

**DISTRIBUTION AND ROOST SITE HABITAT  
REQUIREMENTS OF  
WESTERN YELLOW (*Lasiurus xanthinus*)  
AND WESTERN RED (*Lasiurus blossevillii*)  
BATS**

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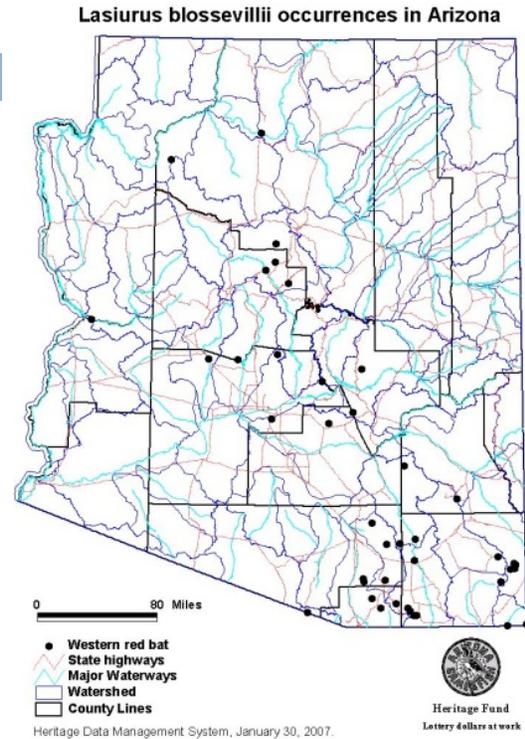
**Arizona Game and Fish Wildlife Contracts Branch**





# Western Red Bat Ecology

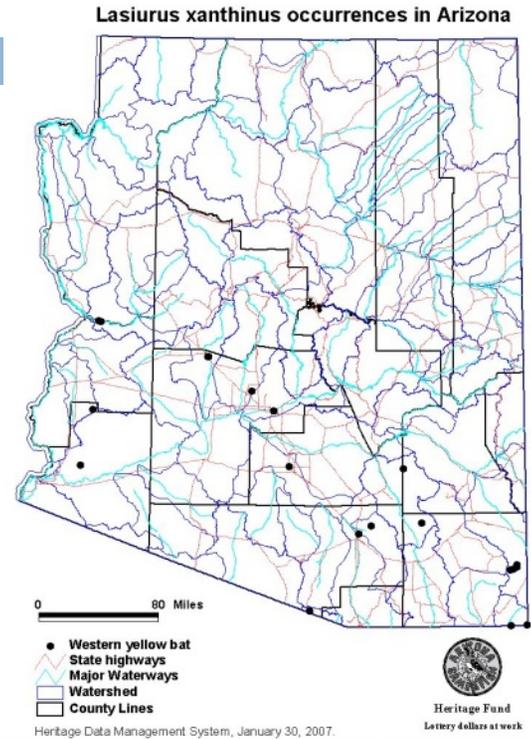
- Riparian
  - Cottonwood, oak and sycamore communities
- Foraging
  - Lepidoptera
  - Canopy and understory
- Roosting
  - Foliage
- Distribution
- Migratory
  - Warm season
  - Resident?





# Western Yellow Bat Ecology

- Riparian
  - Palm trees
- Foraging
  - Beetles
- Roosting
  - Foliage (dead leaves)
- Distribution
- Migratory
  - Warm season





# Research Objectives

1. Locate roost
2. Describe roost
3. Estimate distribution
4. Management guidelines





# Methods: Study Area (Treatment)

## 6 Treatment plots

- ▣ Riparian habitat
  - Cottonwood canopy
  - Even-aged stand
  - Little or no understory

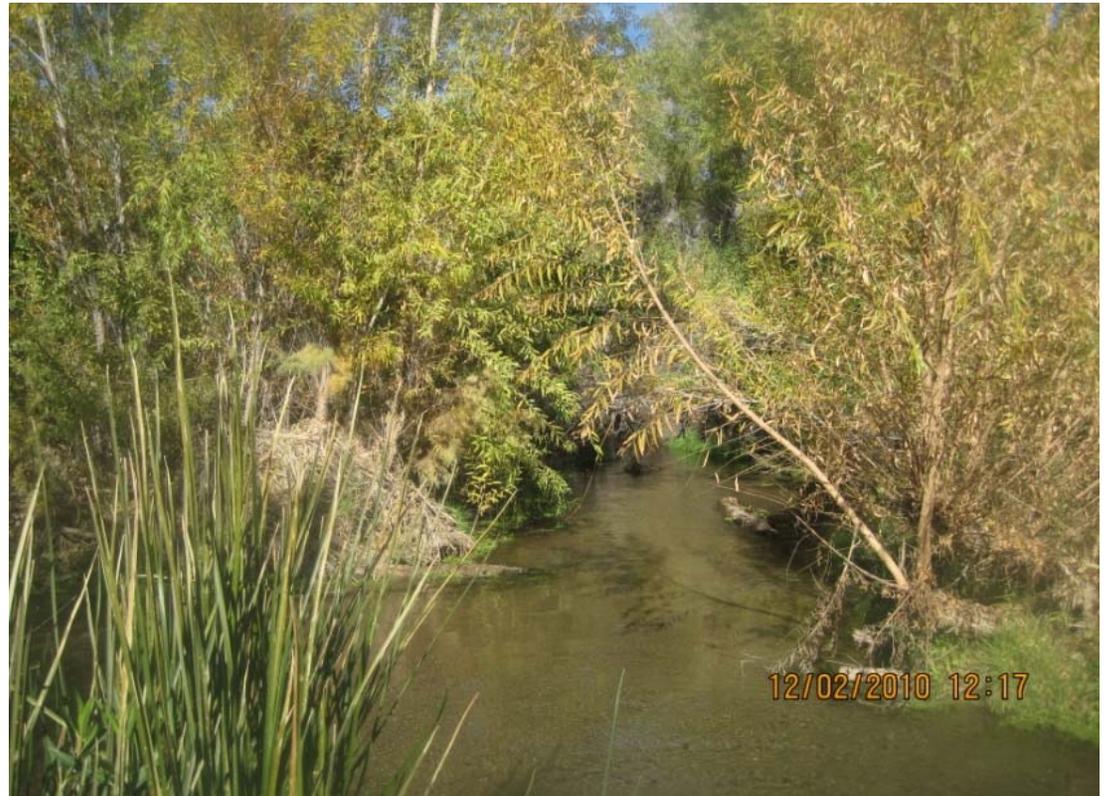




# Methods: Study Area (Control)

## Control plots

- 4 (2012)
- 3 (2011)
  - ▣ Riparian habitat
    - Cottonwood canopy
    - Mixed understory
      - Native
      - Invasive





# Methods: Locate Roosts

## Western red bat

- ❑ 3 seasons
- ❑ Sampling period
  - Cold season
  - Warm season
- ❑ Telemetry
  - 5/20 individuals
- ❑ Sampling methods
  - 39m by 7.5m



## Western yellow bat

- ❑ 3 seasons
- ❑ Sampling period
  - Warm season
- ❑ Telemetry
  - 20 individuals
- ❑ Sampling methods
  - 39m by 7.5m





# Methods: Describe Roost

## Variables

- ❑ tree heights
- ❑ DBH
- ❑ canopy cover
- ❑ canopy height
- ❑ slope
- ❑ aspect
- ❑ tree roost species
- ❑ number of live branches
- ❑ dead crown ratio
- ❑ foliage condition
- ❑ bat roost height
- ❑ distance from trunk





# Methods: Describe Roost

## Variables

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- ❑ foliage condition
- ❑ bat roost height
- ❑ distance from trunk





# Results: Species Diversity

## Sample days:

- ▣ 39 (2012)
- ▣ 42 (2011)

## Control:

- ▣ 17 species (2012)
- ▣ 17 species (2011)

## Treatment:

- ▣ 11 species (2012)
- ▣ 12 species (2011)





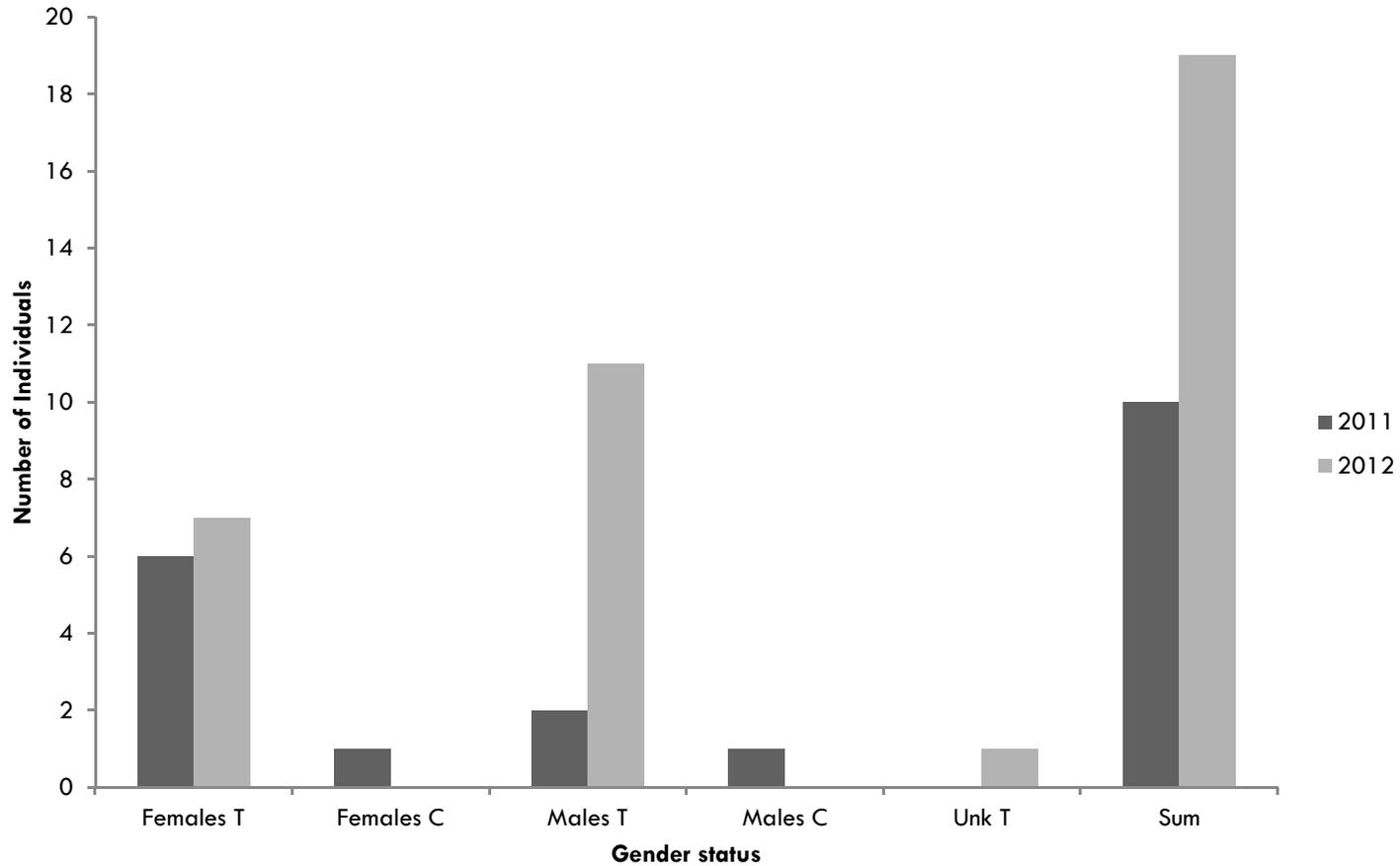
# Results: Western Yellow Bat

2012

19 individuals

2011

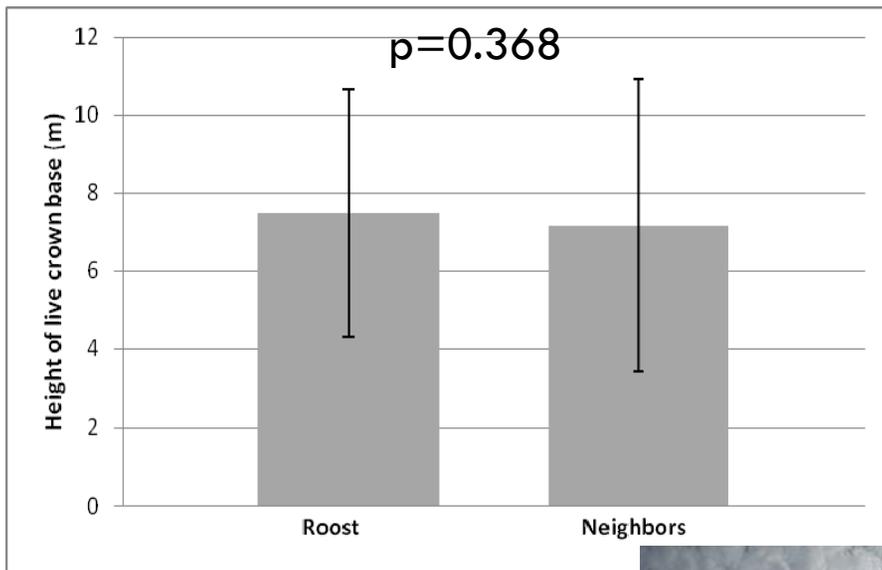
10 individuals



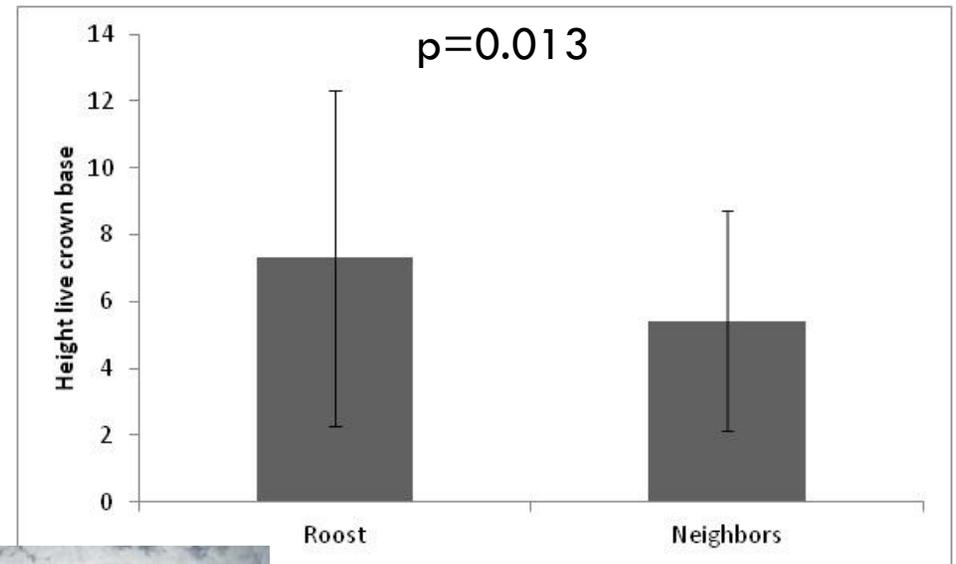


# Western Yellow Bat

2012



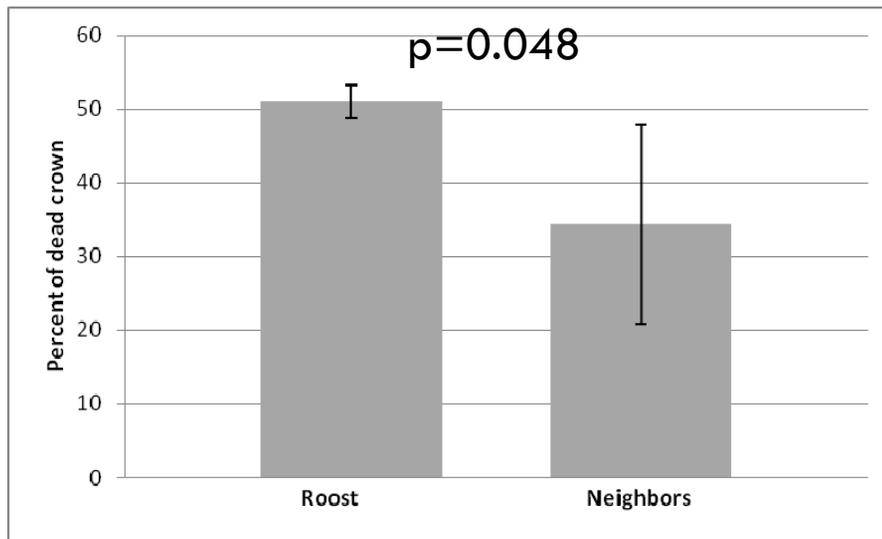
2011



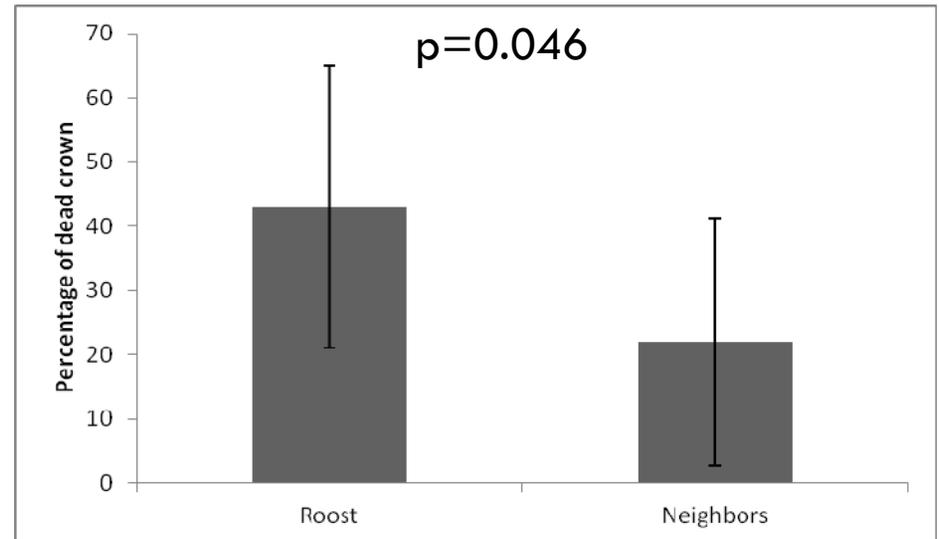


# Western Yellow Bat

2012



2011





# Results: Western Red Bat

2012

2011

■ Cold season

■ 6 individuals

■ Warm season

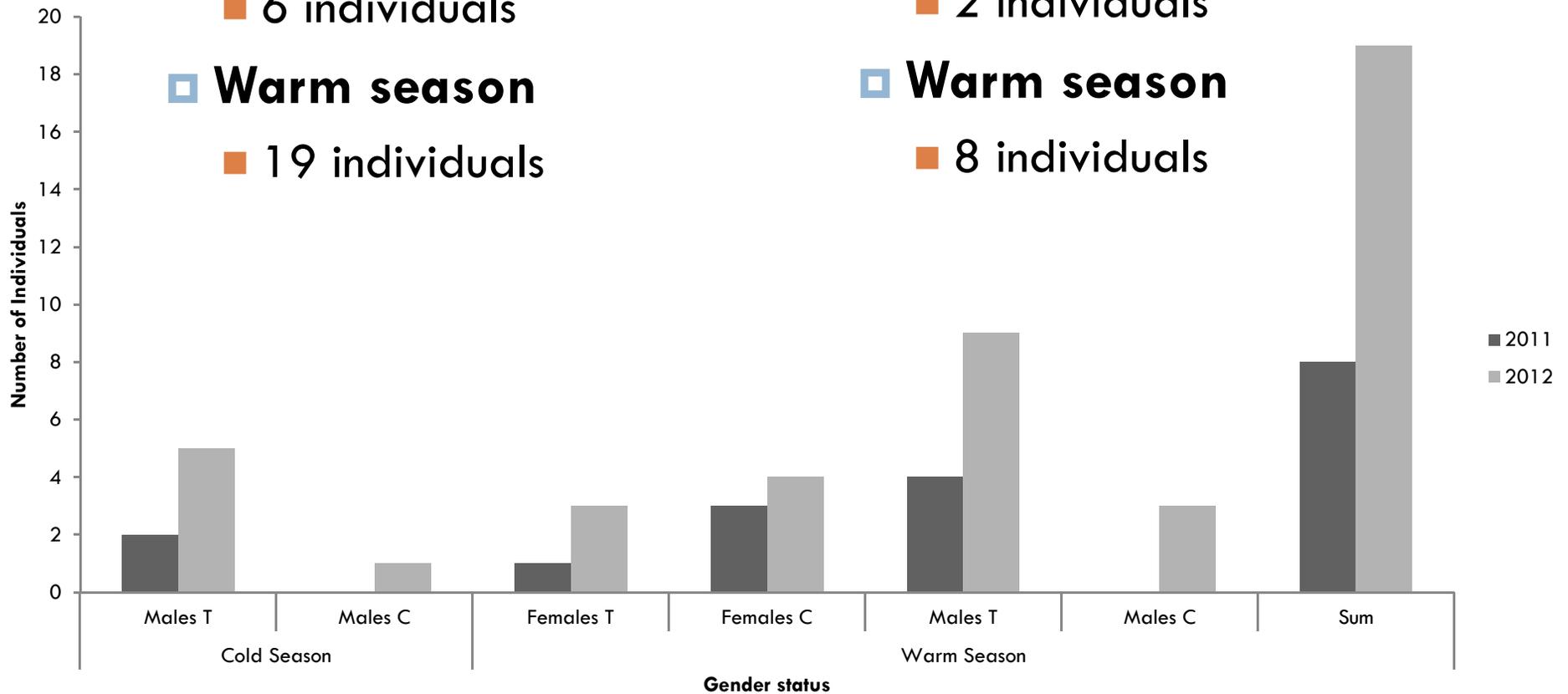
■ 19 individuals

■ Cold season

■ 2 individuals

■ Warm season

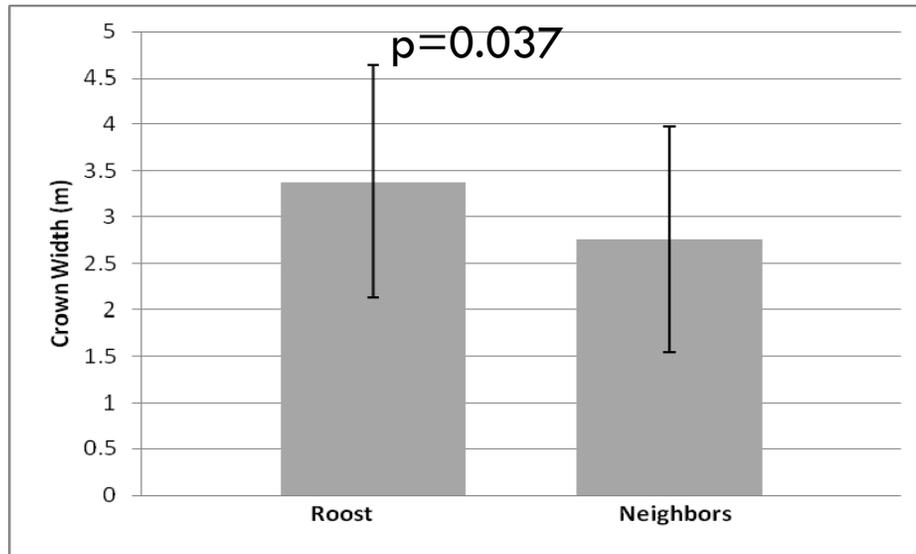
■ 8 individuals





# Western Red Bat

**2012**

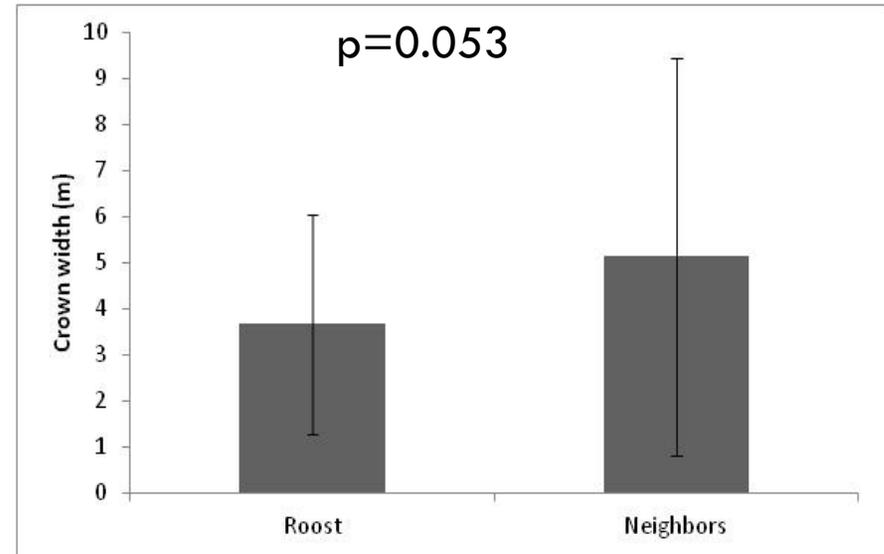


**2012:** Roost trees *did not* vary significantly from the Neighboring trees.

- Roost tree height ( $p=0.666$ )
- DBH ( $p=0.214$ )
- Height of the base of the live crown ( $p=0.354$ )
- Percent of live crown ( $p=0.354$ )
- Crown width ( $p=0.037$ )



**2011**



**2011:** Roost trees *did not* vary significantly from the Neighboring trees.

- Roost tree height ( $p=0.825$ )
- DBH ( $p=0.419$ )
- Height of the base of the live crown ( $p=0.806$ )
- Percent of live crown ( $p=0.342$ )
- Crown width ( $p=0.053$ )



# Discussion

## Western Yellow Bat

- ▣ High live crown base
- ▣ High Percent dead crown
- ▣ Wide and deep dead palm frond skirt
- ▣ Selecting for the Tree

## Single scale analysis (Tree)

- ▣ Patch
- ▣ Landscape





# Discussion

## Western Red Bat

- ▣ Canopy
- ▣ Patch scale selection
- ▣ Eastern Red Bats (Higginbotham et al. 2000)

## Single scale analysis (Tree)

- ▣ Patch
- ▣ Landscape





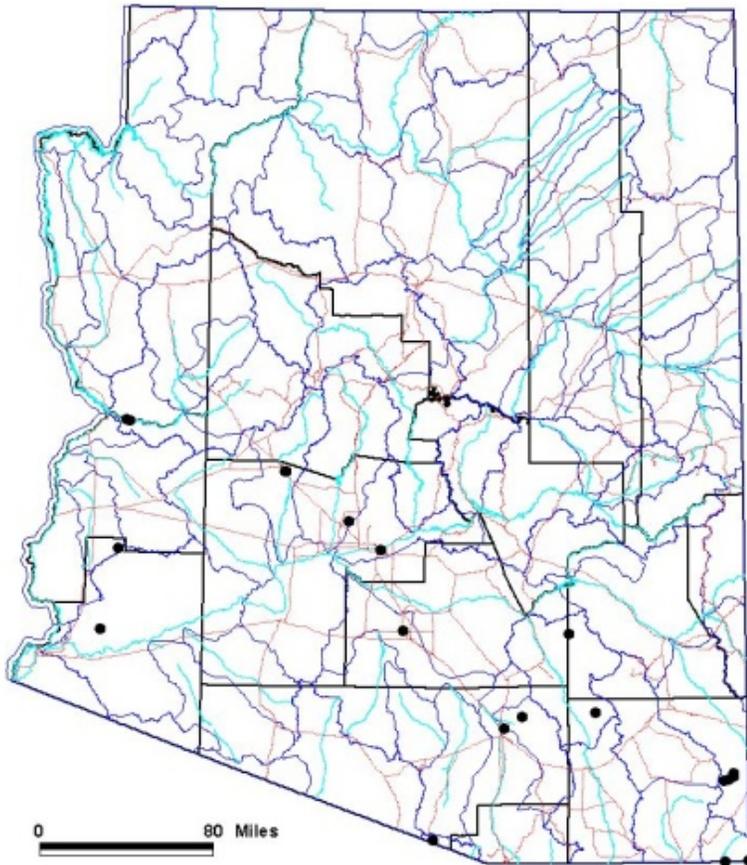
# Discussion

- 2012 vs. 2011
- Warm Season
- Cold Season
  - ▣ All Males
- Single scale analysis (Tree)
  - ▣ Patch
  - ▣ Landscape



# Implications

**Lasiurus xanthinus occurrences in Arizona**



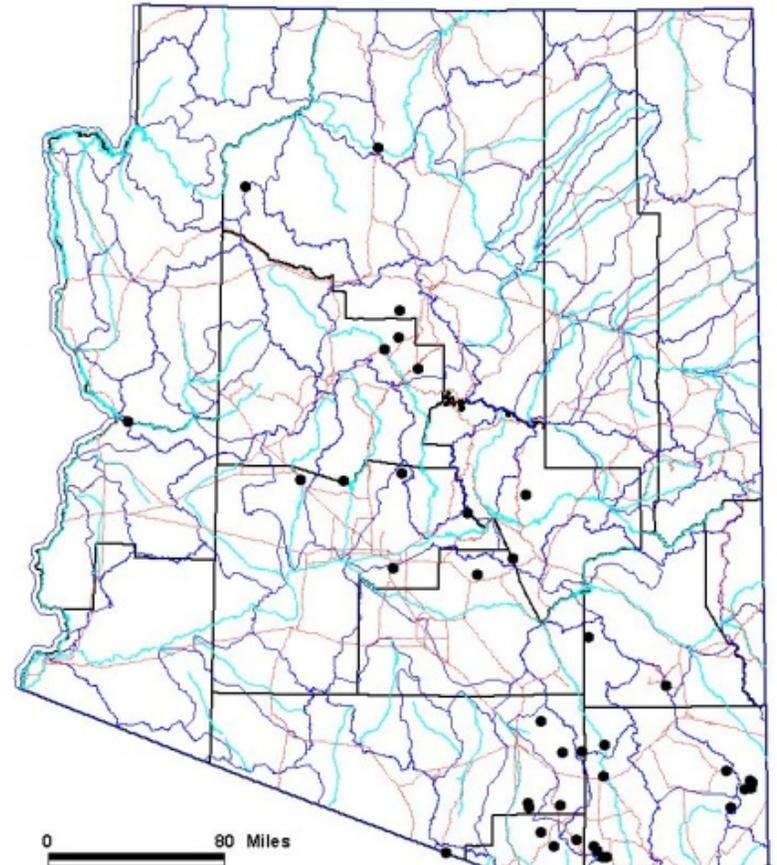
- Western yellow bat
- State highways
- Major Waterways
- Watershed
- County Lines



Heritage Fund  
Lottery dollars at work

Heritage Data Management System, January 30, 2007.

**Lasiurus blossevillii occurrences in Arizona**



- Western red bat
- State highways
- Major Waterways
- Watershed
- County Lines



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Lottery dollars at work

Heritage Data Management System, January 30, 2007.