Bosque Disturbance Ecology:

The Future of Flooding, Fire, Clearing, and “Restoration” in the Bosque
Sites that Experience Overbank Floods; High Native Diversity and Cover

Dominant Plant Species at Harrison

- Coyote willow
- Cottonwood
- Horsetail
- Mule’s fat
- Sedge
- Scratchgrass
- Ragweed
- Golden top
- Horseweed
- Dropseed
- Russian olive
- Saltcedar
- Siberian elm
- Clover

Sum intercept length (cm)

- Native
- Exotic
Clearing without Subsequent Flooding Leads to Increased Exotic Understory
Exotics Dominating Post-Fire, No Flooding

5 Months Post-Fire Sprout Height

- cottonwood
- willow
- saltcedar
- Russian olive

Plot
Mean sprout height (cm)
Valencia Forest – 5 years post fire
May 7, 2009
August 2013
Response to Drought
Annual Precipitation Across BEMP Sites and USGS Mean Annual Albuquerque River Flow

- Annual precipitation (mm)
- River flow (cfs) (USGS)
Change in Depth to Groundwater and River Flow During Drought Years (2008-2013) and Recovery Years (2013-2015)
Change from 2008 to 2012

-250
-200
-150
-100
-50
0
50
2008

precipitation (mm)
understory cover (cm)
carabids (2008-2011)
Prolonged drought leads to ↓ river flows and ↓ groundwater

↑ cottonwood limb and tree mortality

↑ shrub mortality

↑ wood fall and fuel load

↑ fire hazard

↓ opportunity for restoration projects based on restored river function
Santa Ana Mean Annual Leaf Fall

Annual sum litterfall (g/m²)

- **cottonwood**
- **all leaves**

Data for years 2000 to 2014.
Restored Wetlands Below Cottonwood Canopy
Take-Home Messages: *It’s all about the water*

- Clearing and/or fire in the bosque without subsequent flooding leads to:
- Clearing and/or fire in the bosque followed by flooding leads to:
- The mosaic allows for resiliency in response to stresses on the ecosystem