Monitoring of Bird and Habitat Change During Minute 319, Colorado River Delta

Colorado River Terrestrial & Riparian Meeting, 2016

X. Itzel Hernandez-Morlan
Mean daily Colorado River flow at the Southerly International Border
EVI decreased 31%
59% of green foliage
Riparian corridor needs a continuous base flow and a pulse flow every 4 years.
Minute 319 Environmental Flows

• Pulse flow = 130 Mcm (105,392 af), 8 weeks in spring 2014, @3 locations.

• Base flow = 65 Mcm (52,696 af) to restoration areas through Dec 2017.

• Monitoring of hydrology, landscape change, vegetation and biodiversity response.
Riparian Monitoring

• Document trends of riparian birds & vegetation in the Colorado River, in relation to environmental flows and groundwater levels. Contrast active vs. passive restoration sites.

• Monitoring: 136 point counts (17 transects), 4 times per year (once per season) since Spring 2002 (up to date).

• NEW: 4 transects at restoration sites + 4 transects at Limitrophe. Now, Total of 25 transects = 200 points.
Riparian Monitoring

- Variable distance point count, all birds detected in a 5 minute period.

- Each transect with 8 points each, points separated 200 m from each other.

Riparian Surveys
200 survey points
25 transects
Reach 1 – 5

Waterbird Surveys
80 survey points
Reach 6 and 7
Habitat Changes

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Shrubs</td>
<td>35.04 (32.35 - 37.72)</td>
<td>35.64 (32.94 - 38.33)</td>
<td>34.80 (32.35-37.24)</td>
</tr>
<tr>
<td>Emergent</td>
<td>5.40 (4.32 - 6.49)</td>
<td>4.06 (3.14 - 4.97)</td>
<td>3.91 (2.91-4.91)</td>
</tr>
<tr>
<td>Herbs</td>
<td>1.93 (1.43 - 2.43)</td>
<td>2.56 (1.67 - 3.45)</td>
<td>3.47 (2.69-4.24)</td>
</tr>
<tr>
<td>Forbs</td>
<td>0.52 (0.16 - 0.87)</td>
<td>0.66 (0.39 - 0.93)</td>
<td>0.90 (0.65-1.14)</td>
</tr>
<tr>
<td>Water</td>
<td>5.65 (4.59 - 6.71)</td>
<td>4.63 (3.43 - 5.83)</td>
<td>4.61 (3.53-5.68)</td>
</tr>
<tr>
<td>Bare Soil</td>
<td>23.89 (21.46 - 26.32)</td>
<td>39.72 (36.91 - 42.54)</td>
<td>40.17 (37.74-42.61)</td>
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Bird Results

• 204 species.

• Over 310,000 records.

• Changes in avian indices (abundance, diversity & community composition): by guilds and species.

• Different responses by Reach.

• Different response comparing active restoration sites vs. rest of riparian corridor.
Average Bird Abundance - Spring

AVG bird abundance in Spring 2010-2015
Average Bird Abundance per Reach, 2002-2015, Spring

33%
46%
20%
Spring Abundance by Reach

Reach 3
Diff 2013 vs 2015 = +11%

Reach 4
Diff 2013 vs 2015 = -12%

Reach 5
Diff 2013 vs 2015 = 0%
Average Bird Diversity (N2) by transect, Spring
Average Bird Diversity per River Reach

<table>
<thead>
<tr>
<th>River Reach</th>
<th>Average Diversity</th>
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<tbody>
<tr>
<td>3</td>
<td>4.6</td>
</tr>
<tr>
<td>4</td>
<td>6.4</td>
</tr>
<tr>
<td>5</td>
<td>4.8</td>
</tr>
</tbody>
</table>
Bird Diversity by Reach - Spring

Difference 2015 vs 2013

Reach 3 (0%)

Reach 4 (7%)

Reach 5 (-2%)
Bird Diversity by Reach - Summer

Difference 2015 vs 2013

Reach 3 (19%)

Reach 4 (41%)

Reach 5 (25%)
Riparian Bird Community Change

2002

2013

2014

2015

Species:
- MODO
- RWBL
- BHCO
- VERD
- SOSP
- CLSW
- GTGR
- ABTO
- Others

Species:
- WFIB
- RWBL
- MODC
- YHBL
- GTGR
- GAQU
- CLSW
- LBCU
- Others

Species:
- RWBL
- MODO
- WFIB
- YHBL
- GTGR
- GAQU
- CLSW
- AMCR
- Others

Species:
- RWBL
- MODC
- YHBL
- WFIB
- GTGR
- YRWA
- MALL
- OTHER
Nesting Riparian Landbirds

Average abundance by River Reach

Years: 2002-2015

River Reaches: 3, 4, 5
Resident Waterbirds

Average abundance by River Reach

[Graph showing abundance from 2002 to 2015 for River Reaches 3, 4, and 5.]
Wintering Waterbirds

Average abundance by River Reach
Ag-related Birds

Average abundance by River Reach
Birds in restoration sites vs the riparian corridor
Average abundance/point of 19 species of conservation interest was 2.7 times higher at restoration sites in 2013.

Average abundance/point was 1.3 times higher at restoration sites in 2015.
Next Steps

- Further exploration of patterns by Season and Reach (Guilds and Species)
- Contrast bird trends in active restoration sites vs. rest of the riparian corridor.
- Regional patterns for Ag and generalist species (changes in the Mexicali Valley)
- Habitat relationships (vegetation, surface water and groundwater)
- Avian and habitat changes in 2016 and 2017