California Department of Transportation Road Ecology Meeting

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Bats and Transportation

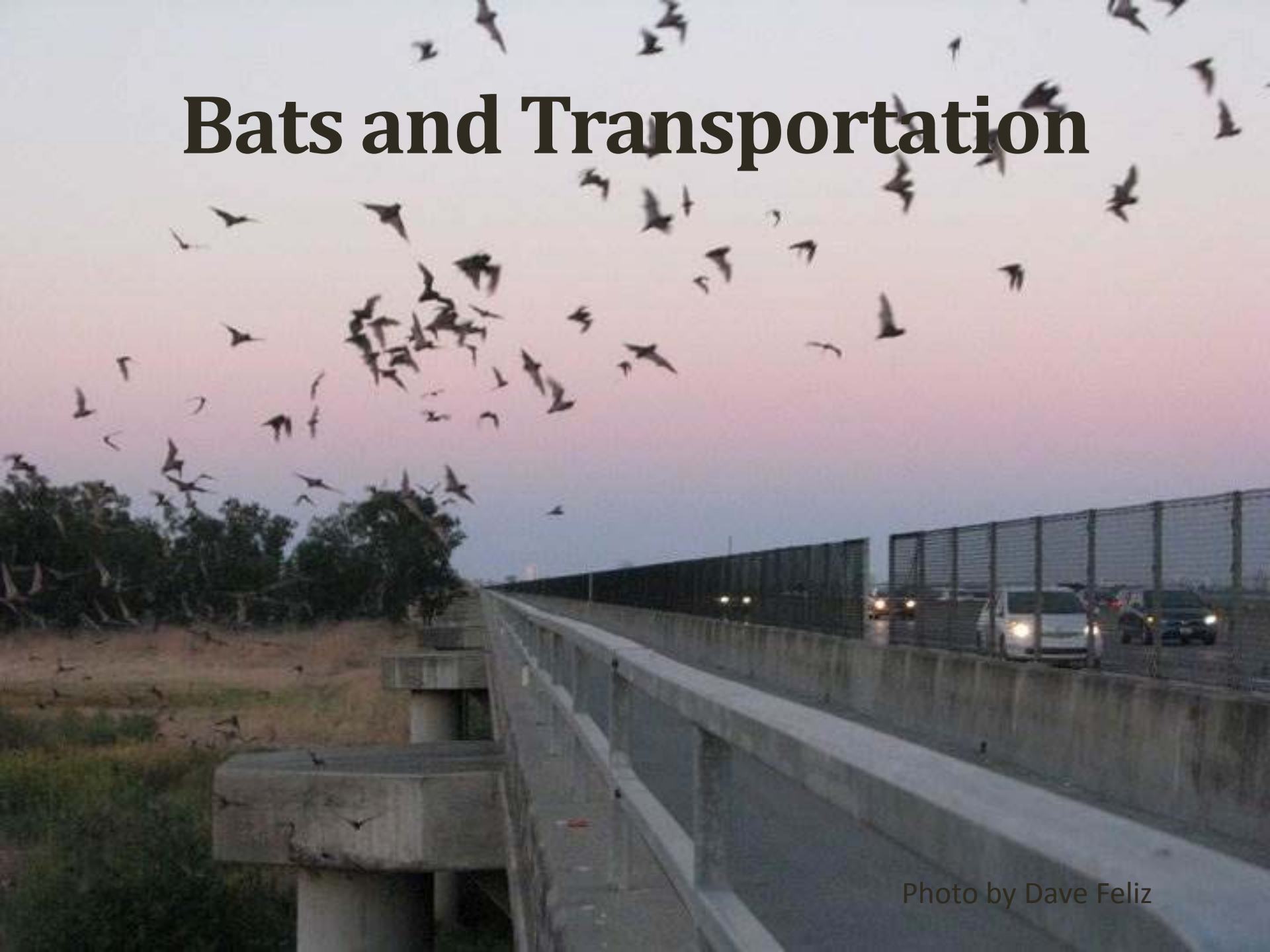


Photo by Dave Feliz

Bat Basics

- 25 different species of bats in California
- They roost in many different habitats – trees, rocky outcrops, caves/mines, buildings and bridges.
- Most feed on insects, invertebrates or small animals, a few are nectar or fruit eating.
- They may forage closely to their roost or travel several miles to a feeding site.
- They feed at different elevations from the ground up.

Basics of Bat Behavior

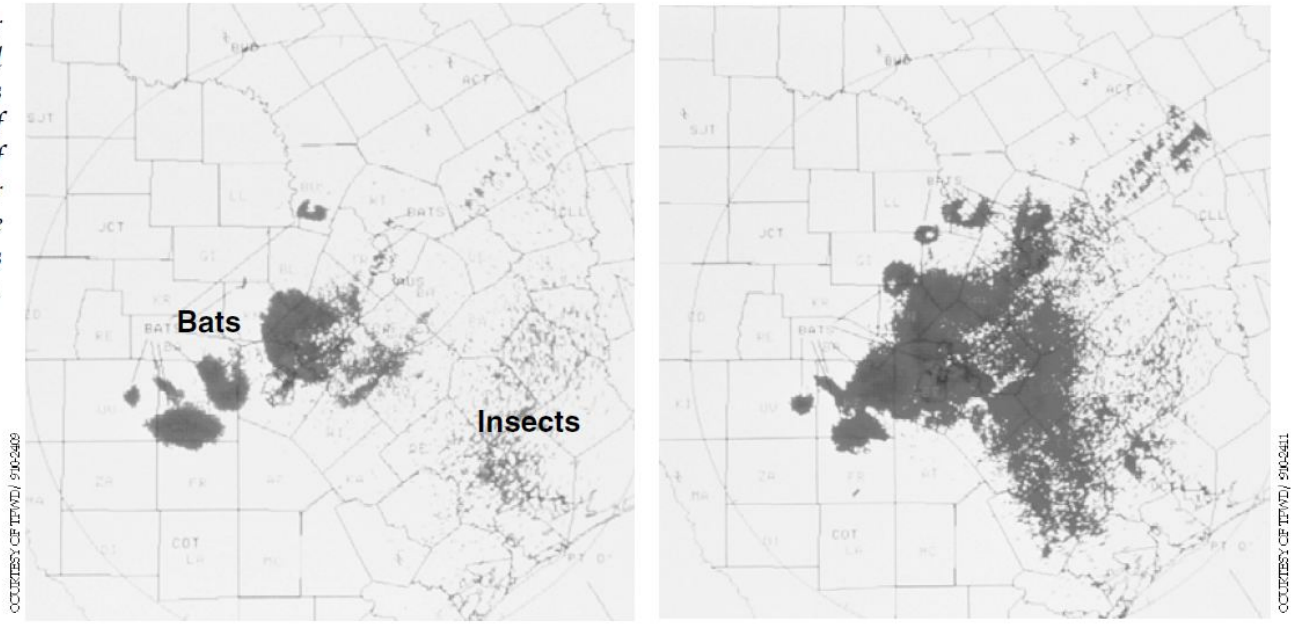
- Bats live year-round in California;
- Winter: some bats migrate; most hibernate
- Summer: Day roosts (females in maternity colonies; males solitary or in bachelor colonies); Night roosts;
- Emerge around dusk to drink and feed

Importance of Bats

- Economic
- Disease Control
- Pollination

Radar image of bats rising to eat corn earworm moths

Figure 2. Doppler radar images reveal large bat emergences spreading to engulf concentrations of insects rising for crop lands where corn earworm moths are primary pests.



White Nose Syndrome

- What is WNS?
- 5.7 million bats have died from WNS in US/90-100% of some hibernacula
- WNS continues to spread west
- Most important in areas with cold cave hibernacula
- FWS decontamination procedures

Bat Roosts

- Night roosts: Resting places to keep warm, digest food, engage in social behavior.
- Day roosts: Hidden, dark places where the bats sleep through the day.

Safety

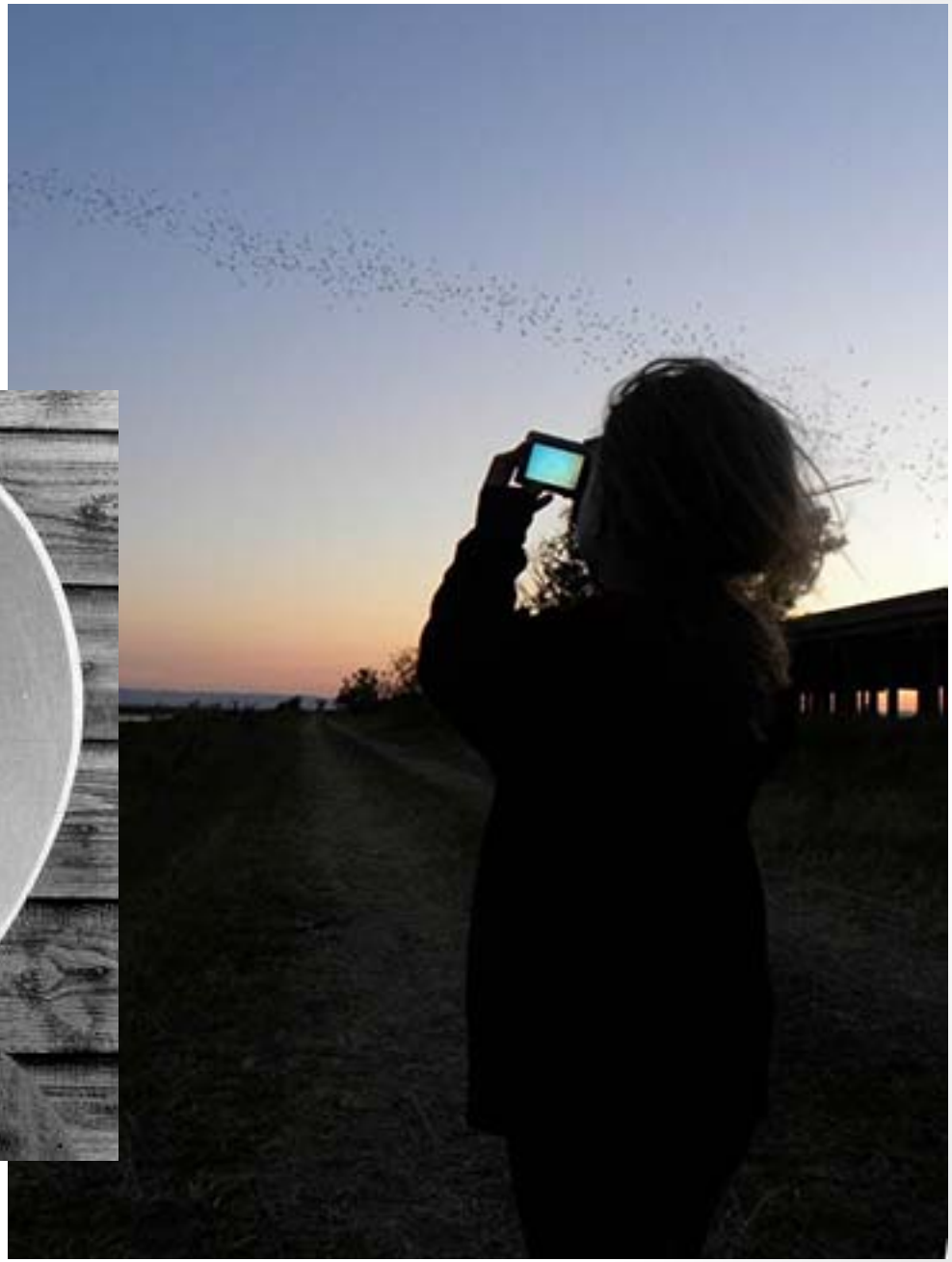
- Do not pick up bats;
- Bats out in the open during the day are probably sick, and could be rabid; only rabid bats can transmit the disease;
- Bats can get rabies but do not harbor the disease;
- If you need to move a bat, use a tool (shovel, broom);
- Use caution when removing droppings;

Identifying Bat Presence

- Guano

- Staining

- Hearing or Seeing them



Surveying for bats

What type of surveys are needed?

When should they be performed?

How many/how long do they need to be performed?

Qualifications

- Who is qualified to perform surveys?
  - Depends on type of survey
  - Level of education/training
  - Years of experience
  - Level of sensitivity of species

Scientific Collecting Permits and MOU Process

- Scientific Collecting Permits
  - Contact CDFW Sacramento permitting office at: https://www.wildlife.ca.gov/Licensing/Scientific-Collecting

- Memorandum of Understanding
  - Required for bat handling

Legal Protection for Bats

- Which species of bats are protected?
- All are considered non-game mammals and are afforded protection by state law from take and/or harassment (Fish and Game Code § 4150, California Code of Regulations, Section 251.1)

Bats and CEQA

- Several species of bats are considered SSC and meet the CEQA definition of rare, threatened or endangered species (CEQA Guidelines § 15065)
- Take of SSC could require a mandatory finding of significance by the lead agency (CEQA Guidelines § 15065)

T&E and Species of Special Concern

- Townsend's big-eared bat is currently a Candidate for listing under CESA.
- Species of Special Concern

Bats and bridges

- Concrete bridges:
  - T-beam, Box beam, Sub-structure with vertical surfaces; Larger bridges;
- Timber bridges
- Steel bridges

Wooden construction

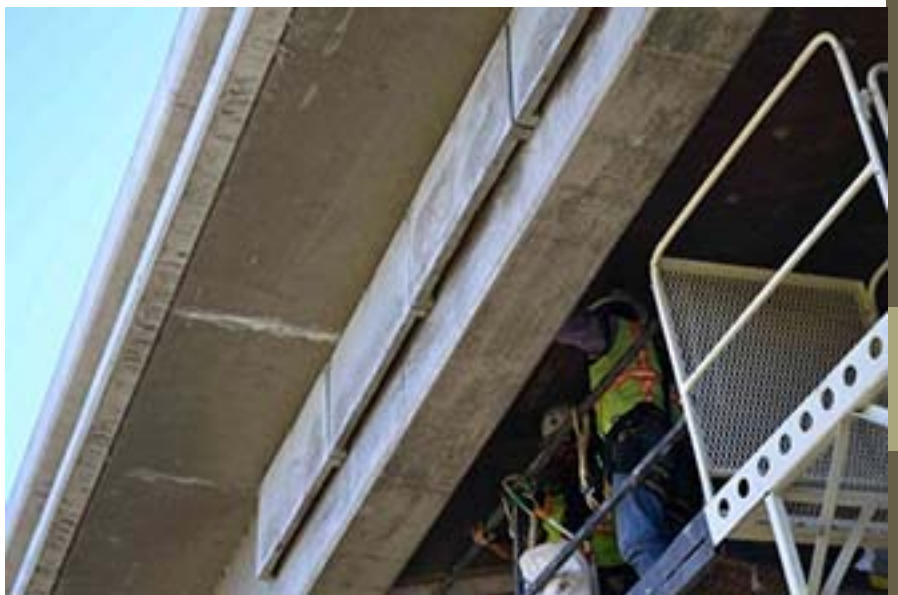
Concrete trapezoidal construction

Steel construction

Shading on west side of bridge

Avoidance and/or Mitigation

- Avoidance
- Minimization
- Mitigation
  - Temporary roost replacement
  - Permanent roost replacement



Considerations for Replacement Roosts on Structures

- Type of roost being replaced
- Temperature and humidity
- Activity around the proposed roost site
- Maintenance
- Safety

Replacement Habitat

How do you exclude bats?

- Exclude bats using one way “doors”
- Fill in gaps after bats have vacated.
- Screens or foam fillers (e.g. pool noodles with construction adhesive but expandable foam is not recommended).
- Deterrent sprays are generally not effective
- Acoustic deterence
- Netting

Case Study

- SR-91 Lane Extension Project in Yorba Linda

Expansion joints and Exclusions

Exclusions

Mitigation

Noise reduction

Replacement roosts

Avoidance

Monitoring

Western mastiff bat

Western pipistrelle or canyon bat

Questions?

Contact information

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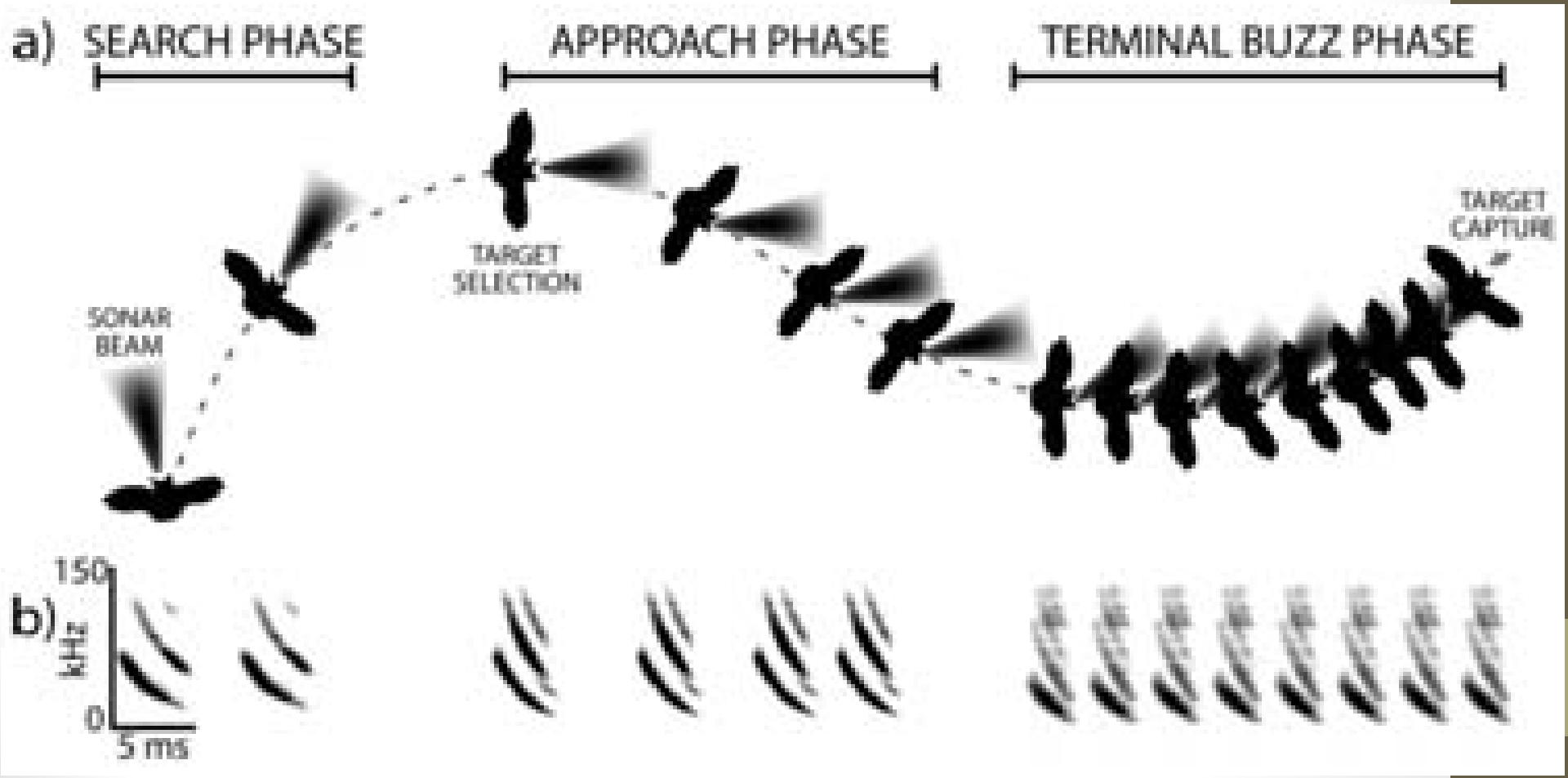
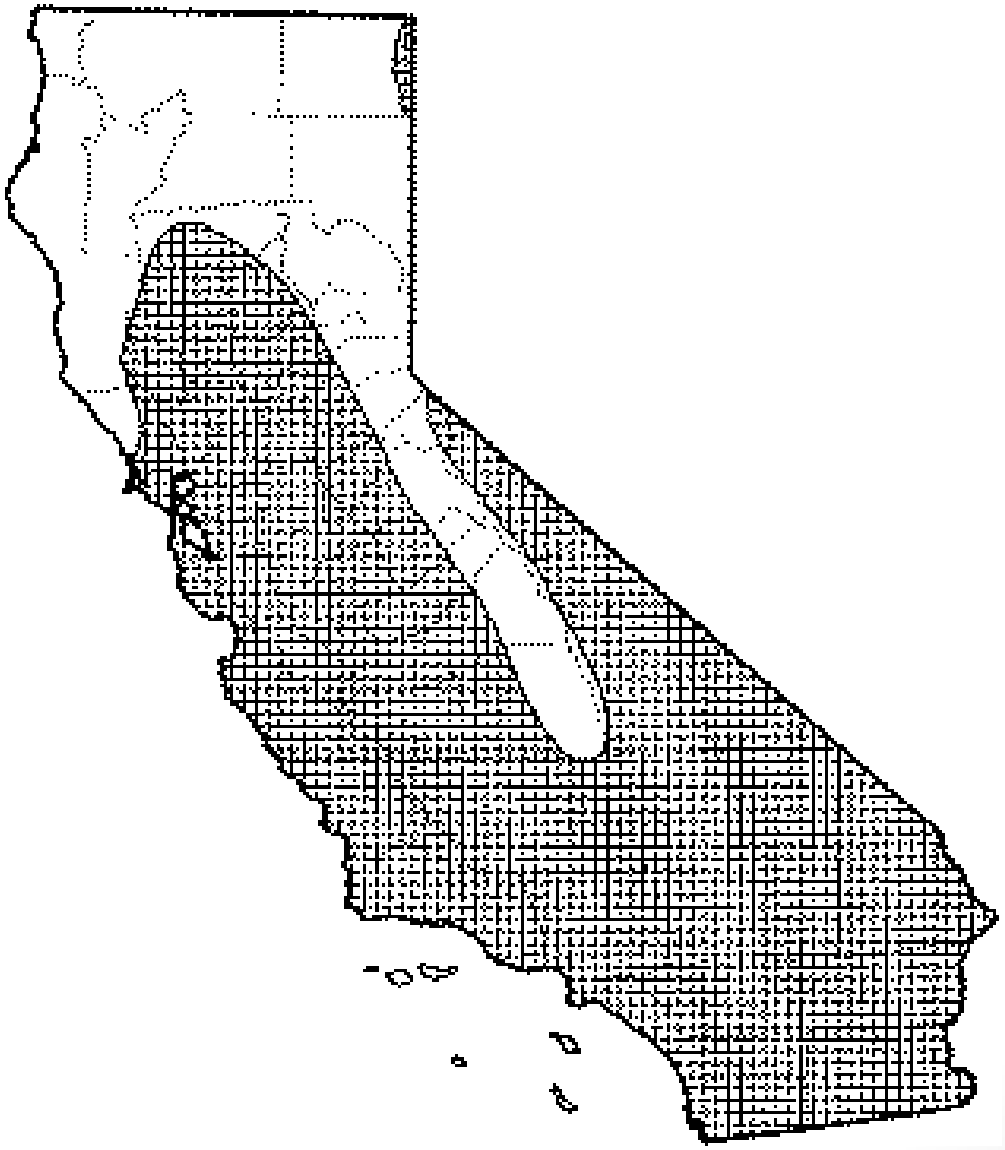
Typical feeding pattern

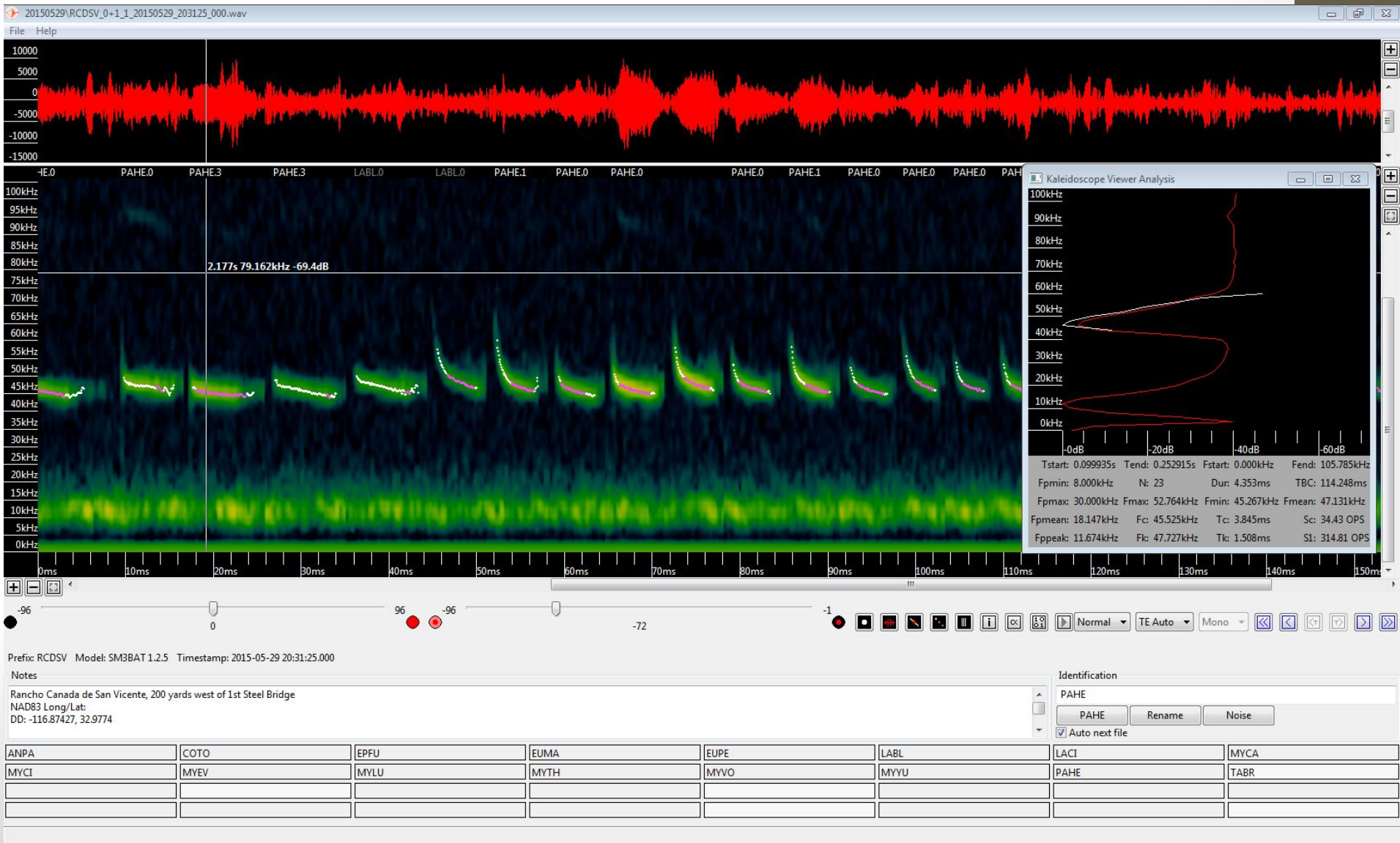


Canyon bat (*Parastrellus hesperus*)

Canyon bat range map



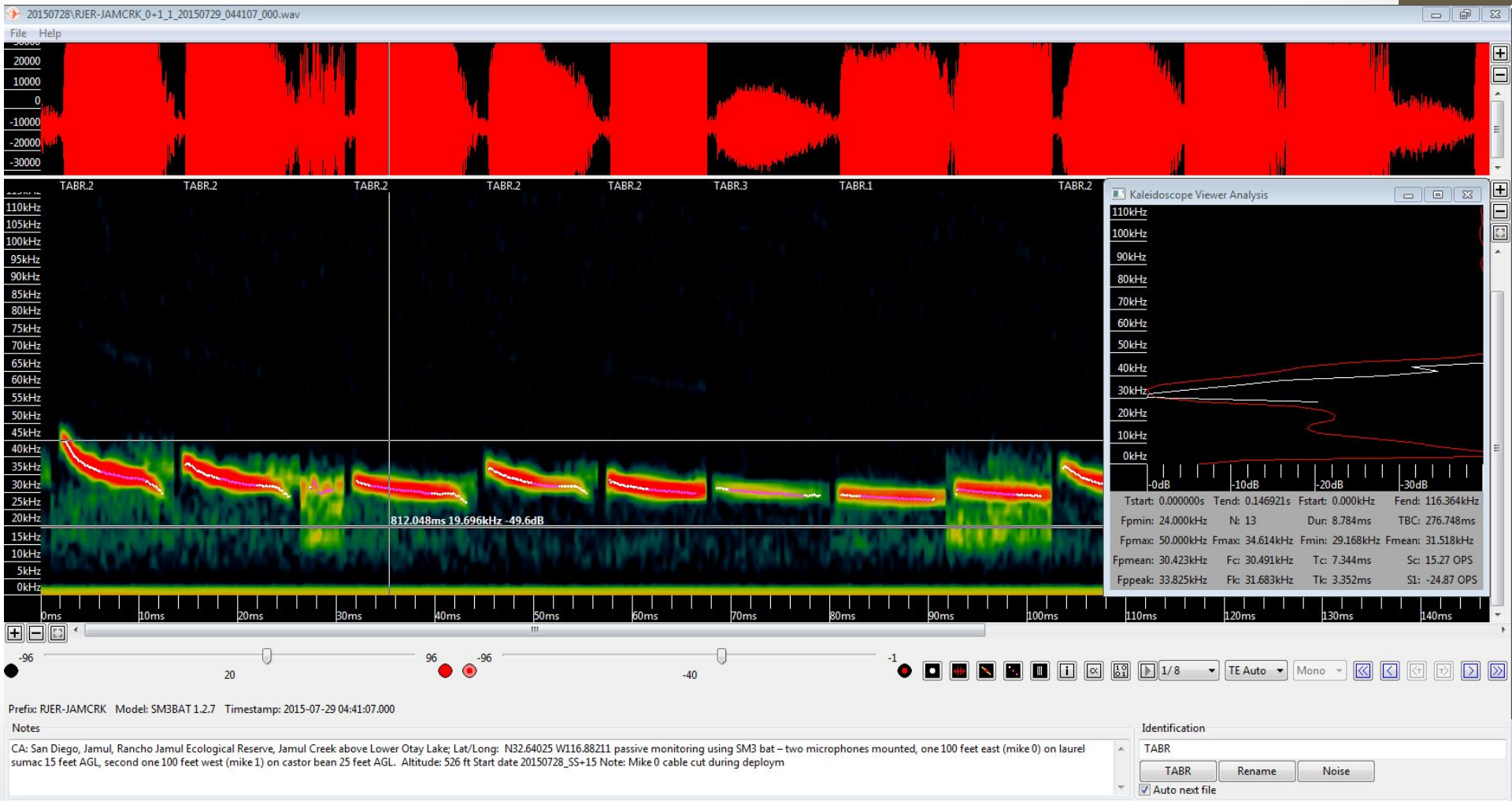
Canyon bat spectrogram



Mexican free-tailed bat (*Tadarida brasiliensis*)

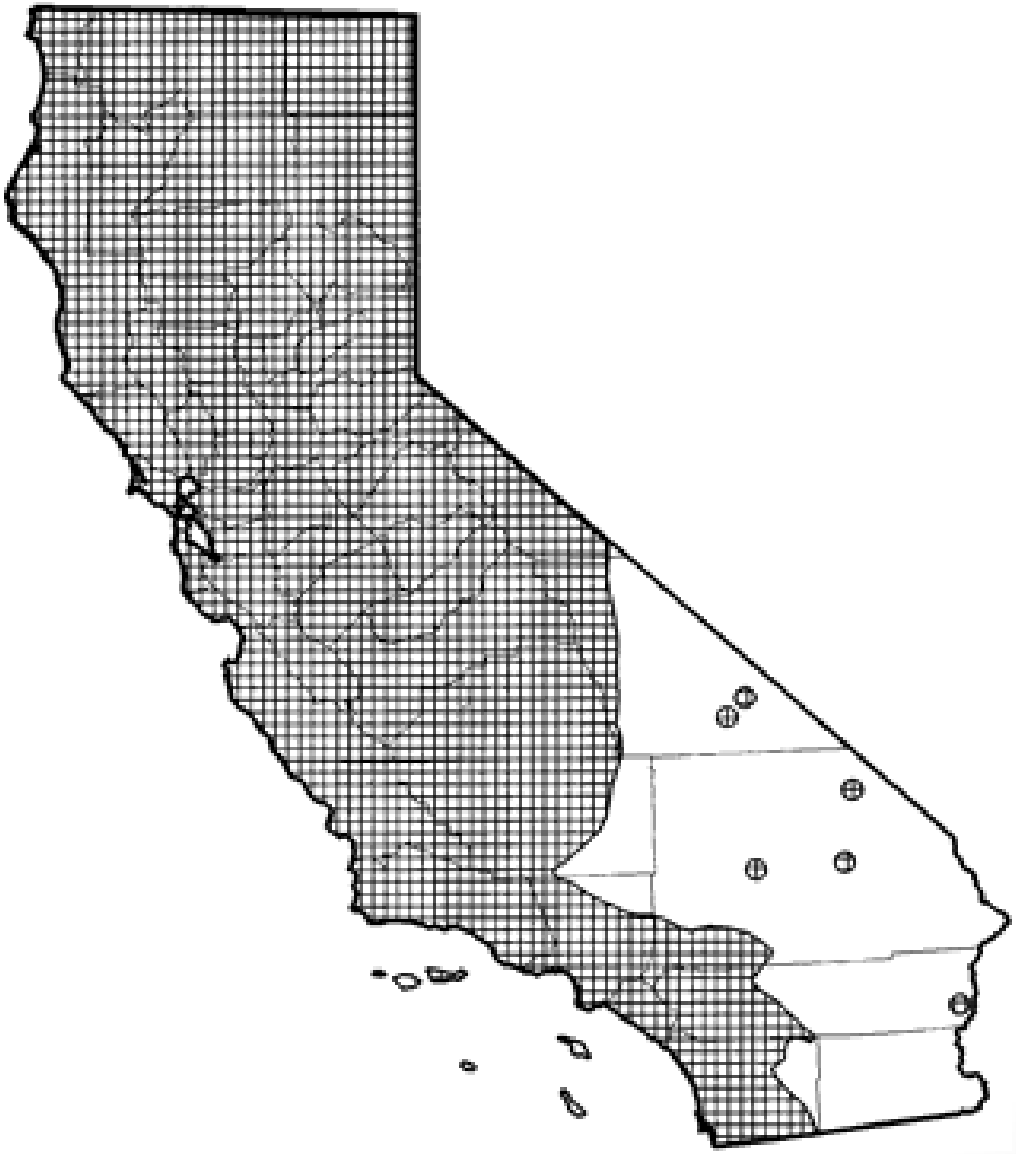
Mexican free-tailed bat range map

Mexican Free-tailed bat spectrogram

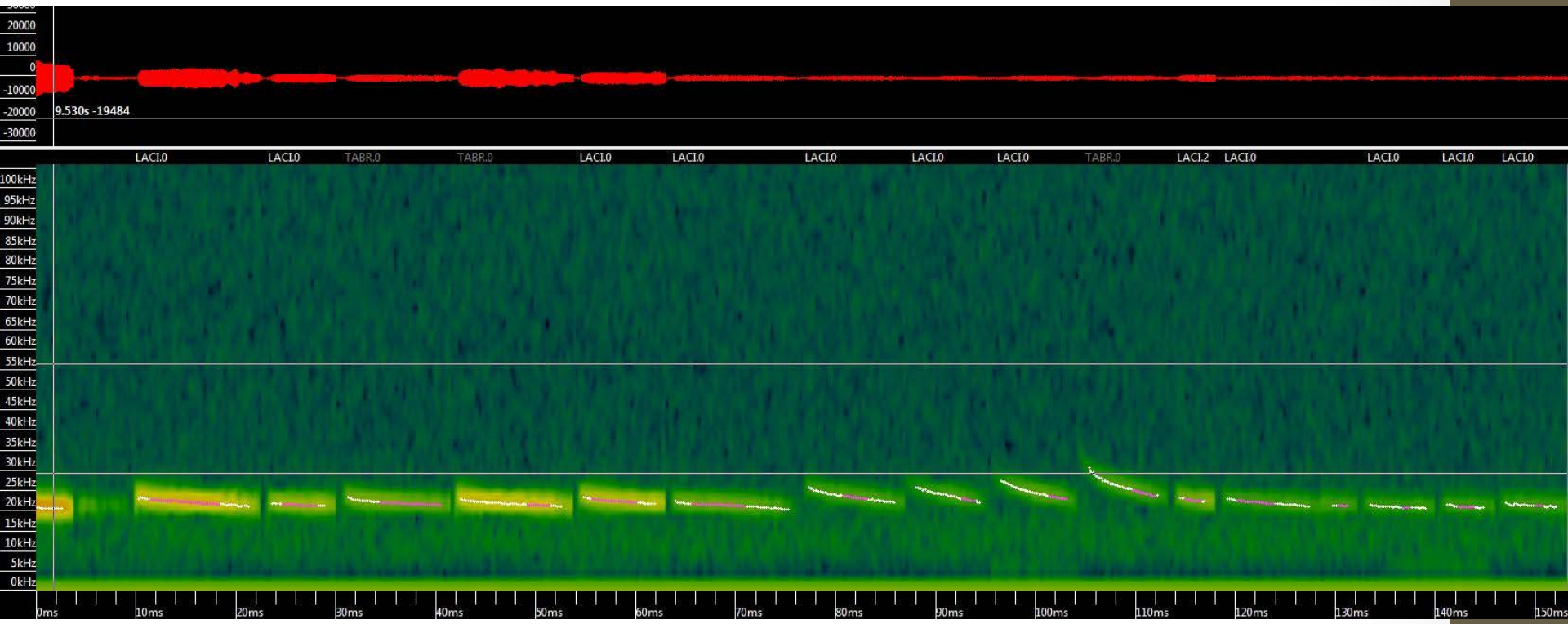


Hoary bat (*Lasiurus cinereus*)

Hoary bat range map



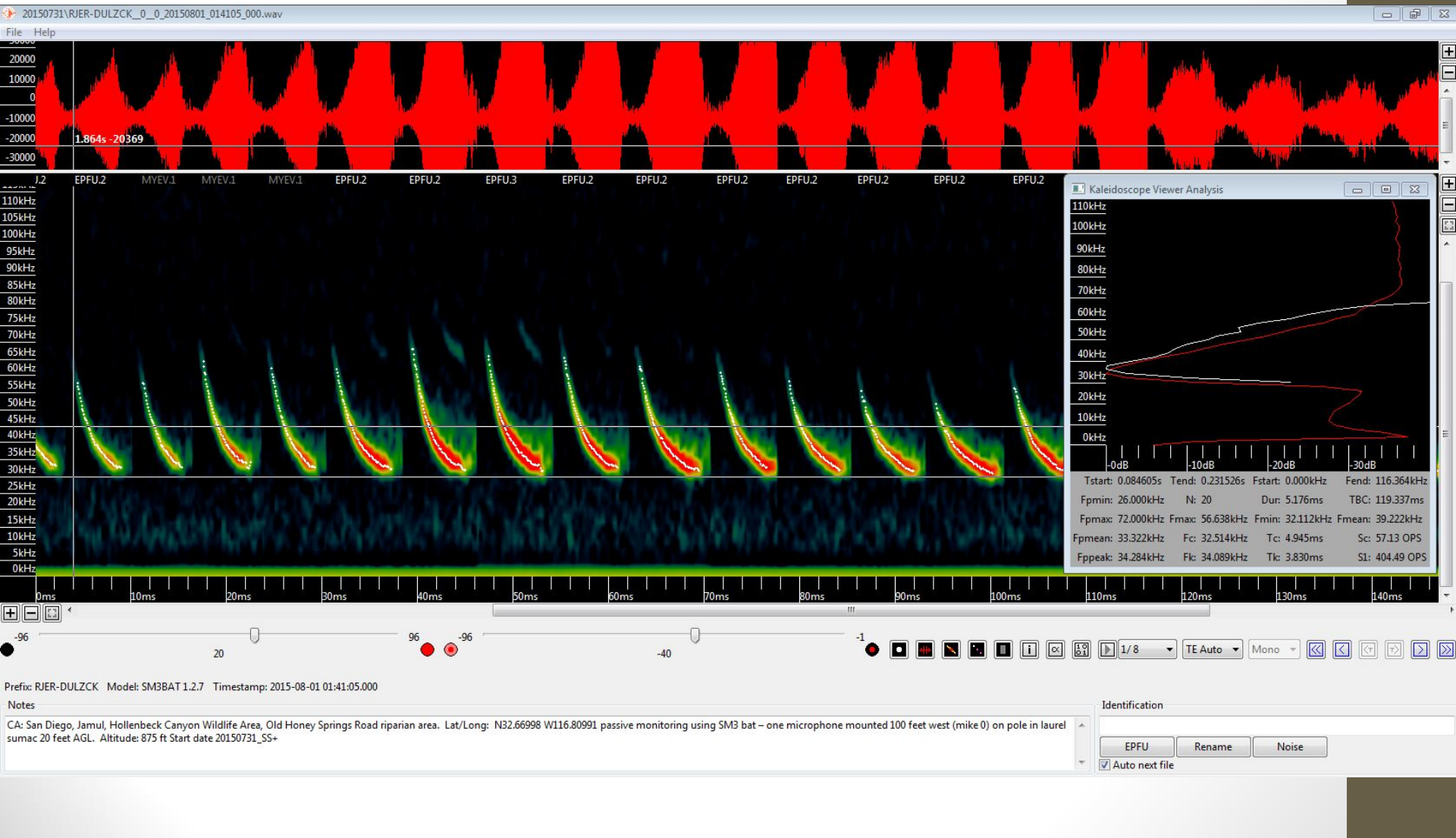
Hoary bat spectrogram



Big brown bat (*Eptesicus fuscus*)

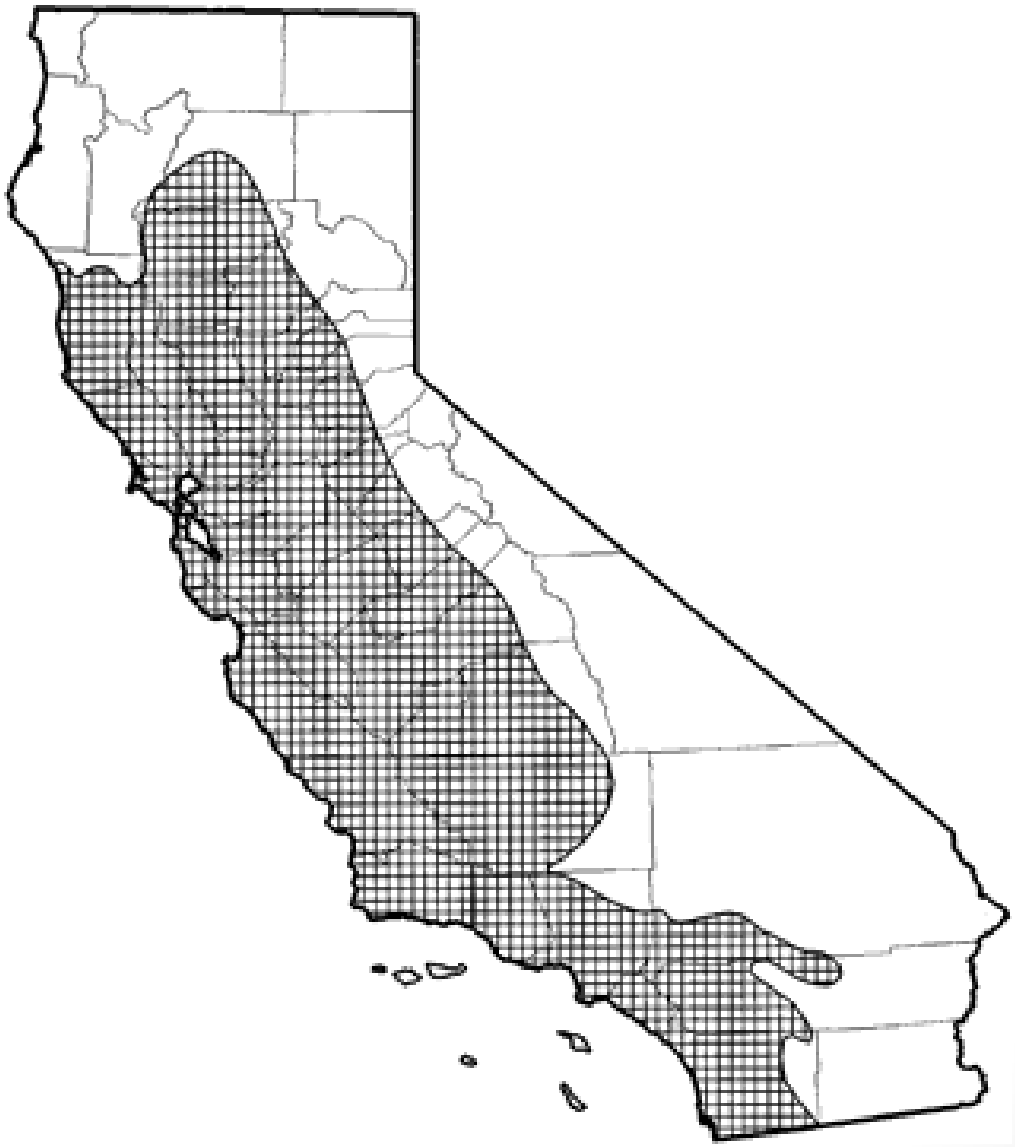
Big brown bat range map

Big brown bat spectrogram

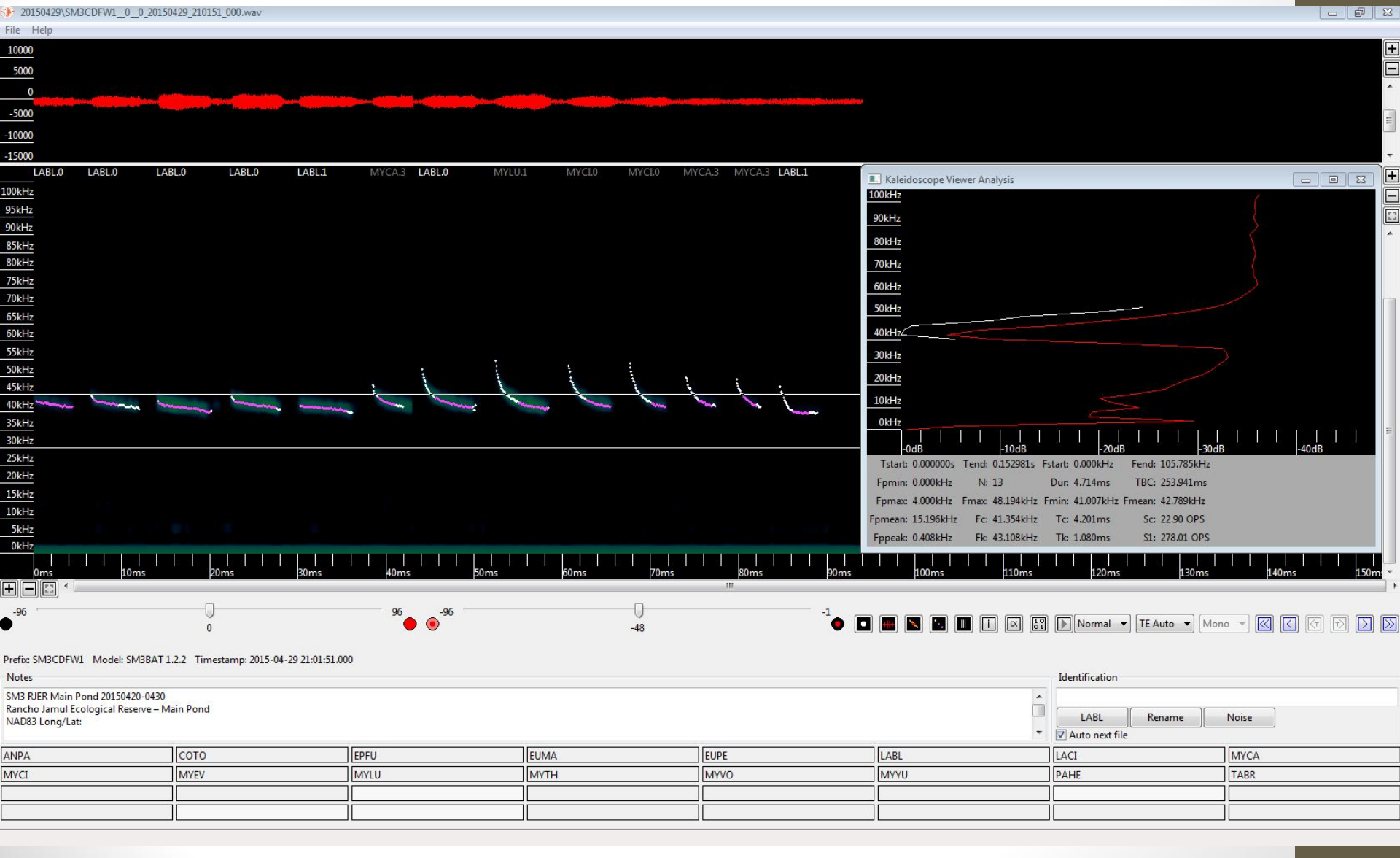


Western red bat (*Lasiurus blossevillii*)

Western red bat range map



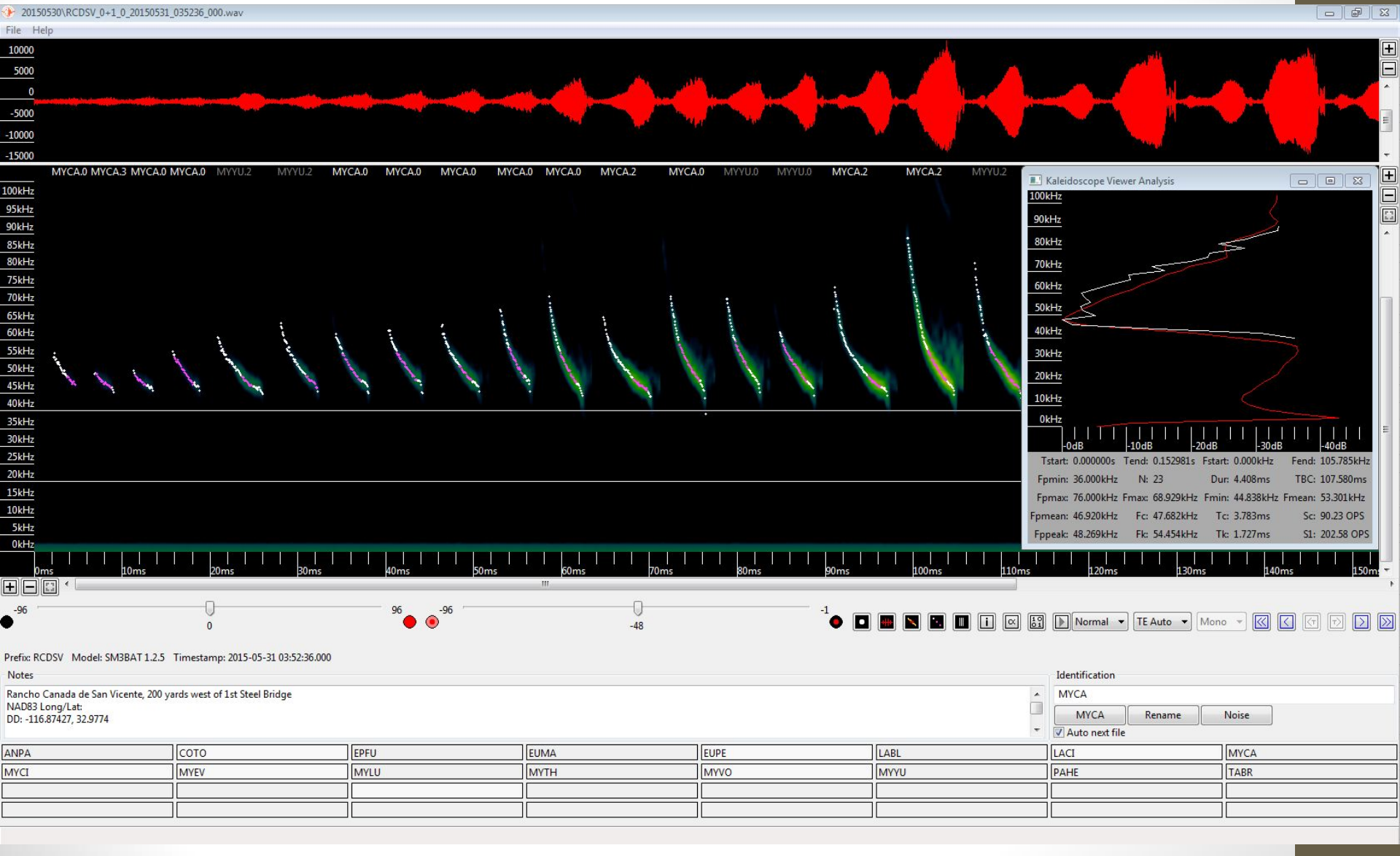
Western red bat spectrogram



California myotis (*Myotis californicus*)

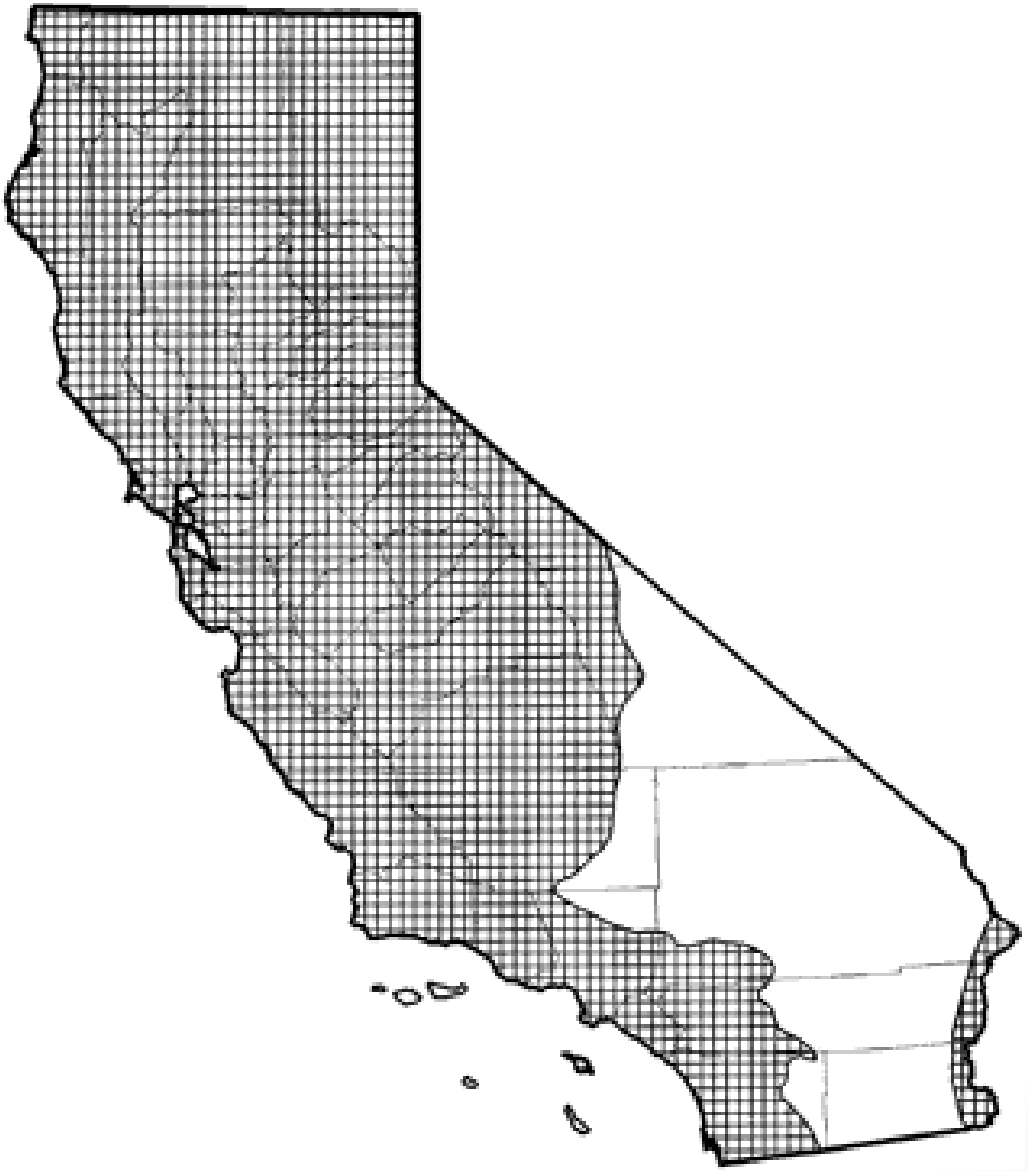
California myotis range map

California myotis spectrogram



Yuma myotis (*Myotis yumanensis*)

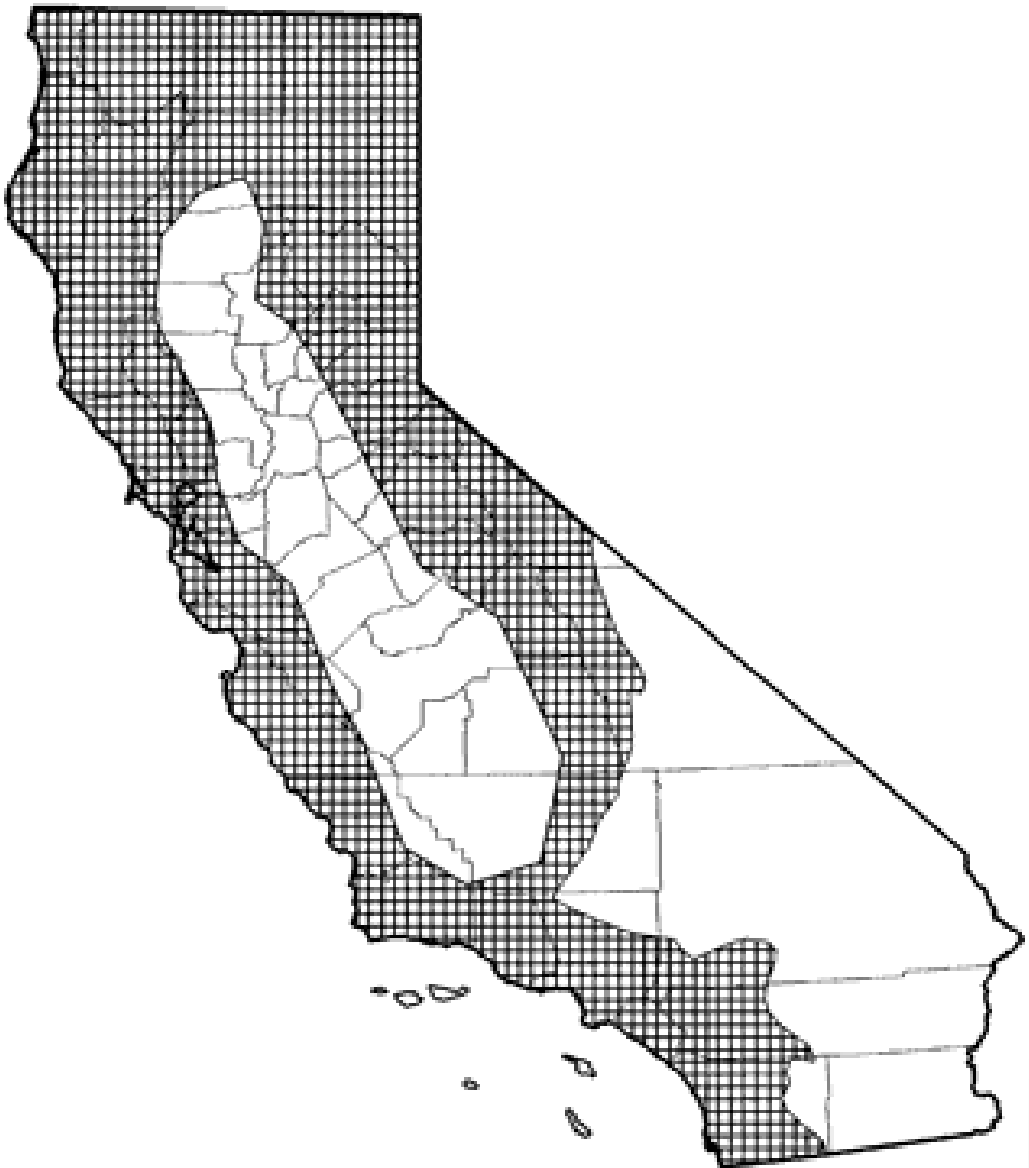
Yuma myotis range map



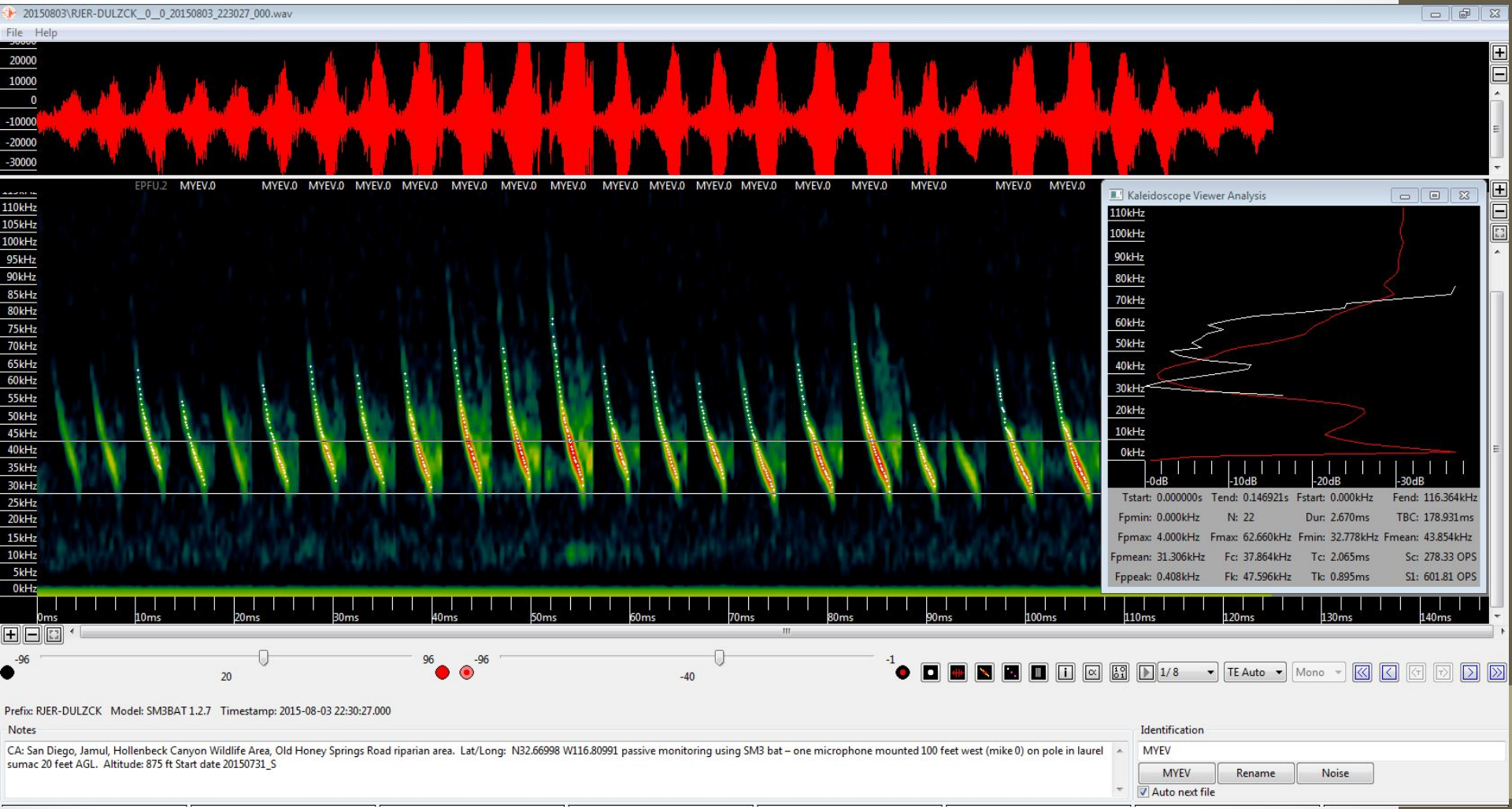
Yuma myotis spectrogram

Long eared myotis (*Myotis evotis*)

Long eared myotis range map



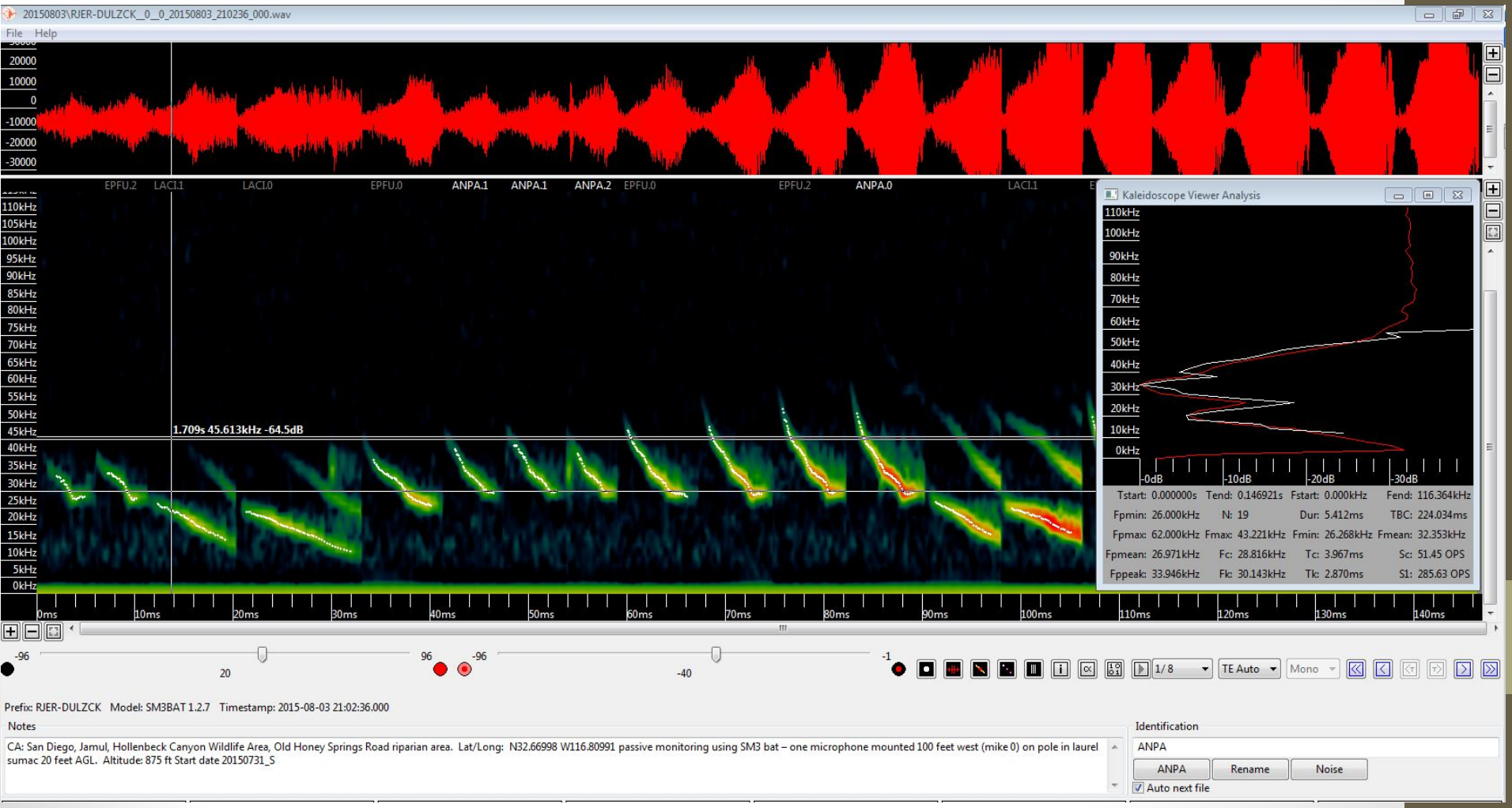
Long eared myotis spectrogram



Pallid bat (*Antrozous pallidus*)

Pallid bat range map

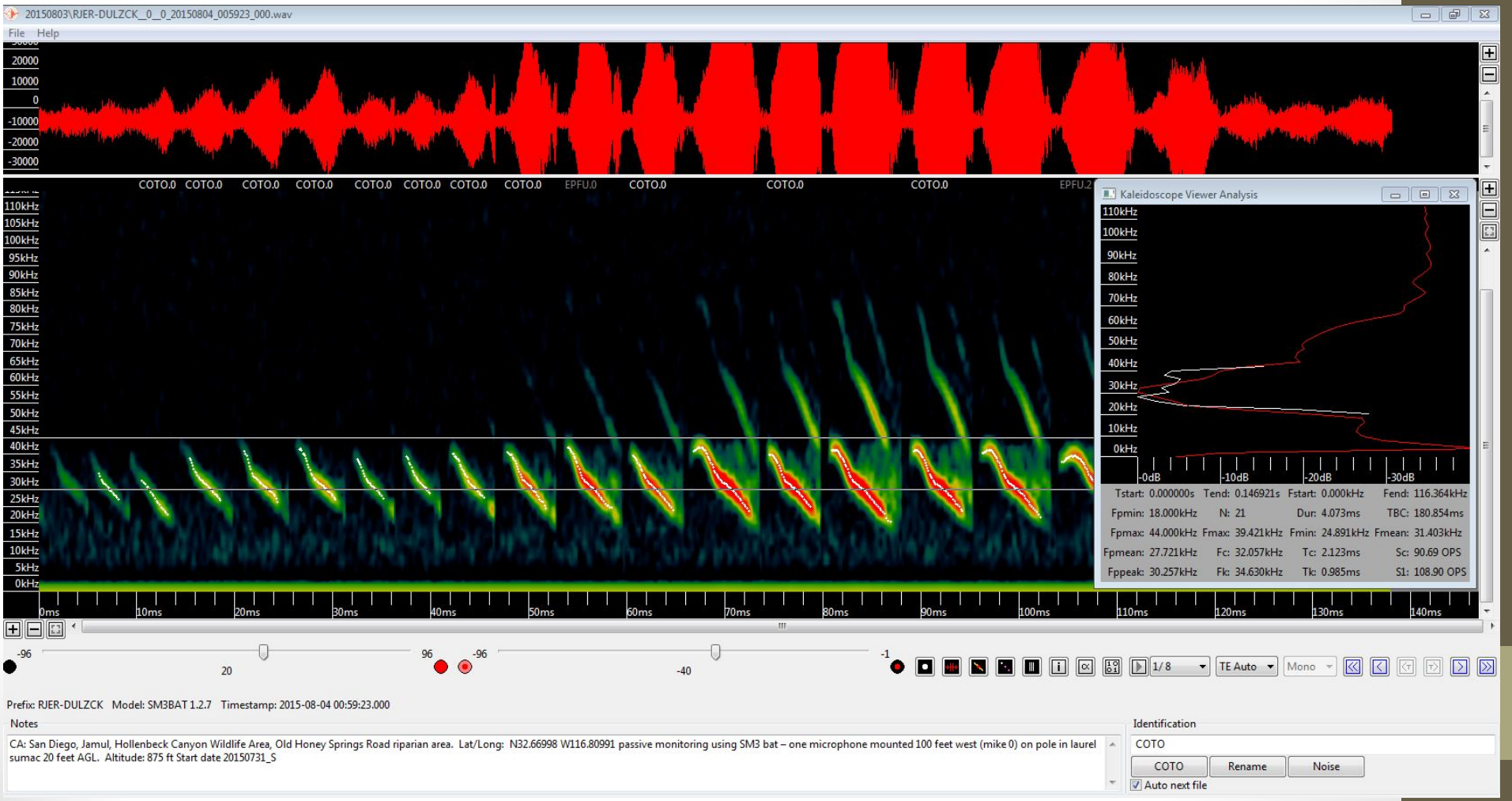
Pallid bat spectrogram



Townsend's big eared bat (*Corynorhinus townsendii*)

Townsend's big-eared bat range map

Townsend's big-eared bat spectrogram



References

- Erickson, Gregg A. and Pierson Elizabeth D., et al. 2000. Microchiropteran Bridge Utilization (Hitchhiker Guide to Bat Roosts), California Department of Transportation, Sacramento CA,
- Bats and Bridges Technical Bulletin – abridged Hitch Hikers Guide to Bat Roosts. 2003. Caltrans and CDFW. 143 pp.
- Johnston, D., G. Tatarian, and E. Pierson. 2004. California bat mitigation techniques, solutions, and effectiveness. (H. T. Harvey & Associates Project No. 2394-01.) Prepared for California Department of Transportation. California State University Foundation Contract No.507451A. [online]: https://nrmsecure.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=19685 .
- Johnston, D. S. 2005. Recreating battered bat roosts: planning and perseverance pay off at a California bridge. Bats 23(2):1-4.
- Johnston, D. 2002. Data collection protocol: Yuma bat (*Myotis yumanensis*). Pages 1–7 *in* Wetlands Regional Monitoring Program Plan 2002, Part 2: Data Collection Protocols. Wetlands Regional Monitoring Program Steering Committee.
- Keeley, B. and M. Tuttle. 1999. Bats in American Bridges. 1999. Bat Conservation International, Inc. Resource Publication No. 4. www.batcon.org