FOR BETTER OR FOR WORSE:
LONG-TERM TRENDS IN ABUNDANCES FOR THE RESIDENT
BIRDS OF A DESERT RIVER.

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“The goal is not to create optimal conditions for all species all of the time; rather, we want to create adequate conditions for all native species enough of the time.”
As one of the largest remaining native dominated riparian forests of the LCR, and the only one still flood regenerated, understanding the responses of species to various environmental conditions and cycles is critical to accurate modeling for management decisions.
Environmental conditions control a variety of ecological factors

- Precipitation controls many vegetative species especially annual and herbaceous plants and insect reproduction in desert systems = bird food
- In riparian systems, groundwater is critical to tree survivorship and nutrient value = bugs = bird food
- Floods in riparian systems are the successional reset to which those plant species are adapted and which create the habitat mosaic many animal species require
- Floods and precipitation (and human water use) interact to maintain surface flow and groundwater
- Important to recall population level response will have a time lag for growth or reproduction.
Environmental factors may influence population dynamics of riparian species.

**PRECIPITATION AT BWRNWR OFFICE**

**HISTORIC FLOW AND RECENT RELEASES FROM ALAMO DAM**

![Graph showing precipitation and flow data](Image)
Gaging station at Kohen Ranch surface flow. Before mid-2014 was never without some flow, after April 2015 has been dry.
Then there is DRY>>>
Bill Williams River Corridor Steering Committee has coordinated a variety of research projects to model riparian responses to various natural and experimental flow events including

- Riparian vegetation
- Groundwater and surface flow
- Channel morphology
- Beaver
- Aquatic insects

But is may be difficult to separate effects of release flows from those of local precipitation.
Resident species are tied year around to a particular location and so may be more informative of the influence of environmental variables than are migratory species.
Strip transects started in winter 1998/1999 on BWRNWR

- 400 m long x 20 m wide with 20 stations 20m apart = .8 hectare, 3 minutes per station run 3 consecutive days. In effect, 20 contiguous plots in several floodplain riparian, abandoned (1983) agriculture terrace, and upland habitats.

- For birds, 4 times per year beginning solstices and equinoxes start 30 min after sunrise except winter when mid-morning start due to temperature reducing activity.

- Environmental conditions including temperatures and rainfall are monitored. Flow in the BWR is gaged at Kohen Ranch near the middle of the refuge and below Alamo Dam.
Ten most common riparian bird species on the BWRNWR

- Song Sparrow
- Yellow-rumped Warbler
- Yellow-breasted Chat
- Abert’s Towhee
- Ruby-crowned Kinglet
- Gambel’s Quail
- Mourning Dove
- Bewick’s Wren
- Yellow Warbler
- Gila Woodpecker
Mean N/Minute for Song Sparrows and Abert’s Towhees.
Both Song Sparrows and Abert’s Towhees had high relative frequencies when average Alamo releases were at least 20 cfs and:

**HIGH PRECIPITATION**
- 2004-2005
- 2009-2010

**SURFACE FLOW**
- 2005-2006
- 2009-2010
- 2015
Both Song Sparrows and Abert’s towhee relative abundances (N/Min across all riparian habitats) creased sharply in years of above average precipitation and high flows with releases from Alamo Dam resulting in surface flow gaged at Kohen.

Both Song Sparrows and Abert’s Towhees also increased in years with surface flow that were NOT accompanied by above average local precipitation.

Relative abundances were lowest in years with average or below precipitation and below average Alamo releases.
Conclusions

- Dams in desert ecosystems can be used as a management tool to increase riparian habitat quality and wildlife populations independent of or in conjunction with local precipitation.
- On the Bill Williams River – it can work!
- **JUST ADD WATER!**
In a time of diminishing resources, data gathering and other refuge projects would not be possible without the help of our volunteers. MANY, MANY THANKS!

- Jan Richmond
- Bobby Paintner
- Wayne Paintner
- John West (especially for the wonderful photos!)
- And all the others who follow me around out there!
Yes, the beetle are here...