Riparian Bird Surveys at Conservation Areas in the Lower Colorado Region

Dawn Fletcher, Lauren Harter, & Elisabeth Ammon, Great Basin Bird Observatory, Reno, NV
**Background**

1. Implement long-term system-wide monitoring of riparian birds
2. Study the effects of habitat restoration measures
Focal Species
1. Arizona Bell’s Vireo
2. Gilded Flicker
3. Gila Woodpecker
4. Sonoran Yellow Warbler
5. Summer Tanager
6. Vermilion Flycatcher
Double Sampling Method

Rapid area search surveys (two visits) on each selected plot
- The goal is to obtain estimates of the number of breeding territories over a large sample of area search plots.

Intensive area search surveys (8 visits) on each selected plot
- The goal is to obtain a complete and unbiased measure of all species breeding on the plot.
Goals

— Determine presence and document breeding territories of riparian birds with emphasis on 6 covered species

— Estimate error in survey data with intensive surveys to eventually calculate population sizes and trends
Study Area/Plot Selection

Plots are selected using a stratified random design.

Selected first by conservation area and then by habitat within conservation area.

Plots surveyed ranged in size from 4 to 18 hectares (ha).
Plot Distribution 2019

Conservation Areas

Rapid = 81 plots/year

Intensive = 8 plots/year
### Plot Breakdown:

<table>
<thead>
<tr>
<th>Conservation area</th>
<th># of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beal Lake Conservation Area</td>
<td>2</td>
</tr>
<tr>
<td>Middle Bill Williams River NWR East</td>
<td>4</td>
</tr>
<tr>
<td>Middle Bill Williams River NWR West</td>
<td>10</td>
</tr>
<tr>
<td>Cibola National Wildlife Refuge Unit #1 Conservation Area</td>
<td>10</td>
</tr>
<tr>
<td>Cibola Valley Conservation Area</td>
<td>14</td>
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Plot Breakdown Continued:

<table>
<thead>
<tr>
<th>Conservation area</th>
<th># of plots</th>
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</thead>
<tbody>
<tr>
<td>Hunters Hole</td>
<td>1</td>
</tr>
<tr>
<td>Laguna Division Conservation Area</td>
<td>10</td>
</tr>
<tr>
<td>Palo Verde Ecological Reserve</td>
<td>15</td>
</tr>
<tr>
<td>Parker Dam Camp</td>
<td>2</td>
</tr>
<tr>
<td>Pretty Water Conservation Area</td>
<td>9</td>
</tr>
<tr>
<td>Yuma East Wetlands</td>
<td>4</td>
</tr>
</tbody>
</table>
Survey Methods

- Surveys are conducted using area search method
- Begin at sunrise and last several hours
- Surveyed systematically passing within 50m of all points on plot
- Surveyor identifies and maps all territorial breeding birds

Sample of an intensive plot with territory mapping
Results
- 77 breeding species observed
- Over 20,000 bird locations recorded
- 3,183 territories created from data collected
Number of rapid plots with each territorial species
Number of territories

- Arizona Bell's vireo
- Gila woodpecker
- Summer tanager
- Vermilion flycatcher
- Sonoran yellow warbler
- Ash-throated flycatcher
- Brown-crested flycatcher
- Bewicks wren
- Blue grosbeak
- Black-tailed gnatcatcher
- Bullock's oriole
- Canyon wren
- Crissal thrasher
- Hooded oriole
- Hutton's vireo
- Lucy's warbler
- Marsh wren
- Northern cardinal
- Northern mockingbird
- Phainopepla
- Say's phoebe
- Song sparrow
- Verdin
- Western kingbird
- Yellow-breasted chat
Number of Territories or Estimated Pairs per Hectare by Conservation Area

- Real Lake Conservation Area
- Middle Bill Williams River NWR East
- Cibola National Wildlife Refuge Unit #1
- Cibola Valley Conservation Area
- Laguna Division Conservation Area
- Palo Verde Ecological Reserve
- Parker Dam Camp
- Pretty Water Conservation Area
- Yuma East Wetlands

Breeding territories per ha
Non-territorial estimated pairs per ha
Bird Observations Bill Williams River NWR

Top 10 species shown in legend
Gila Woodpecker Territories by Conservation Area
Summer Tanager Territories by Conservation Area

- Real Lake Conservation Area: 1
- Cibola National Wildlife Refuge Unit 1: 1
- Laguna Division Conservation Area: 1
- Hunters Hole: 1
- Middle Bill Williams River East: 1
- Middle Bill Williams River West: 10
- Parker Dam Camp: 7
- Palo Verde Ecological Reserve: 7
- Pretty Water Conservation Area: 1
- Yuma East Wetlands: 1
Yellow Warbler Territories by Conservation Area

- Beal Lake Conservation Area
- Cibola National Wildlife Refuge Unit 1
- Laguna Division Conservation Area
- Hunters Hole
- Middle Bill Williams River East
- River West
- Parker Dam Camp
- Palo Verde Ecological Reserve
- Pretty Water
- Yuma East Wetlands
Plots and Focal Species Territories
Highlight: Gila Woodpecker

CVCA
Highlight: Gila Woodpecker

Cibola NWR Unit #1
Acknowledgements
- US Bureau of Reclamation Wildlife Group
- National Wildlife Refuge Staff
- Awesome field crew