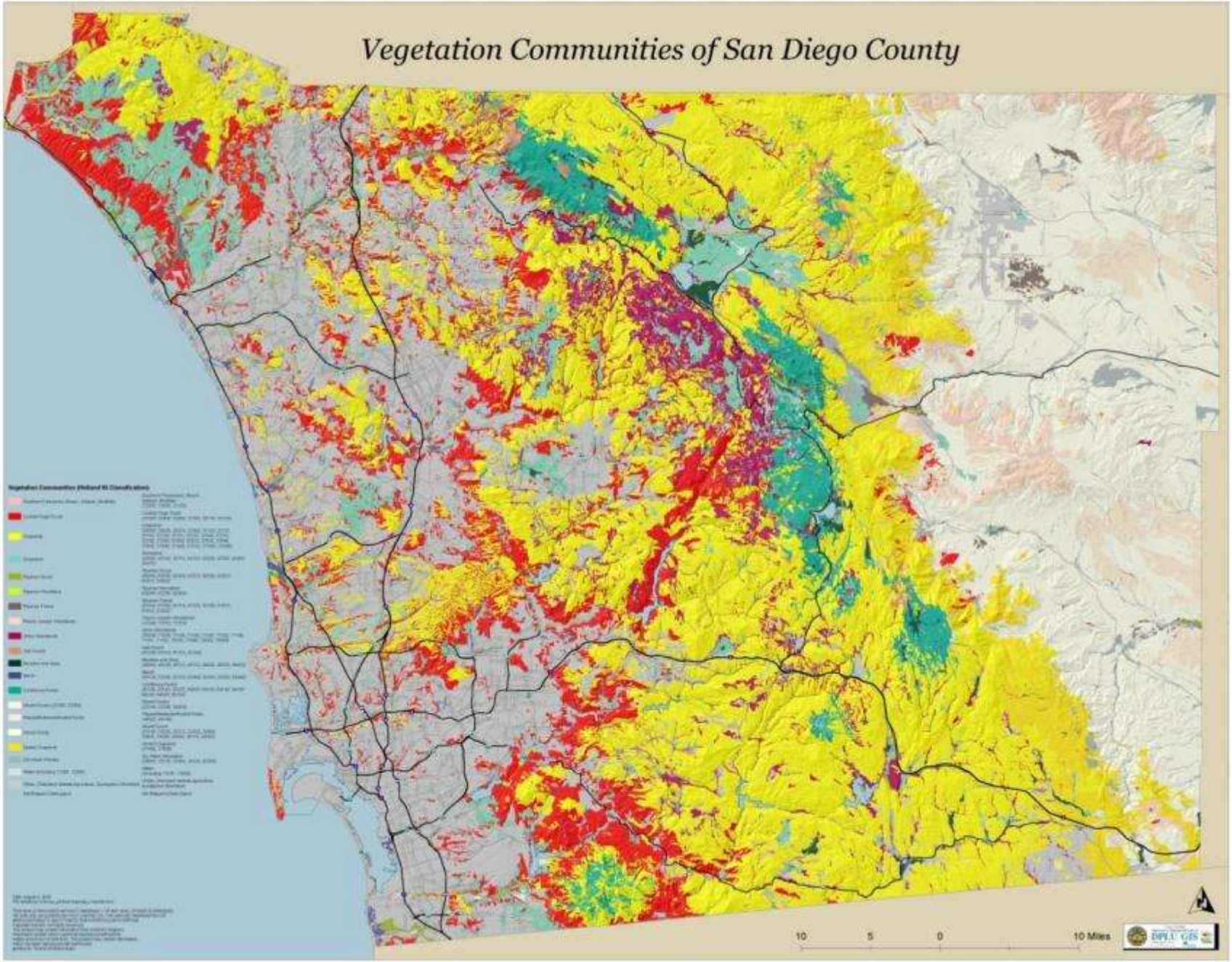
Vegetation

- Large number of Holland vegetation communities
  - Coastal sage scrub
  - Coastal dune
  - Coastal salt marsh
  - Vernal Pools
- Various forms of chaparral
  - Southern mixed chaparral
  - Desert transition chaparral
  - Redshank chaparral
  - Chamise chaparral

Vegetation

- Oak Woodland
- Riparian Woodland
- Sierran Coniferous Forest
- Pinyon Juniper Forest
- Montane Meadow
- Grassland
- Great Basin Sagebrush
- Cypress Woodland

- Many more under San Diego Manual using CNPS Manual


Vegetation Communities of San Diego County
10
5
0
10 Miles

Coastal sage scrub 75% loss

Artemisia californica-Eriogonum fasciculatum-Opuntia littoralis Association

Bahiopsis laciniata Diegan CSS

Bahiopsis laciniata-Artemisia californica-Eriogonum fasciculatum Association
Salvia munzii

Mission Trails CSS and CHP

Baccharis sarothroides Association in foreground

Encelia californica
Point Loma CSS

Inland: Variety of Vegetation

Coastal Sage Scrub Adjacent to Woodland

Chaparral and Oak Woodlands

Riparian Vegetation
Chaparral slopes

Chaparral and Oaks

Quercus berberidifolia-Adenostoma fasciculatum Alliance and Quercus kelloggii Association

Dense Forest

Deserts: Desert Scrub

Desert Scrub

Plant Soil Affinities

Gabbros

- Nolina interrata
- Packera ganderi
- Carex obispoensis serpentine disjunct

Metavolcanics

- Fremontodendron mexicana
- Lepechinia ganderi

Gabbros or Metavolcanics

- Calochortus dunnii
- Hesperocyparis forbesii
- Satureja chandleri
- Tetracoccus dioicus

Plant Soil Affinities

Clay Soil
Acanthomintha ilicifolia
Bloomeria clevelandii
Convolvulus simulans

Sandy soils
Chorizanthe orcuttiana
Dudleya blochmanii brevifolia
Acmespon nuttalliana
Pinus torreyana
Chaenactis glabriuscula orcuttiana

Calochortus dunnii
Dunn's Mariposa Lily Gabbro and Metavolcanic

Lepechinia ganderi

Nolina interrata Gabbro endemic

Coastal Plants: *Chaenactis glabriuscula orcuttiana* Sandy soils

Coast: *Chloropyron maritima* Salt Marsh

Pinus torreyana
Torrey Pines State Park

Agave shawii
Point Loma

Glebionis coronaria

Came late 1970's OriginallyTidy Tips and Camissoniopsis cheiranthifolia

Leptosyne maritima
Point Loma

Linanthus dianthiflorus
Torrey Pine State Park

Linanthus dianthiflorus Torrey Pines, Veldt Grass removal

Dudleya brevifolia
Del Mar

Vernal pool with water
96+% loss of habitat

Vernal Pool Spring

Pogogyne nudiuscula

Brodiaea orcuttii

Poway post fire 2008

Del Dios post fire 2008 Sage Scrub

Otay Mountain

3,500 foot peak with Chaparral and Tecate cypress, metavolcanic rock

Rare Plants San Diego County Otay Mountain

- *Acanthomintha ilicifolia*
- *Arctostaphylos otayensis*
- *Artemisia palmeri*
- *Astragalus deanei*
- *Brodiaea orcuttii*
- *Calandrinia breweri*
- *Calochortus dunnii*
- *Caulanthus stenocarpus*
- *Chamaebatia australis*
- *Chorizanthe leptotheca*
- *Chorizanthe polygonoides longispina*
- *Chorizanthe procumbens*
- *Clarkia delicata*
- *Comarostaphylos diversifolia diversifolia*
- *Hesperocyparis forbesii*
- *Dichondra occidentalis*
- *Dudleya variegata*
- *Ericameria palmeri palmeri*
- *Fremontodendron mexicanum*
- *Galium californicum californicum*
- *Gilia caruifolia*
- *Harpagonella palmeri*
- *Deinandra floribunda*
- *Horkelia truncata*
- *Juglans californica*
- *Juncus acutus leopoldii*
- *Lathyrus splendens*
- *Lepechinia ganderi*
- *Lilium humboldtii ocellatum*
- *Hosackia crassifolia otayensis*

Lathyrus splendens, Chaparral

San Diego County Mountains

Upper Palomar Mountain

Rare Plants San Diego County Mountains

- *Androsace elongata acuta*
- *Astragalus douglasii perstrictus*
- *Astragalus oocarpus*
- *Berberis fremontii*
- *Berberis nevinii*
- *Boechera hirshberiae*
- *Boykinia rotundifolia*
- *Brodiaea orcuttii*
- *Calochortus dunnii*
- *Caulanthus simulans*
- *Chaenactis parishii*
- *Chorizanthe leptotheca*
- *Chorizanthe polygonoides longispina*
- *Clarkia delicata*
- *Hesperocyparis forbesii*
- *Hesperocyparis stephensonii*
- *Deinandra floribunda*
- *Deinandra mohavensis*
- *Delphinium hesperium cuyamacae*
- *Delphinium parishii subglobosum*
- *Downingia concolor brevior*
- *Ericameria cuneata macrocephala*
- *Eriogonum foliosum*
- *Galium johnstonii*
- *Galium angustifolium jacinticum*
- *Geraea viscida*
- *Gilia caruifolia*
- *Grindelia hirsutula hallii*
- *Heterotheca sessilifolia sanjacintensis*
- *Heuchera brevistaminea*
- *Heuchera rubescens versicolor*
- *Hulsea californica*
- *Hulsea mexicana*
- *Hulsea vestita callicarpha*

San Diego County Mountains Rare Plants

- *Hymenothrix wrightii*
- *Lathyrus splendens*
- *Lessingia glandulifera tomentosa*
- *Lewisia brachycalyx*
- *Lilium humboldtii ocellatum*
- *Lilium parryi*
- *Limnanthes gracilis parishii*
- *Linanthus bellus*
- *Linanthus orcuttii*
- *Machaeranthera asteroides lagunensis*
- *Malacothamnus aboriginum*
- *Mimulus clevelandii*
- *Mimulus diffusus*
- *Monardella macrantha hallii*
- *Monardella nana leptosiphon*
- *Navarretia peninsularis*
- *Penstemon clevelandii connatus*
- *Pentachaeta aurea*
- *Perideridia gairdneri gairdneri uncertain*
- *Poa atropurpurea*
- *Quercus engelmannii*
- *Ribes canthariforme*
- *Rubus glaucifolius ganderi*
- *Rupertia rigida*
- *Scutellaria bolanderi austromontana*
- *Selaginella asprella*
- *Packera ganderi*
- *Streptanthus bernardinus*
- *Streptanthus campestris*
- *Thermopsis californica semota*
- *Viola aurea*

Mixed Forest

Mendenhall Valley

Conifer and Meadow

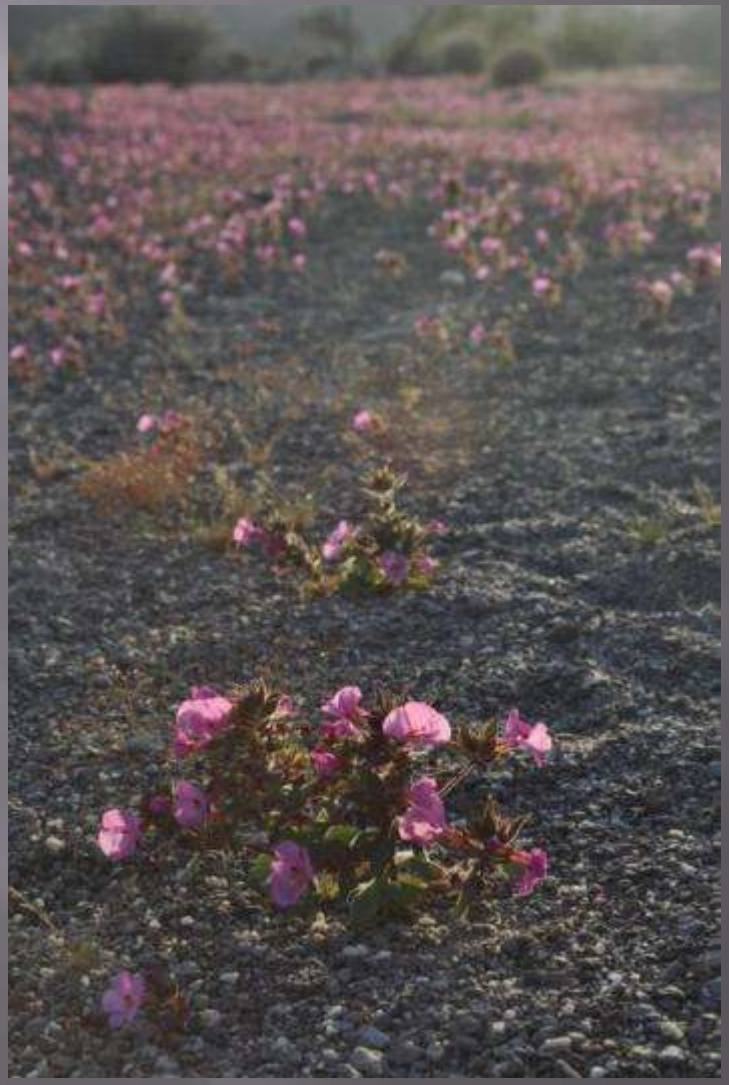
French Valley

Lilium humboldtii ssp. ocellatum

Monardella macrantha

Linanthus bellus east edge of mountains

Desert Plants
Mimulus bigelovii



Oenothera deltoides, Abronia villosa, Geraea canescens, Sahara mustard removal

Xylorhiza orcuttiana

Mohavia conferta

Disjuncts

Disjuncts from North

Ceanothus foliosus Holy Jim Canyon 9 2009? SLO

Salvia sonomensis LAC possibly ornamental helipad SGabriel mtns. Santa Barbara next records

Vaccinium ovatum to Santa Barbara

Cornus nuttallii not in Santa Barbara or SLO down the Sierras

Rhododendron occidentale skips LA, SLO, SB, OC up the Sierran SB and Riverside county paths

Lewisia brachycalyx SB LA Plumas and Arizona and Utah N Baja

Disjunct from South

Viguiera purisimae Camp Pendleton 300 miles north of nearest location found in 1997.

Banana slug

Negative Disjuncts

Hesperochiron californicum SB, Ventura mt pinos Sierras and Sierra Juarez with *Lewisia brachycalyx*

Penstemon californicus Riverside OC and Sierra Juarez, near San Diego County line

Pinus contorta murrayana San Jacinto Mtns and Sierra San Pedro Martir

Populus tremuloides San Bernardino Mtns

Sarcodes sanguinea San Jacinto and Sierra San Pedro Martir

Southern Limits

Pacific Madrone
Big Leaf Maple

Drought killed trees 2003


2003 Cedar Fire

From internet

From Web 1880s

Loss of Big trees and loss of nearly 20,000 acres of conifers with 9,000 in Cuyamaca alone
Note density of dead trees

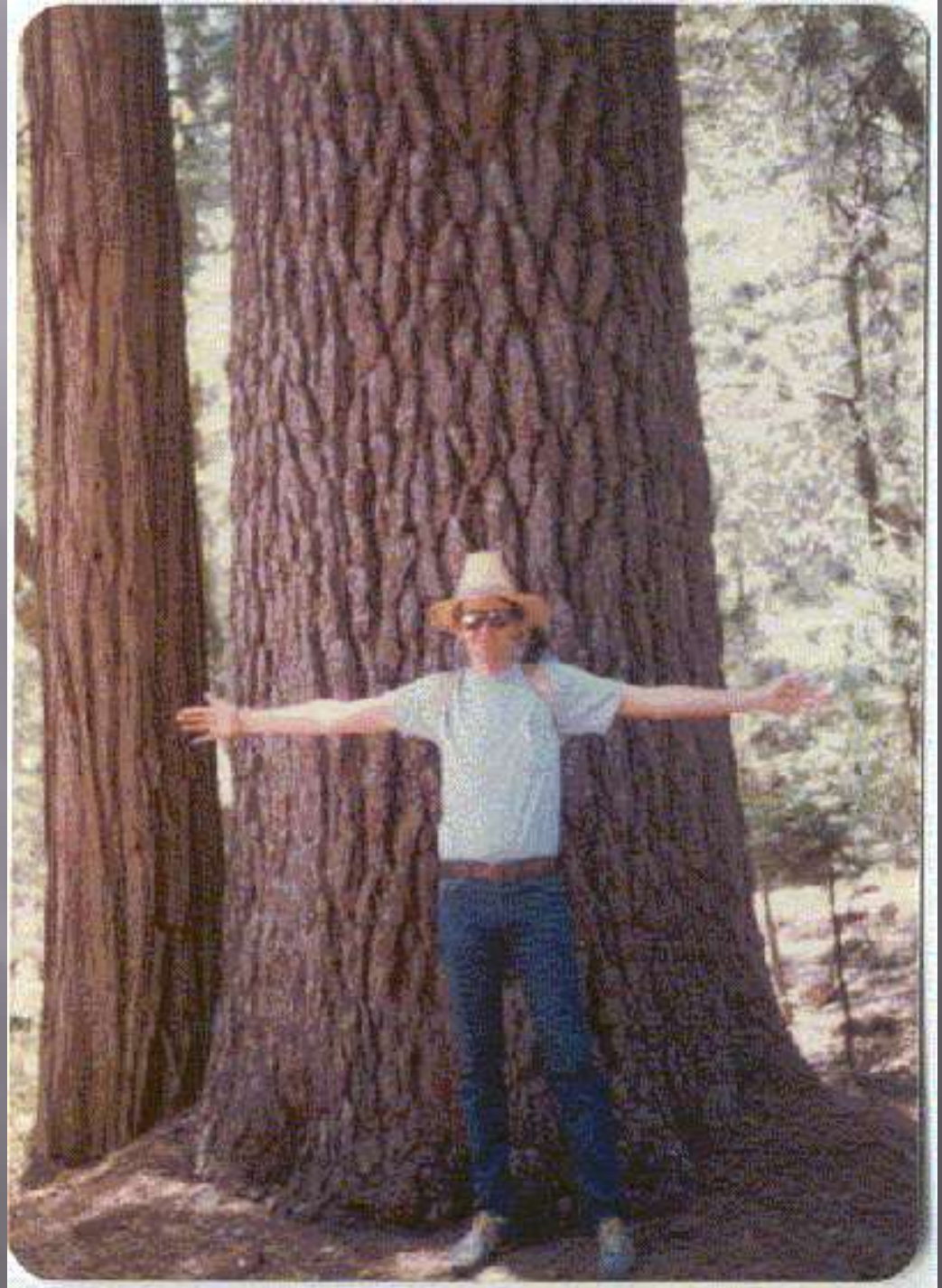
Burned forest on Middle Peak, Cuyamaca Mountains. All photographs by the author unless otherwise specified.

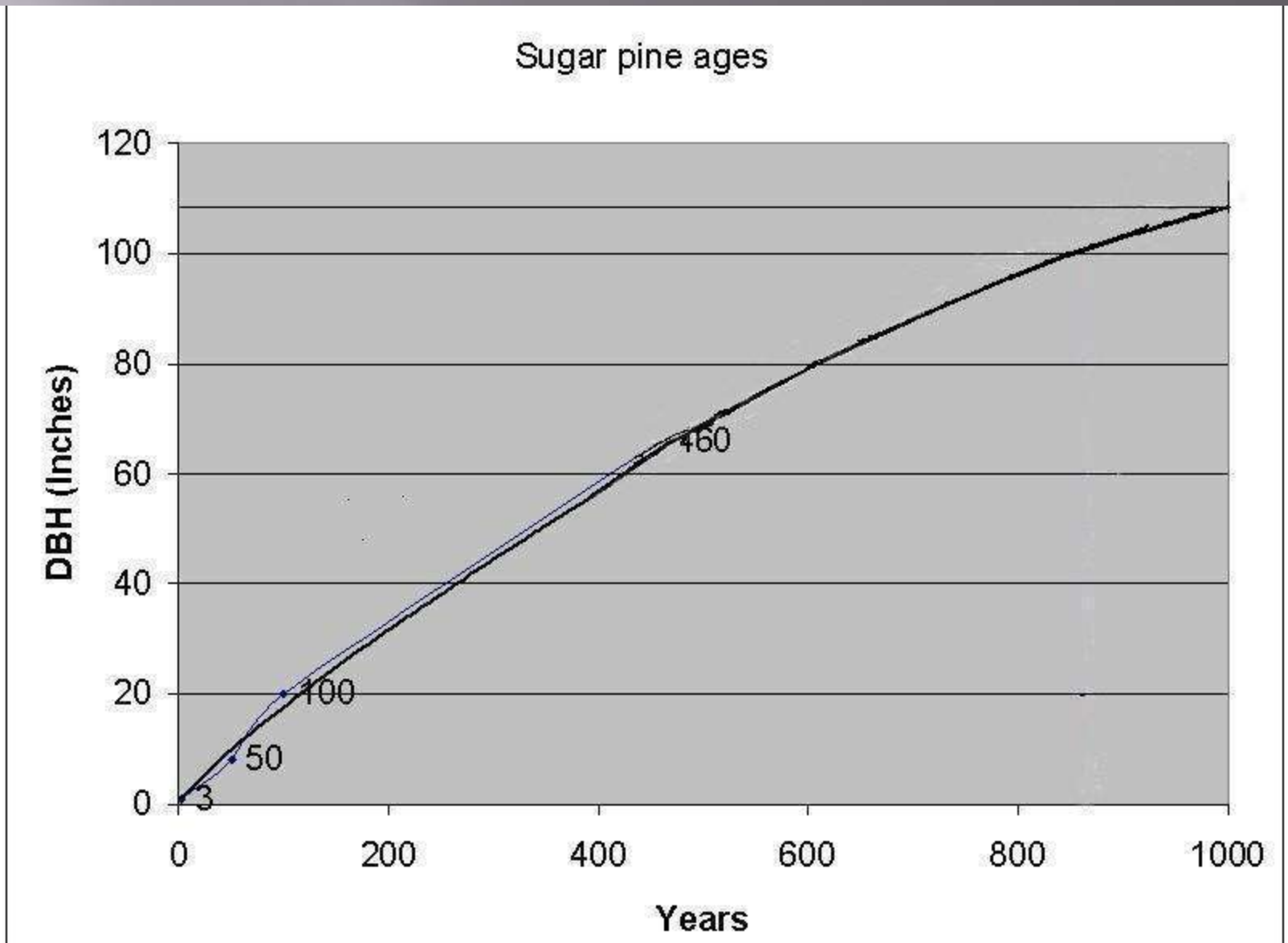
LOSS OF 500-YEAR-OLD SUGAR PINES DURING OCTOBER 2003 FIRE STORMS

by Thomas Oberbauer

Sugar pine, *Pinus lambertiana*, is known for extreme size: It is the largest growing member of the pine genus, and supports one of the largest cones of any pine. The cones up to a foot-and-a-half (45 cm) long, dangling from the branch tips are familiar to anyone who has visited Yosemite or Sequoia National Parks. I recall a park ranger stating that unopened cones heavy with sap have been known to shatter car windshields. This five-needle member of the white pine group has relatives in Asia and a long fossil history (Critchfield, 1986). But when I first studied this tree in college, at San Diego State University, I had never seen one in San Diego County.

That changed quickly, as my project was to draw a detailed map of the species' distribution, use an increment borer to measure age, create growth charts, and measure the height of the trees by triangulation. In San Diego County, Griffin and Critchfield (1976) generally mapped a population on the Cuyamaca Mountains in central San Diego County, including Cuyamaca Peak, Middle Peak, and some near Japacha Peak, as well as Hot Springs Mountain above Warner Springs in the northeastern portion of the county. Their maps were the basis for my

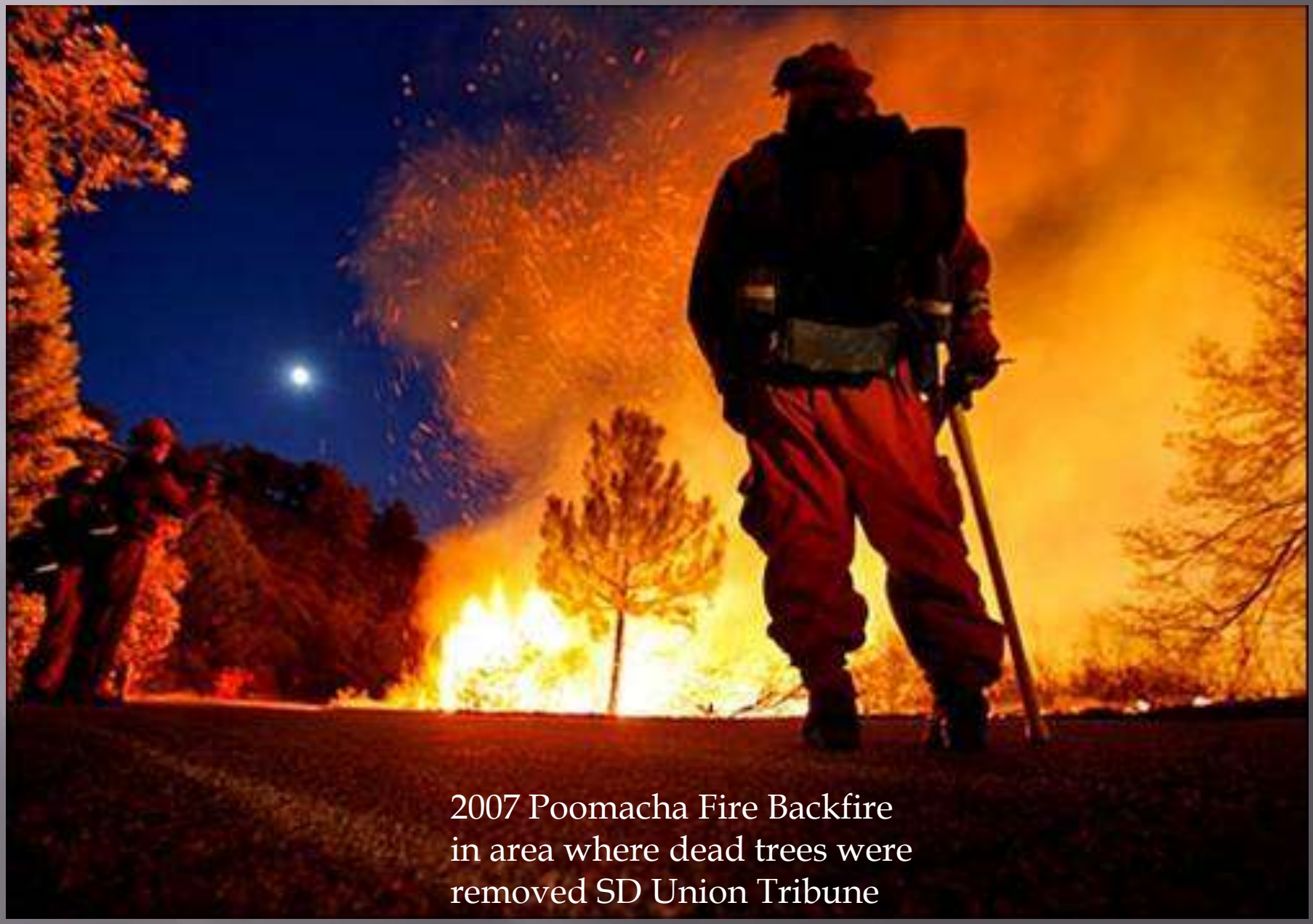



Sugar pine ages
120
100
80
60
40
20
0
DBH (Inches)
0
200
400
600
800
1000
Years
460
100
50
3

World's Largest Coulter Pine Register Big Trees

Photo from Web

Cypress saplings Otay Mountain



2007 Poomacha Fire Backfire in area where dead trees were removed SD Union Tribune

Poomacha Fire fighter
working in defensible space
SD UNION TRIBUNE

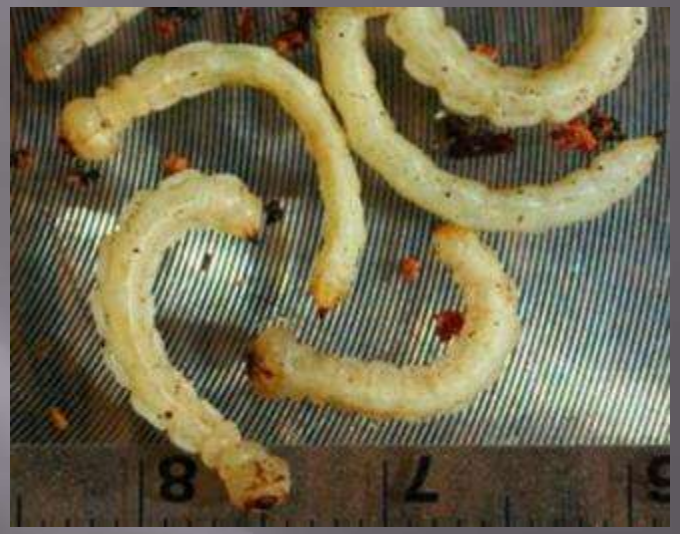
Dead Dying Diseased Tree removal created Defensible Space for backfires

Cuyamaca Peak Remnant conifers from Cedar Fire

10 foot tall *Ceanothus palmeri*

Chamise Chaparral I-8 Overlook burned 3 times in last 15 years

Gold spotted oak borer



Photos from Internet

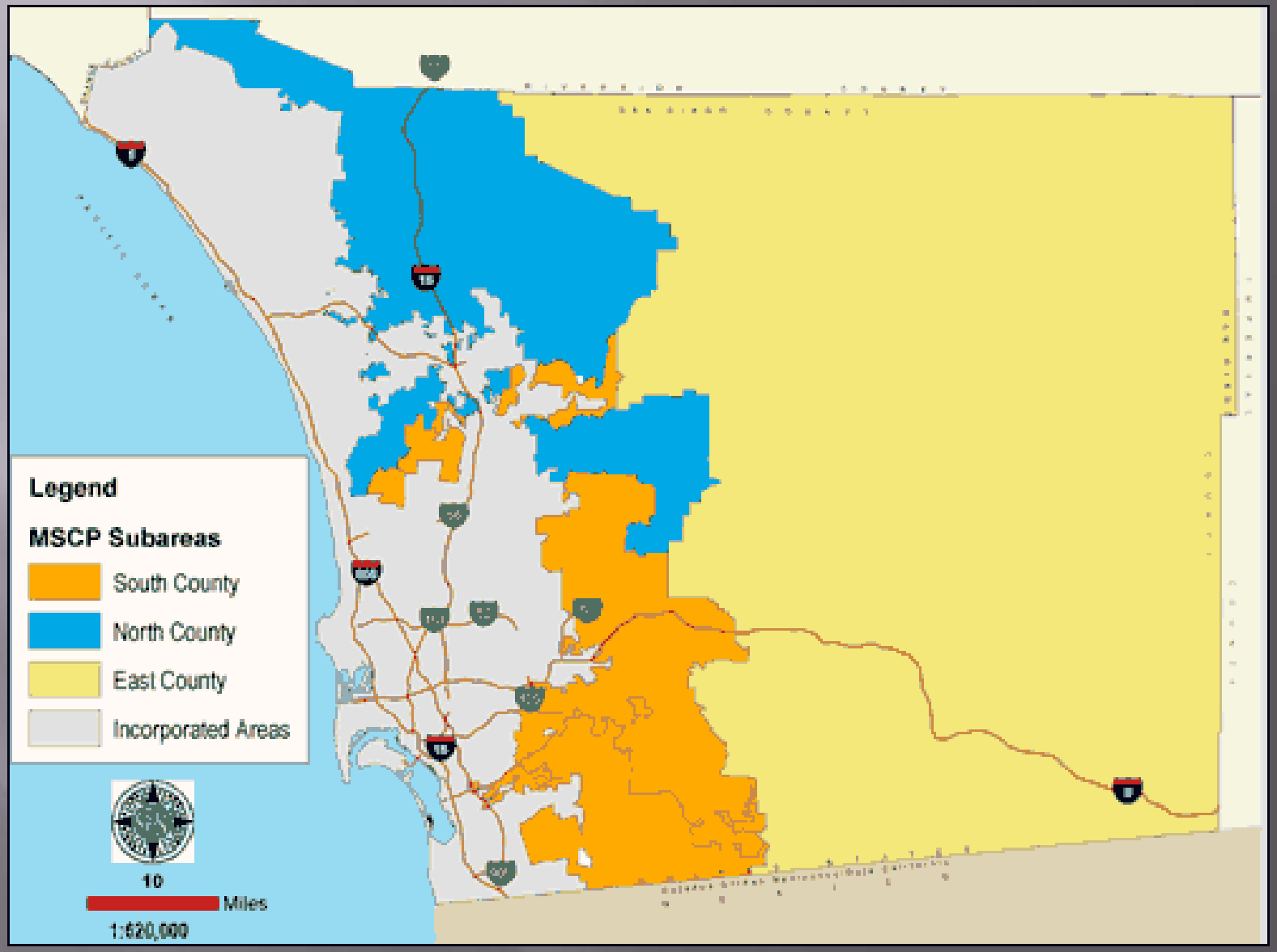
GSOB

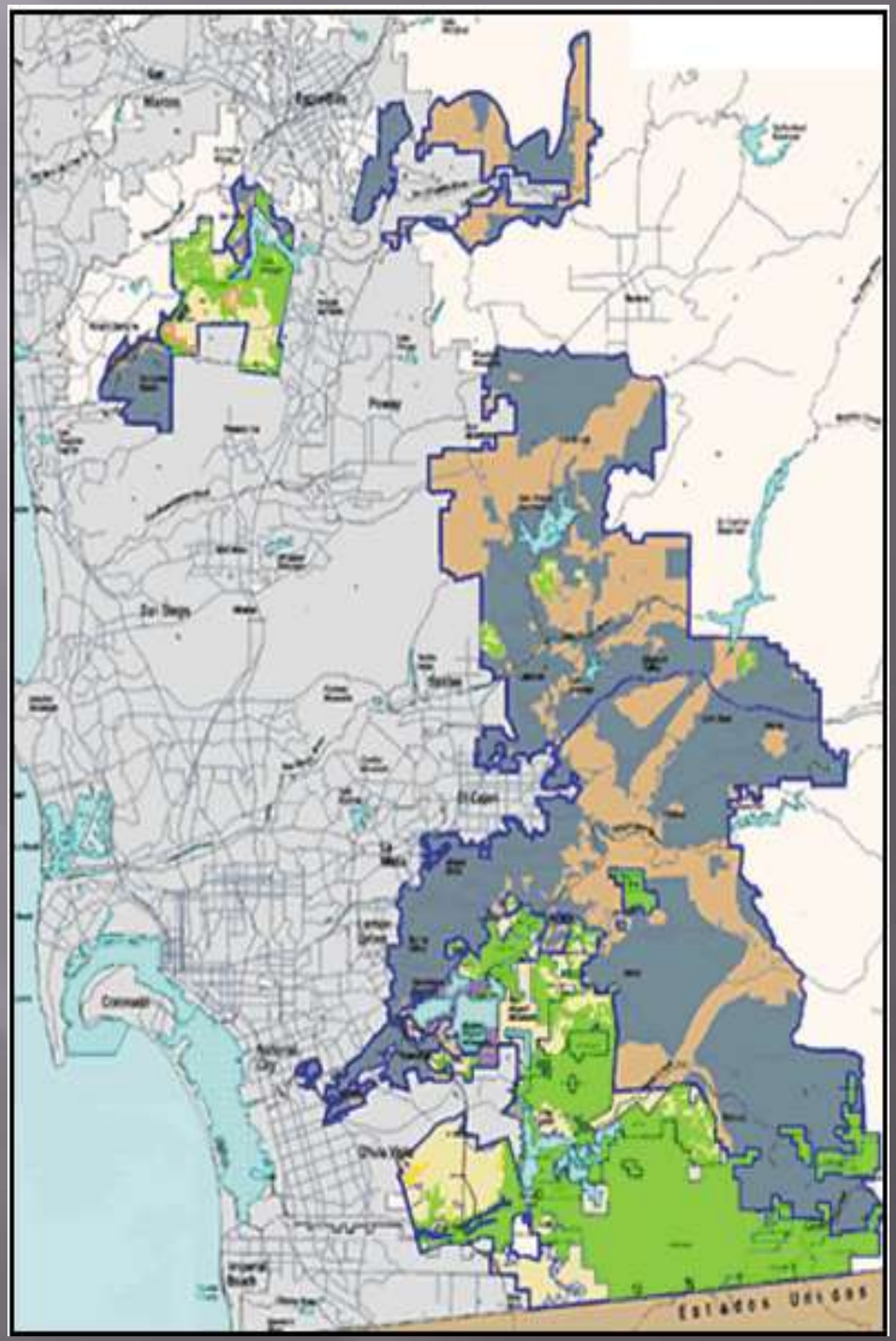
Feral Pigs

- Introduced in 2006
- 200-300 animals
- Working on plans to eradicate them
- Eat acorns

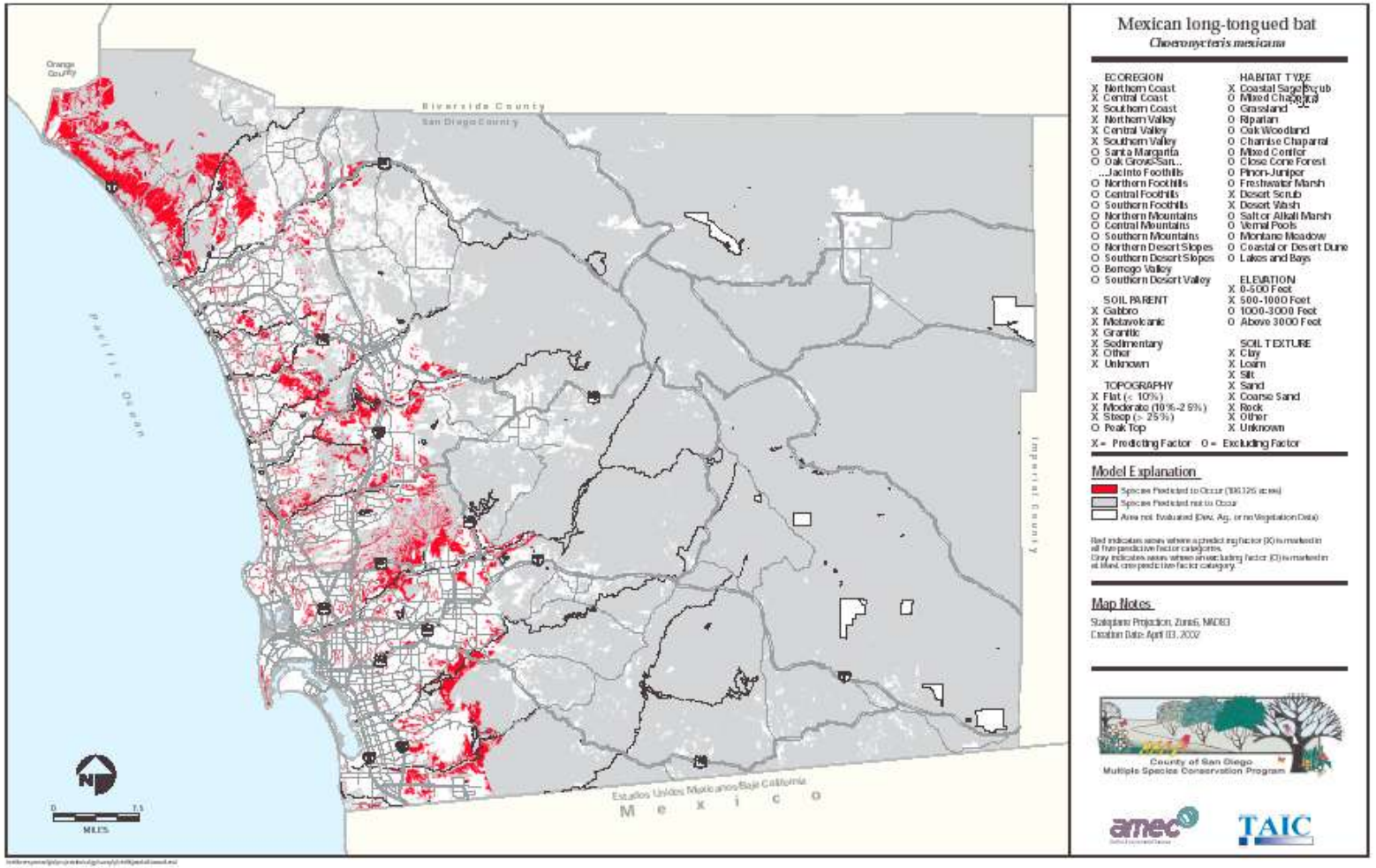
- Turkeys introduced 1990s eat acorns
- Combine with GSOB dim future for oaks

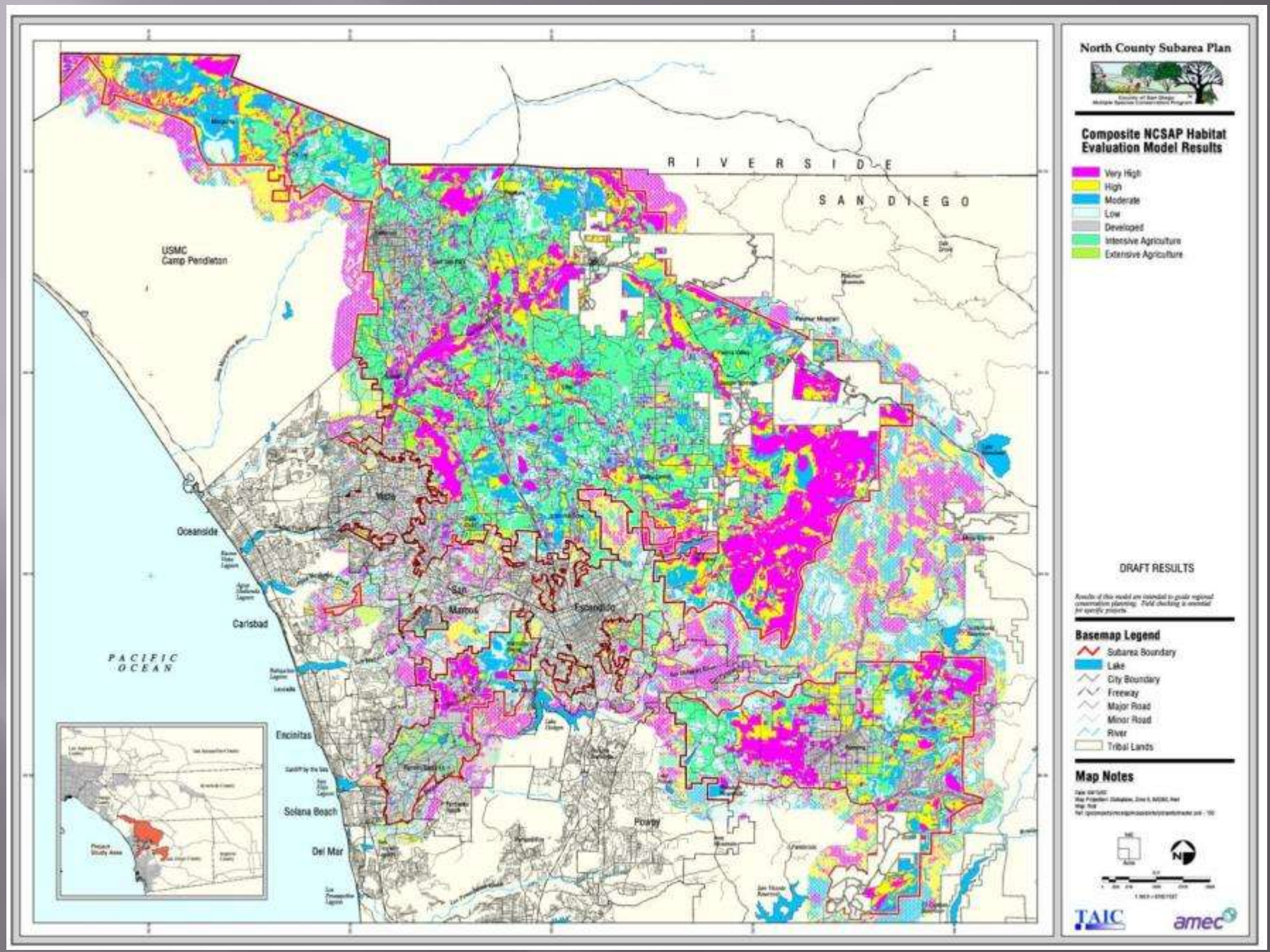
MSCP Subareas

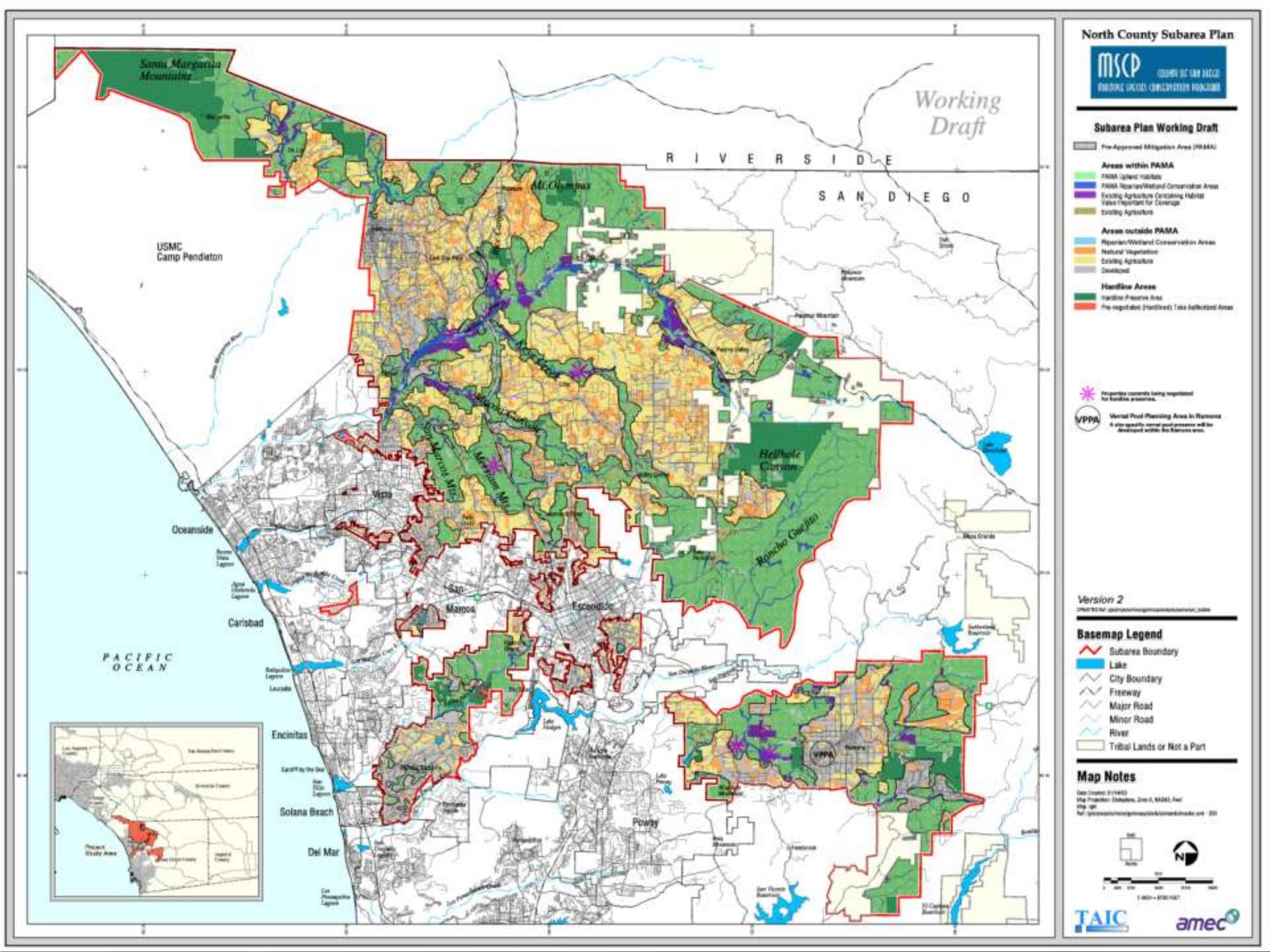



Estados Unidos

Output of County Species Distribution Model




North County Subarea Plan
Composite NCSAP Habitat Evaluation Model Results
Very High
High
Moderate
Low
Developed
Intensive Agriculture
Extensive Agriculture
DRAFT RESULTS
Basemap Legend
Subarea Boundary
Lake
City Boundary
Freeway
Major Road
Minor Road
River
Tribal Lands
Map Notes
RIVERSIDE
SAN DIEGO
USMC
Camp Pendleton
Oceanside
Carlsbad
Vista
San Marcos
Escondido
Encinitas
Solana Beach
Del Mar
Poway
PACIFIC OCEAN


North County Subarea Plan
MSCP
Subarea Plan Working Draft
Pre-Approved Mitigation Area (PAMA)
Areas within PAMA
PAMA Upland Habitats
PAMA Riparian/Wetland Conservation Areas
Existing Agriculture Containing Habitat Valued Important for Coverage
Existing Agriculture
Areas outside PAMA
Riparian/Wetland Conservation Areas
Natural Vegetation
Existing Agriculture
Developed
Hardline Areas
Hardline Preserve Area
Pre-negotiated (Hardlined) Take Authorized Areas
Properties currently being negotiated for hardline preserves.
VPPA
Vernal Pool Planning Area in Ramona
A site-specific vernal pool preserve will be developed within the Ramona area.
Version 2
Basemap Legend
Subarea Boundary
Lake
City Boundary
Freeway
Major Road
Minor Road
River
Tribal Lands or Not a Part
Map Notes
Working Draft
RIVERSIDE
SAN DIEGO
Santa Margarita Mountains
USMC
Camp Pendleton
Mt. Olympus
Hellhole Canyon
Rancho Guejito
Oceanside
Vista
San Marcos
Escondido
Carlsbad
PACIFIC OCEAN
Encinitas
Solana Beach
Del Mar
Poway
TAIC
amec

Work with Stakeholders and public officials

- Wildlife Agencies both US Fish and Wildlife Service and California Department of Fish and Game
- Builders
- Environmental groups
- Agricultural groups
- Decision Makers
- **Partners nearly 40,000 acres in MSCP plus tens of thousands more outside MSCP spillover**

Cuyamaca Lake

Castilleja densiflora, Lasthenia gracilis, Lupinus bicolor, Layia platyglossa

Limnanthes gracilis var. parishii

Downingia concolor var. brevior

Lupinus excubitus

Laguna Meadow winter

Laguna Meadow Spring

Sierra Juarez is Large Area

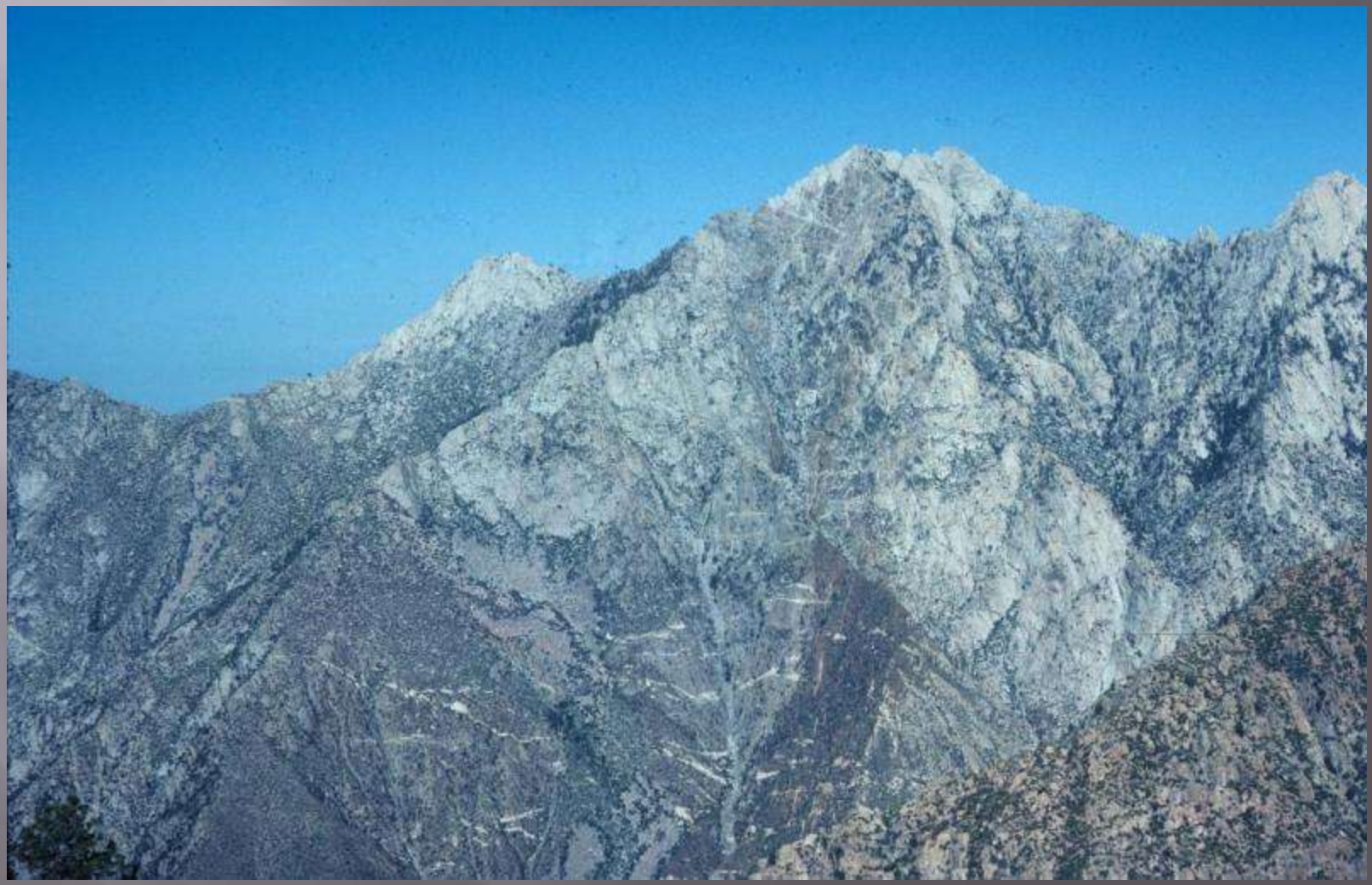
Laguna Hanson

Erendira Pinus muricata

Cedros Island

Senecio palmeri

Picacho Del Diablo



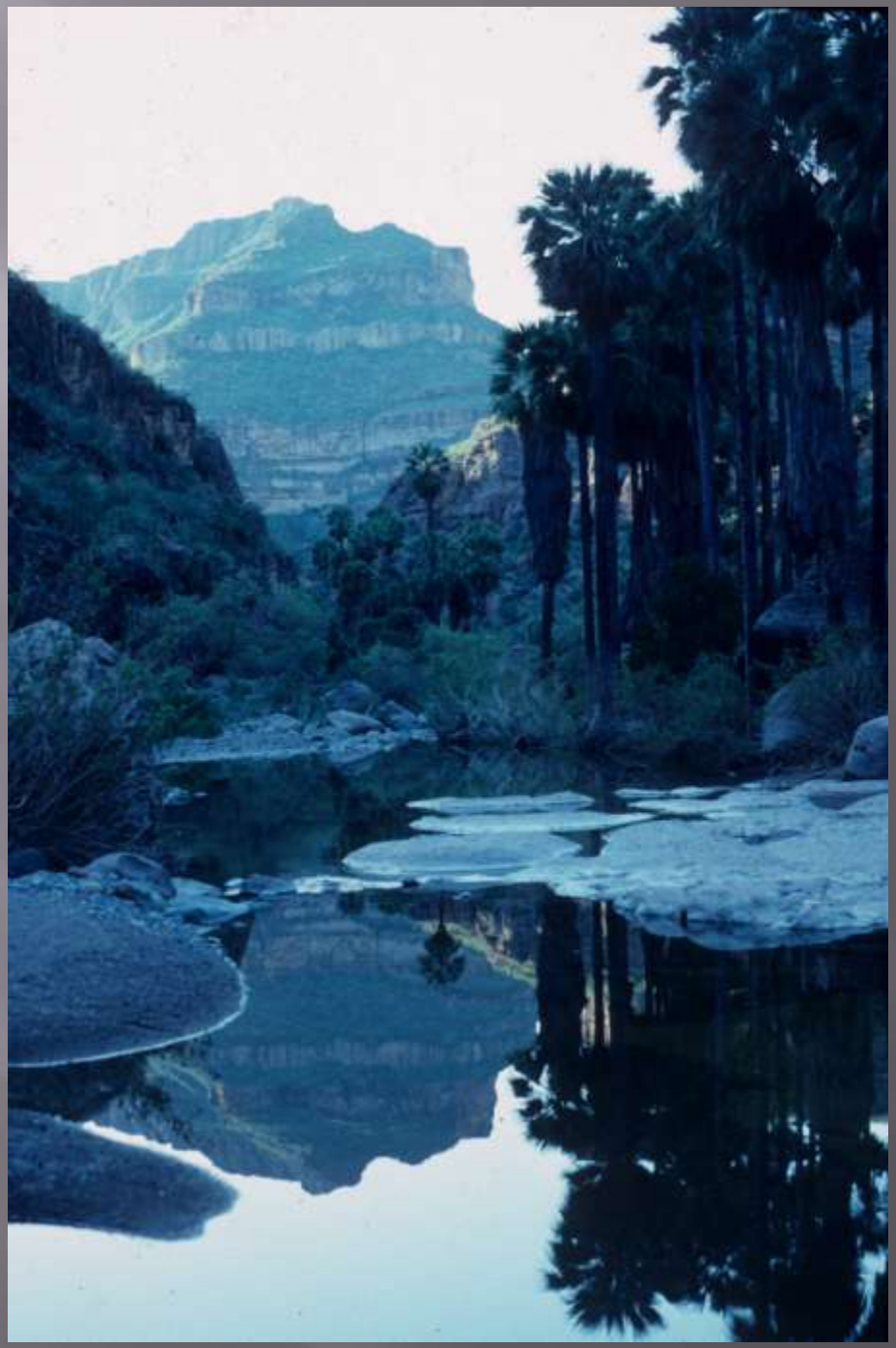
Sierra San Pedro Martir

Vizcaino Desert

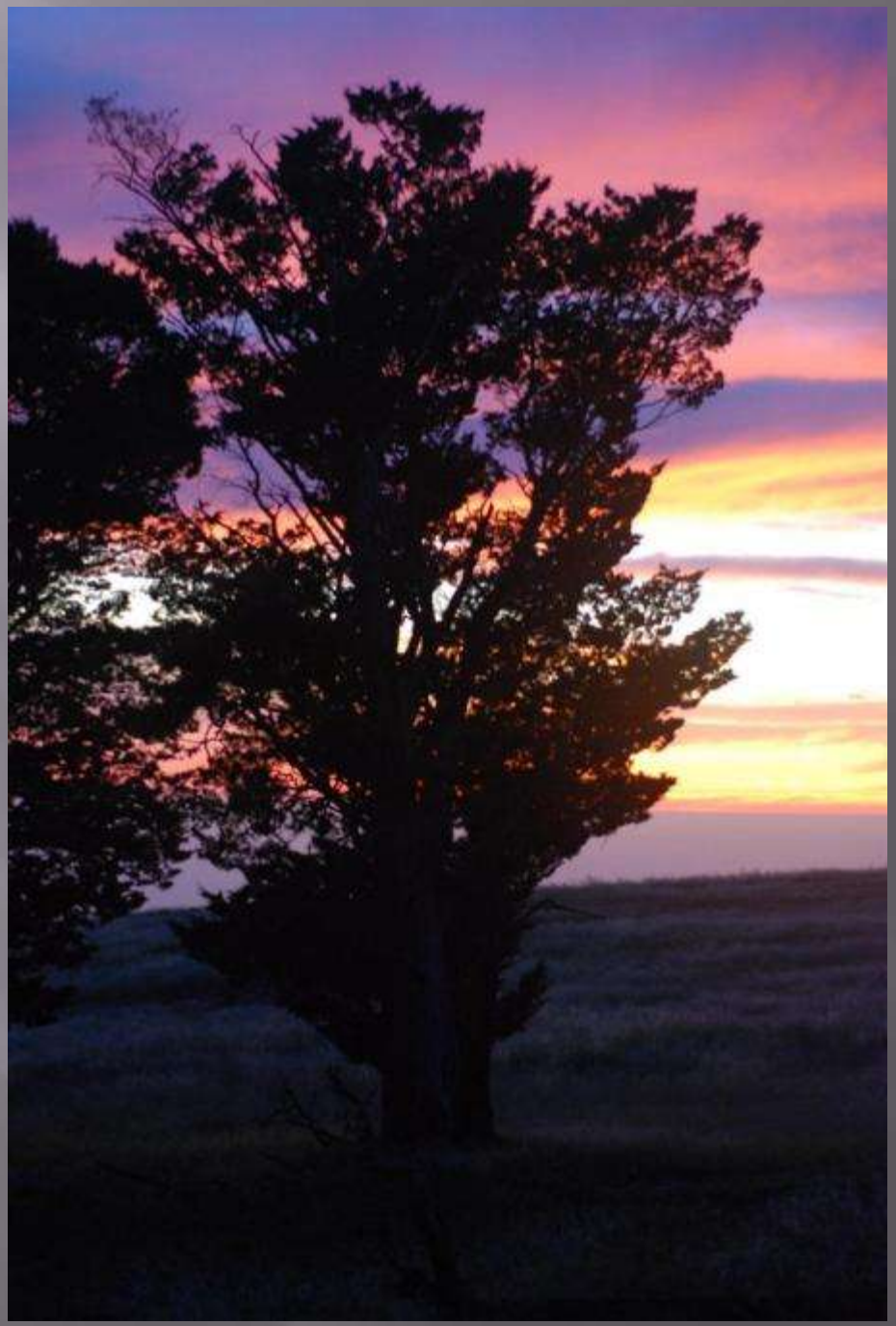
Abronia villosa , Pachycereus, Yucca valida

South of El Rosario

Arroyo San Pablo
Sierra San Francisco



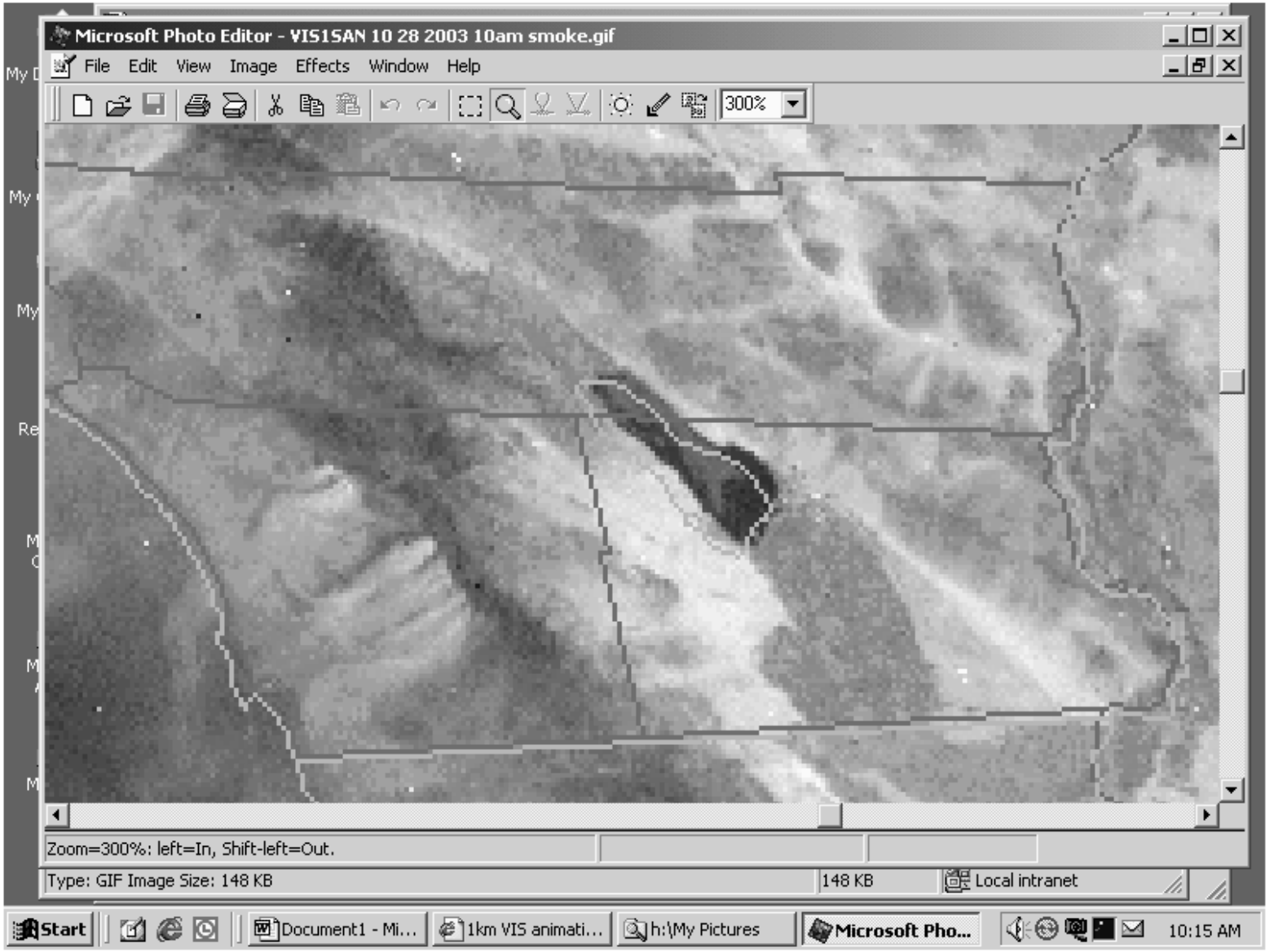
Guadalupe Cypress on Guadalupe Island



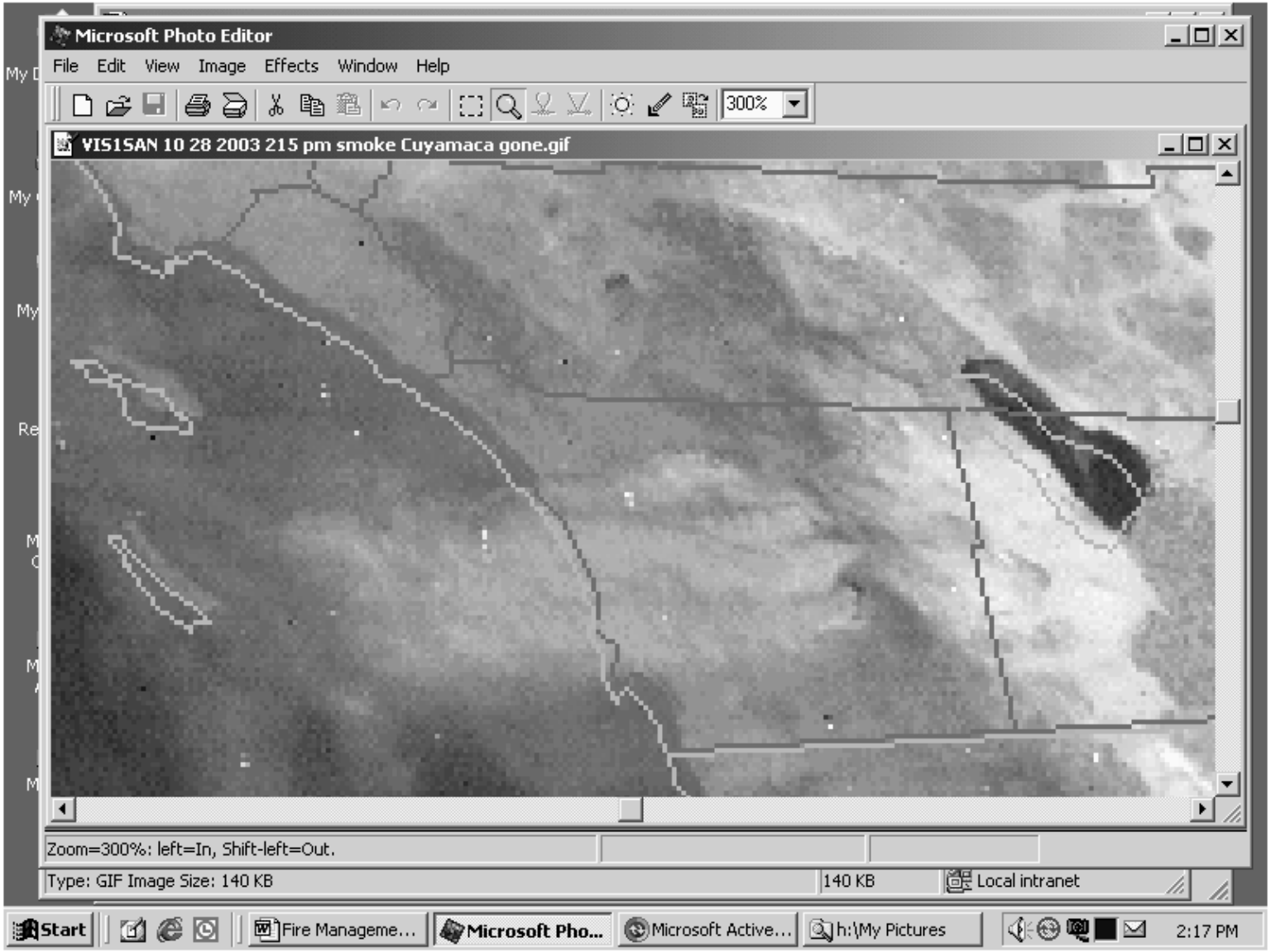
Coastal sage scrub
75+% loss of habitat

Artemisia californica-Eriogonum fasciculatum-Malosma laurina Association

Cuyamaca Burning



Cuyamaca Burned

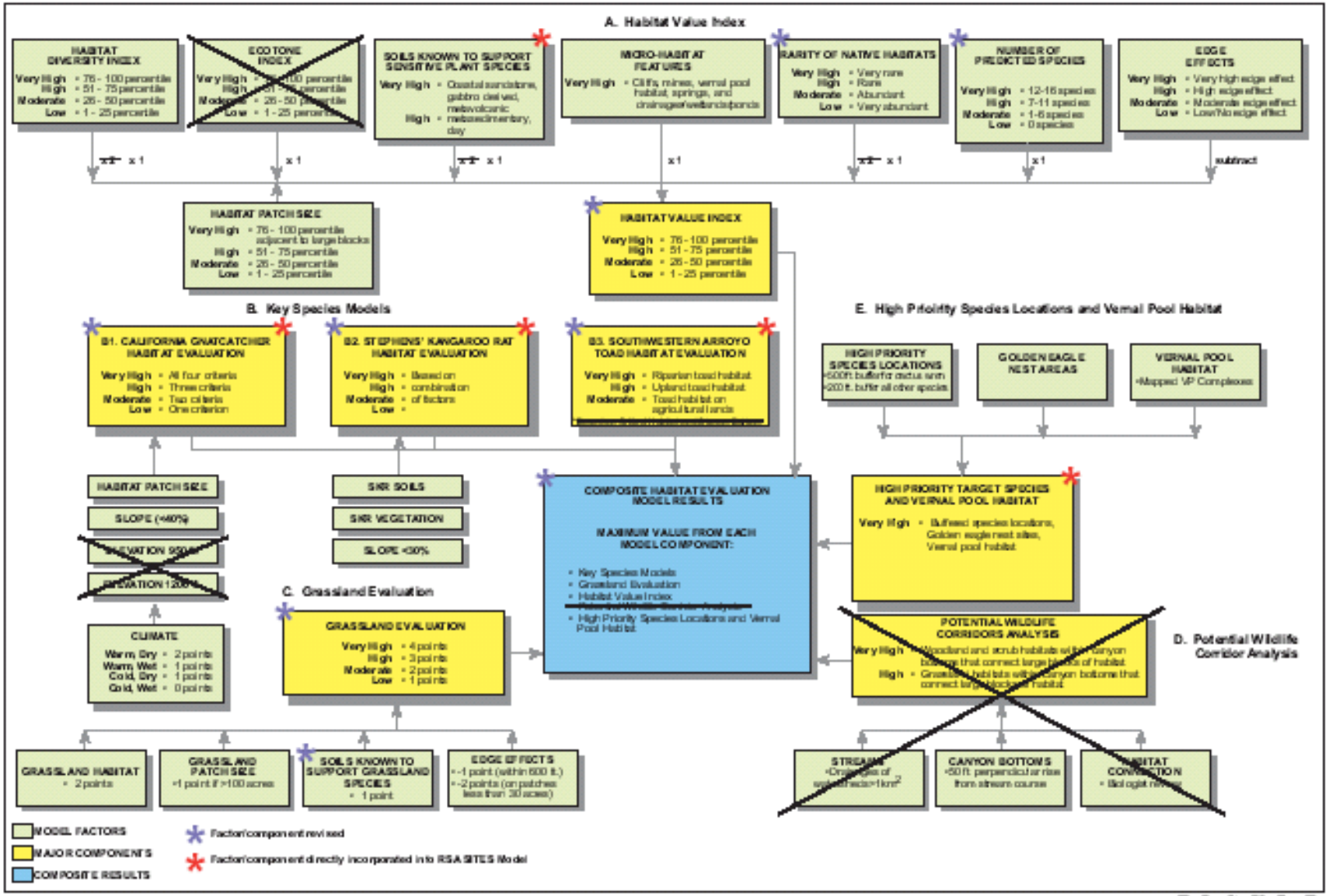


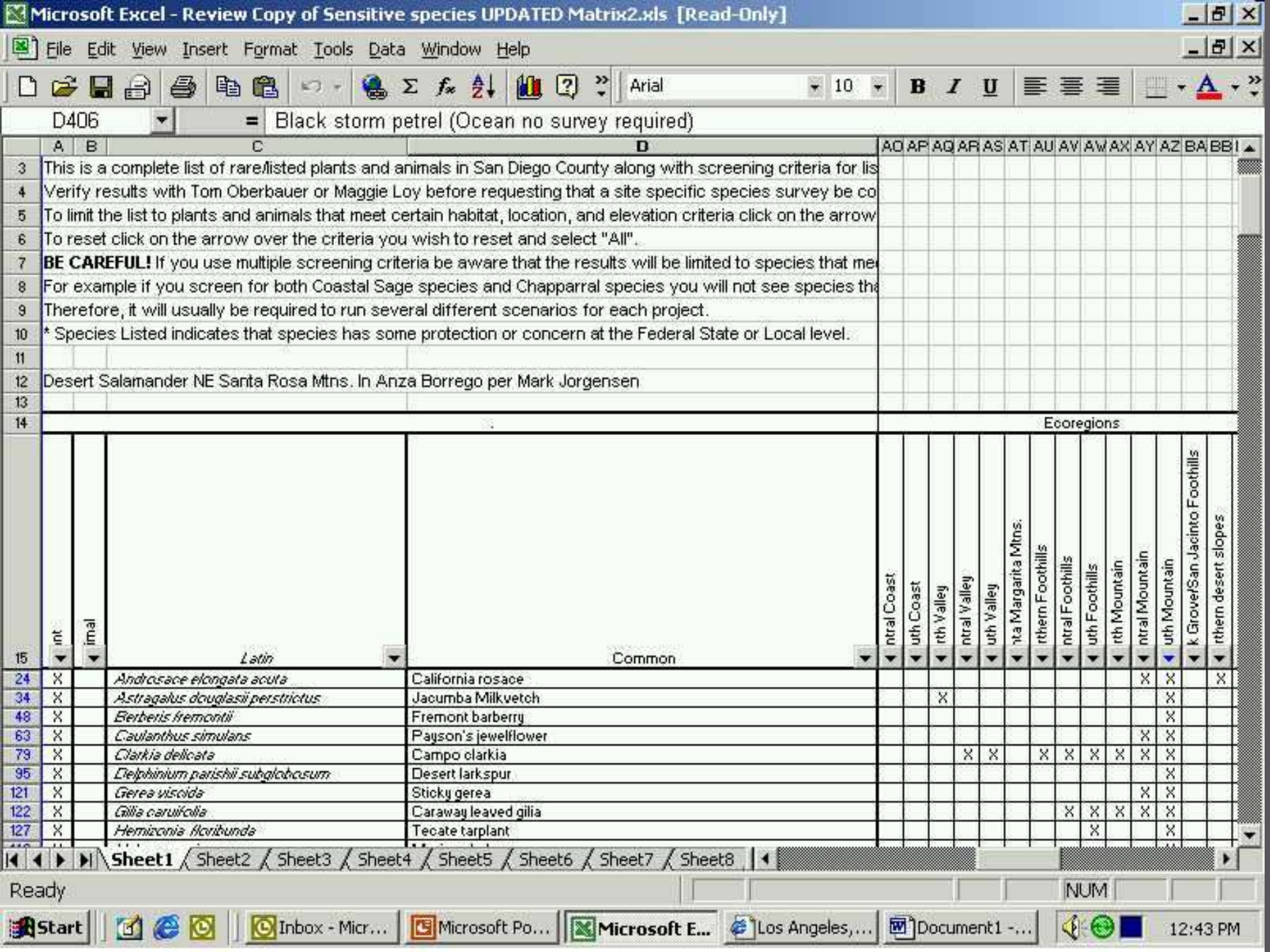
Palomar North Side

Modeling

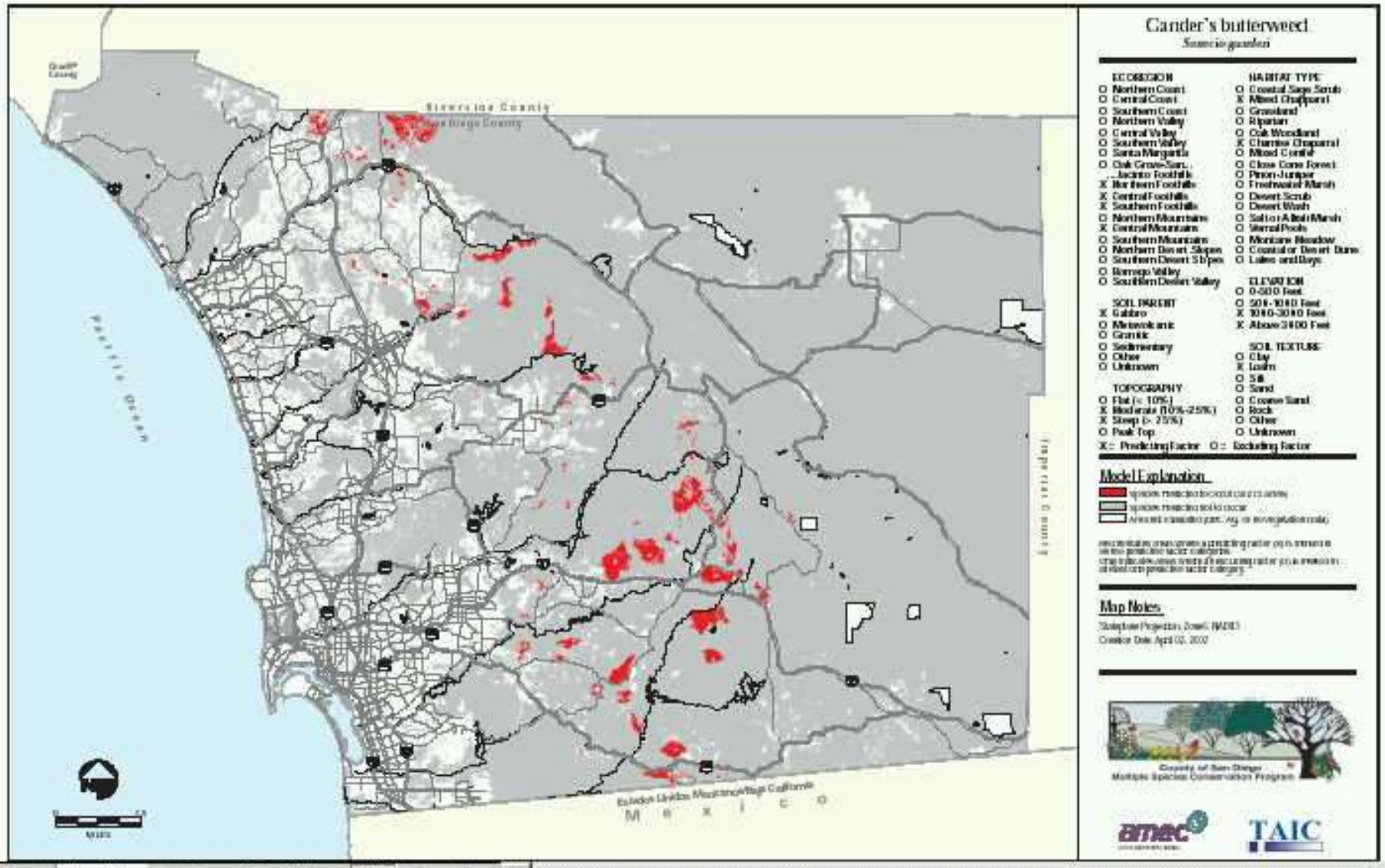
CREATION OF A PLAN IS DEPENDENT ON SOUND BIOLOGICAL AND MODELING PRINCIPLES

- **Lack of access to properties to perform surveys**
- **Need to evaluate relative values of habitat**
- **Large number of species to be considered together to obtain coverage**





			Latin	Common	ntral Coast	uth Coast	rth Valley	ntral Valley	uth Valley	nta Margarita Mtns.	rthern Foothills	ntral Foothills	uth Foothills	rth Mountain	ntral Mountain	uth Mountain	k Grove/San Jacinto Foothills	rthern desert slopes
24	X		*Androsace elongata acuta*	California rosace											X	X		X
34	X		*Astragalus douglasii perstrictus*	Jacumba Milkvetch			X									X		
48	X		*Berberis fremontii*	Fremont barberry												X		
63	X		*Caulanthus simulans*	Payson's jewelflower											X	X		
79	X		*Clarkia delicata*	Campo clarkia				X	X		X	X	X	X	X	X		
95	X		*Delphinium parishii subglobosum*	Desert larkspur												X		
121	X		*Gerea viscida*	Sticky gerea											X	X		
122	X		*Gilia caruifolia*	Caraway leaved gilia								X	X	X	X	X		
127	X		*Hemizonia floribunda*	Tecate tarplant									X			X		



SITES Model

- Referred to as a Reserve Selection Algorithm
- Mechanically evaluate the trade-offs associated with drawing preserve area boundaries
- Optimum conservation area boundaries with the least acreage necessary to meet assigned goals
- Quantification of how many goals are reached
- Objective, repeatable

NCSAP Preserve Planning Process

1 Preserve Design Criteria and Conservation Planning Goals

- *How will the preserve be designed to meet the goals?*

2 Habitat Modeling and Analysis

- *What areas have high biological resource value?*
- *Where are the most important habitats for endangered species?*

3 Gap Analysis

- *What areas are already protected?*
- *Where are the linkages to other surrounding preserve areas?*

4 Reserve Selection Algorithm (SITES) Modeling

"Creating the Preserve"

- *Systematic approach to define preserve boundaries and meet biological goals based on sound biological science and planning*

Public and Stakeholder Input

5 Identification of Pre-Approved Mitigation Area (PAMA) Boundaries

- *Coordinated drawing of preserve area boundaries (PAMA) with Wildlife Agencies*

6 Connectivity Analysis

- *Incorporate critical wildlife corridors into planning*

7 Conservation Analysis

- *Can the preserve configuration meet the project goals (level of conservation, land use planning) and protect the species for which coverage is sought?*

8 NCCP Plan Development and Implementing Agreements

- *Document production and permit processing*

Value of Multiple Species Planning

- Focuses attention on conserving highly sensitive areas
- Partnership with conservation and development. Need to work together to succeed. If not, environment usually loses. Very Difficult. Creating plans is easier than gaining support.

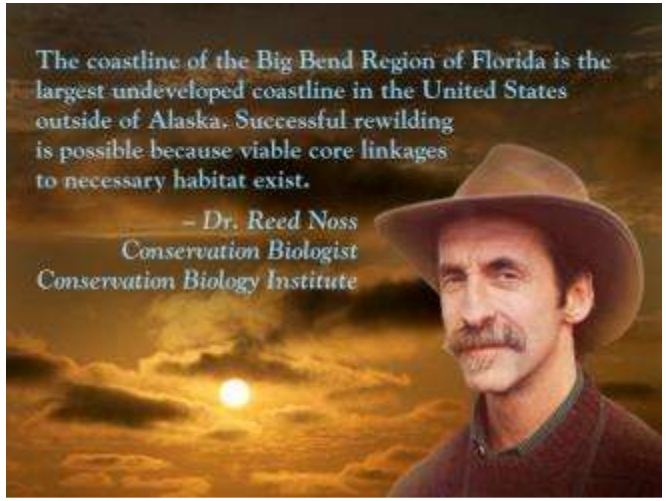
Value of Multiple Species Planning

- Attracts Federal and State Funds.
- Conservation moves more smoothly rather than confrontation for each project.
- South County MSCP Permit 1998. More than 40,000 acres conserved that would not have been.
- Federal Wildlife Refuge.

Independent Science Advisors

- Provide independent peer review to scientific process

- Provide a basis for identification of important biological areas



Sidalcea malviflora

Laguna Meadow winter

Mountains: Palomar Mendenhall Valley

Palomar Doane Valley

Cuyamaca Lake

Mount Laguna

2004-2005 Palomar Mountain
Dead tree treatment area before.

Palomar Mountain dead tree removal after. Note V trees left in place.

Tetracoccus dioicus Gabbro endemic