Bat Monitoring at Riparian Habitat Creation Areas

Allen Calvert
Two methods are used to collect data at HCA’s

**Acoustic Surveys**
- Conducted using long term monitoring stations
- Collects species presence and activity levels

**Capture Surveys**
- Conducted using triple high mist-nets
- Collects demographic data
Goals of Bat Capture Surveys

• Augment acoustic surveys for the detection of MSCP bat species at conservation areas (some species difficult to detect with acoustic survey methods, i.e. whispering bats)

• Collect demographic information about MSCP bat species (which helps to understand how they are utilizing the habitat, i.e. resident vs. migrant)

• Collect information about other bat species utilizing conservation areas (such as presence of species that use cottonwood-willow habitat when covered species have not yet been detected)
Background

- Preliminary surveys began in 2007 at four sites
- Protocol was established in 2009
- 2009-2012 four sites were monitored during each survey period
- In 2012, two additional exploratory sites were included and in 2013 were added to the full survey schedule
- Since then, a total of six sites have been surveyed each year
Methods

• Each site surveyed once per month from May-September

• Surveys started a half hour after sunset and continued for 4 hours (weather permitting)

• Three triple high mist-nets (over 8 meters high) were used at all sites

• Net length varied from 6-18 meters
Cibola NWR Unit 1 Conservation Area (CNU1): Nature Trail and Mass Planting

‘Ahakhav Tribal Preserve (AKTP)
Covered and Evaluation Bat Species

Western Red Bat
(*Lasiurus blossevillii*)

Townsend’s Big-Eared Bat
(*Corynorhinus townsendii*)

California Leaf-Nosed Bat
(*Macrotus californicus*)

Western Yellow Bat
(*Lasiurus xanthinus*)
Results

Beal Lake Conservation Area (BLCA) 2015

- 115 bats of 8 species captured
- Two MSCP species: California leaf-nosed and Townsend’s big-eared
- Two Townsend’s big-eared bats were captured - lactating female in June and post-lactating female in September
Results

Beal Lake Conservation Area (BLCA) 2012-2015

- 300 bats of 10 species captured
- Two MSCP species: California leaf-nosed and Townsend’s big-eared
- Female Townsend’s big-eared bats have been captured in 2013, 2014, and 2015.

N = Species Richness

![Bar chart showing bat species count over years]
Results

‘Ahakhav Tribal Preserve (AKTP)
2015

- 181 bats of 9 species captured
- Two MSCP species: western yellow bat and California leaf-nosed bat
- Lactating females captured for both MSCP species in July

![Bar chart showing bat species distribution by month and species richness]

- Canyon Bat
- Cave Myotis
- Mexican Free-Tailed Bat
- California Leaf-Nosed Bat
- Western Yellow Bat
- Yuma Myotis
- Arizona Myotis
- Pallid Bat
- Big Brown Bat

*Species Richness*
Results

‘Ahakhav Tribal Preserve (AKTP)

2009-2015

• 1,208 bats of 14 species captured

• All four MSCP species captured (only 1 Townsend’s in 2011)

• Western yellow bat and CA leaf-nosed bat captured every year

N= Species Richness

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![Graph showing species richness from 2009 to 2015 for different bat species at 'Ahakhav Tribal Preserve.](image-url)
Results
Palo Verde Ecological Reserve (PVER) 2015

- 172 bats of 9 species captured
- Two MSCP species: western yellow bat and California leaf-nosed bat
- Lactating (June) and post-lactating (July) female yellow bats captured
- Lactating female leaf-nosed bat captured in July

N = Species Richness
Results

Palo Verde Ecological Reserve (PVER)
2010-2015 (summer season only)

• 964 bats of 12 species captured
  \( N = \text{Species Richness} \)
• CA leaf-nosed and western yellow bats captured every year since 2011
• 2015 was first year the western red bat was not captured

![Bar chart showing bat species captures by year from 2010 to 2015.](chart.png)
Results

Cibola Valley Conservation Area (CVCA) 2015

- 247 bats of 11 species captured
  \( N = \text{Species Richness} \)
- A red bat captured in Feb was originally captured and PIT tagged in Feb 2014; indicating winter site fidelity
- One pregnant (May) and one post-lactating (Aug) CA leaf-nosed bat
- One lactating western red bat (June)
- One lactating (July) and one post-lactating (Aug) western yellow bat

![Graph showing bat counts by month and species](image-url)
Results

Cibola Valley Conservation Area (CVCA)
2009-2015 (summer season only)

- 1,291 bats of 13 species captured
  \( N = \text{Species Richness} \)
- Western red bats captured every summer since 2011
- Western yellow bats captured every year
Results
Cibola NWR Unit 1 Conservation Area (CNU1) 2015

- 88 bats of 8 species captured
- Three MSCP species captured (western red bat was in Feb survey)
- Two pregnant (June) and one lactating (July) CA leaf-nosed bats
- Western yellow bats all captured in Aug (likely migrants)

N= Species Richness

<table>
<thead>
<tr>
<th>Species</th>
<th>Feb</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
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<tbody>
<tr>
<td>Western Red Bat</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>3</td>
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<tr>
<td>Yuma Myotis</td>
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<tr>
<td>Cave Myotis</td>
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<tr>
<td>Western Yellow Bat</td>
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<tr>
<td>California Leaf-Nosed Bat</td>
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<tr>
<td>California Myotis</td>
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<td>Pallid Bat</td>
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<td>Big Brown Bat</td>
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</tbody>
</table>
Results

Cibola NWR Unit 1 Conservation Area (CNU1) 2009-2015

- 630 bats of 11 species captured
- Three MSCP species captured
- CA leaf-nosed bats captured every year except 2013

*N = Species Richness*
Results

Yuma East Wetlands (YEWE) 2015

- 115 bats of 6 species captured
- Two MSCP species: western yellow bat and CA leaf-nosed bat
- All yellow bats captured in July were juveniles
- The leaf-nosed bat (male) captured in Sept was reproductively active

N= Species Richness

[Bar chart showing bat species distribution by month with the following data:
- May: California Leaf-Nosed Bat (N=1), Mexican Free-Tailed Bat (N=3), Western Yellow Bat (N=1), Yuma Myotis (N=1), Pallid Bat (N=1), Big Brown Bat (N=1)
- Jun: same species as May
- Jul: California Leaf-Nosed Bat (N=4), Mexican Free-Tailed Bat (N=2), Western Yellow Bat (N=2), Yuma Myotis (N=1), Pallid Bat (N=1), Big Brown Bat (N=1)
- Aug: California Leaf-Nosed Bat (N=5), Mexican Free-Tailed Bat (N=2), Western Yellow Bat (N=1), Yuma Myotis (N=1), Pallid Bat (N=1), Big Brown Bat (N=1)
- Sep: same species as May]
Results

Yuma East Wetlands (YEWE)
2012-2015

• 338 bats of 10 species captured

• Three MSCP species: western red bat was only captured in 2012

• Yellow bats captured every year, CA leaf-nosed captured 2013-2015

N= Species Richness

<table>
<thead>
<tr>
<th>Year</th>
<th>Canyon bat</th>
<th>Cave myotis</th>
<th>Mexican free-tailed bat</th>
<th>Western red bat</th>
<th>California leaf-nosed bat</th>
<th>California myotis</th>
<th>Yuma myotis</th>
<th>Pallid bat</th>
<th>Western yellow bat</th>
<th>Big brown bat</th>
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<td></td>
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<td>2015</td>
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<td>N=6</td>
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</table>
Summary of all sites
2015 – Summer surveys only

- 910 bats of 12 species captured
- Western red bats only captured at CVCA
- Western yellow bats captured at all sites except BLCA
- CA leaf-nosed bats captured at all sites
- Two Townsend’s big-eared bats captured at BLCA

N= Species Richness
Summary of all sites
2012-2015

• 3,450 bats of 15 species captured

• 87% of western red bats have been captured at CVCA and PVER

• BLCA is only site with no red and yellow bat captures

• Townsend’s big-eared bats only captured at BLCA

N= Species Richness
Discussion

• Distance to roost is probably a key factor in detecting any of the 4 MSCP species at a site

• Western red bats are only MSCP species with a high potential to roost within MSCP conservation areas

• MSCP species presence does not necessarily mean high species richness at a site
Changes to Monitoring Schedule

• In 2015, acoustic surveys were reduced to target the breeding season from June – August

• In 2016, capture surveys will also be reduced to match the same schedule as acoustic surveys

• Reviewing data for the past 3 years indicates this will likely not decrease our ability to detect MSCP species
Changes to Monitoring Schedule

- 15 total species have been detected, all species have been detected within the June-August timeframe over the last 3 years.
- 80% of all captures occurred within the June-August timeframe.
Temporal Differences in Detections

- 92% of western yellow bats (N=115) detected from June-August
- 57% of California leaf-nosed bats (N=49) detected from June-August
- 56% of western red bats (N=25) detected from June-August
- 80% of Townsend’s big-eared bats (N=5) detected from June-August
Overall Discussion

• Looking at multiple years of data portrays a better “picture” of what is going on at a site.
• Methods are confirming presence of MSCP species
• Methods collect data incidentally for additional species which can help identify if habitat has been created when MSCP species have not been or are rarely detected.
What’s next?

• The same six sites will be surveyed in 2016
• California leaf-nosed bat and Townsend’s big-eared bat foraging study (Stay for Pat’s talk)
• Want to see some bats? Volunteers welcome!
Questions?

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