Temporal occupancy of 4 focal MSCP bat species along the LCR

Ronald J. Mixan and Joel M. Diamond
Arizona Game and Fish Department
Wildlife Contracts Branch
Project Objectives

Objectives
- Continue Data Collection
- Assess Seasonal and nightly activity patterns

Focal Species
- Western Red Bat
- Western Yellow Bat
- California Leaf-Nosed Bat
- Townsend’s Big-eared bat
Study Area

- Four Permanent Stations
  1. BWRNWR
  2. CNWR
  3. PSRA
  4. MLWA
Acoustic Analysis

- Call Minute Analysis
- Pros
- Cons
Acoustic Analysis

- Occupancy (presence/absence) Analysis
Results

• Western Red Bat Occupancy Per Station
Results

- Western Yellow Bat Occupancy Per Station

**LAXA BWRNWR**

**LAXA CNWR**

**LAXA PSRA**

**LAXA MLWA**

Days of Activity

- Year 2010 2011
- Year 2011 2012
- Year 2012
Results

- California Leaf-Nosed Occupancy Per Station

**MACA BWRNWR**

**MACA CNWR**

**MACA PSRA**

**MACA MLWA**
Results

- Townsend’s Big-Eared Bat Occupancy Per Station

COTO BWRNWR

COTO PSRA

COTO MLWA
Results

Activity Per Station 2010-2012

- BWRNWR
- CNWR
- PSRA
- MLWA
Results

Nightly Activity Patterns

LABL
LAXA
MACA
COTO

2:00 6:00
22:00 2:00
17:00 22:00
Discussion

- Occupancy analysis
  - Covariates
  - Distribution modeling
    - Temporal
    - Spatial
  - LCR habitat management
  - Range-wide Inferential value
  - Broad-scale bat species management
Acknowledgements

- Allen Calvert Bureau of Reclamation
- Susan Broderick Bureau of Reclamation
- Lin Piest Arizona Game and Fish Department
### Townsend's Big‐Eared Bat Calls Per Hour

<table>
<thead>
<tr>
<th>Time</th>
<th>COTO</th>
<th>BWRNWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18:00</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>19:00</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>20:00</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>21:00</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>22:00</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>23:00</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>0:00</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>1:00</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>2:00</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>3:00</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>4:00</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>5:00</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>6:00</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>

### Questions