

# Comparing Bat Capture Surveys between the Bill Williams River and Habitat Creation Areas



Allen Calvert



# 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*)



# Background

- Capture surveys started in 2007 at habitat creation sites
- Bill Williams River has had various opportunistic surveys since at least 2001
- 2010 was the first year that a systematic survey was conducted on the Bill Williams River

# Survey Areas

The 'Ahakhav Tribal Preserve was only surveyed in February to confirm winter use of red bats



# Methods

- The 4 sites were surveyed once per month from May-September
- Surveys started at sunset and continued for 4.5 hours (weather permitting)
- Triple high stacked mist-nets (8 meters high) were used at all sites
- Net length varied from 6-18 meters

Triple highs were usually set within potential flyways where bats would be “funneled” into a smaller area where the net could cover the entire area



Edges were surveyed at PVER  
due to the lack of defined flyways or corridors



# Results

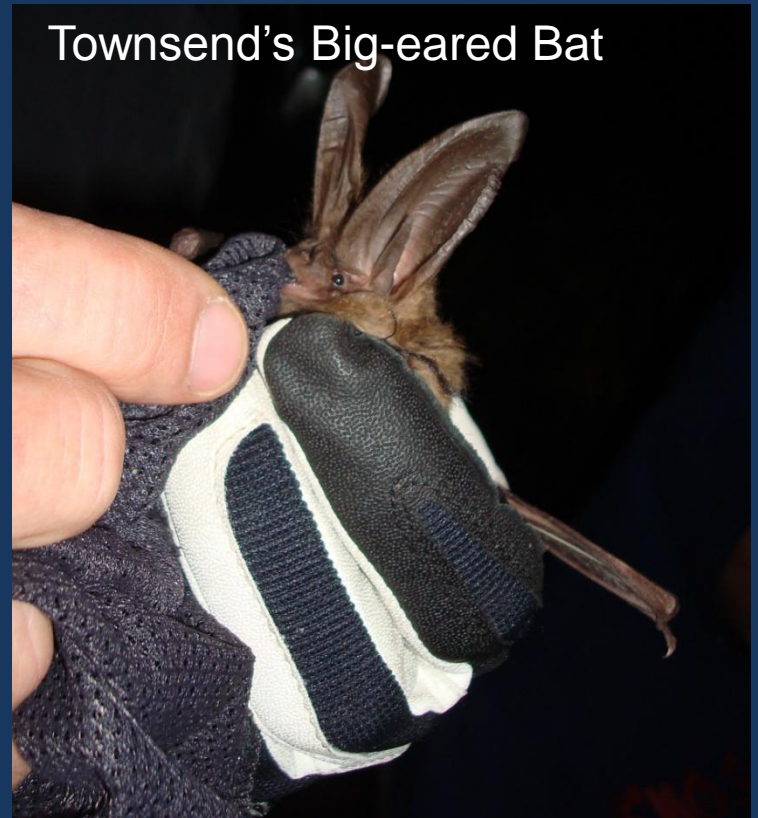
## Bill Williams River

- One triple high and 2-3 single high sets used each night
- 206.25 net hours of effort (# of hours x # of 6-m nets)
- 230 bats of 10 species were captured
- Two MSCP species captured

California Leaf-nosed Bat



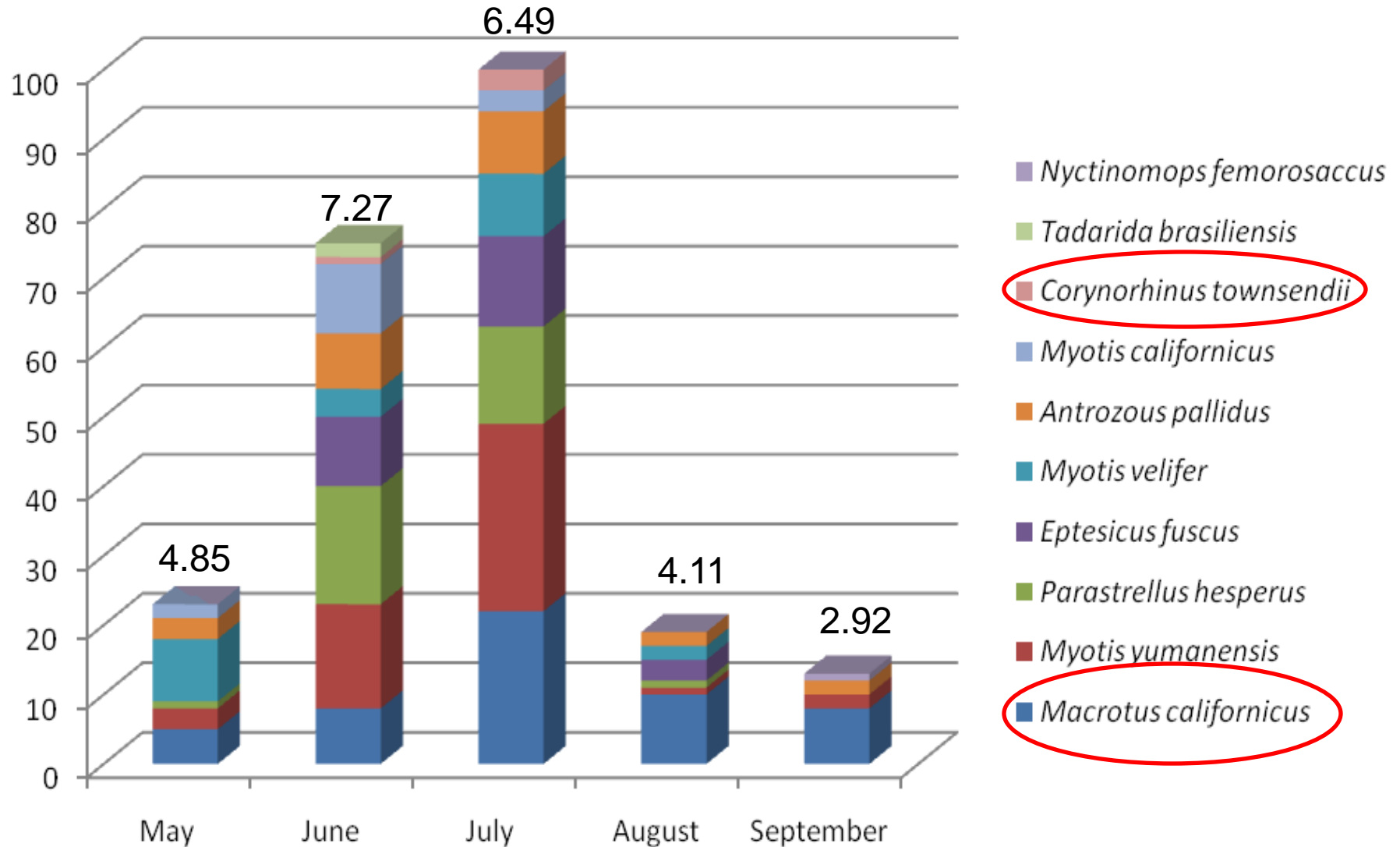
Townsend's Big-eared Bat





# Species Diversity and Composition

## Bill Williams River



# Banded Leaf-Nosed Bats!

- 11 of the 53 *M. californicus* captured were banded
- Pat Brown banded these bats from the Californian Mine near Parker Dam
- Most were banded in February of 2010, but three were banded January 30, 2004!

# Distance between Mine Location and Capture Site of Leaf-Nosed Bats near Bill Williams River and Parker Dam

N



Lake Havasu

Parker Dam

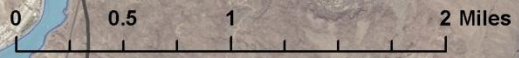
Bill Williams River NWR

95

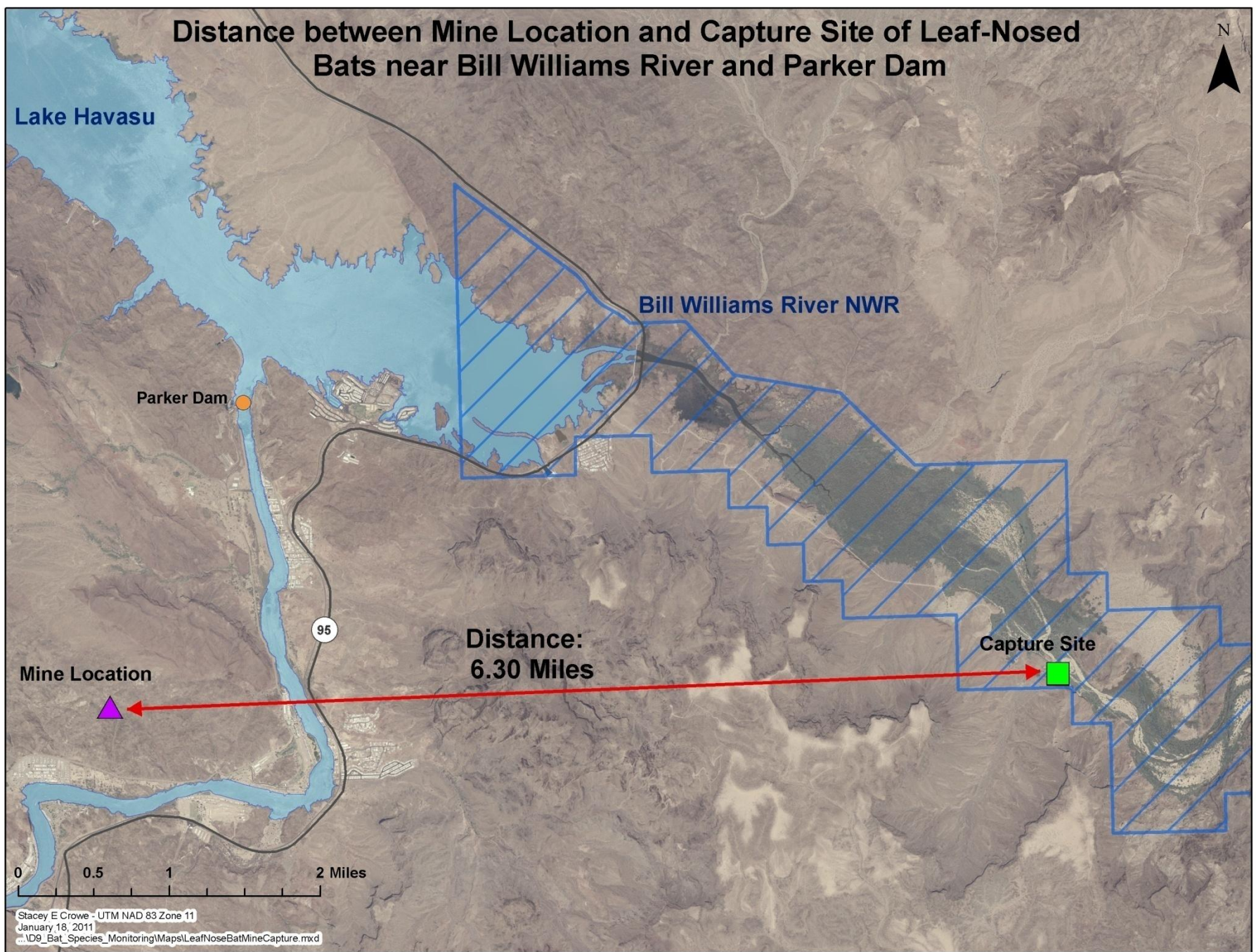
Mine Location

Distance:  
6.30 Miles

Capture Site



Stacey E Crowe - UTM NAD 83 Zone 11  
January 18, 2011  
D9\_Bat\_Species\_Monitoring\Maps\LeafNoseBatMineCapture.mxd

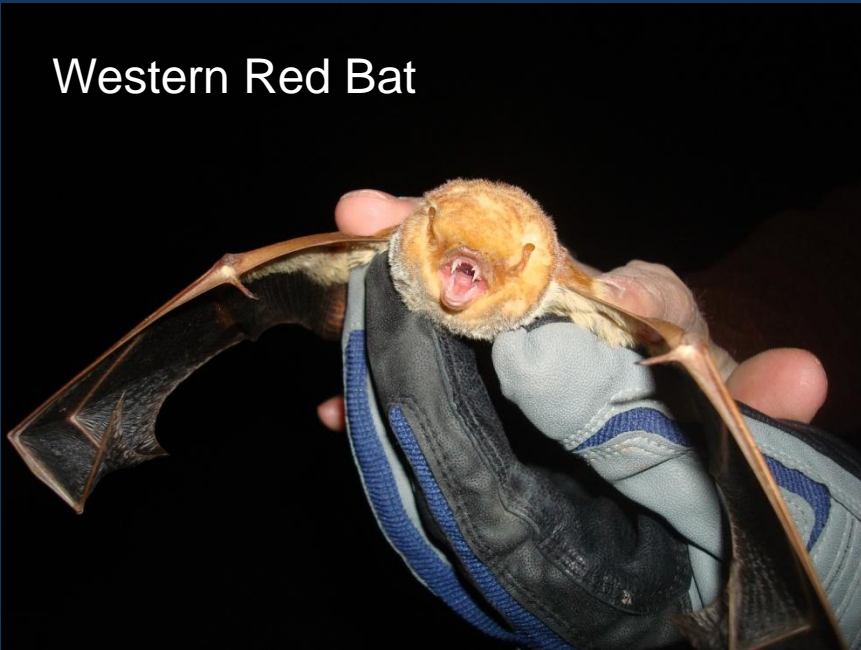


# Results

## Palo Verde Ecological Reserve

- Three triple highs and one 6-m single high set used each night
- 427.5 net hours of effort (# of hours x # of 6-m nets)
- 233 bats of 9 species were captured
- Two MSCP species captured

Western Red Bat

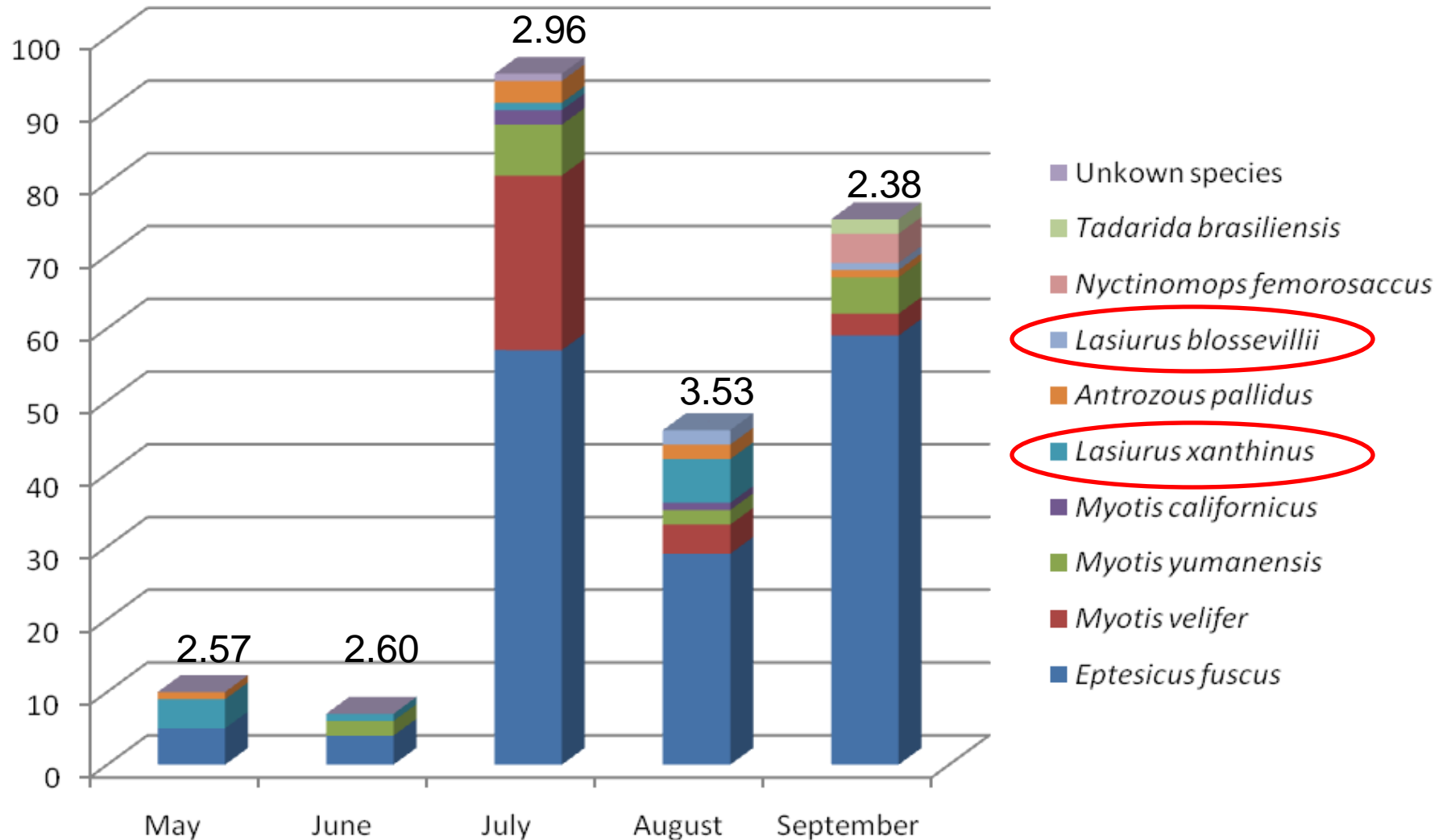


Western Yellow Bat



# Species Diversity and Composition

## Palo Verde Ecological Reserve



# Results

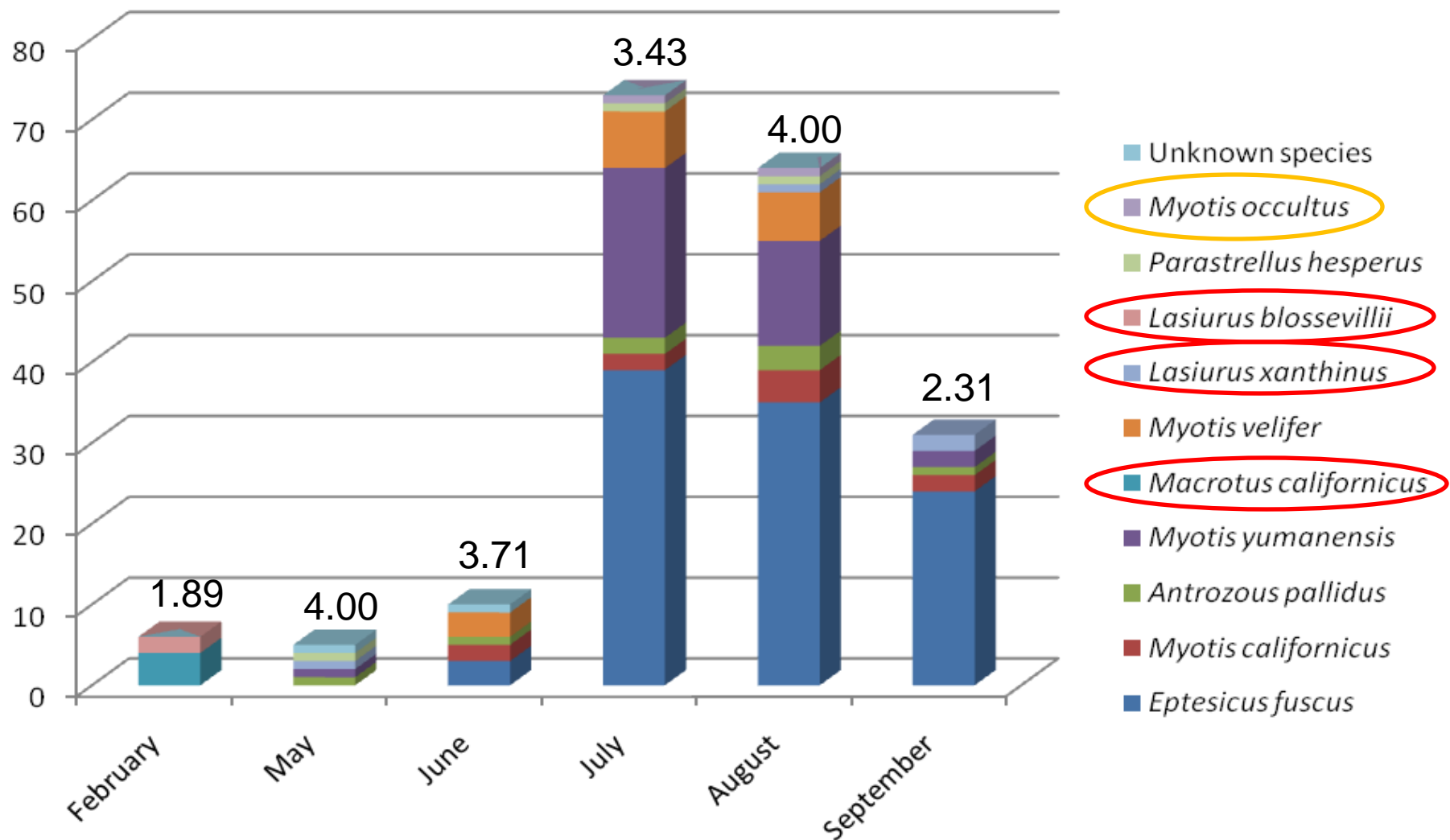
## Cibola Valley Conservation & Wildlife Area

- Three triple highs were used each night
- 462 net hours of effort (includes 1 winter survey)
- 189 bats of 10 species were captured
- Three MSCP species captured



# Species Diversity and Composition

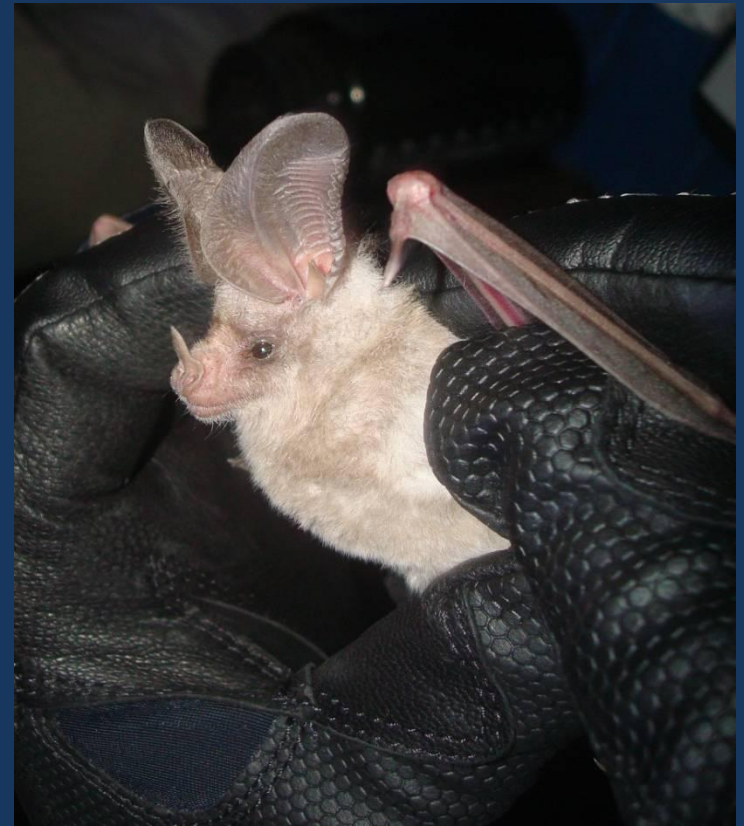
## Cibola Valley Conservation & Wildlife Area



# Results

## Cibola NWR Nature Trail

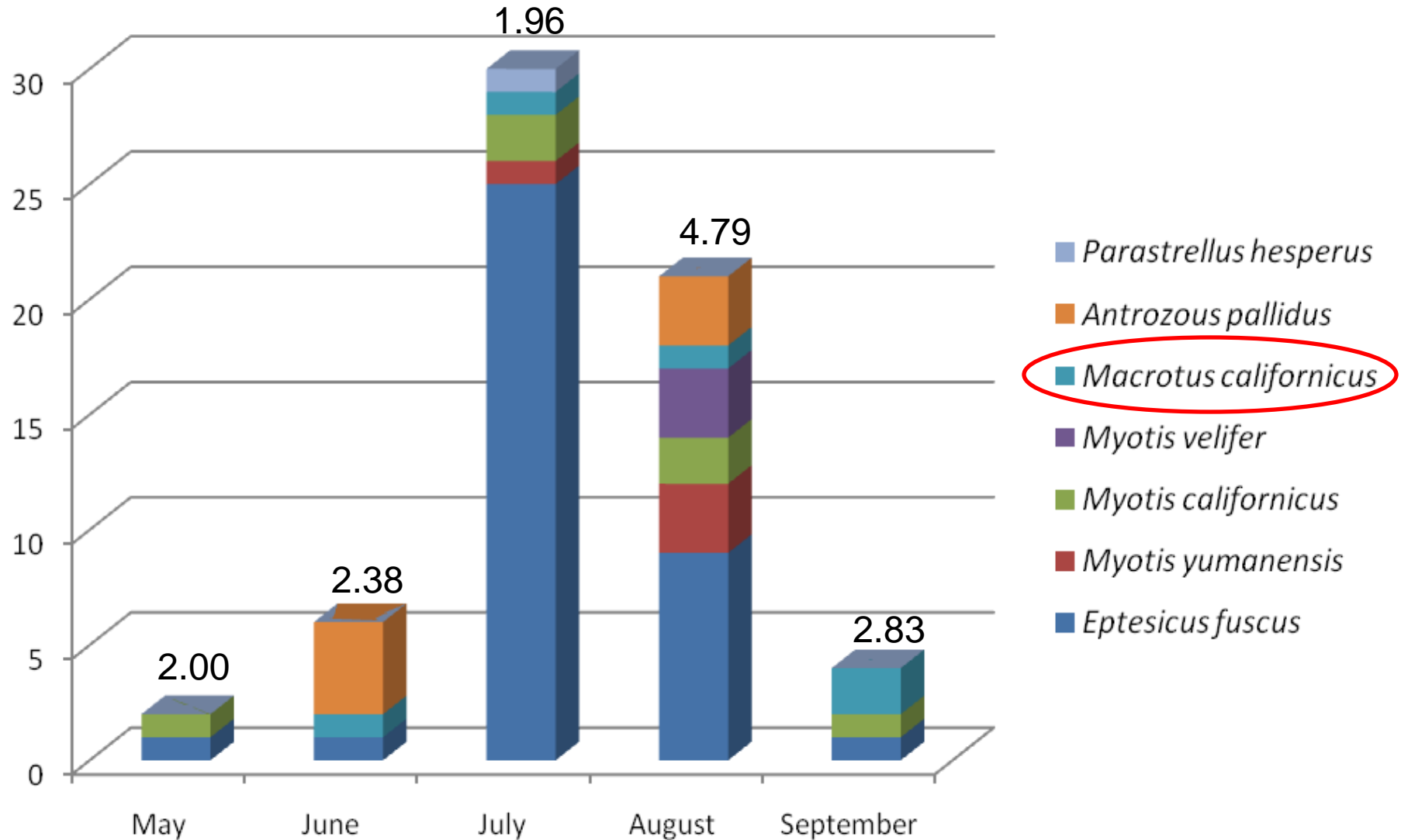
- Three triple highs were used each night
- 407 net hours of effort (# of hours x # of 6-m nets)
- 63 bats of 7 species were captured
- One MSCP species captured





# Species Diversity and Composition

## Cibola NWR Nature Trail



# Results

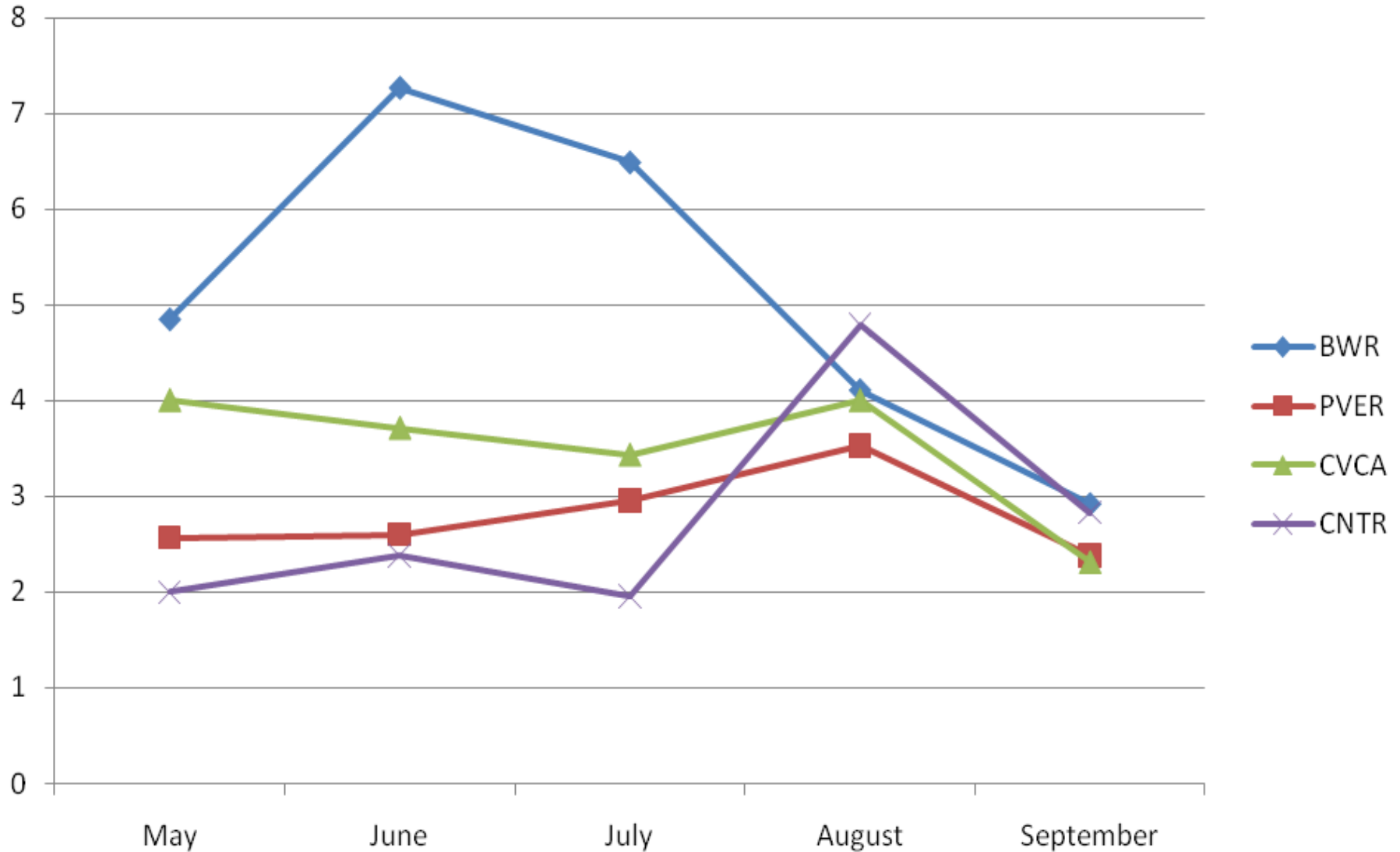
## All Sites

- Three triple highs were used each night (except BWR)
- 1502.75 net hours of effort (# of hours x # of 6-m nets)
- 709 bats of 13 species were captured
- All MSCP species captured



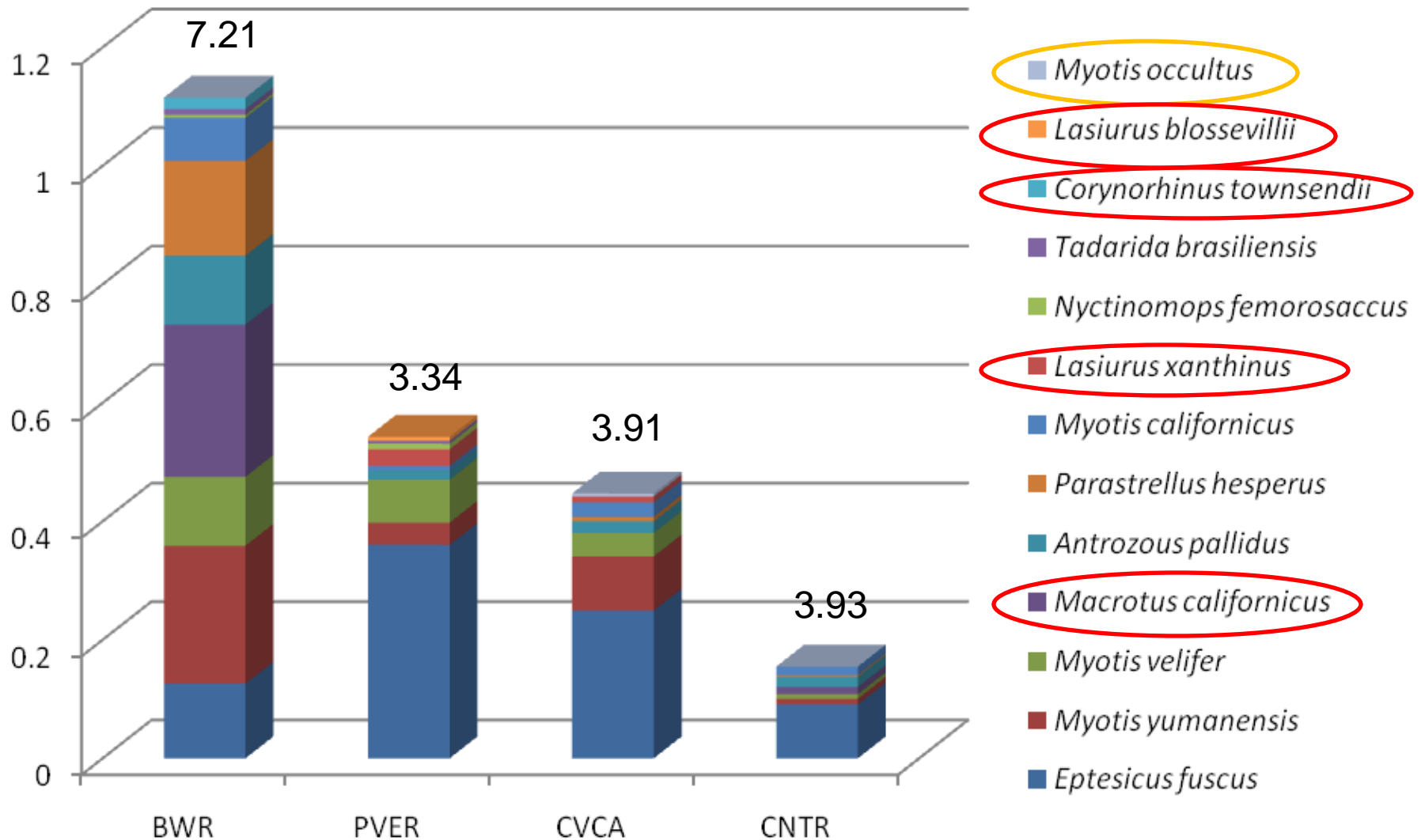
# Monthly Species Diversity

## All Sites



# Species Diversity and Composition

All Sites (captures per net hour)



# Statistical Comparisons

- Using the software R, data was analyzed using a Kruskal-Wallis test (for non-parametric data).
- There was no significant difference between sites for bats per net hour ( $p=0.15$ )
- Species diversity calculations were compared using a bootstrap procedure with Program PAST<sup>1</sup> version 2.05

<sup>1</sup> Hammer, Ø., Harper, D.A.T., and P. D. Ryan, 2001. PAST: Paleontological Statistics Software Package for Education and Data Analysis. Palaeontologia Electronica 4(1): 9pp.

# Statistical Results

- The Bill Williams River site was significantly different from all of the habitat creation sites

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Site comparison	<i>p</i> value
BWR vs. PVER	<0.001
BWR vs. CVCA	<0.001
BWR vs. CNTR	<0.001
PVER vs. CVCA	=0.178
PVER vs. CNTR	=0.439
CVCA vs. CNTR	=0.987

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# What does this mean?

- While the new habitat creation sites (PVER & CVCA) are showing a quick response for covered species, the overall bat community is currently not similar to more natural areas
- This is similar to the response of yellow-billed cuckoos to habitat creation sites compared to most other MSCP riparian bird species

# What's next?

- Four habitat creation areas will be surveyed in 2011
- Bill Williams River will be discontinued
- Red and yellow bats will be radio tracked to their roosts (AZGFD study)





# Questions?



[www.LCRMSCP.gov](http://www.LCRMSCP.gov)