

# UCD WILDLIFE HEALTH CENTER MOUNTAIN LION STUDIES - 2022 UPDATE

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- UC Davis Wildlife Health Center



# ACKNOWLEDGEMENTS

- Current primary funders and in-kind:
  - NCCP LAG
  - SANDAG
  - TNC
  - OCNCC
  - OC Parks
  - Private donors
- CDFW Wildlife Investigations Lab and Region 5 biologists – in-kind genetics / capture / necropsies
- Many, many land managers and owners allowing access
- Our field crew – J. Bourdon, R. Codington, A. Amico, J. Gonzalez, L. Vu, C. Duncan
- Our great collaborators across multiple Universities, Non-Profits, and Agencies



FIG. 1. Greater Los Angeles, southern California, USA showing the location of the Santa Monica (blue polygon) and Santa Ana (red polygon) Mountains within which we studied population dynamics of mountain lions. Also shown are other nearby mountain ranges, major (white lines) and more minor (gray lines) roads, and areas where natural habitat has been replaced by urbanization (dark gray) and agriculture (lighter gray).

# ADDRESSING MORT, CONNECTIVITY, AND MONITORING ISSUES

- Developing and testing deterrent devices
- Working with highway agencies on crossing improvements, new crossings, crossing monitoring
- Using collar data to examine negative factors like light and sound and mitigations
- Comparing monitoring techniques and creating ePR monitoring plan

## POPULATION MONITORING – TESTING TECHNIQUES – DNA CAPTURE, CAPTURES, MORTALITIES – CDFW GENETICS LAB IS KEY COLLABORATOR

- Hair snares and opportunistic hair collection at daybeds and kills
- Swabs of kills for saliva
- Opportunistic scat and scat dogs
- Capture and collaring and mortality sampling
- Photos – demographic info and facial

### Hair Snare Cubby Sites

- No mountain lion detections
- Mountain lion detection
- Mountain lion detection and genotype

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

# HAIRSNARE "CUBBY"



92 F 28.66 inHg

39 20 1 C

06/10/2021 12:33:24 PM



Testing photo methods  
for population  
monitoring and  
individual ID

Testing hair snare  
methods



67 F 28.69 inHg

341 1P

07/27



8 62F 28.70 inHg

33 20 1C

▶ 08/16/2021 06:2



213 S2 C2

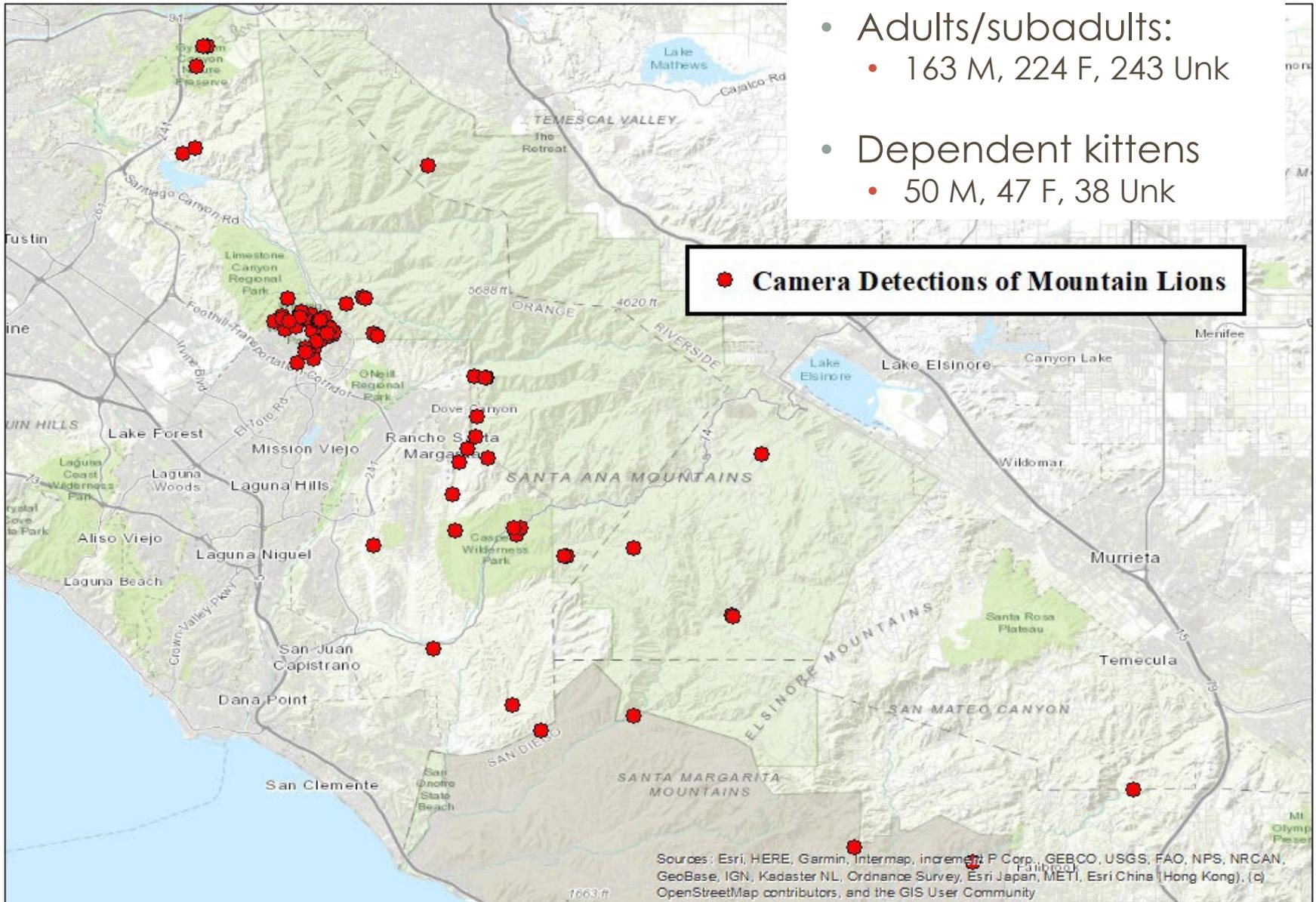
# PHOTOS AT CUBBY AND OTHER SITES

- 608 visits - 765 animals

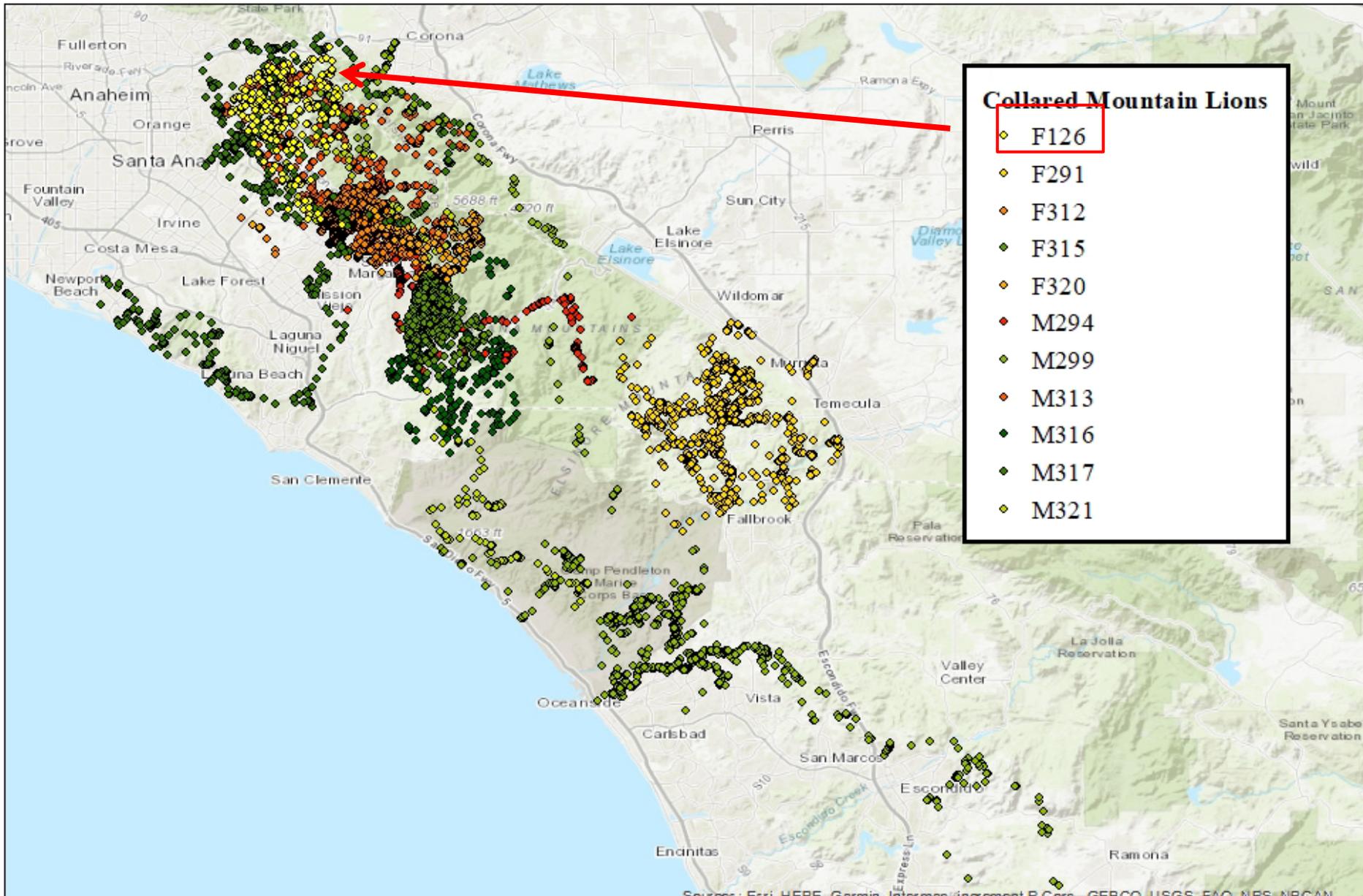
- Adults/subadults:
  - 163 M, 224 F, 243 Unk

- Dependent kittens
  - 50 M, 47 F, 38 Unk

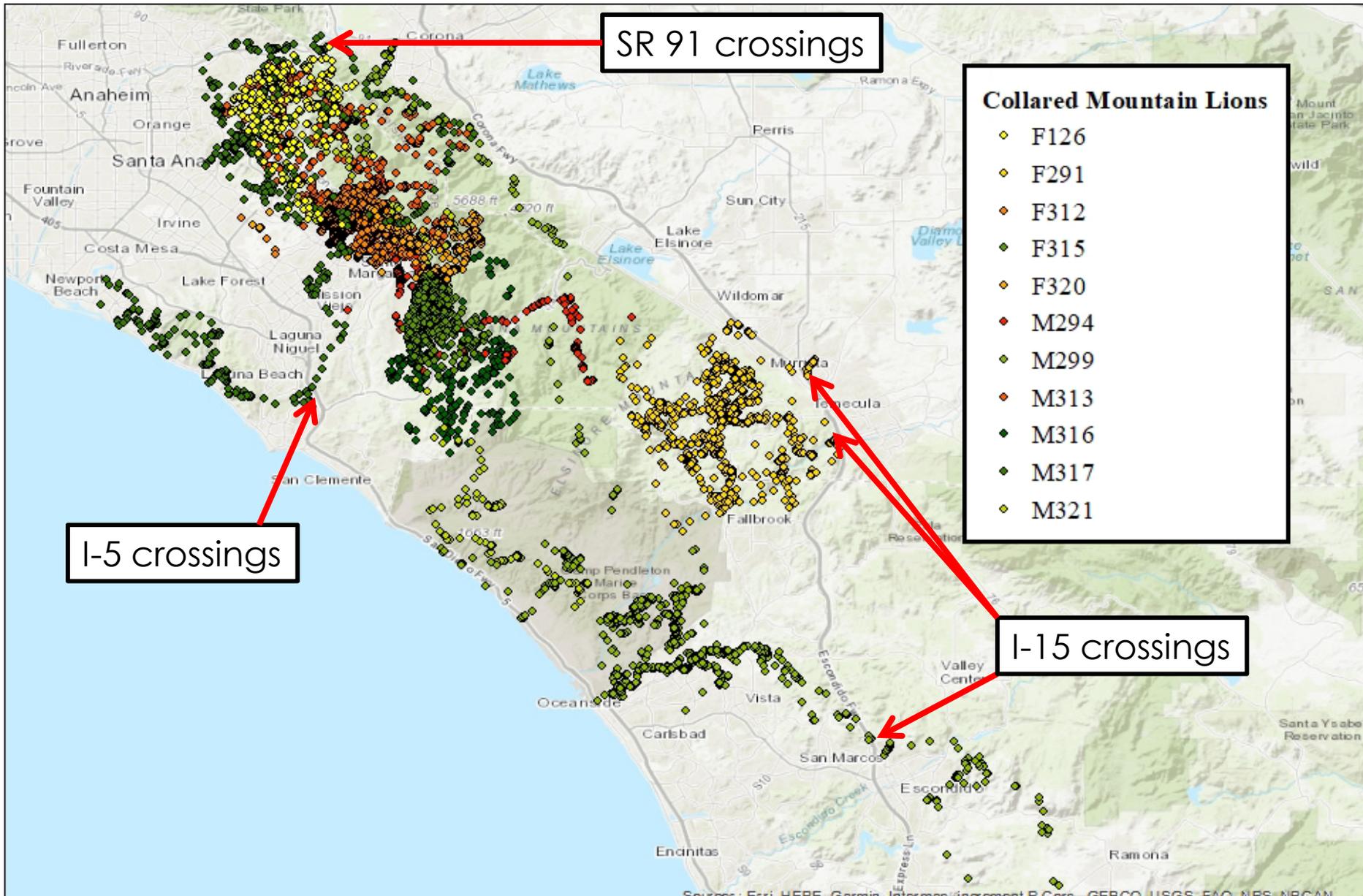
● Camera Detections of Mountain Lions



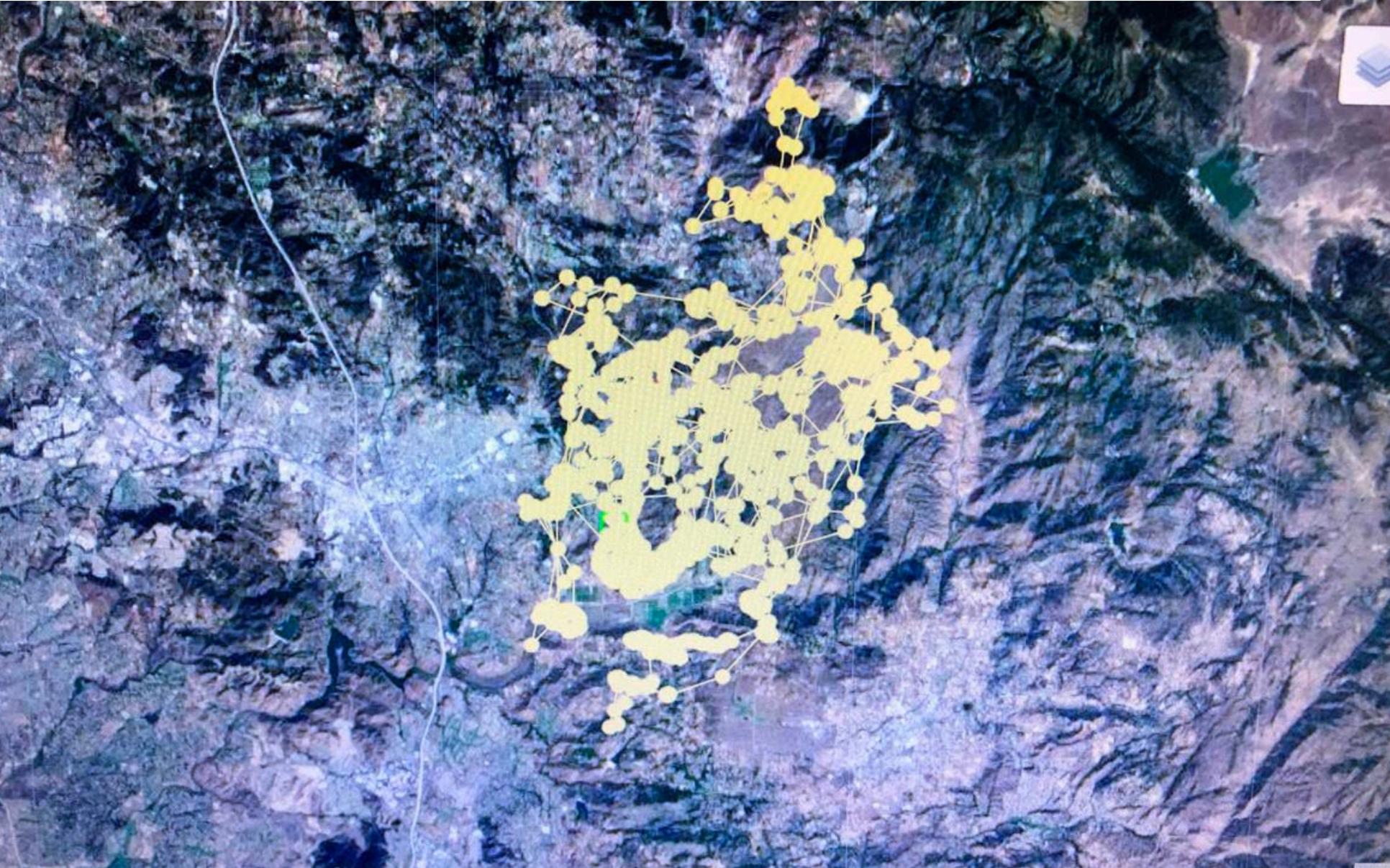
# 2021-2022 COLLARED LIONS



# 2021-2022 COLLARED LIONS



F307



Each DNA collection method detected the following numbers of animals in the SAM

- **Blood and tissue** from mortalities and captures – **n=18**
- **Scat** opportunistically collected – **n=14**
- **Hair** from snares and opportunistic collection – **n=9**
- **Swabs** from hair snare or kill- **n=2**
- **The combined data set yielded 29 unique individuals**
- **17 individuals were detected by only one method, with 12 being detected by 2-4 methods**
- **4 individuals were ID'd by distinct markings in photos**

# DNA FINGERPRINTING RESULTS

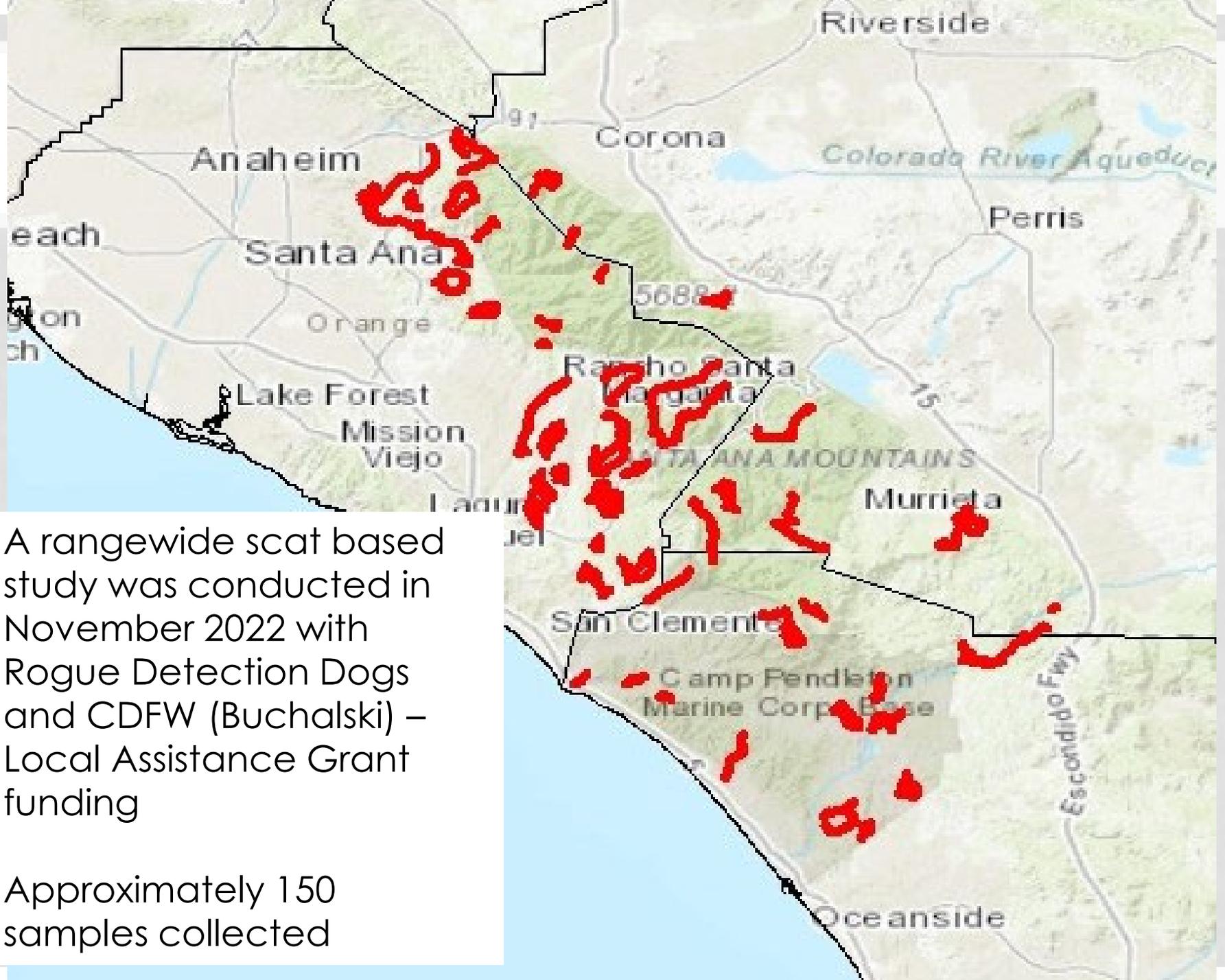
- The ages of the **29 confirmed individuals** as determined by direct exams or cameras were:
  - **Total Adults or Subadults = 17 (8 F, 9 M)**
  - **Kittens (0-18 mo) = 6 (4F, 2M)**
  - **Age unknown (scat detection only) = 6 (2F, 2M, 2 could not be determined)**



SA results to be incorporated into  
statewide study – Manuscript in  
prep, Dellinger et al.

# POPULATION ESTIMATE COMPARISONS - SANTA ANAS

- Benson et al. (2019)- Capacity of the range –
- 16-21 adults (5-7 M, 11-14F) (exclusive of the Chino Hills)
  
- Extrapolation from statewide scat DNA-based study (Dellinger et al. in prep) - 2.12 (1.9-2.3) animals per 100 sq. km.
- Estimated population of 32.4 (95% CI: 29-35.2) total animals above 10-12 months of age.
  
- Methods of Cooley et al. (2009) - 1.6 per 100 sq. km.,  
Estimate of 24.48 individuals in the Range



A rangewide scat based study was conducted in November 2022 with Rogue Detection Dogs and CDFW (Buchalski) – Local Assistance Grant funding

Approximately 150 samples collected

# NEXT STEPS

- Completed review of lit review of long term monitoring options
- Create long term monitoring plan for ePR, and extrapolate to SA's
- Monitoring likely to be a combination of techniques
- Create integrated population model to project ePR population trajectory and derive population viability analysis
- Expansion of camera monitoring and collaring to evaluation of I-10, SR 58 and I-5 in the Tehachapis, SR 101 and 152 in the Gabilans and Pacheco Pass
- Testing of camera array based population estimation – time-to-event and space-to-event analytics

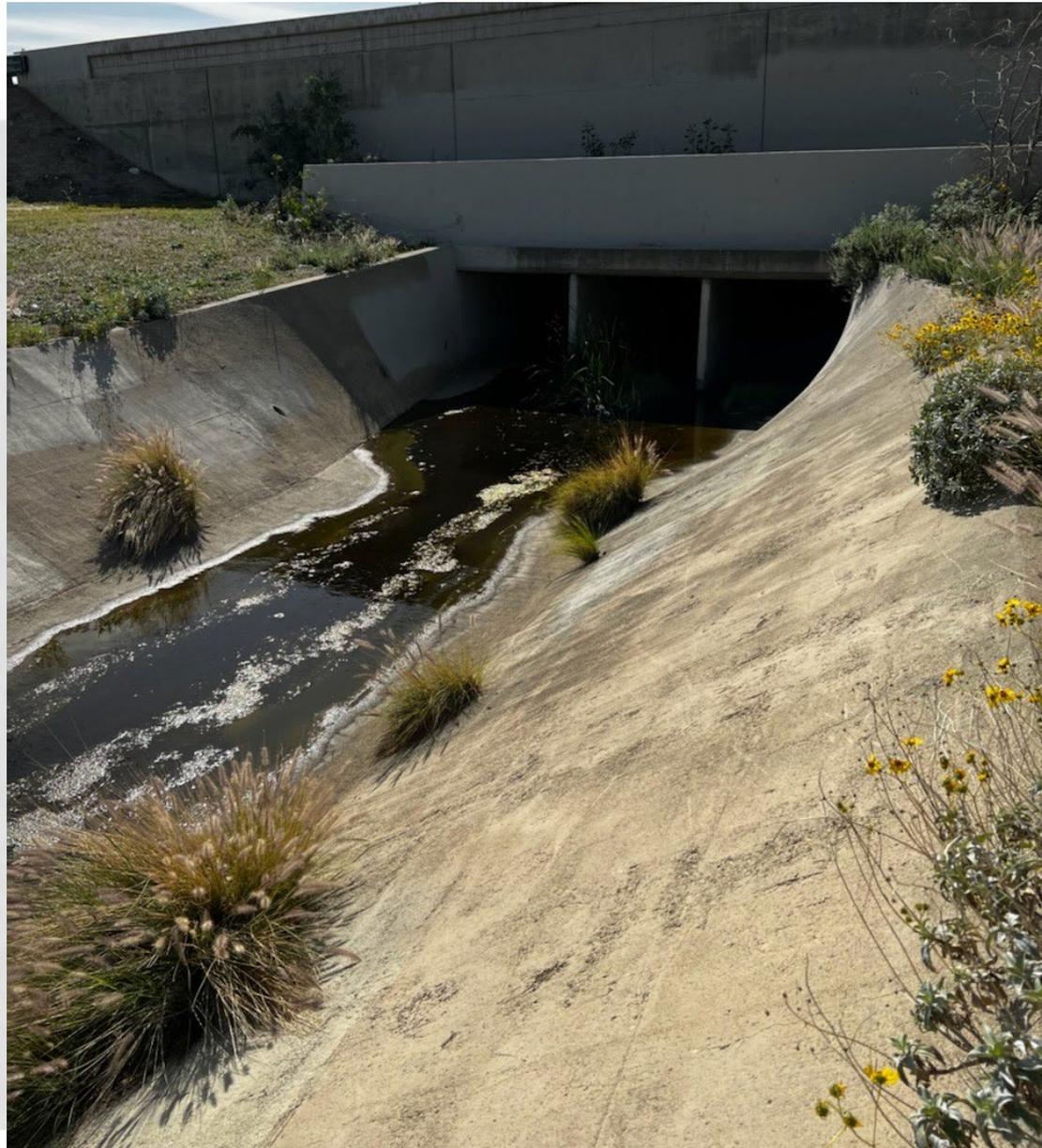
M317 ON RELEASE AFTER FIRST CAPTURE IN  
IRVINE OFFICE PARK BETWEEN I-5 AND I-405



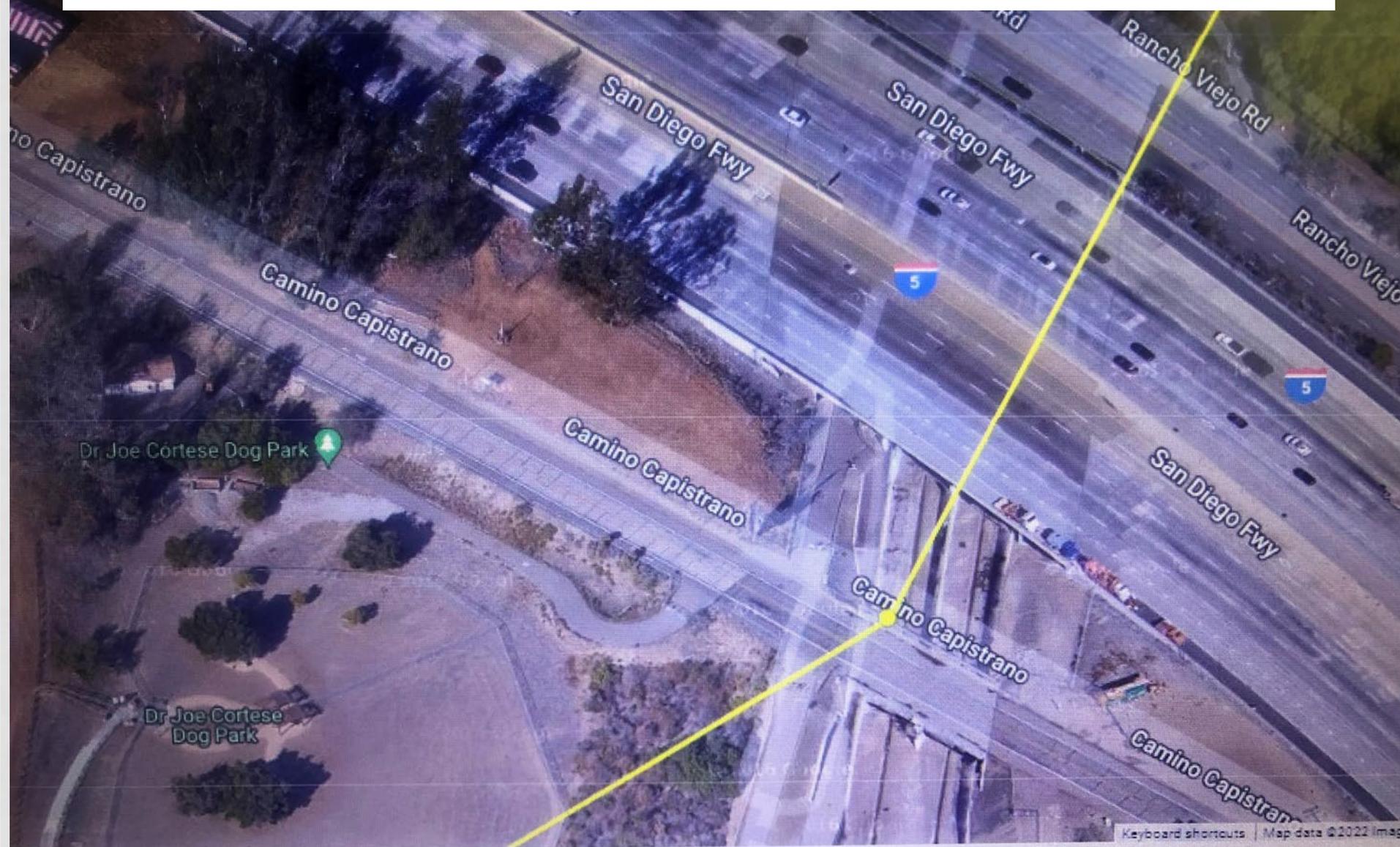
# M317 FIRST CROSSING SR91 - S TO N PHOTO COURTESY USGS



# M317 LIKELY CROSSING SITE N TO S



# M317 CROSSING SITE I-5 TRABUCO CREEK FLOOD CHANNEL



A satellite map of Southern California, showing a dense network of yellow lines representing travel routes. The routes are concentrated in the Orange County and Los Angeles areas, with a major path extending from Whittier in the north to Huntington Beach in the south. Major highways like I-5, I-10, I-15, and SR-605 are visible. A white text box is overlaid on the left side of the map.

M317  
TRAVELS  
SINCE  
COLLARED

# M317 NORTH OF 91-

