

# *Prevalence of rabies VNA in free-flying bats in Az*



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# *Bats as RV hosts*

- Bats are primary RV reservoirs on every inhabited continent
- Unique RV variants among bat species
- In the US, bats are the 2<sup>nd</sup> most commonly reported wildlife with rabies

# AZ Bat surveillance study

- Developed a protocol with the CDC to:
  - Determine prevalence of rabies virus neutralizing antibodies in free-flying bat species through a serological survey of captured bats
  - Gain a better understanding of rabies exposure rates in different species of bats with varied life history traits.

# *AZ Bat surveillance study*

- Objectives cont.
  - Gain a better understanding of how the rabies virus circulates in natural populations and how this might relate to spillover events (bat rabies in other terrestrial carnivores, such as skunks).
  - Compare rabies exposure rates in bats collected from an urban versus non-urban setting.
  - Compare rabies exposure rates to terrestrial carnivores

# *What we need*

- Data on seroprevalence of rabies VNA in free-flying bats
  - Serum
- Data on frequency of infectious individuals
  - Presence of rabies viral genome in saliva

# Other research

- Dynamics of rabies in urban Big Brown Bats in Fort Collins, CO
  - 20-25% of adult females = + rabies VNA response
  - Antibodies persist 1-2 years from initial capture
    - Potential for acquired immunity?
  - No evidence of rabies virus in seropositive bats

# Cooperators

- Partnering with AGFD to obtain samples
  - Also coordinate with:
    - USFWS
    - Bureau of Reclamation
    - Colorado River Indian Tribe
    - Bat Conservation International
    - US Forest Service
    - Yuma Proving Ground
    - Northern Arizona University
- Partnering with CDC to analyze samples





**Cha-seal**  
Chase Scientific Glass  
CATALOG NO. 510

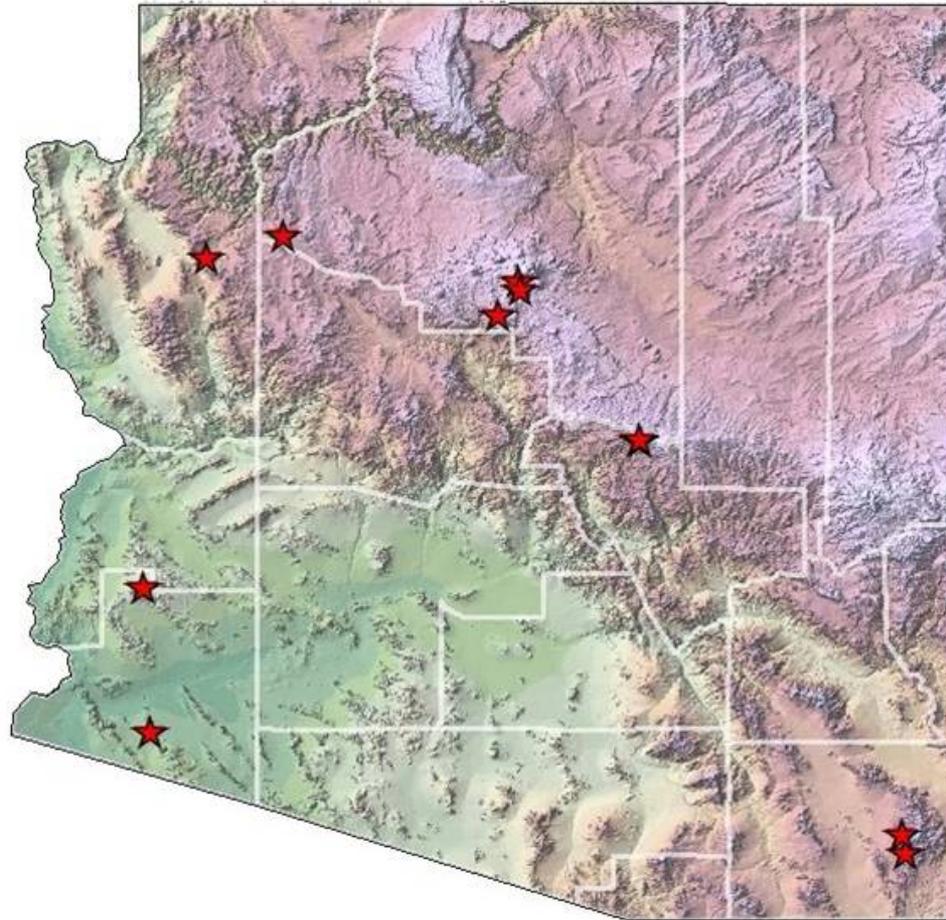
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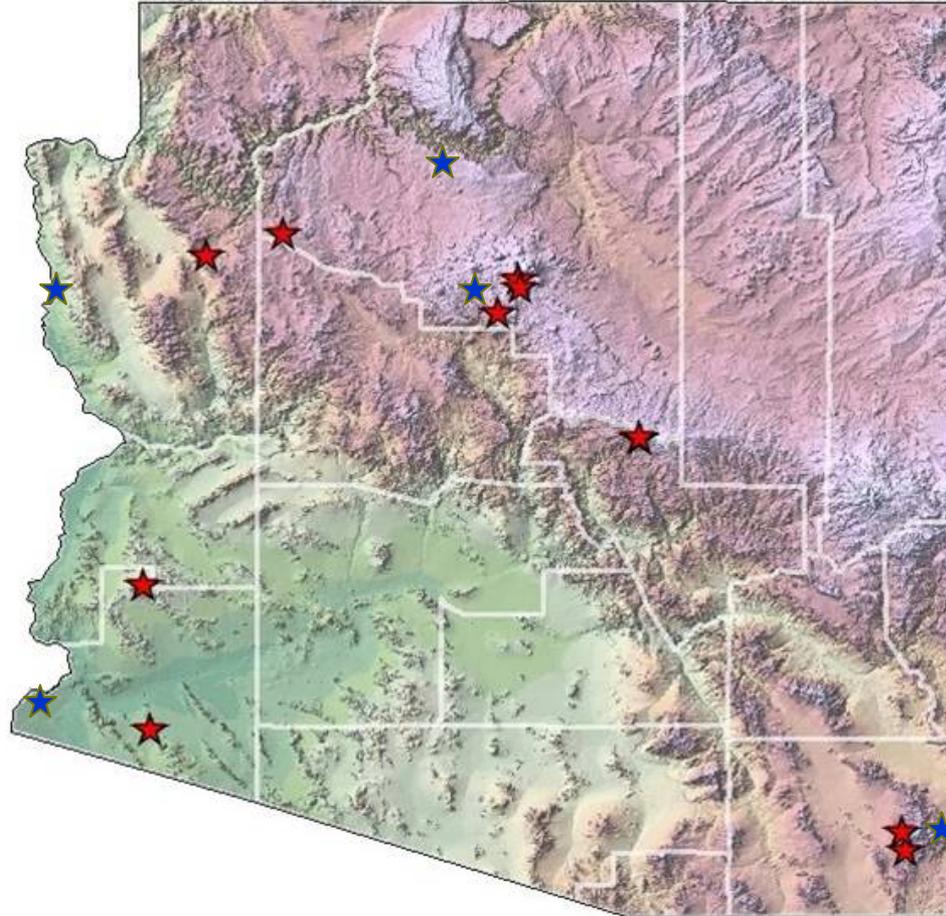
# *Sampling sites 2007*



# Results from 2007

- Sampled 270 bats from 16 species for viral amplicon analysis – 1 positive
  - Western pipistrelle – positive for Western pipistrelle variant found in Flagstaff, AZ
  - Animal showed no obvious signs of having rabies and was released at the capture site
- Sampled 205 bats for rabies VNA – 18 positives
  - 8.8% overall, 14% of Big Brown bats

# *Sampling sites 2007 + 2008*



# *Bats Sampled 2008*

- 878 bats from 22 species
  - 685 will be analyzed for rabies VNA
- Larger sample sizes from more locations will allow for more confidence in results

# *Understanding bat rabies in the wild*

- Commonly accepted rates of rabies infection in bat populations range from 0.5 to 1%
- Rates of infection higher in “downed” bats and those tested by health departments – sometimes up to 20%
- We see exposure rates at 8% overall - how does this compare to infection rates?

# *Campaign to Control Bovine Paralytic Rabies*



**WS Wildlife Services**

Protecting People  
Protecting Agriculture  
Protecting Wildlife



United States Department of Agriculture  
Animal and Plant Health Inspection Service

# History

- Disease known since Spanish Conquest when men and horses were bitten by vampire bats and contracted rabies.
- Bovine paralytic rabies found throughout the range of the vampire bat (*Desmodus rotundus*)
- Previous control relied on cattle vaccination since controlling vampires was not feasible

# *Recognized need*

- There is a recognized need to control bovine paralytic rabies throughout Latin America
  - Pan American Health Organization
  - SAGARPA
  - SALUD
  
- Best to accomplish through vampire control programs **IN CONJUNCTION** with cattle vaccination efforts

# *San Luis Potosi state*



UNITED STATES

**Mexico**

■ San Luis Potosi

*Pacific Ocean*

0 300 Kilometers  
0 300 Miles

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BELIZ

GUATEMALA

# *Genetic research on vampire bats*

- **Population genetic study of *Desmondus rotundus* in an area of high rabies incidence in cattle, San Luis Potosí State, Mexico**
- Antoinette Piaggio\*, Ignacio Amezcua Osorio, Alejandro Jiménez Ramírez, Luis Lecuona; USDA/WS/National Wildlife Research Center, Fort Collins, CO; Bovine Paralytic Rabies Campaign Coordinator. Pecuary Committee, San Luis Potosi State, Mexico; Coordinator of the National Campaign of Paralytic Rabies in Bovines (SAGARPA). Mexico City; USDA/APHIS/IS NAR Mexico, Mexico City

# Collecting genetic samples



# *Rabid vampire bat found at ranch*



# *Vaccinating cattle*



# *Setting nets near cattle corral*



# *Vampire bat captured in mist net*



# *Vampire bat anatomy facilitates feeding*



# *Use of anticoagulants to control vampires*



# *Applying anticoagulant*



# *Anticoagulant on a vampire bat*





# Questions?