



Long-term Banding of California Leaf-nosed Bats Along the Lower Colorado River to Determine Movements and Longevity

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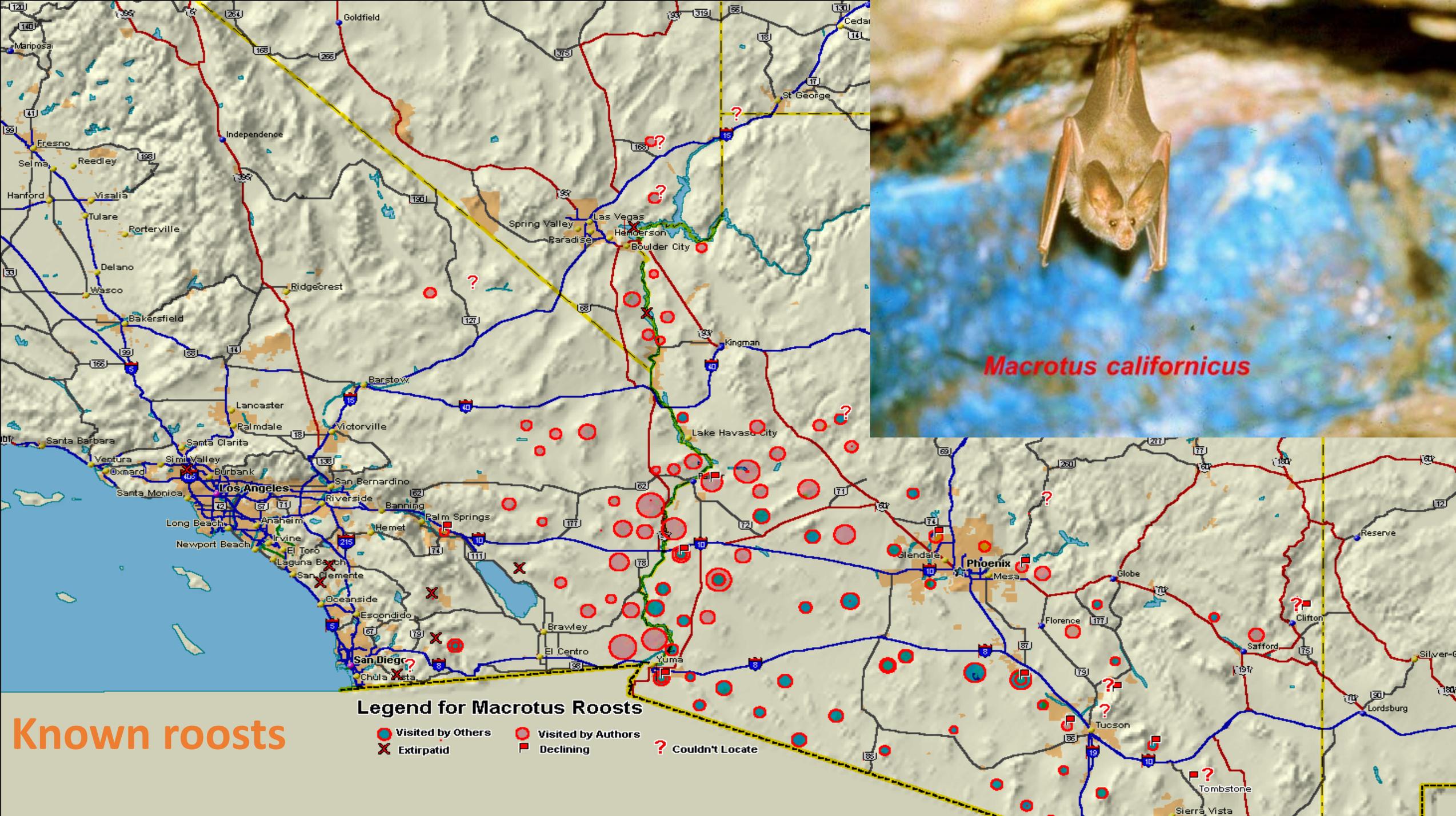
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California leaf-nosed bat
Macrotus californicus

- The northernmost species of the tropical leaf-nosed bat family
- This species has a narrow thermal-neutral zone and does not lower its body temperature to enter torpor
- They remain active year-round in the temperate zone, in part through the selection of warm cave and mine roosts ~26°C/80°F
- Forages by gleaning large insects, and occasionally lizards





Macrotus californicus

Legend for Macrotus Roosts

- Visited by Others
- Visited by Authors
- X Extirpated
- Declining
- ? Couldn't Locate

Known roosts

Macrotus californicus in mine near Parker, AZ





Californian Mine 1975





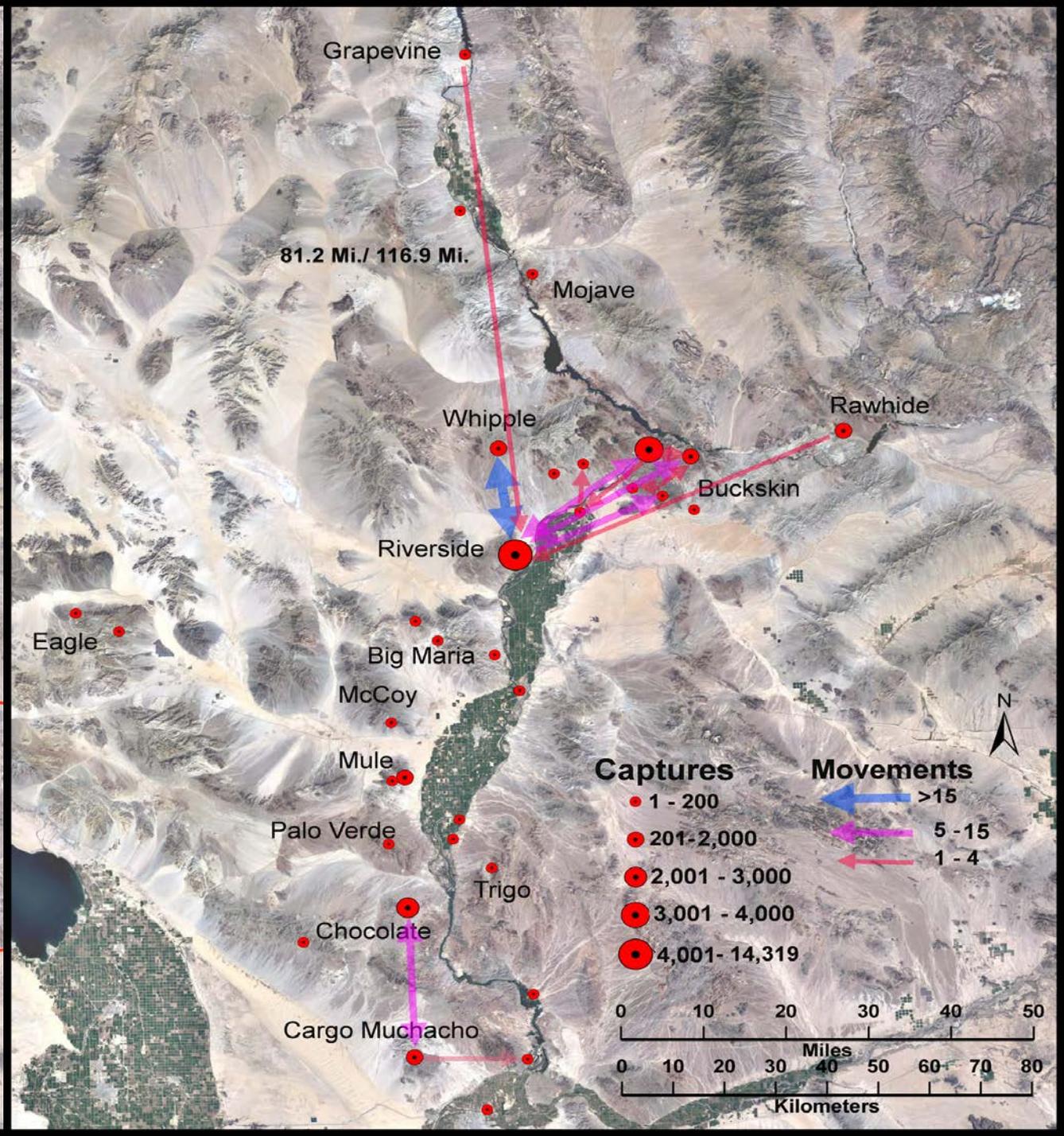
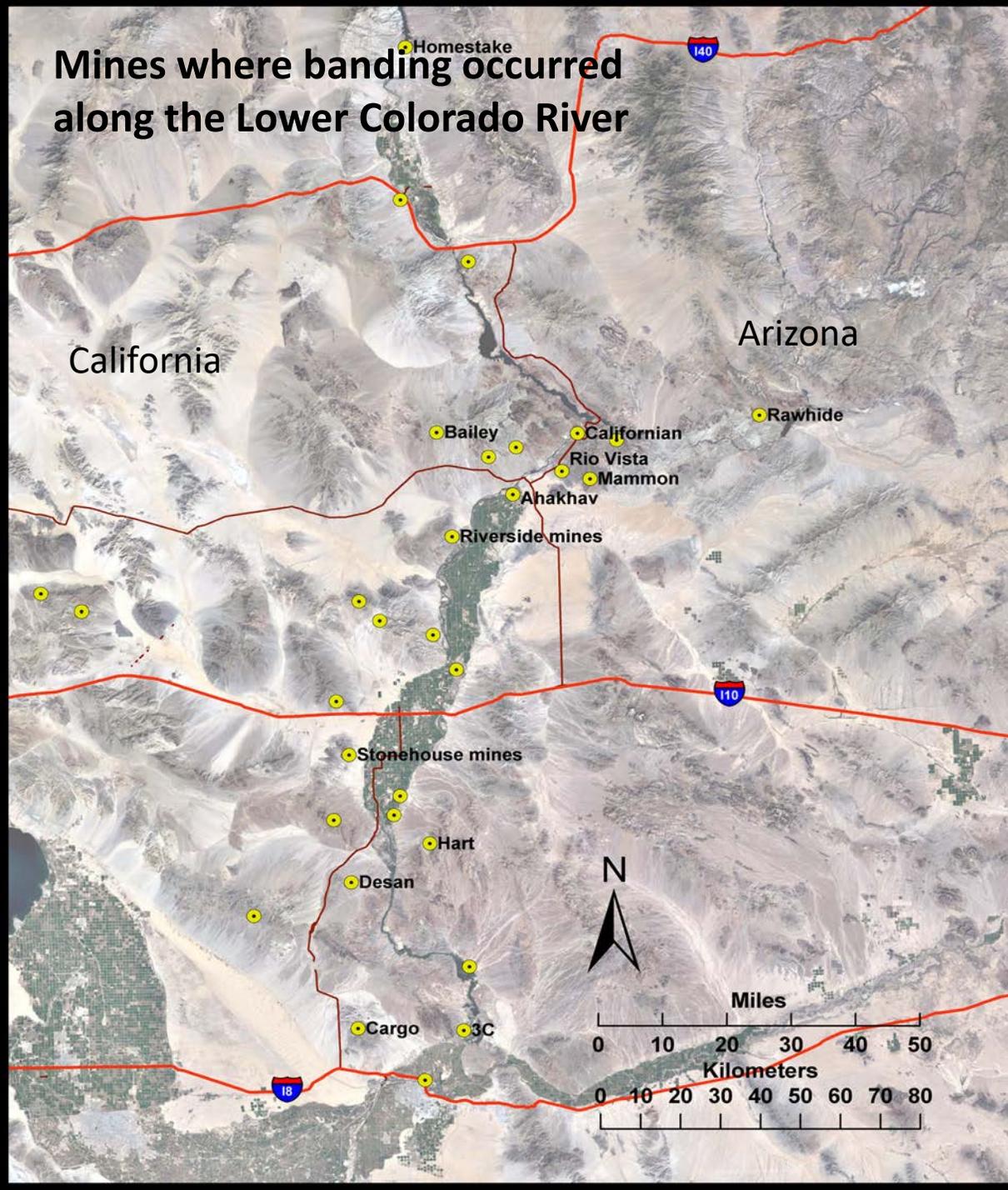
Banded *Macrotus* released



RESULTS

- **15,680** California leaf-nosed bats in mines along the Lower Colorado River (8,960 females; 6,720 males) were banded between 1958 and 2018 in 36 mines in 10 mountain ranges.
- **8,463** bat recapture events, representing **5,585** Individuals (3,183 females, 2,392 males).
- **Roost fidelity** (banding and recapture at same mine) was **> 75 %**, while 1,232 bats were recaptured at a mine other than the one of initial banding.
- The **greatest movement** between band and recapture location along the LCR was **131 km** (81 miles straight line) or **188 km** (117 miles) via terrain following. One bat moved 40 km (25 miles) between mines in one night.

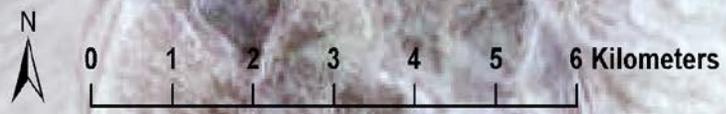
Mines where banding occurred along the Lower Colorado River



Bat No. 1
Estimated distance
flown ~ 75.7 Km
February 15, 2015

**Nightly foraging flights
via aerial telemetry study**

Stonehouse mine



Bat No. 7 Estimated distance
flown ~ 47.6 km
February 10, 2016

3C mine

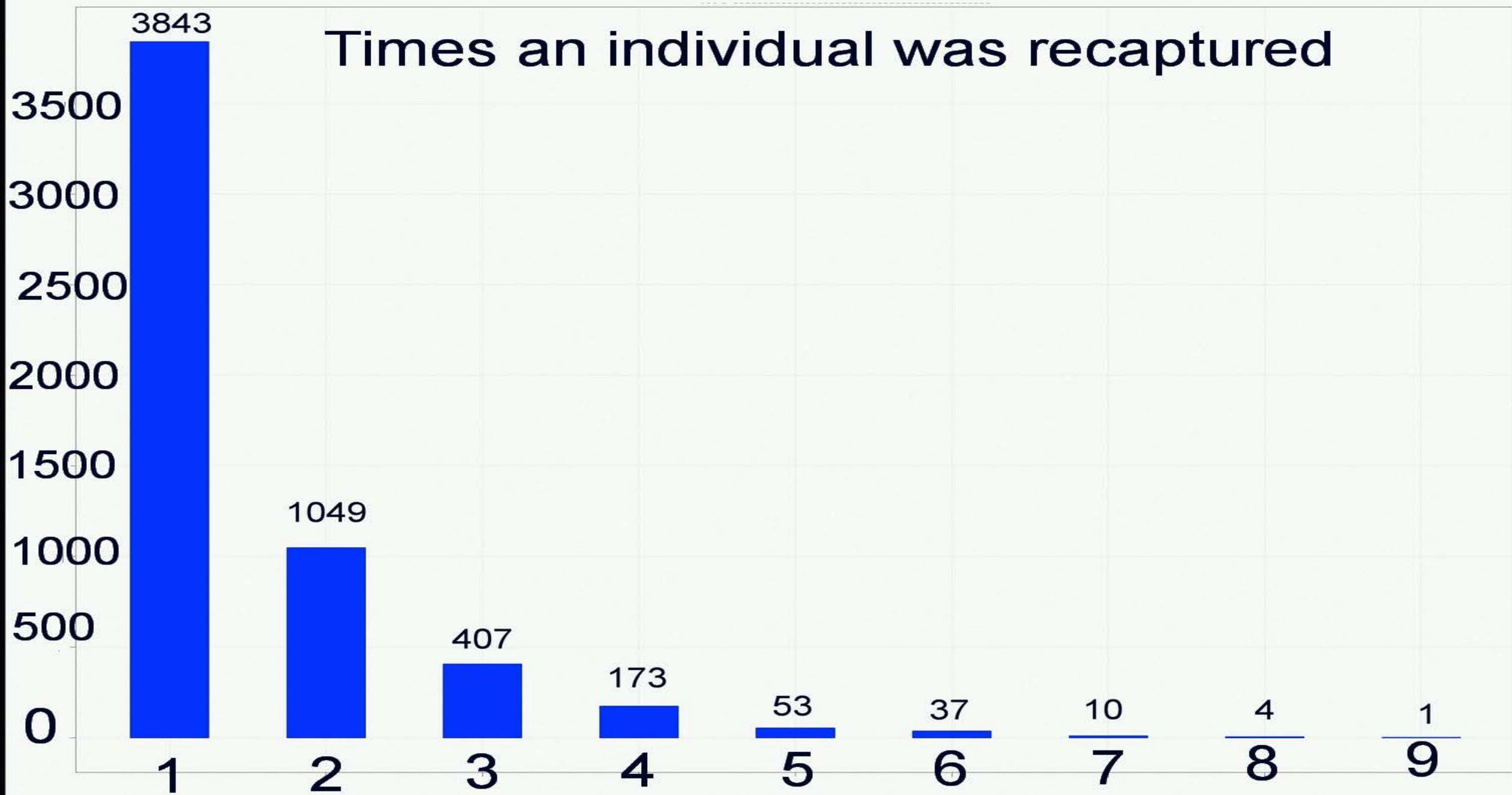
Bat No. 7



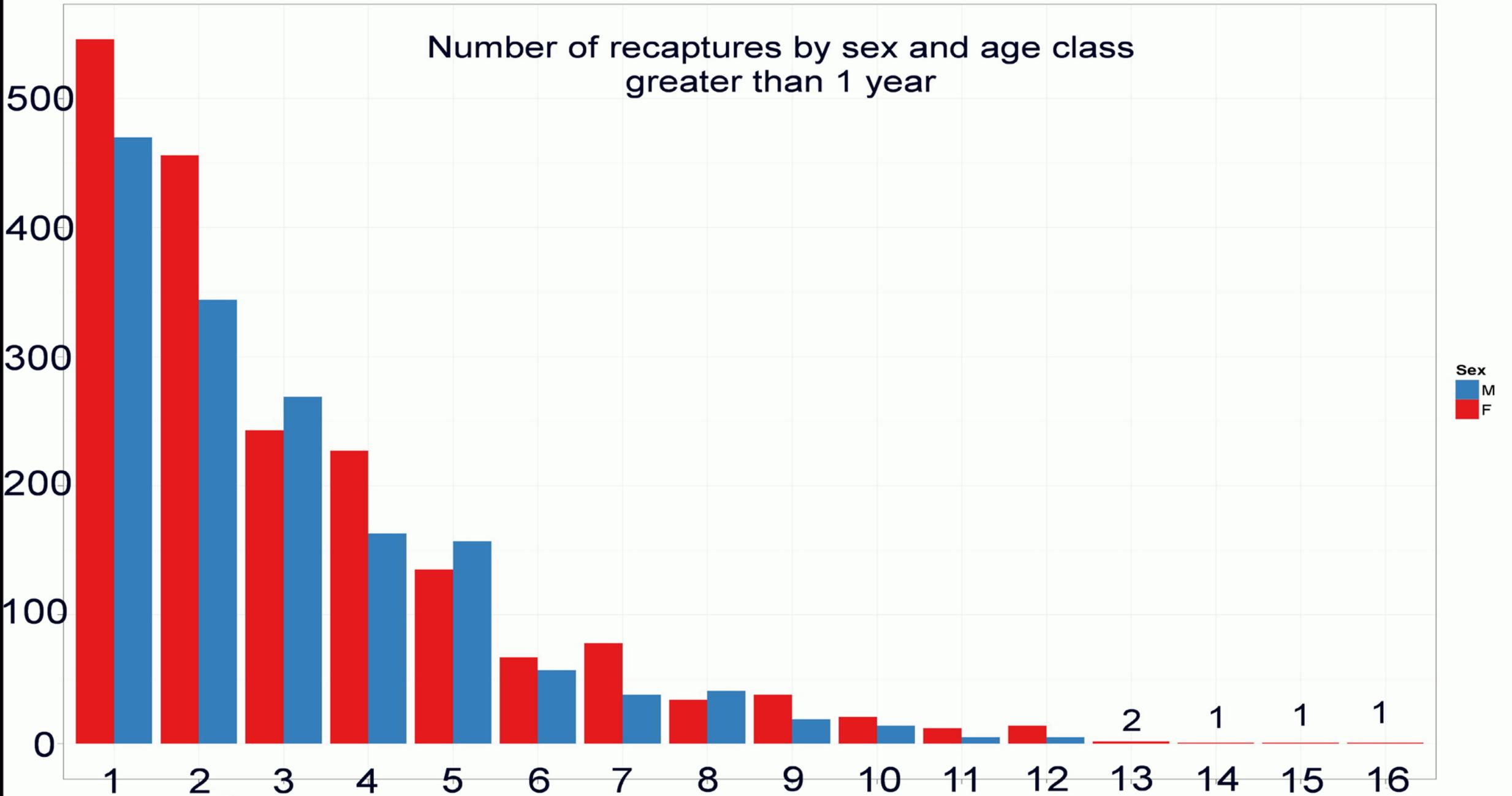
RESULTS (continued)

- **Recapture frequency** of individual bats was **1 to 9 times**. The male bat recaptured 9 times over 9 years was always in the same mine.
- The greatest interval between initial banding and recapture was 16 years. Banding and recapture occurred in the winter with births in June, so the **minimum age** of the female bat was **16 years and 7 months**.

Times an individual was recaptured



Number of recaptures by sex and age class greater than 1 year





ACKNOWLEDGMENTS

This research project is the result of a volunteer effort by the authors, numerous students and colleagues over the past 60 years.

Special thanks goes to Allen Calvert for securing a grant through the Bureau of Reclamation Lower Colorado River Multi-Species Conservation Program to start analysis of the data

We are indebted to the more than 15,000 bats who endured capture and banding. Hopefully these results will be used to understand and to conserve this species.