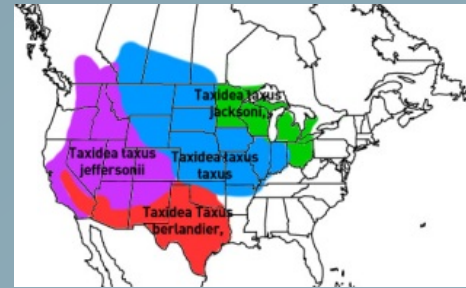


USGS Western Ecological Research Center

Badger Research in San Diego County



American Badger



- Widespread in North America
- Open grasslands, prairies
- Annual home range = 2- 200 km²
- Eat ground squirrels, gophers, rodents, bees, some plants.
- Mainly nocturnal- less active in winter
- Delayed implantation- mate in Fall, give birth in Spring
- Young disperse from mothers June- August
- Mortality: Habitat loss/fragmentation, Road-kill, Rodenticides, farmers (pest), fur trapping
- California Species of Special Concern (DFG)
- Fur-bearing mammals >1957: Can be hunted in almost any manner, no bag limits Nov-Feb (DFG Trapping License Exam Ref Guide)

How are our conserved lands working for wildlife?



Connectivity Monitoring Strategic Plan

“Goals of connectivity amongst core conserved habitat areas are:

- ensuring the persistence of species across the preserve system
- preserving ecosystem functions across the landscape.”
- Wide-ranging animals considered indicators of functional connectivity.
- Mountain lions: Connectivity of riparian habitats
- Badger: Connectivity of upland habitats (grasslands, scrub, chaparral).

USGS Badger Research

Problem: Very little known about American badgers in southern California

- Distribution
- Status
- Ecology
- Abundance
- Movement Patterns



Badger Survey Techniques 2011- present



Western Ecological Research Center

Rapid Assessment of the Distribution of Badgers Within Western San Diego County, 2011



Prepared for:
California Department of Fish and Game

U.S. Department of the Interior
U.S. Geological Survey
Western Ecological Research Center



Western Ecological Research Center

Research of American Badgers in Western San Diego County, 2014



Prepared for:
California Department of Fish and Wildlife and San Diego Association

U.S. Department of the Interior
U.S. Geological Survey
Western Ecological Research Center



Western Ecological Research Center

American Badger Research in Western San Diego County, 2015



Prepared for:
San Diego Association of Governments

U.S. Department of the Interior
U.S. Geological Survey
Western Ecological Research Center



Canine Scent Detection- 2011 & 2014



Conservation
Canines

<http://conservationbiology.net/>



47 grassland sites: 5-12 km per day

Scat

Species-Specific Mitochondrial DNA assay (2 badger specific markers)



Scat Contents

Bone

Hair

Honeycomb

Avocado

Grasshoppers

Burrow/Sign Searches:



Burrow/ Sign Searches:



Infrared Cameras: Trails & Burrows





science



Bushnell

2015-06-06 22:21:08

Hair Snags



Public Involvement



Have you seen a badger?

Please help us find out more about badgers in San Diego!



- Black & white facial markings.
- White Vertical stripes on face (not horizontal like raccoons).
- Stocky Flattened body with short legs and gray-yellow fur.
- Dig large oval shaped burrows with claw marks 1" apart often apparent.
- Often dig out squirrel burrows for prey



Because badgers are constantly on the move, we depend on citizen sightings to identify usage areas where the species still occur. Also, road-killed badgers provide vital genetic and movement information. Please provide date seen, detailed location, and photo(s), if possible.

**If you have recently seen a badger, fresh burrows, or a dead badger,
Please Call USGS scientists at: 619-225-6458**

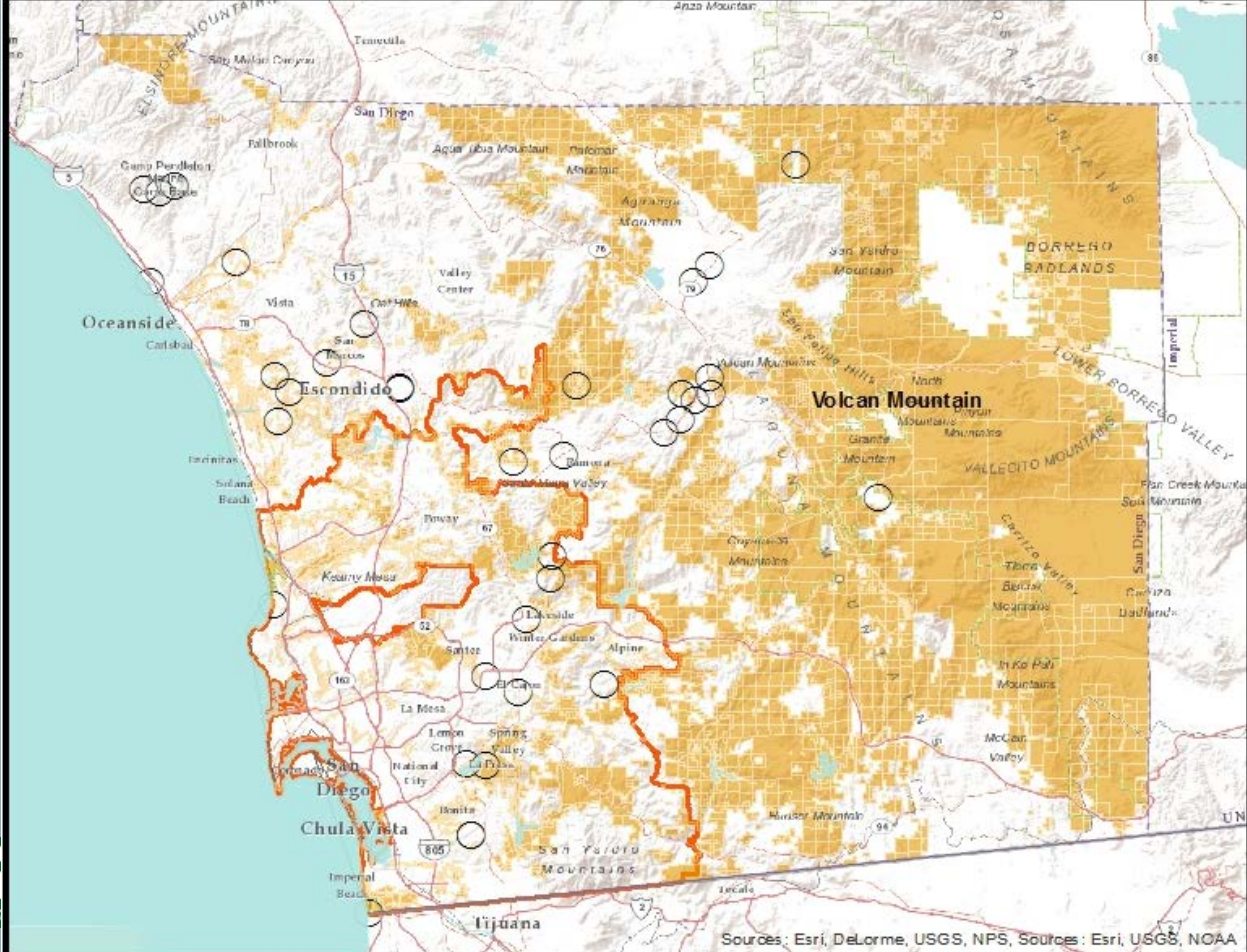
You can also e-mail us your sightings to SDBadgers@usgs.gov

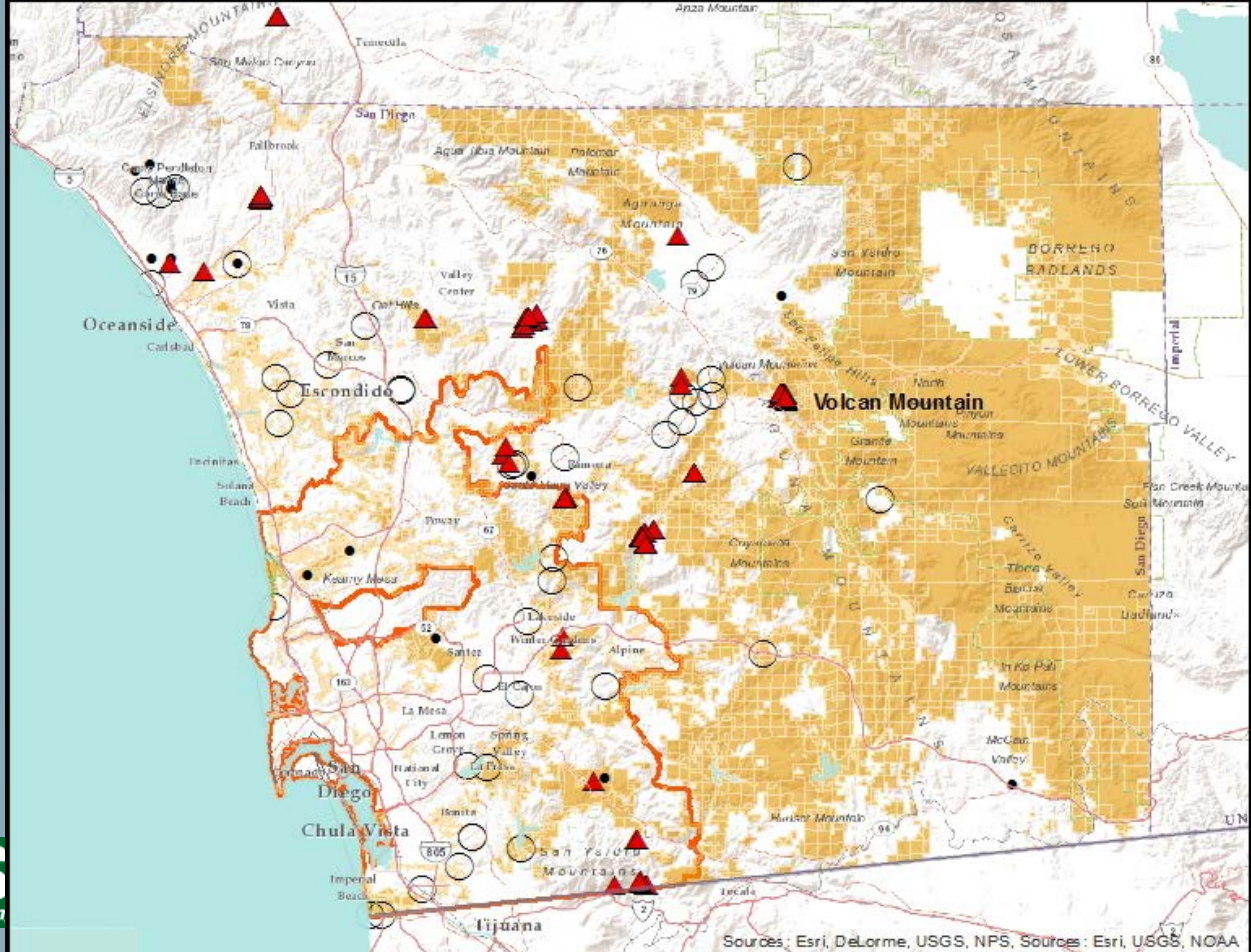


For more information on badgers and our wildlife study
go to www.werc.usgs.gov/sdbadgers



Pics by Joni Bye, Ryan McCreary,
cyclist name TBD





Badgers at Volcan Mountain

- Surveying since April 2014
- Badger Activity
 - April & May 2014
 - No badger activity 2015
 - May, Aug, Sept, Nov 2016
 - March 2017
- Squirrel Activity



Individual Badgers

Volcan Mountain
Longnose



Notch



Sideburn 2016



Sideburn 2017



Marron Valley



SD River- El Capitan



SD River- Eagle Peak



20S

Conclusion:



- **Badgers are largely absent from nature reserves within urban areas that were historically occupied. They persist only in large contiguous habitats in the east and northern portions of the County.**
- **Badgers do not occupy single reserves but are highly transient. Only several sites have been documented to be repeatedly visited in the past 6 years.**
- **Badgers persist in low densities**
- **Use of multiple survey methods has been successful for better understanding badger distribution and activity in western San Diego County.**
- **Unknown: Abundance, home ranges, movement corridors**

Next Steps:



1. **Badger Monitoring** (MSPA long-term plan)
 1. **Monthly/Seasonal sign surveys at core sites.**
 2. **Yearly sign surveys at any historically occupied sites.**
 3. **Validation surveys of Hotline tips.**
 4. **Record habitat & small mammal activity data.**
 5. **Further Develop Microsatellite Assay for Individuals-**
design a species-specific microsatellite library for
Southern California badgers (Wood et al. 2016)
(Population genetics of American badger in western San Diego County)

Next Steps:



1. **Badger Monitoring** (MSPA long-term plan)
2. **Continue and expand public outreach, working with partners**



Have you seen a badger?

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Next Steps:



1. Badger Monitoring
 2. Continue and expand public outreach, working with partners
 3. Radio telemetry study- badger movement
- Most effective & safe methods (DTA Review)
- Locate live animals (canine surveys)
 - Capture (body snare)
 - Telemetry (internal satellite transmitters)



Best practice recommendations for the use of fully implanted telemetry devices in pinnipeds

Markus Horning^{1,2*}, Martin Hauken³, Pamela A. Tuomi⁴, Jo-Ann E. Mellish¹, Caroline E. Goertz², Kathleen Woodie⁵, Rachel K. Bergant⁶, Shawn Johnson⁷, Courtney R. Shuert⁸, Kristen A. Walker⁹, John P. Skinner⁹ and Peter L. Boveng⁹

Next Steps:



1. Badger Monitoring
2. Continue and expand public outreach, working with partners
3. Radio telemetry study- badger movement
4. Can we increase the effectiveness of current HCP's for upland species? *Road permeability- addition of culverts, habitat management, etc.* **MSPA Badger Mgmt Plan**



PETITION 2015-008 to repeal hunting of American badger and gray fox

California Fish and Game Commission
June 20-21 commission meeting in Sacramento

fgc@fgc.ca.gov

