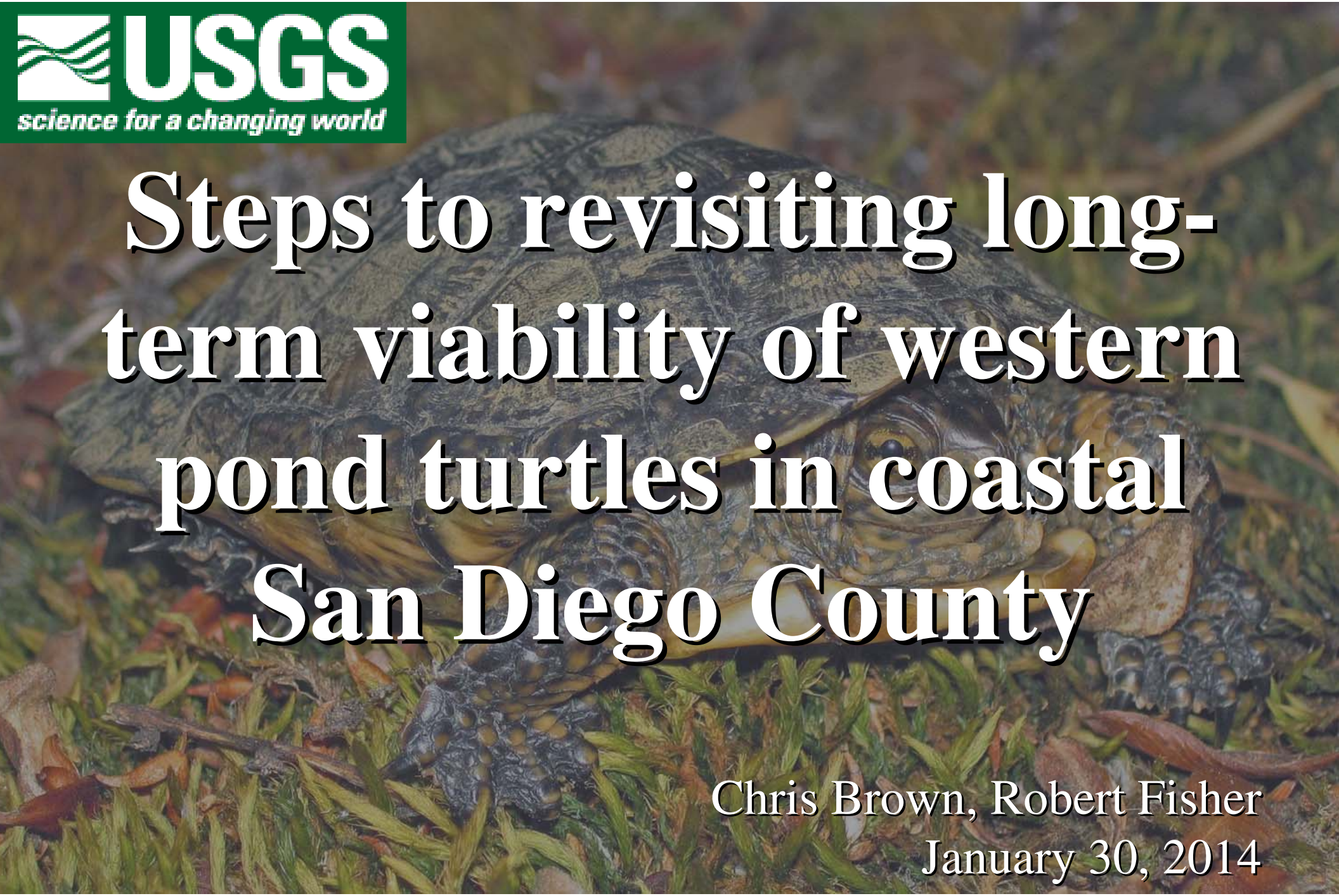

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Steps to revisiting long-term viability of western pond turtles in coastal San Diego County

Chris Brown, Robert Fisher

January 30, 2014

WPT in Coastal San Diego County

Status of WPT in Coastal San Diego

1. Review MSCP 2002-2005 surveys
2. Fill in gaps (genetics, north county, and USFS Surveys)

Identify and score threats/stressors

1. Regional threats (dams/diversions, roads)
2. Local threats (nonnative species, access/recreation)

Genetics based management units

1. Examine range wide and watershed genetic assignments
2. Establish management units

Evaluate active management strategies

1. Nonnative species removal
2. Headstarting

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Status of WPT in Coastal San Diego

"**The decline of the western pond turtle in southern California has been recent and rapid**. In 1960 there were 87 known localities for the species from Ventura County to the Mexican border. As of 1970, these were reduced to 57. In 1987, 255 sites were inspected of which 53 possessed turtles, and 25 of these were in Ventura County…

South of the Santa Clara River, sites with western pond turtle populations become increasingly rare: Los Angeles County - 10, **San Diego County - 8**, Orange County - 4, western Riverside County - 3, and southwestern San Bernardino County - 3. **Only five of the populations** south of the Santa Clara River were thought to be **reproductively viable** (Brattstrom, 1988; Brattstrom and Messer, 1988)."

--Lovich, 1998. Western pond turtle species account for BLM.

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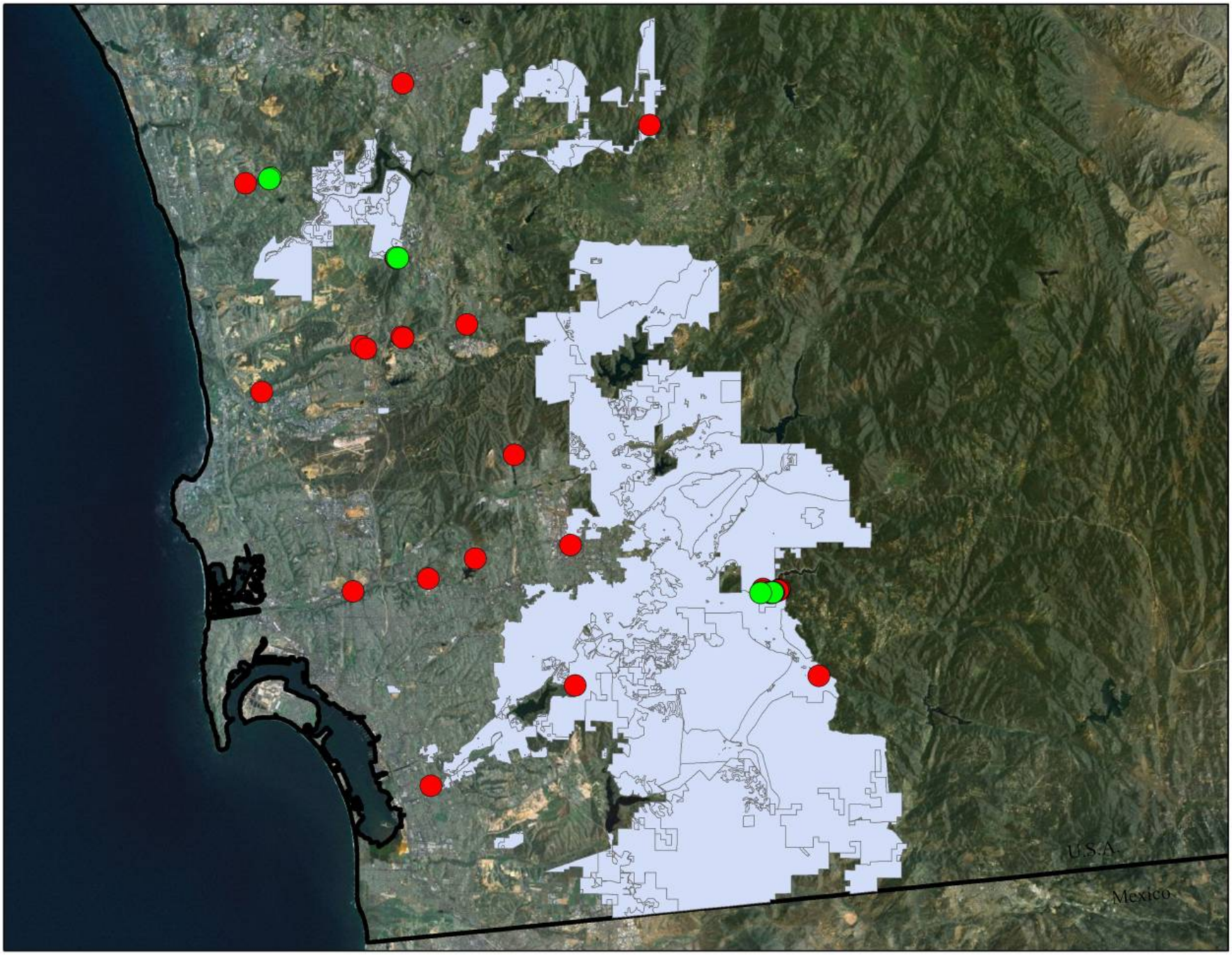


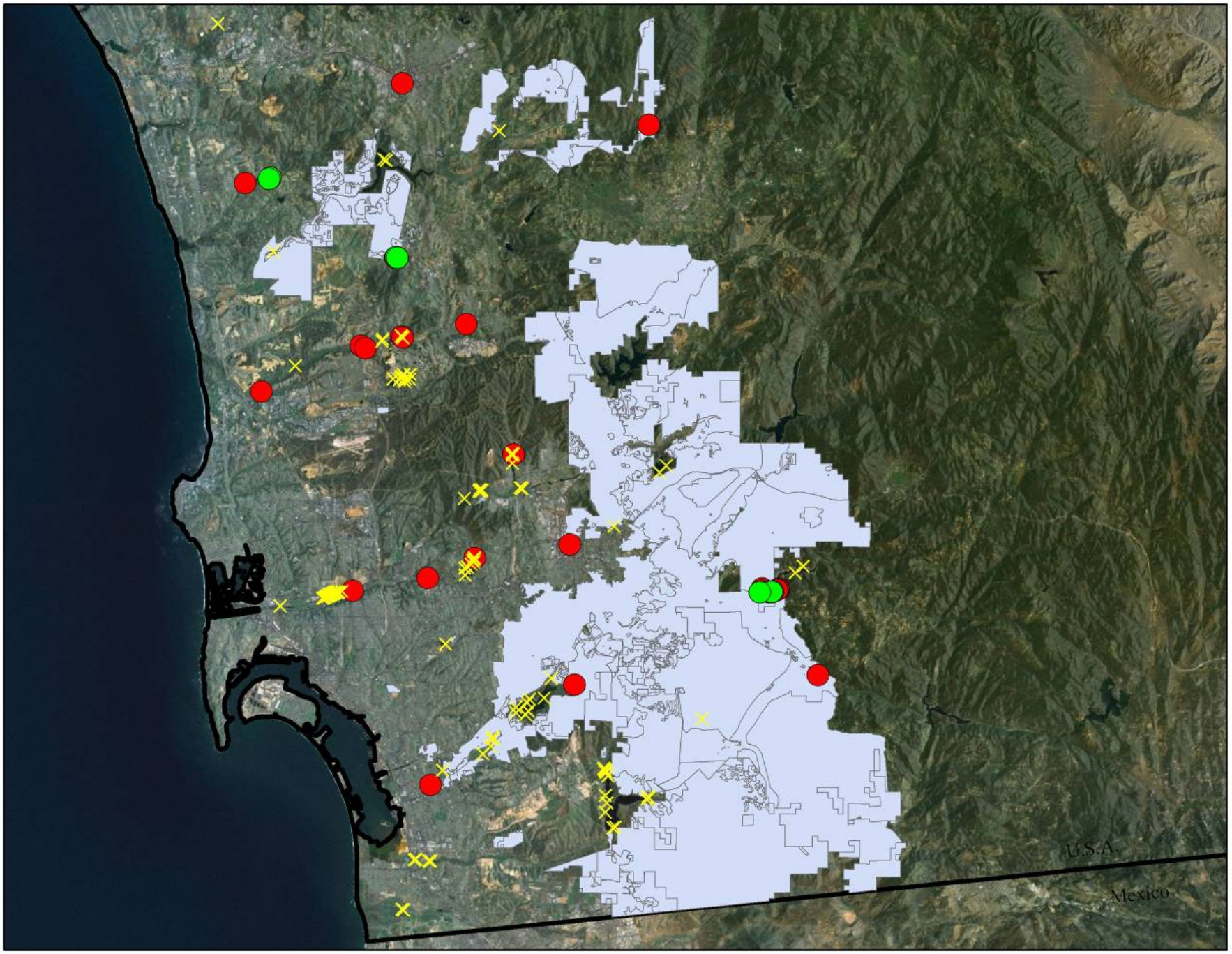
MSCP 2005

Area ~900mi²

Turtle Records

Historic

Females



MSCP 2005

Area ~900mi²

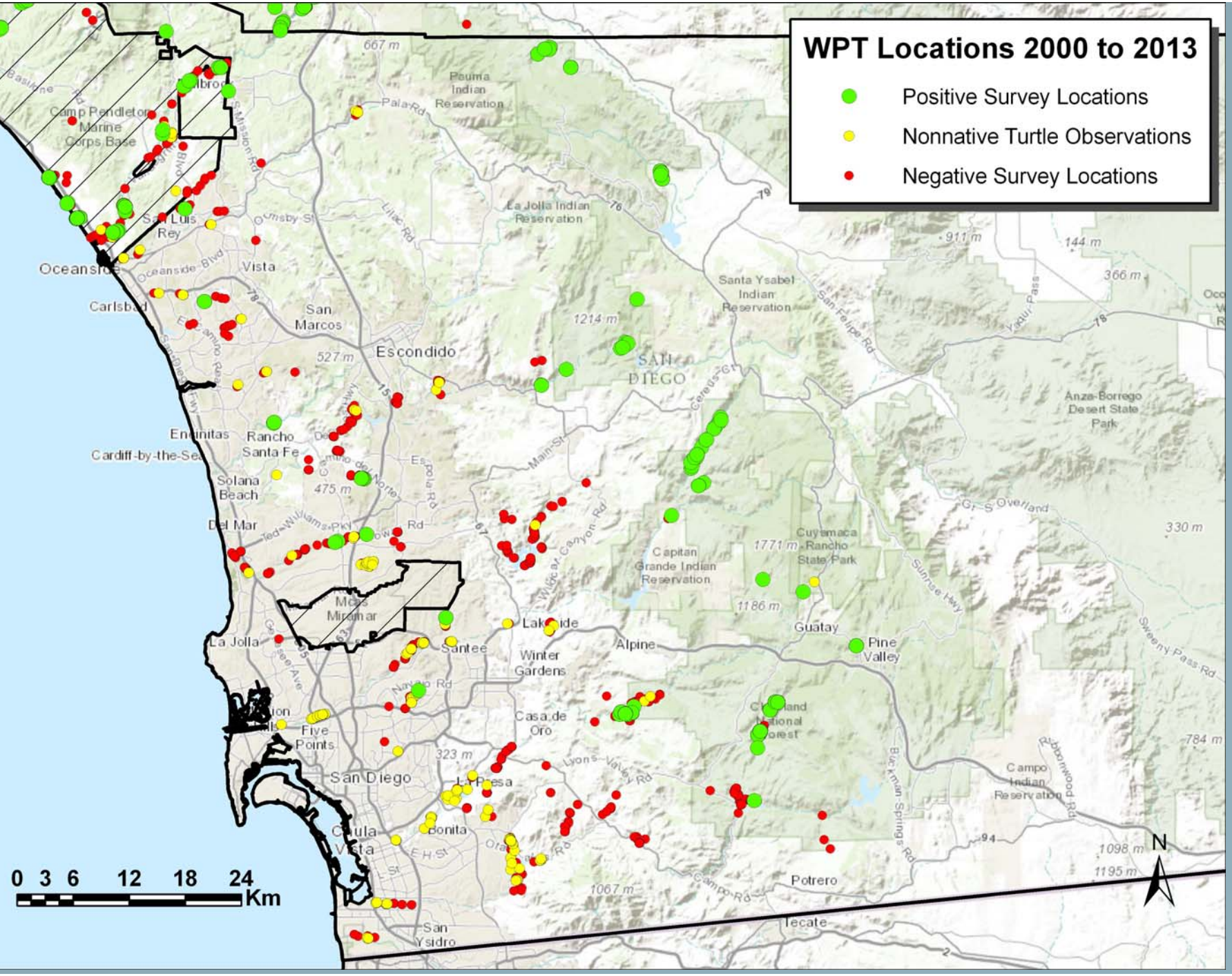
Turtle Records

Historic

Females

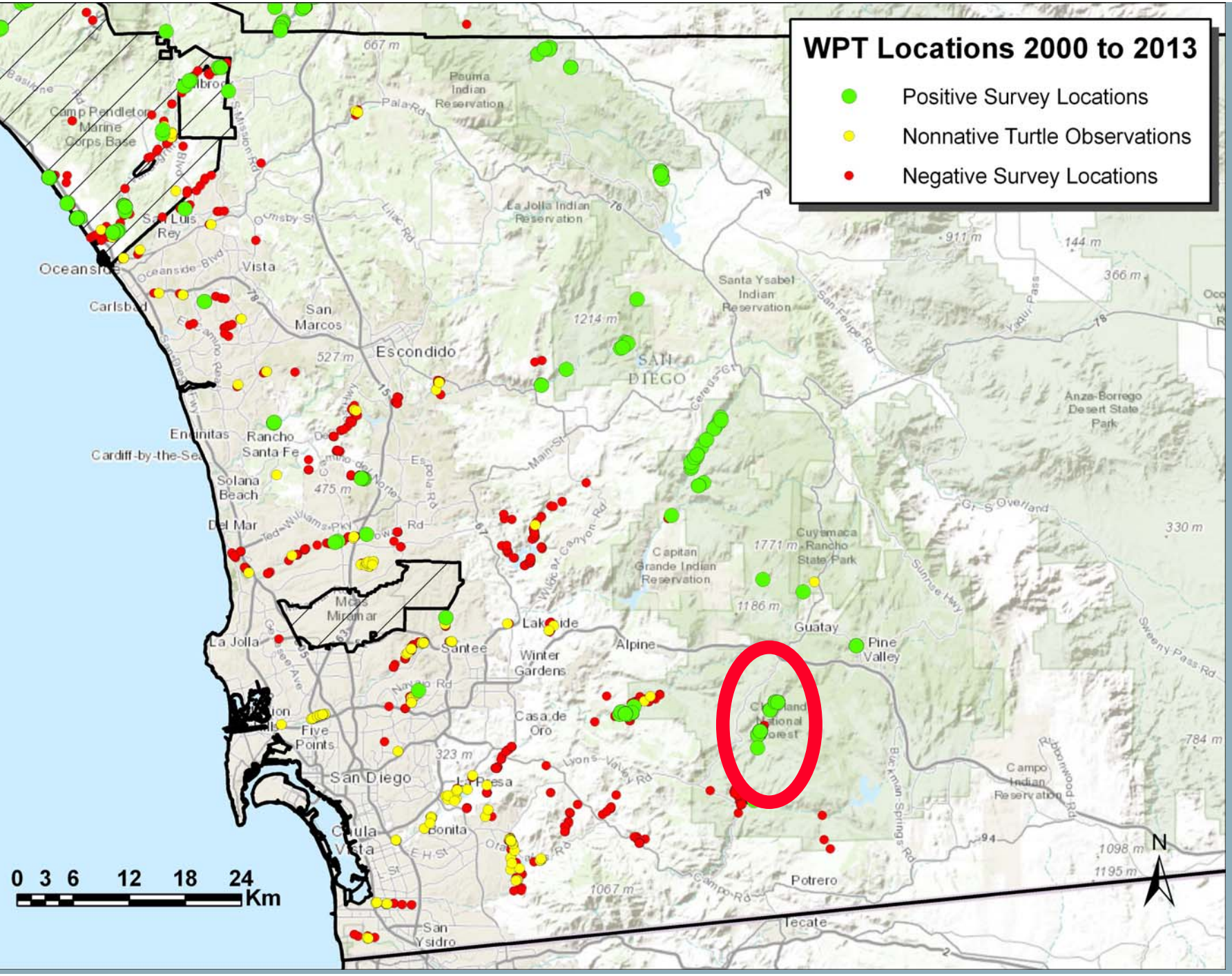
X

Nonnative Turtles



Additional Surveys for:

- **Camp Pendleton**
- **Genetics**
- **North County Assessment**
- **County of San Diego**
- **USFS**



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Pine Valley Creek

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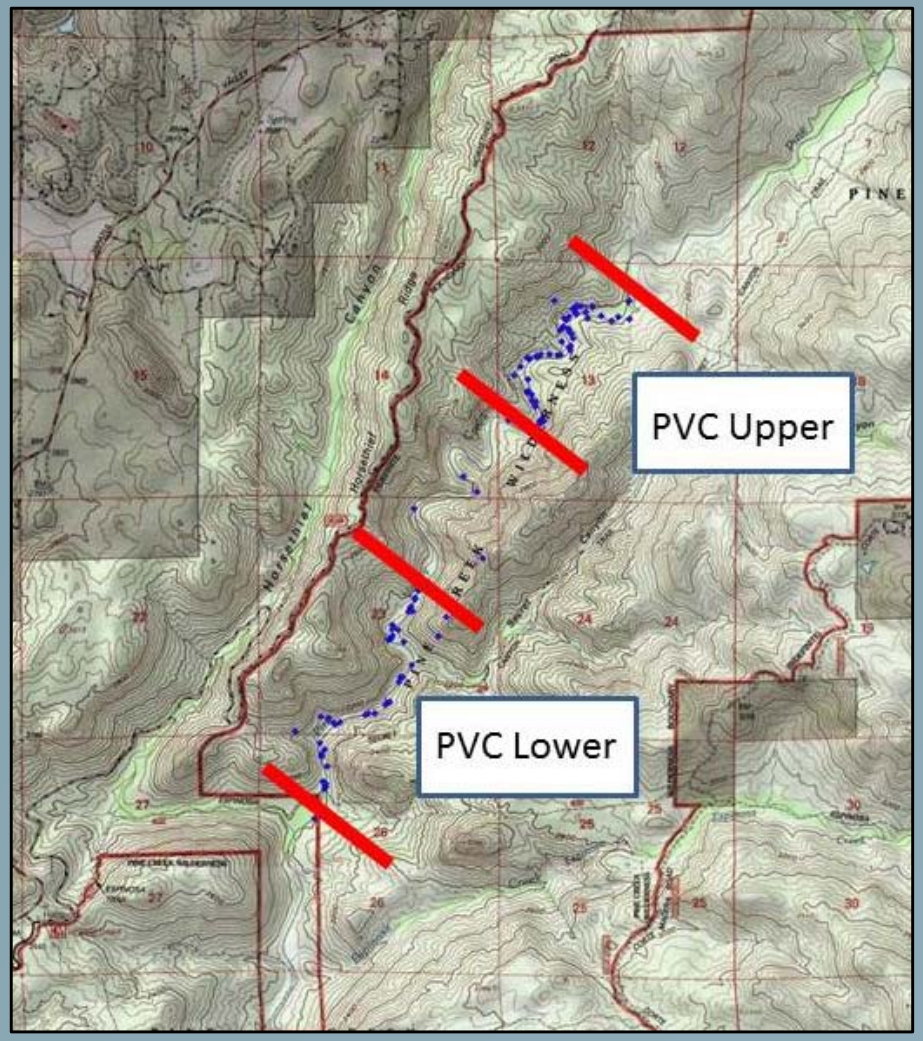
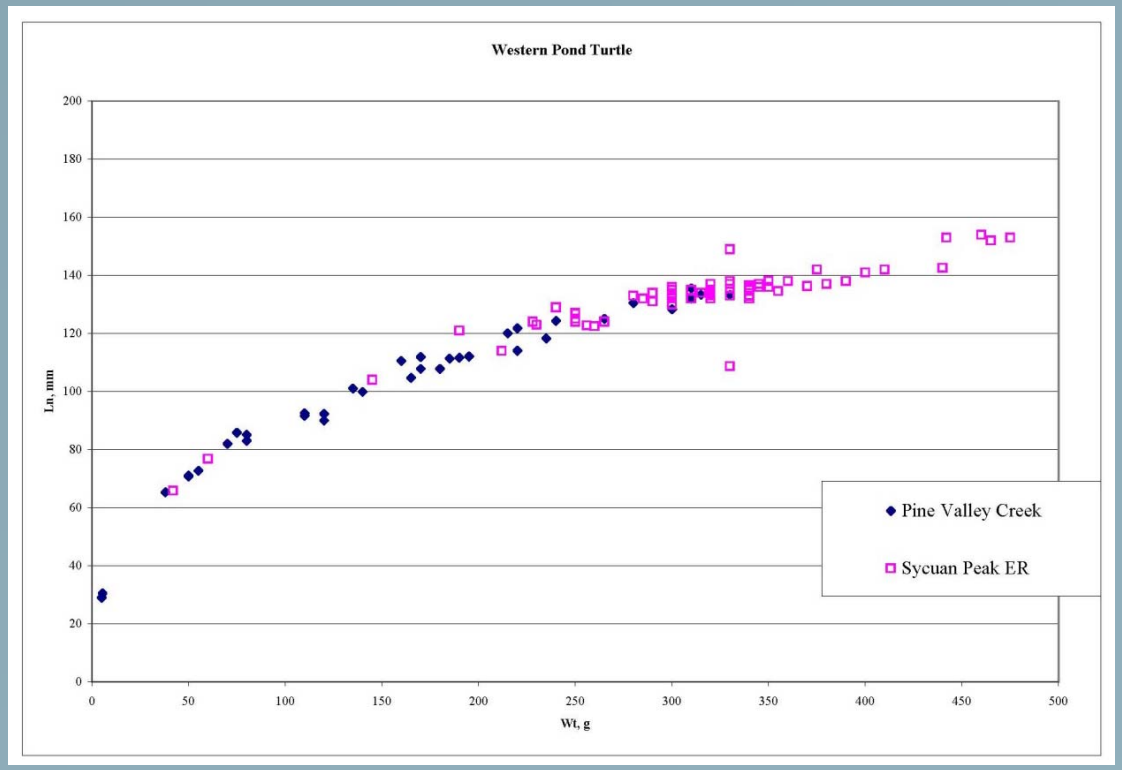
Pine Valley Creek





Site	Est.	Lower 95% Conf.	Upper 95% Conf.
Lower	219.5	82.4	8607
Upper	215.25	106.3	1052

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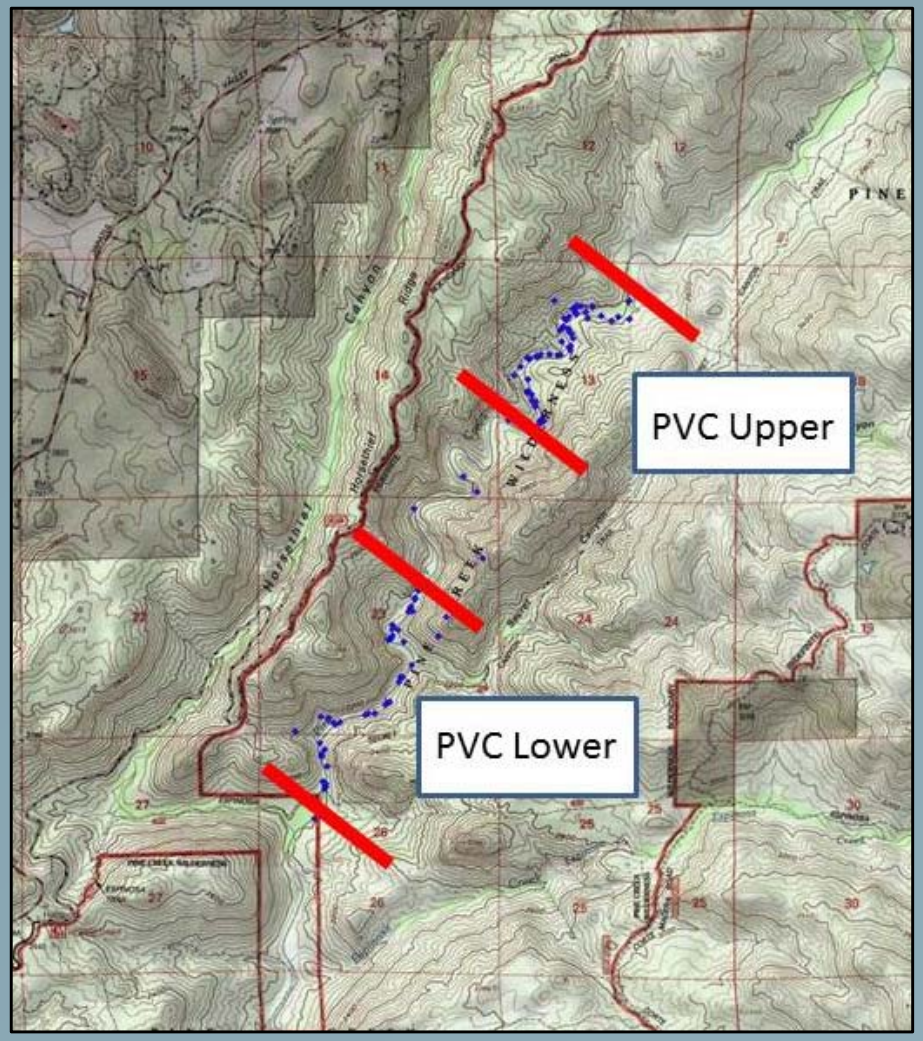
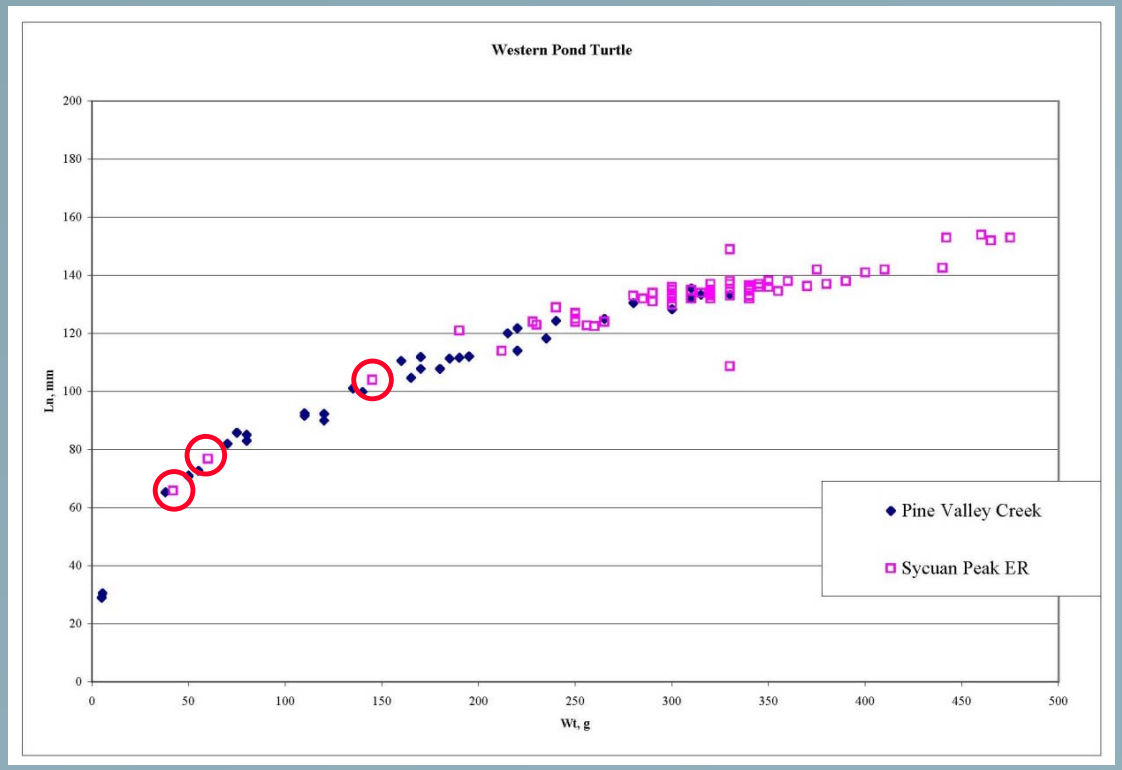
Pine Valley Creek





Site	Est.	Lower 95% Conf.	Upper 95% Conf.
Lower	219.5	82.4	8607
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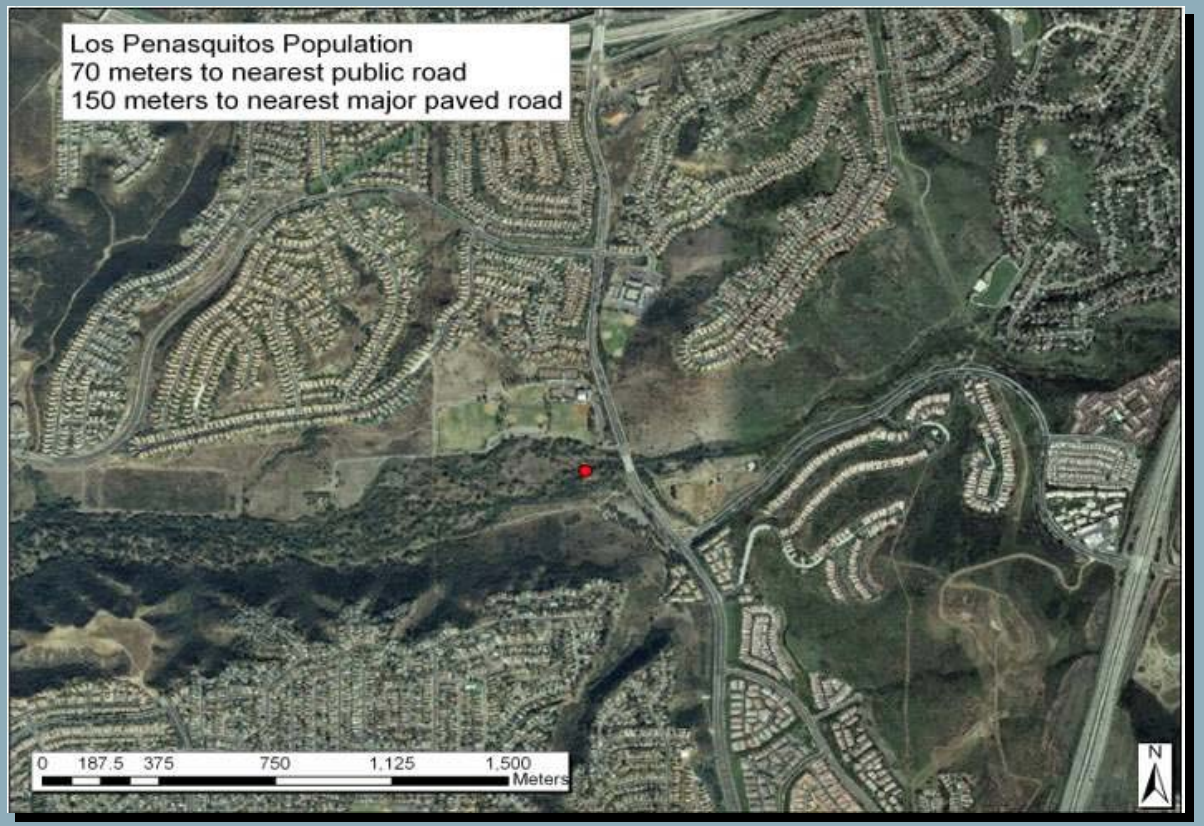
So... why are some populations doing well while others are not or are gone all together?

Identify and score threats/stressors



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Summary of Impacts on the Western Pond Turtle

Human Access \ Naturalness of Site	Natural	Modified Natural	Artificial
High	Pond Turtle ↓↓ Nonnative ↑↑	Pond Turtle ↓↓ Nonnative ↑↑	Pond Turtle 0 Nonnative ↑↑
Medium	Pond Turtle ↓ Nonnative ↑	Pond Turtle ↓ Nonnative ↑	Pond Turtle 0 Nonnative ↑
Low	Pond Turtle ↑ Nonnative 0	Pond Turtle ↑ Nonnative 0	Pond Turtle 0 Nonnative 0

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From Madden-Smith, et al., 2005

Assess impacts to establish management priorities…

1. Add locations from outside MSCP

2. Assess regional and local impacts to individual populations/sites
   - Water diversion/impoundment
   - Proximity to roads
   - Types of roads
   - Nonnative species
   - Level of access
   - Type of access/recreation

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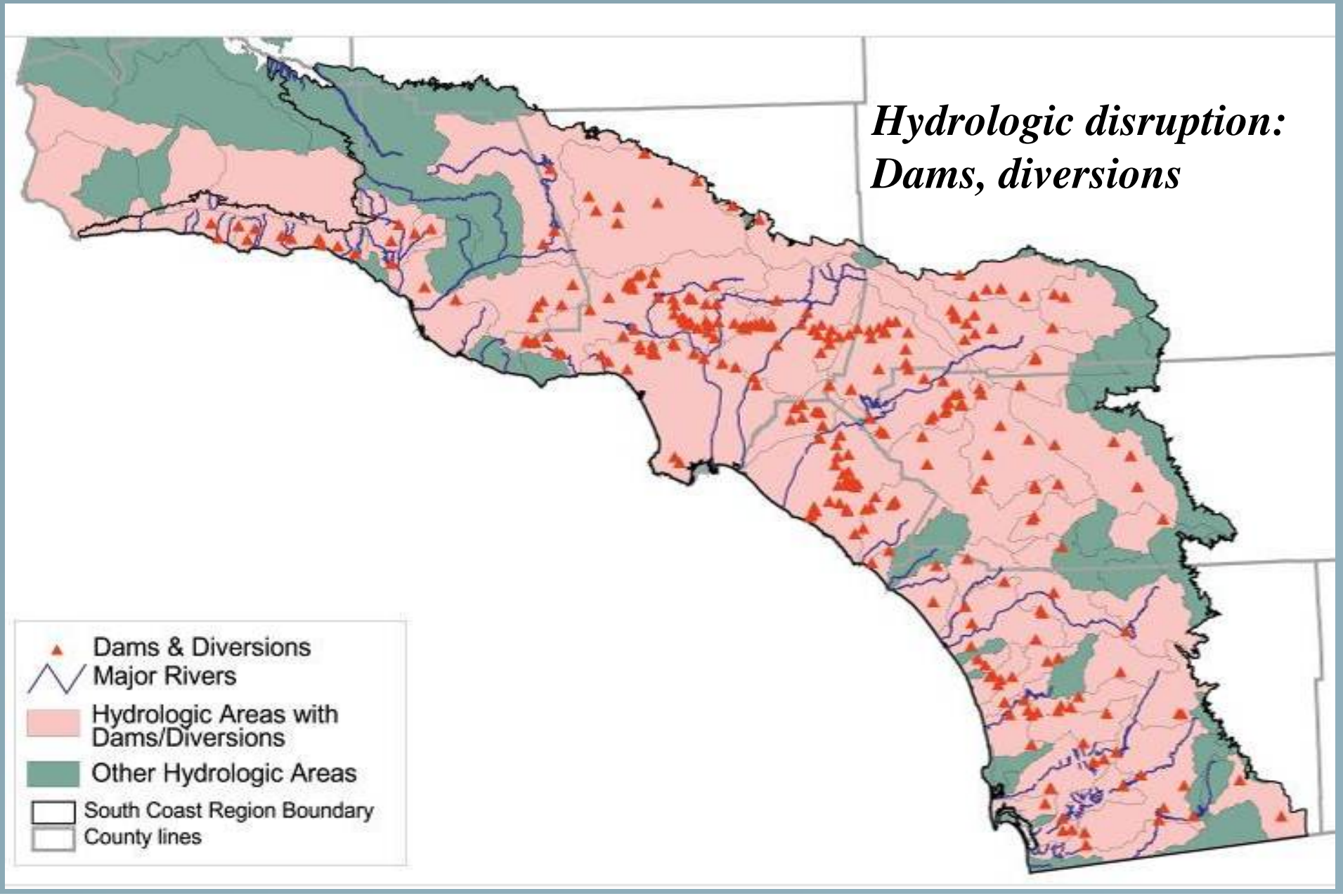
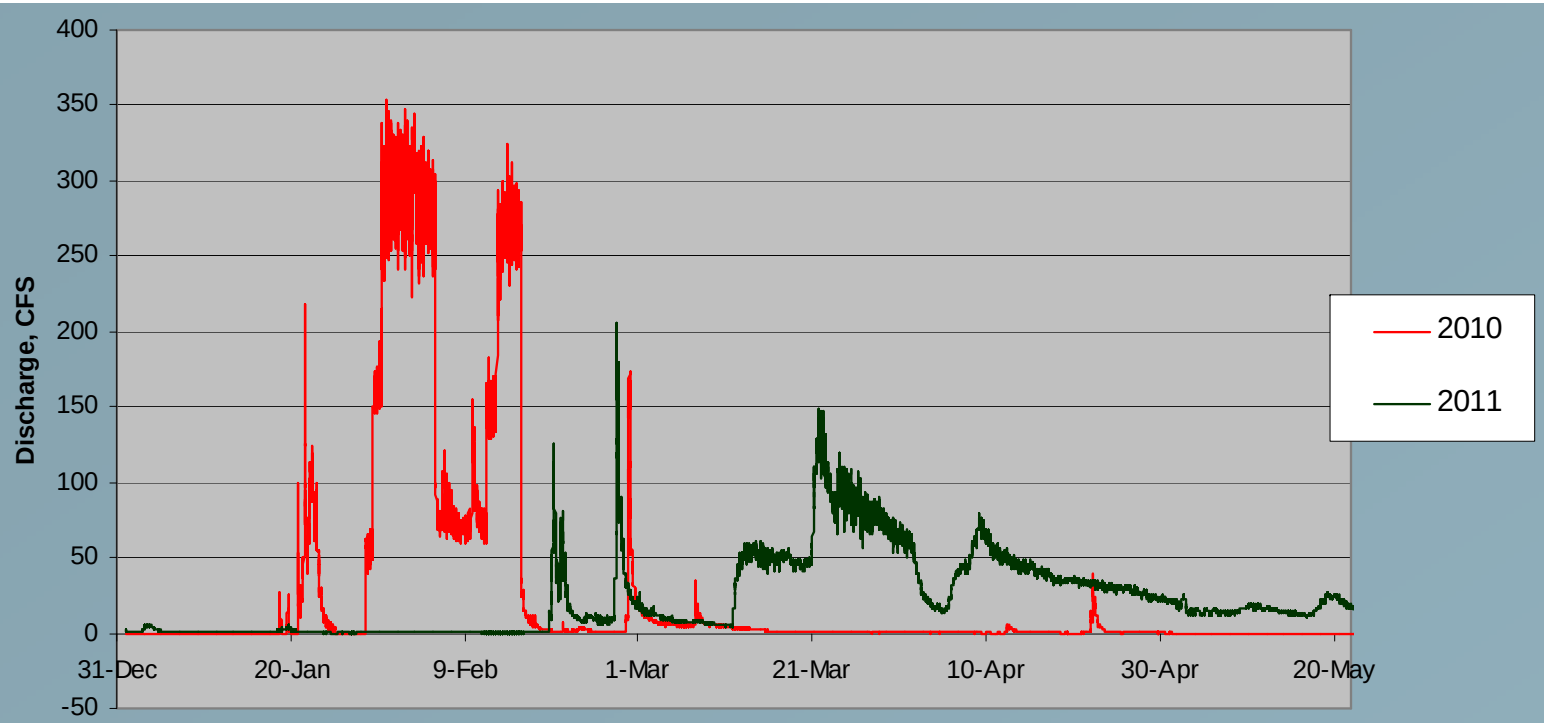
Regional Impacts on the Western Pond Turtle



Managed discharge can influence the composition and rate of nonnative species colonization AND when species management should take place



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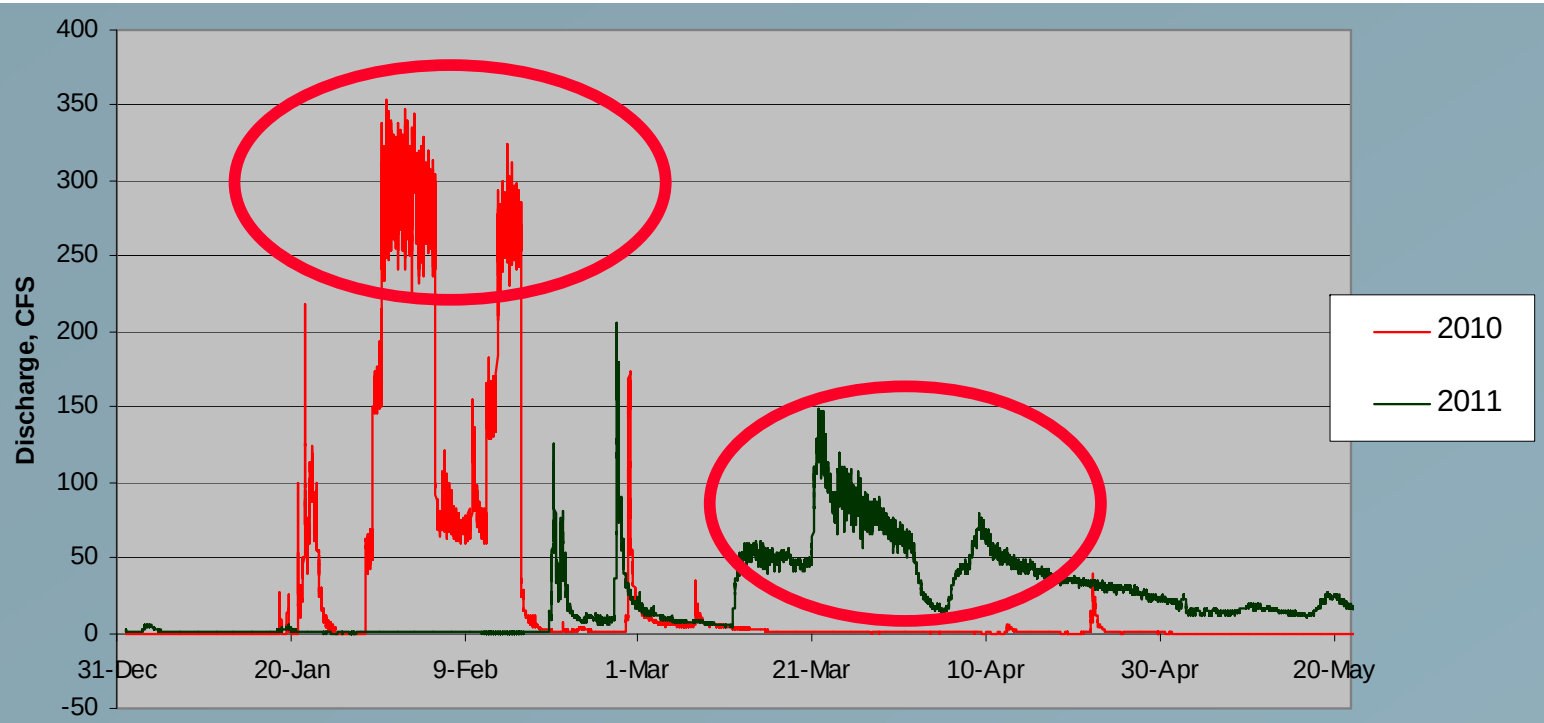
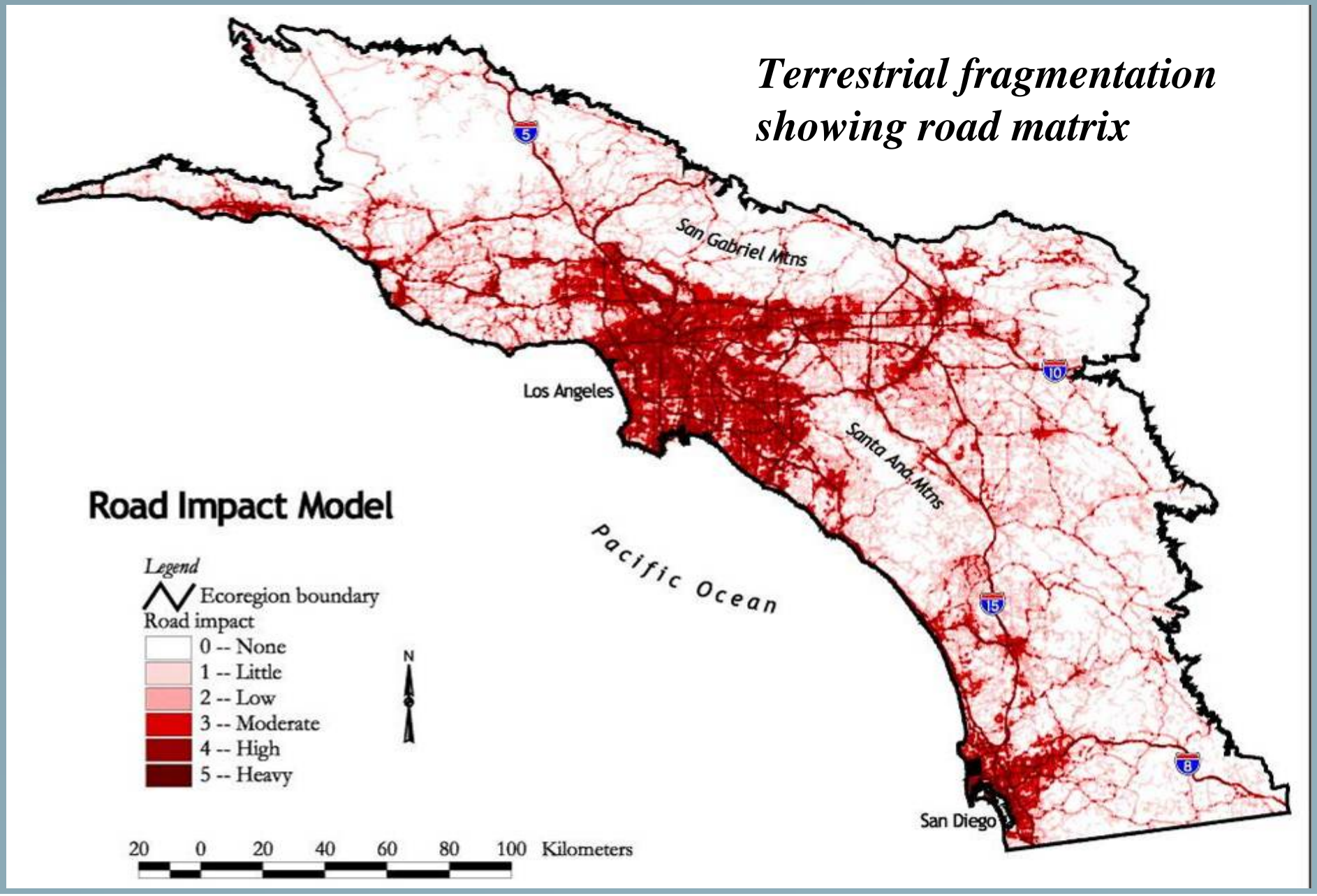
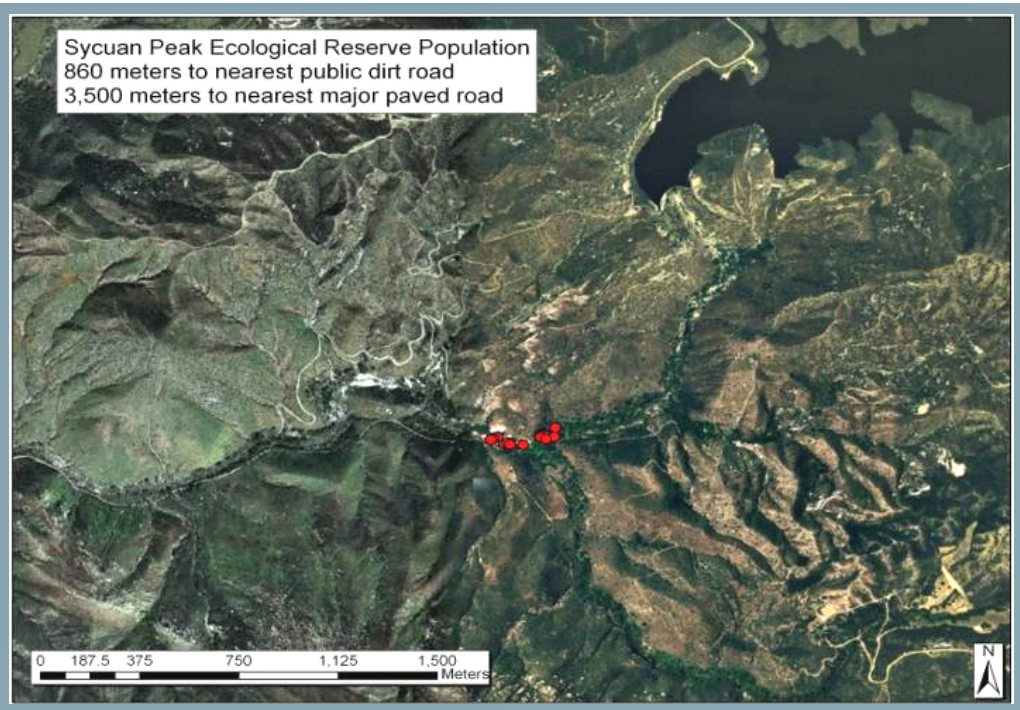
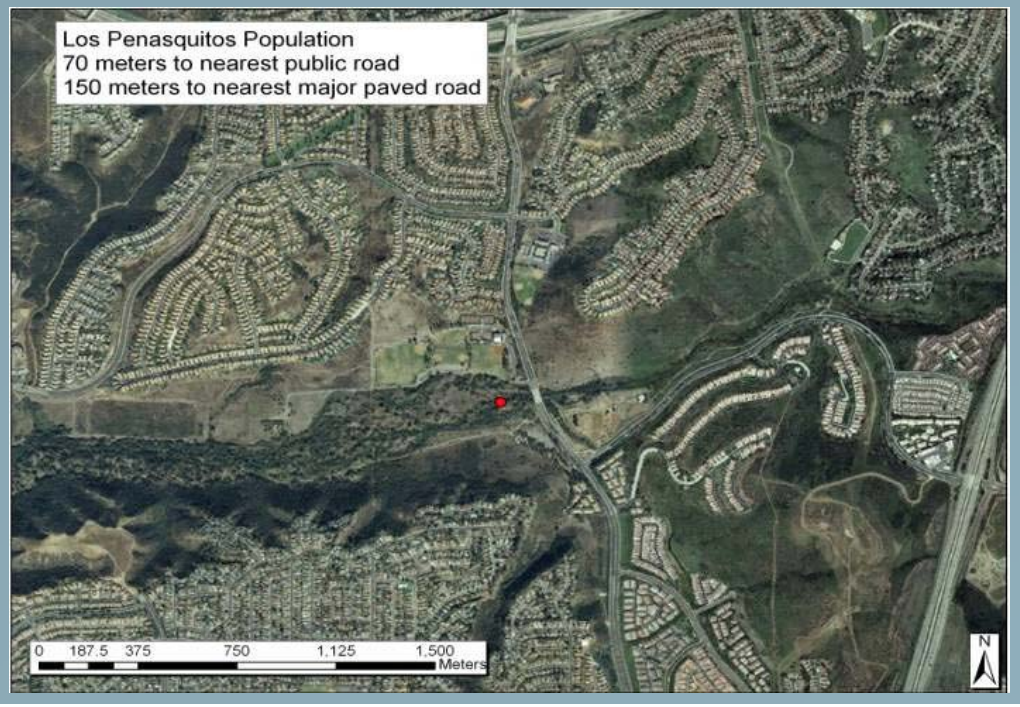


Regional Impacts on the Western Pond Turtle







Roads:

- **Public vs Controlled Access**
- **Major vs Side**

Distance to major public road:

Los Penasquitos (150m): 6 males, 0 females
Lusardi Creek (250m): 11 males, 1 female
Sycuan Peak (3,500m): 10 males, 9 females

Local Impacts on the Western Pond Turtle

-Nonnative aquatic species
-Fishing/hunting
-Public access (dogs, traffic, etc.)
-“Good Samaritans”

This OTHER - ID#A1419001

I am a brown and green Turtle.

My age is unknown.

I have been at the shelter since Jun 25, 2011.

This information is 5 hours old.

For more information about this animal, call:
San Diego County Department of Animal Services - San Diego at (619

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Nonnative aquatic species

- Turtles (sliders)
- Bullfrogs
- African clawed frogs
- Predatory fish
- Competitive fish
- Crayfish

Types of public access/recreation

- Hiking
- Wading/Bathing
- Fishing (bait vs artificial lures)
- Residential/Social events

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Nonnative aquatic species

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Pine Valley Creek (400+)

- **Competitive fish**
- **Crayfish**
- **Hiking**
- **Wading**

Sycuan Peak (35+)

- **Bullfrogs &Clawed Frogs**
- **Predatory & Comp Fish**
- **Crayfish**

Lusardi Creek (~20)

- **Bullfrogs &Clawed Frogs**
- **Predatory & Comp Fish**
- **Crayfish**
- **Fishing**
- **Residential/Social events**

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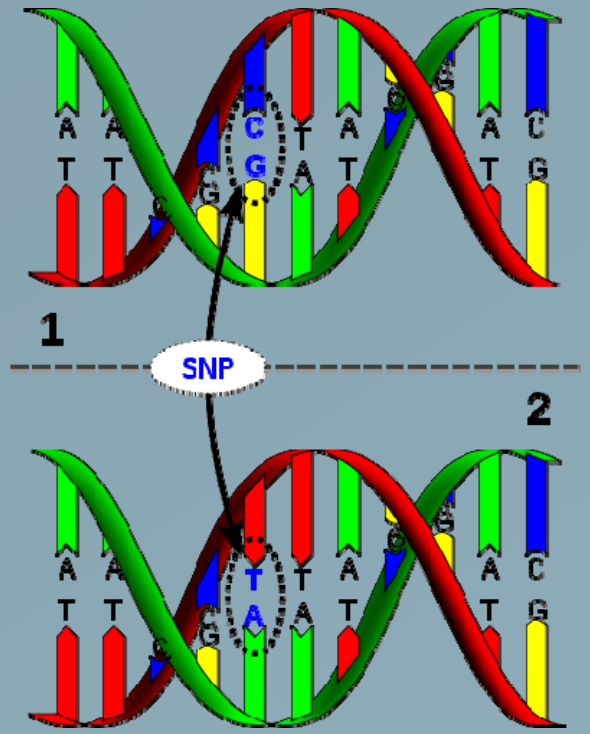
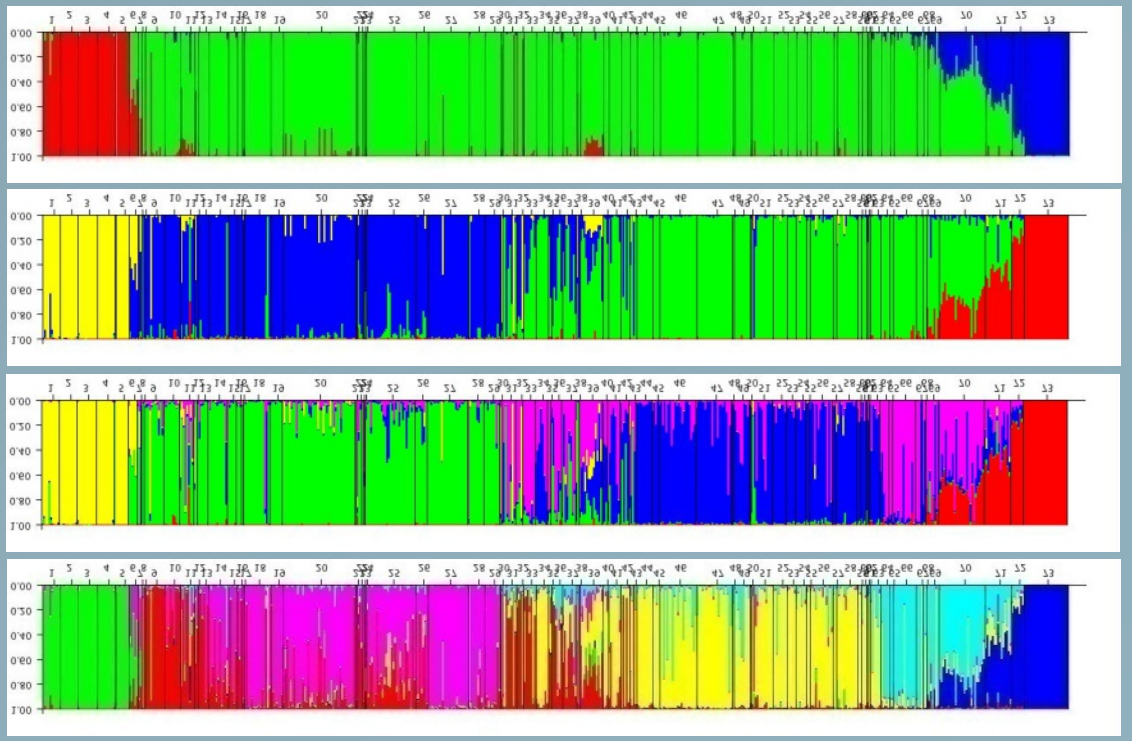
Genetics based management units





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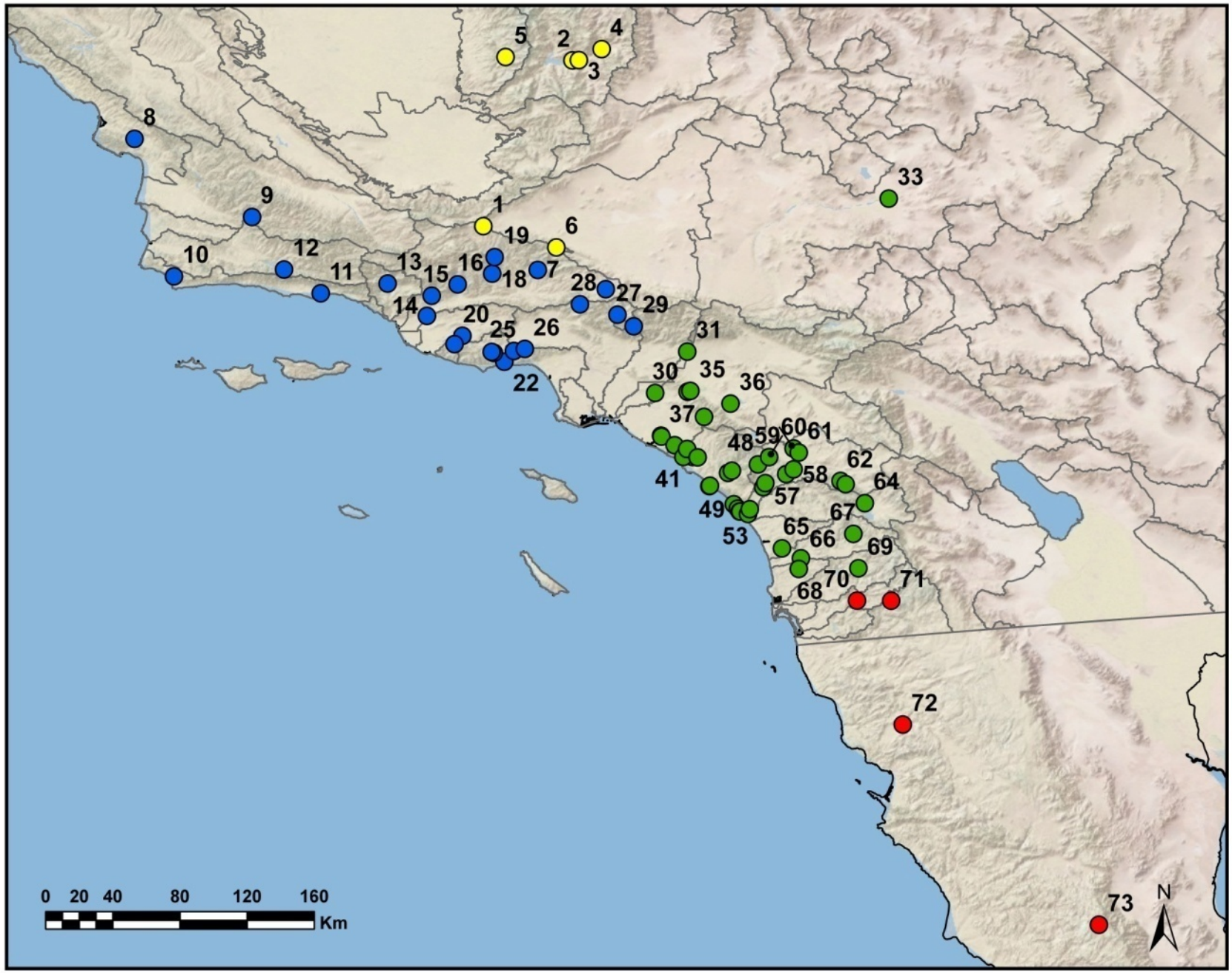
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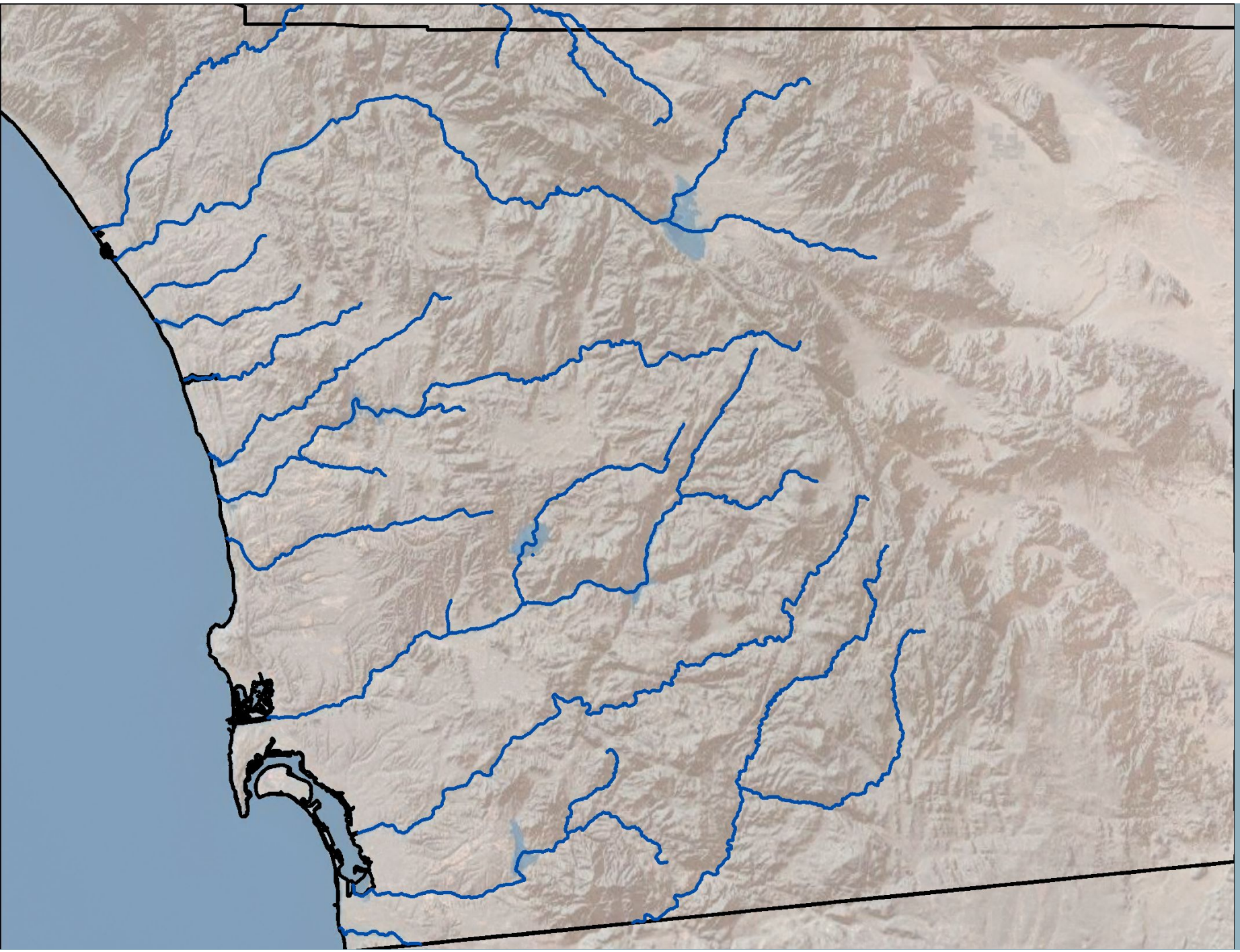
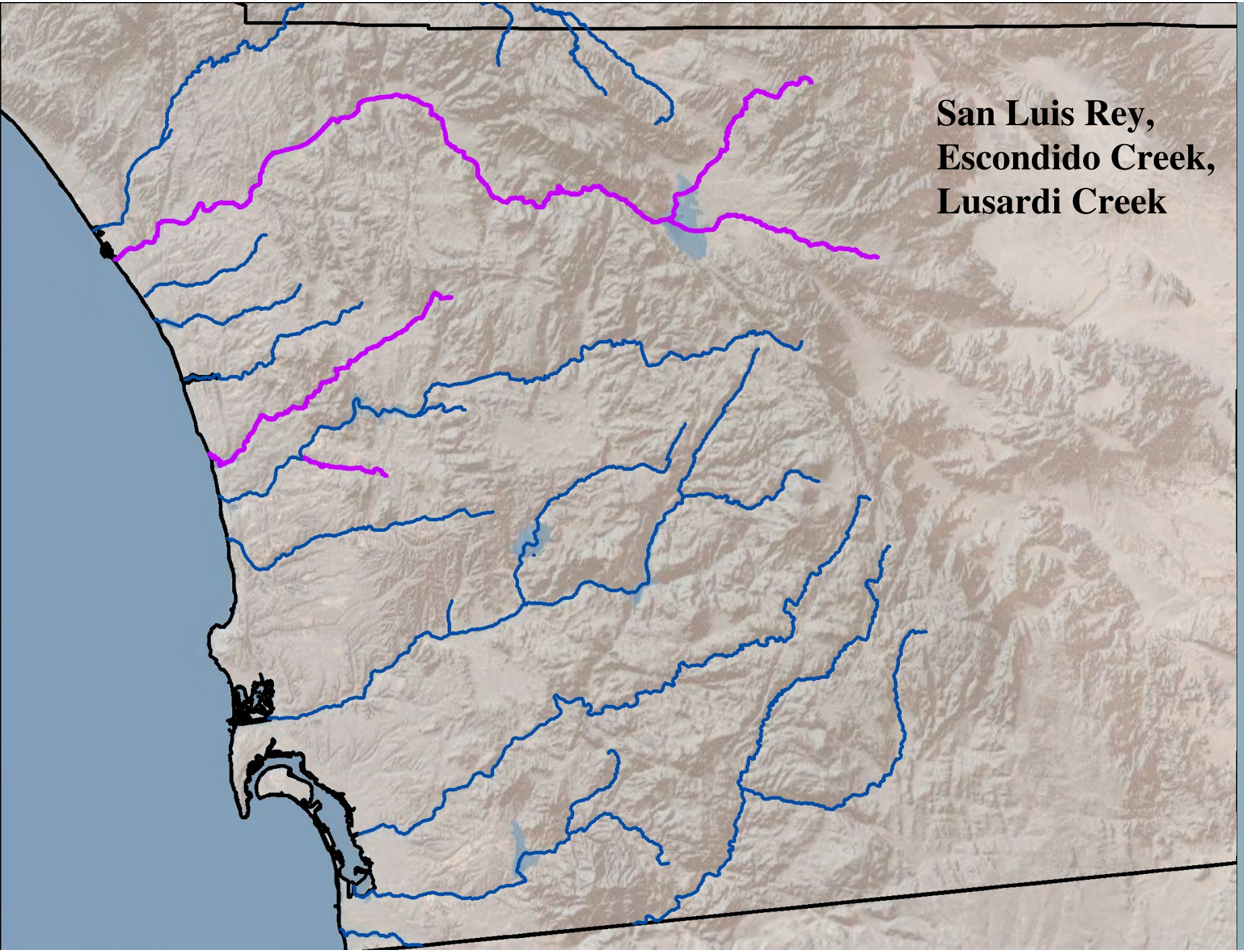
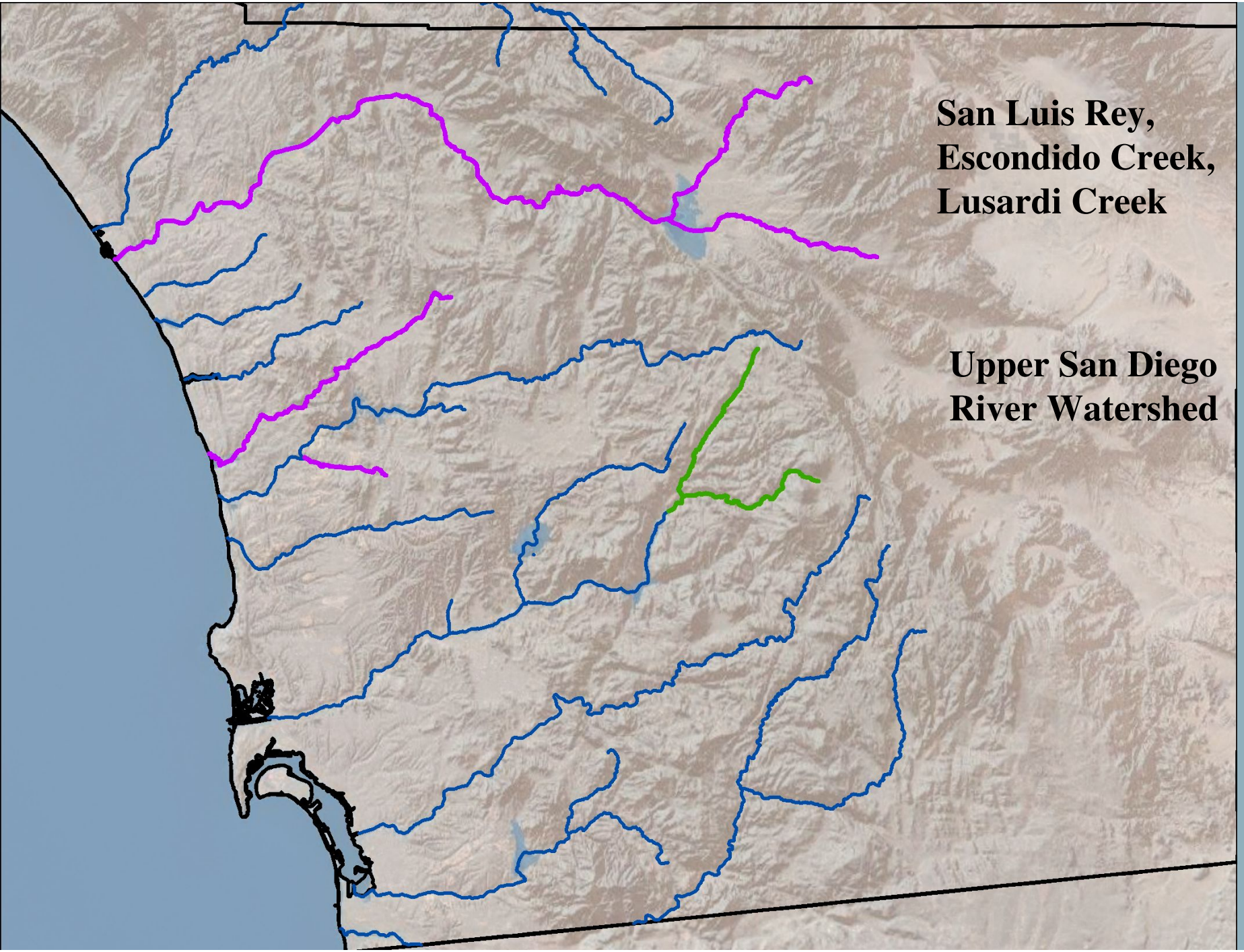
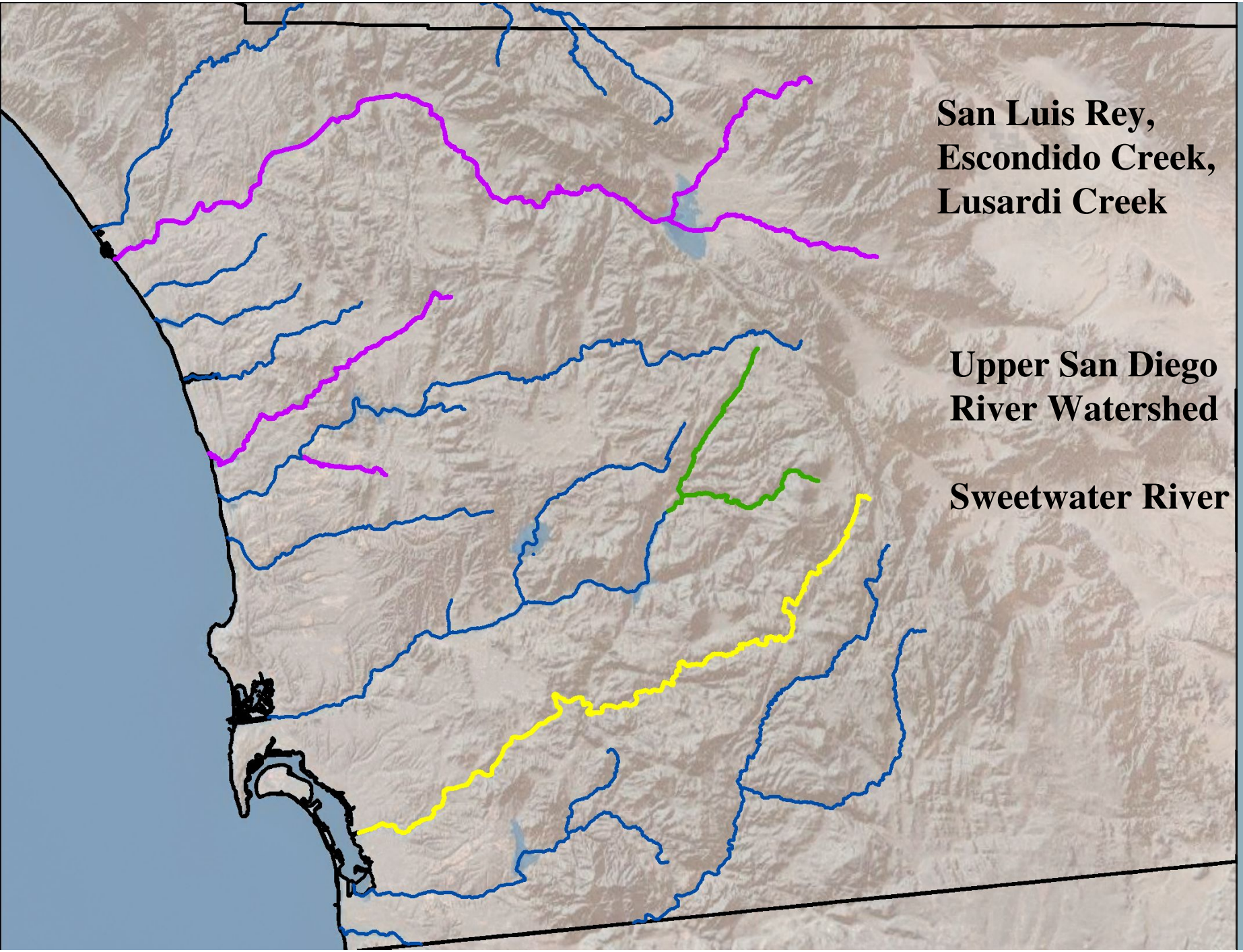
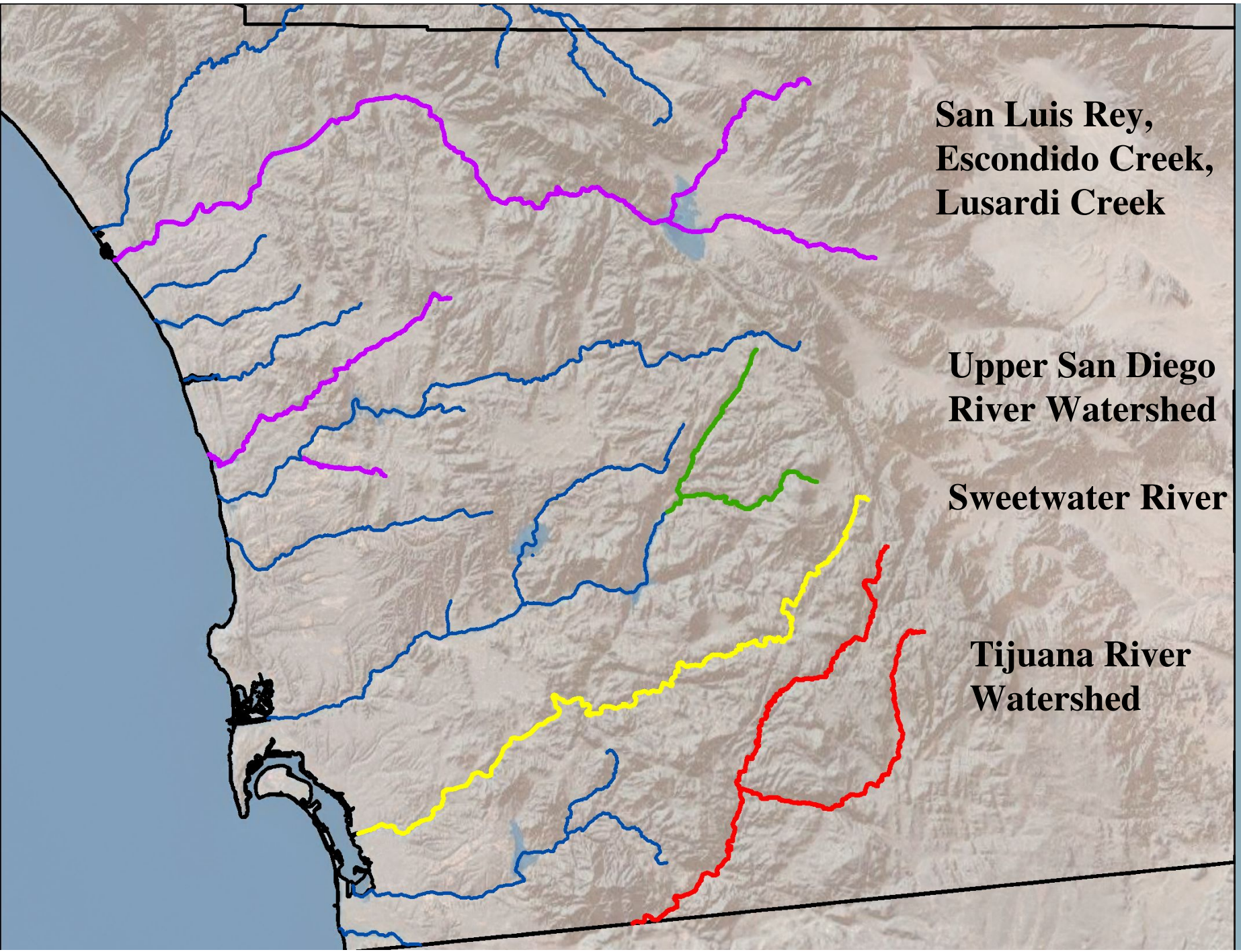



San Luis Rey,
Escondido Creek,
Lusardi Creek


San Luis Rey,
Escondido Creek,
Lusardi Creek
Upper San Diego
River Watershed


San Luis Rey,
Escondido Creek,
Lusardi Creek
Upper San Diego
River Watershed
Sweetwater River


San Luis Rey,
Escondido Creek,
Lusardi Creek
Upper San Diego
River Watershed
Sweetwater River
Tijuana River
Watershed

Management Implications

- **Need to keep clusters intact:**
  - Look for restoration sites and source populations within the same genetic management unit
  - Tijuana watershed turtles for restoring Otay
  - San Diego River turtles for San Vicente/Boulder Oaks
  - Use current SPER hatchlings to enhance Sweetwater populations
  - Keep restored populations pure, do not mix and match
  - Need more samples from key populations
    - Upper San Dieguito
    - Los Penasquitos

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Evaluate active management strategies

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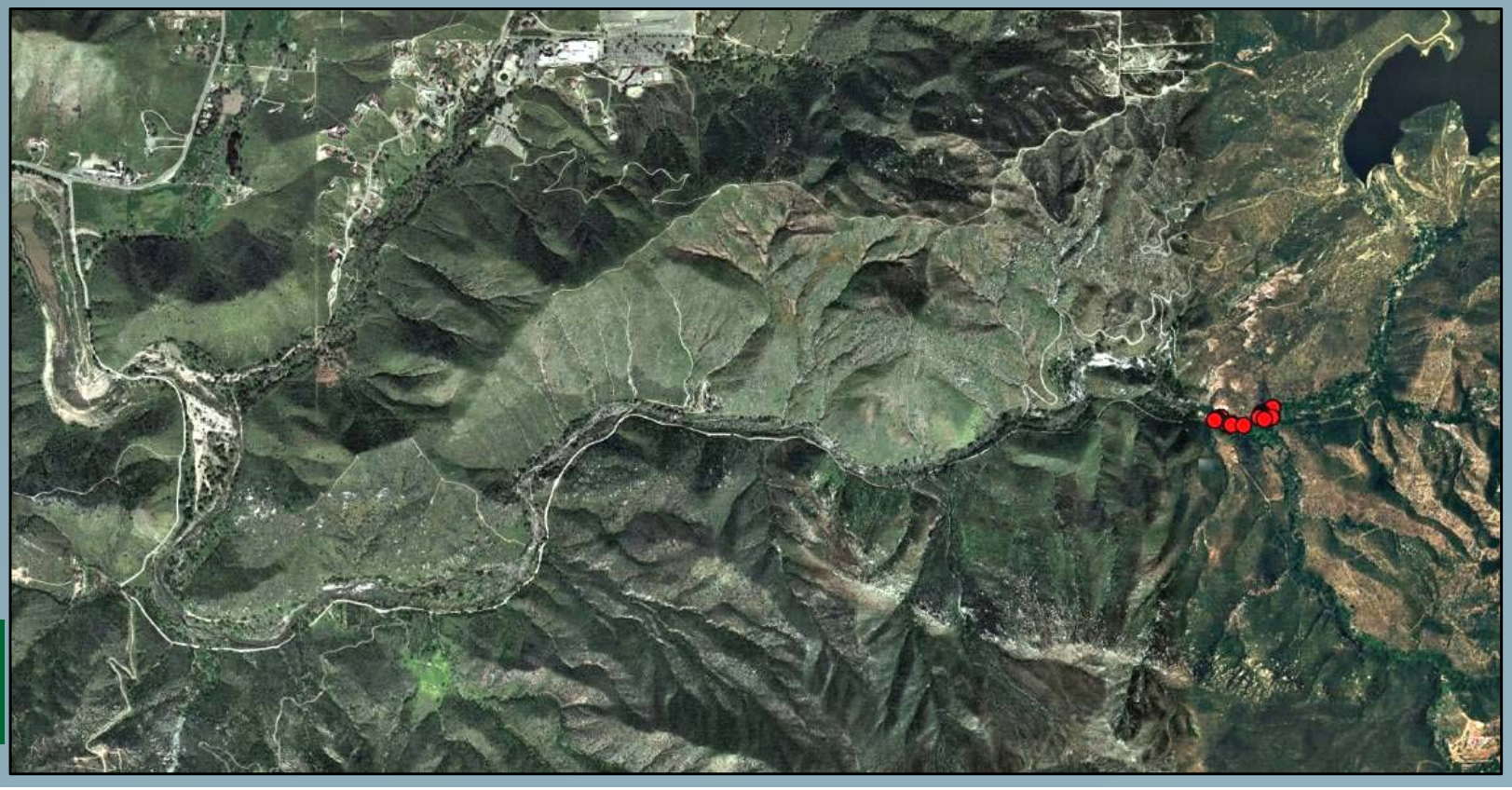
--Sycuan Peak Ecological Reserve--

- Headstarting and nonnatives removal
- CDFG Reserve—Restricted access and multi-agency collaboration
- Discrete ponds—Easier for trapping and exotics control
- Ideal for testing nonnatives species management as a strategy



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Restoration process at SPER

- Initial surveys to determine population (10 females, 14 males)
- Harvest eggs for headstart program (3 females producing eggs)
- Utilize traps, nets, visual encounter surveys to remove nonnative aquatic species
- Continue monitoring to determine population response and harvest eggs
- Continue nonnative species removal as needed
- Release headstarted individuals, monitor for site fidelity

SAN DIEGO ZOO

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WPT monitoring after nonnative species removal

- More gravid females with higher fertility
- 4 wild subadult WPT captured
  - One young adult WPT-2010 (105mm)
  - Three juvenile WPT-2010, 2011, and 2013
  - Youngest 4 WPT detected in MSCP region in 10 years

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SAN DIEGO ZOO

Western Pond Turtle headstarting

- 5 juveniles released in 2013
- 5 more scheduled for 2014

By the end of 2014, efforts by USGS, San Diego Zoo, Cal DFW, and SANDAG will have increased the population size by nearly 50% with the first 15 juveniles on site since before 2002.

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SAN DIEGO ZOO

Identify, Remove, and Restore…

- Identify and score threats and stressors to prioritize sites
  - Water management
  - Roads
  - Nonnative species
  - Recreation/access
- Remove local threats
  - Nonnative species removal
  - Outreach/signage
  - Trails/roads management
- Restore populations
  - Headstarting
  - Translocations

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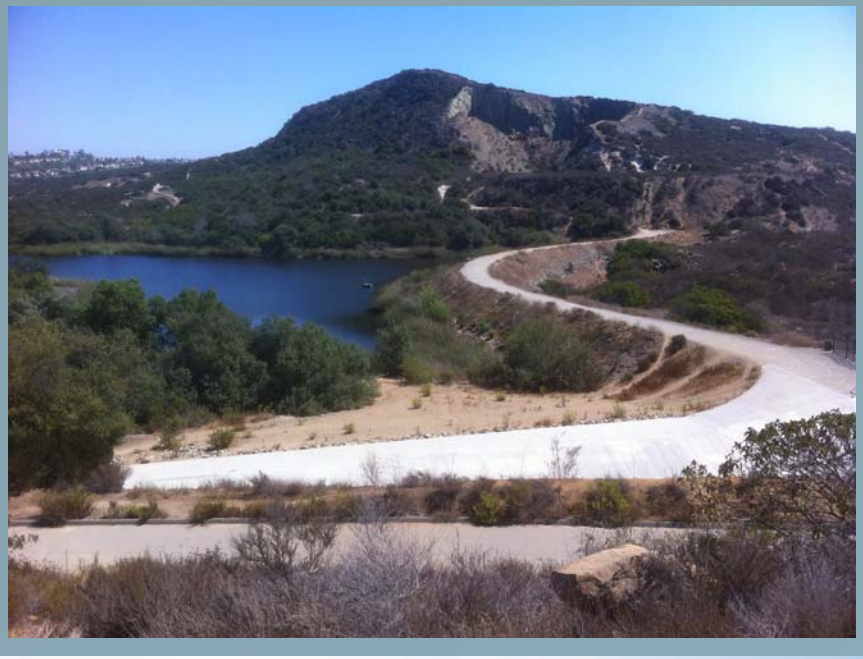
Identify, Remove, and Restore…

Different sites require different strategies…



Discussion…

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