

Avian Responses to Arundo Removal and Restoration

Sean Carey, UC Santa Barbara

Linnea Hall, Western Foundation for Vertebrate Zoology

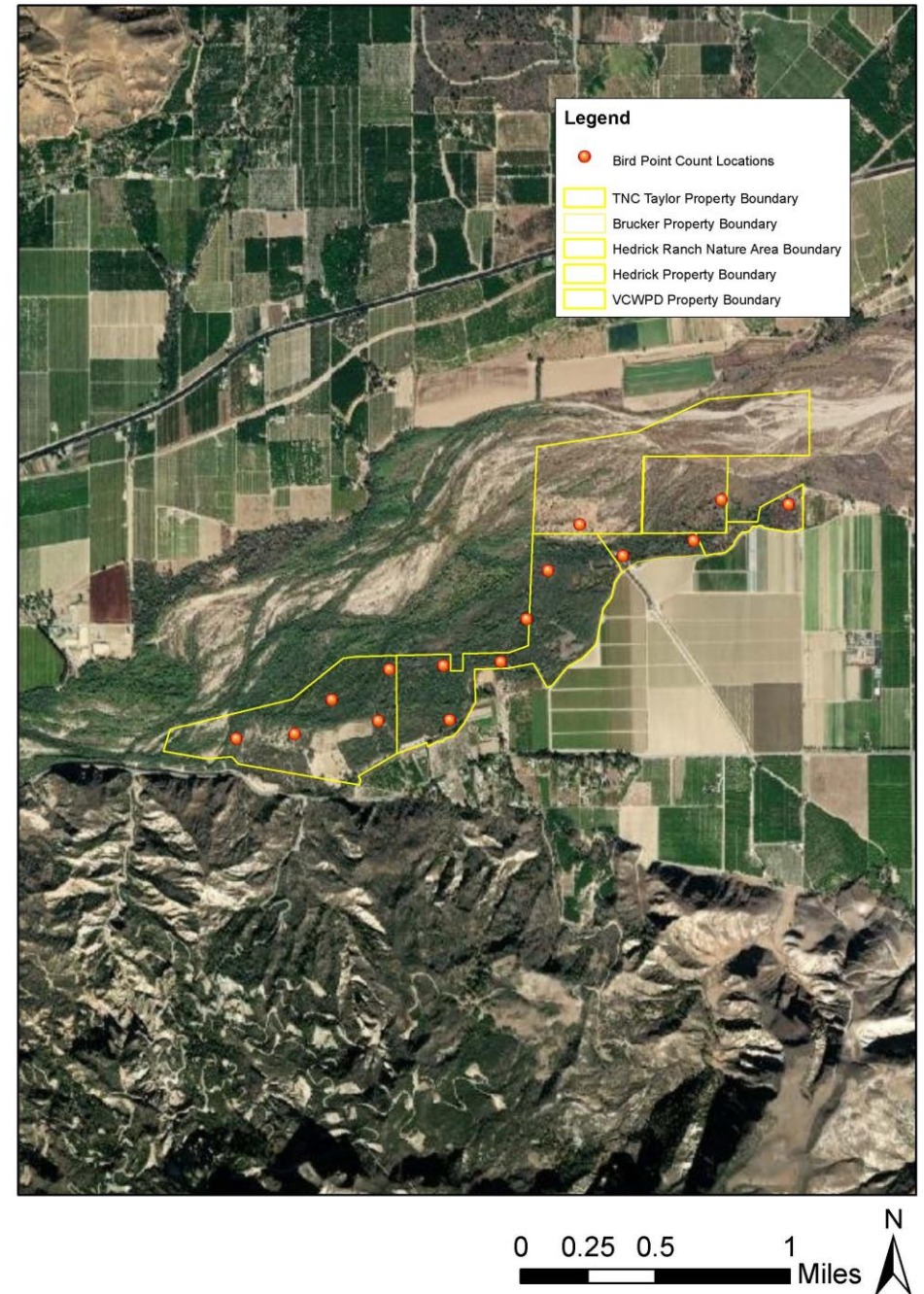
David Kisner, Kisner Restoration and Ecological Consulting

Adam M. Lambert, UC Santa Barbara

Charlie Braman, UC Santa Barbara

Restoration and Research on the Santa Clara River

- Since 2014, project partners have conducted large scale restoration and research on the Santa Clara River
 - Giant reed (*Arundo donax*) removal
 - **Active** planting and **passive** recovery methods to restore riparian habitats
- Scientific evaluation of avian response to *Arundo* removal and native revegetation as measurement of project success
 - 15 point count locations – uniformly distributed; 150 meters.
 - Points monitored 2015-2021



Bird Species - Habitat Preferences

- High moisture, canopy cover, complex structure characteristic to willow/cottonwood forest
 - **Least Bell's vireo** (endangered species)
 - **Yellow breasted chat** (CA sensitive species)
 - Oak titmouse
 - Pacific slope flycatcher
 - Common yellow throat
- Low soil moisture, ground cover, open non-mosaic structure characteristic to riparian scrub
 - Mourning dove
 - Quail
 - House finch
 - Crow



Evaluating Avian Responses to Restoration

- Treatments:
 - Restoration - Active, Passive, Long-Term Passive
 - Habitat Type - Riparian scrub, Willow/cottonwood forest
 - Individual plant species influence
 - Arundo Cover - No Arundo, Low, Medium, High
- Bird responses:
 - Communities Present
 - Relative Abundance



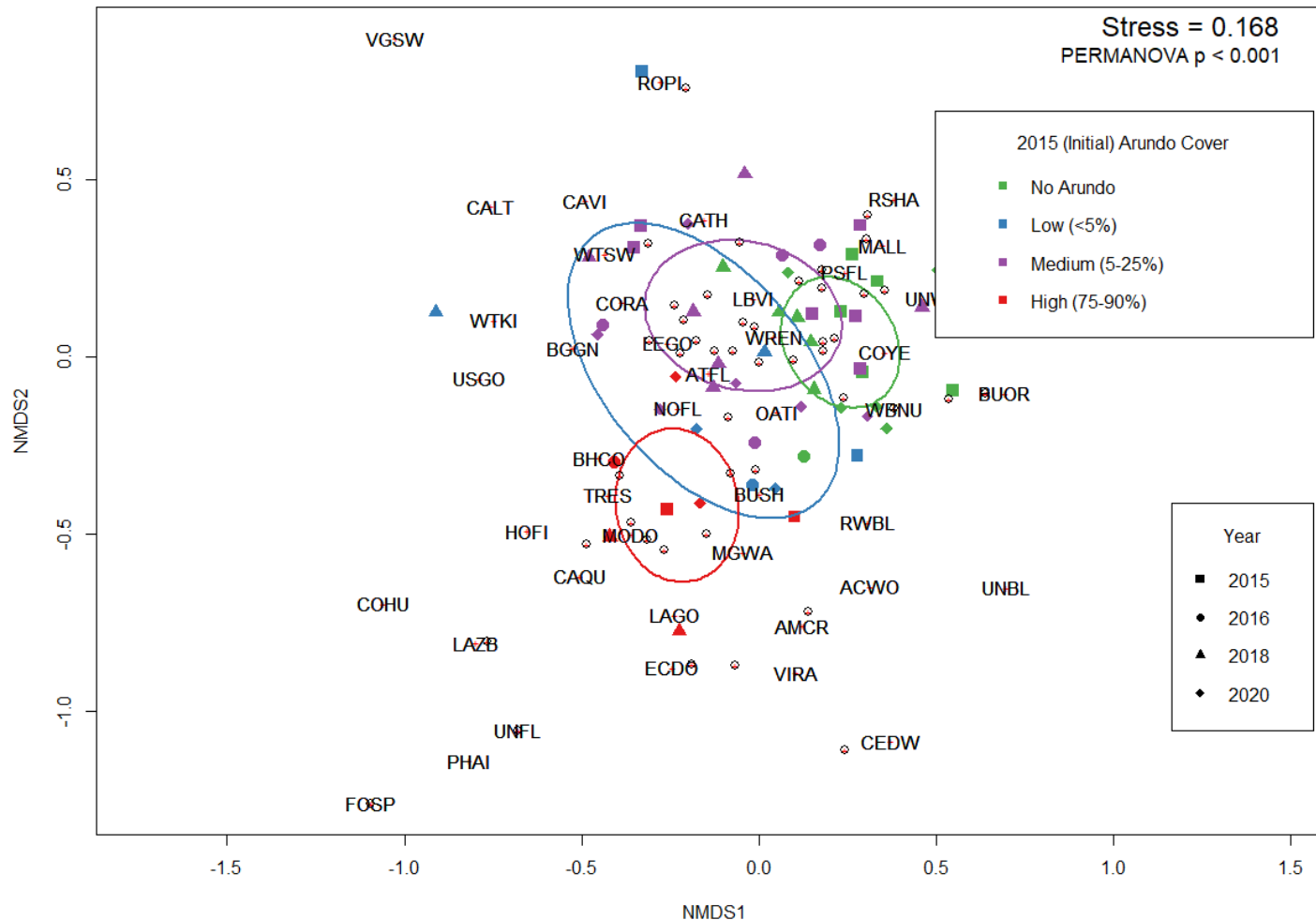
Willow/cottonwood forest habitat



Riparian scrub habitat

Bird Communities by Initial Arundo Removal

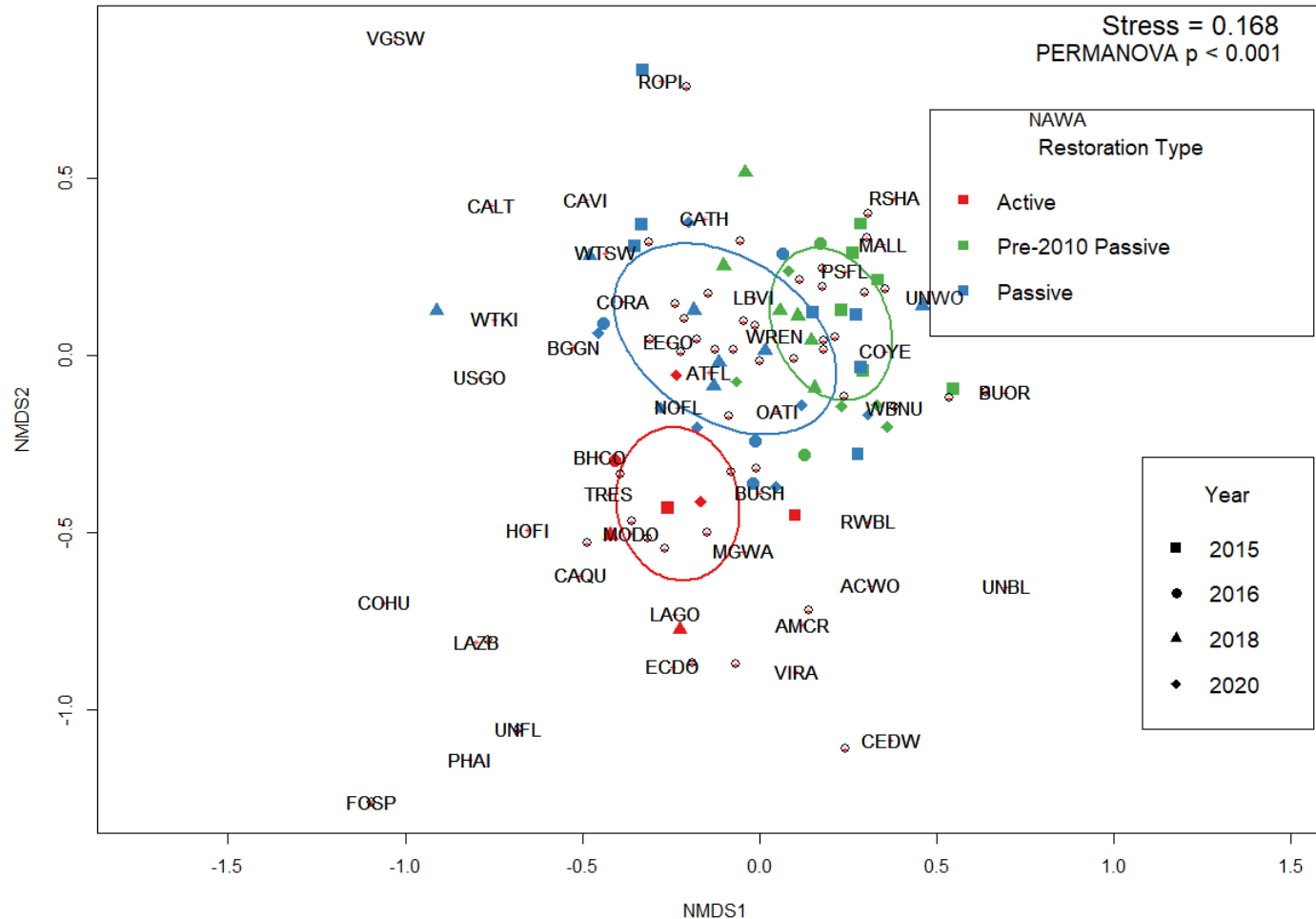
- NMDS ordination showing the different clustering of bird communities based on initial arundo cover



- 4 letter codes are bird species abbreviations
- Ellipses represent clusters of distinct bird communities

Bird Communities by Restoration Type

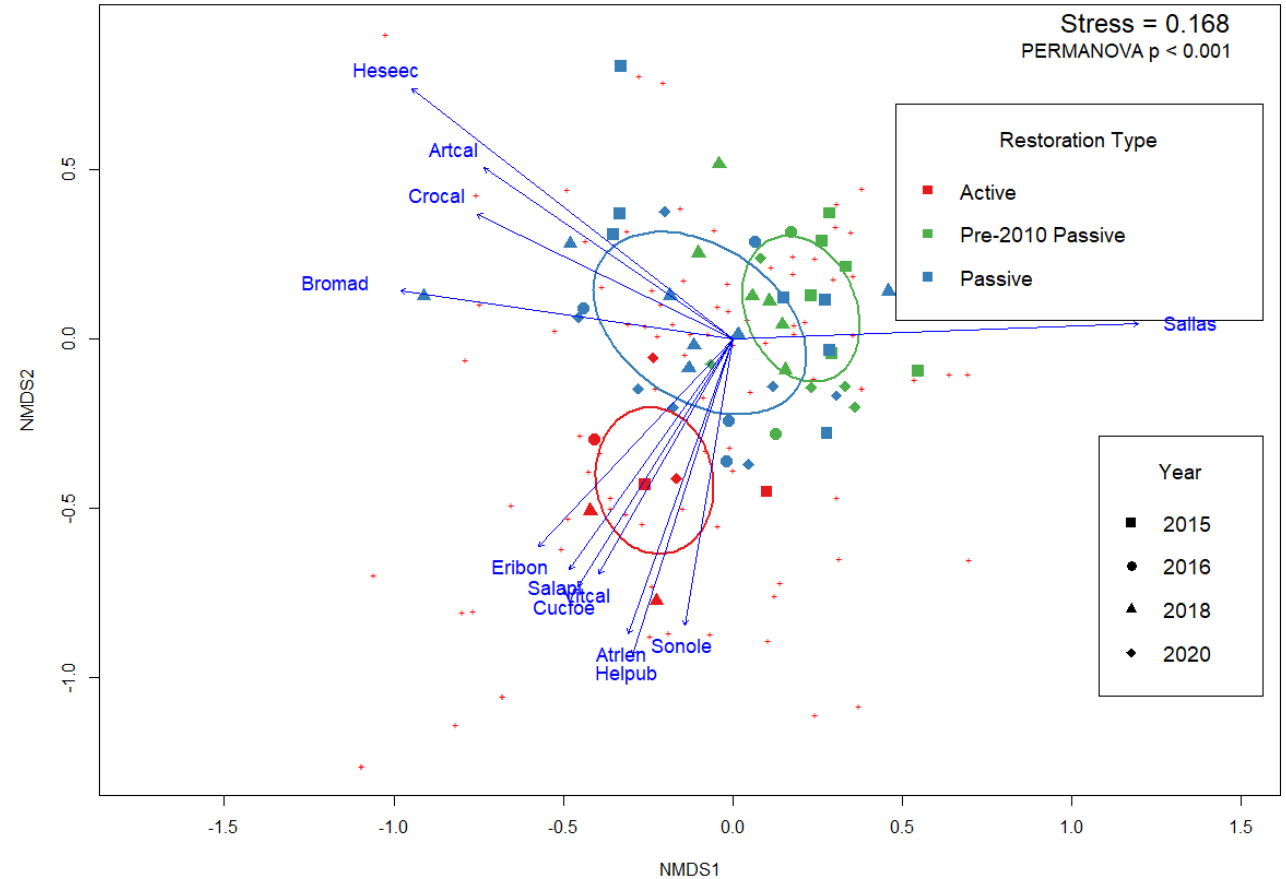
- NMDS ordination showing clustering of bird communities based on restoration treatment



- Restoration treatment type has shaped distinct bird communities
- Active restoration sites composed of early succession species/riparian scrub species
- Passive restoration sites composed of willow/cottonwood forest habitat

Plant Species Driving Differences in Bird Communities

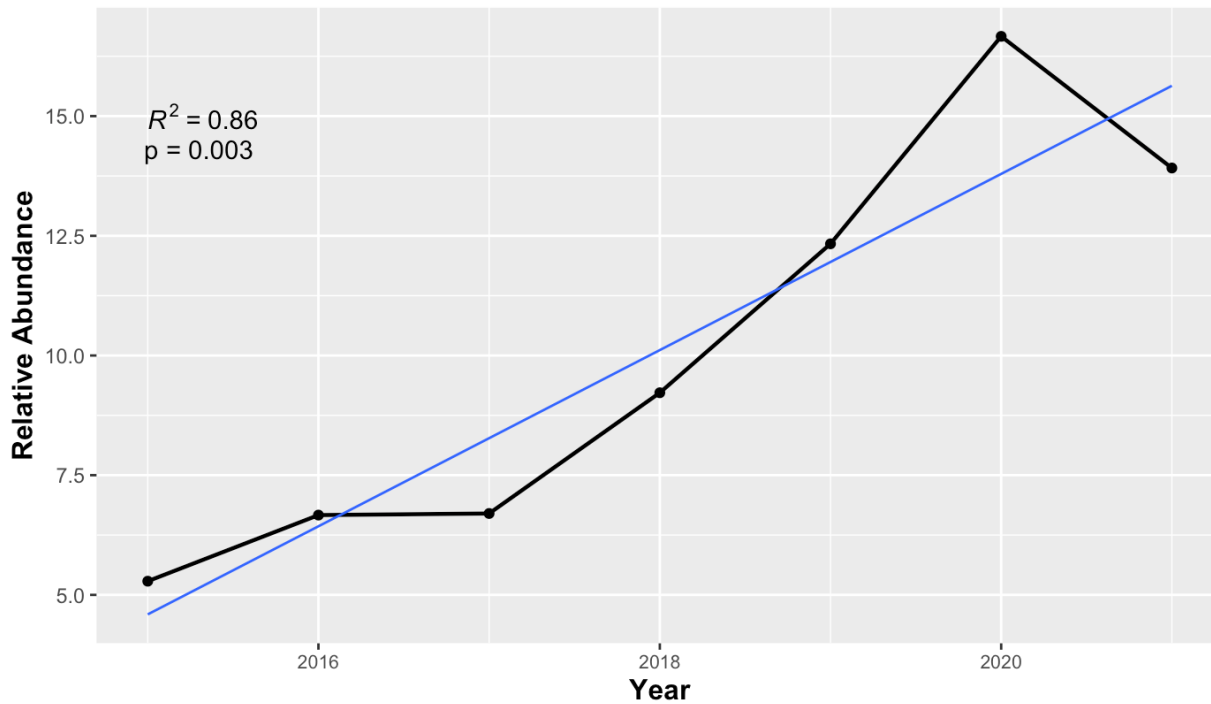
- Plants installed during active revegetation have led to distinct bird species composition
- Willows are important drivers of bird community composition in long-term restoration plots



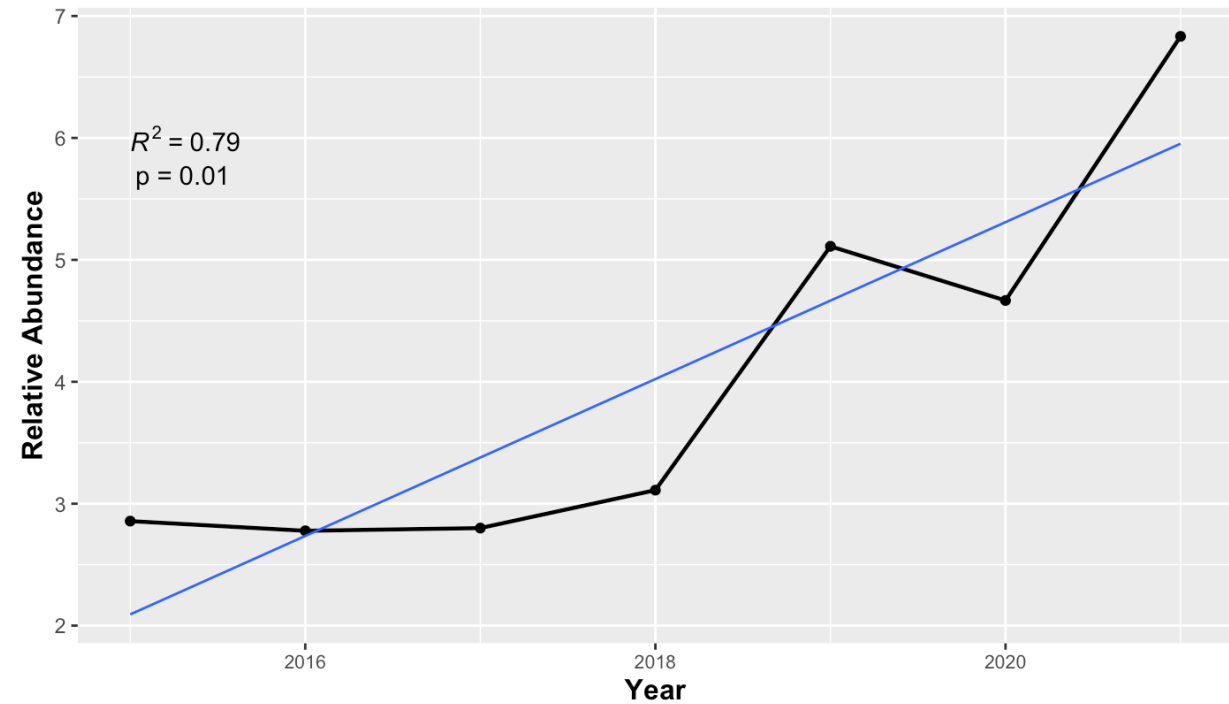
Relative Abundance

- Relative Abundance Index (RAI) for least Bell's vireo and yellow-breasted chat
 - RAI formula: sum of "total count" across all the count sessions in the breeding, divided by number of count sessions in each of those periods

LBVI Spring



YBCH Spring



Takeaways

- Arundo removal and restoration efforts...
 - shape distinct bird communities
 - Have improved habitat and caused increase in abundance of most bird species on site