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PRBO Conservation Science



Regional Monitoring of Restoration Outcomes on the Sacramento: the Central Valley Floodplain Forest Bird Survey

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PRBO Conservation Science

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Outline

- Birds as indicators and metrics of restoration success
- The Central Valley Floodplain Forest Bird Survey
 - Legacy site monitoring
 - Regional monitoring
- Preliminary results
- Conservation applications



Why riparian songbirds?

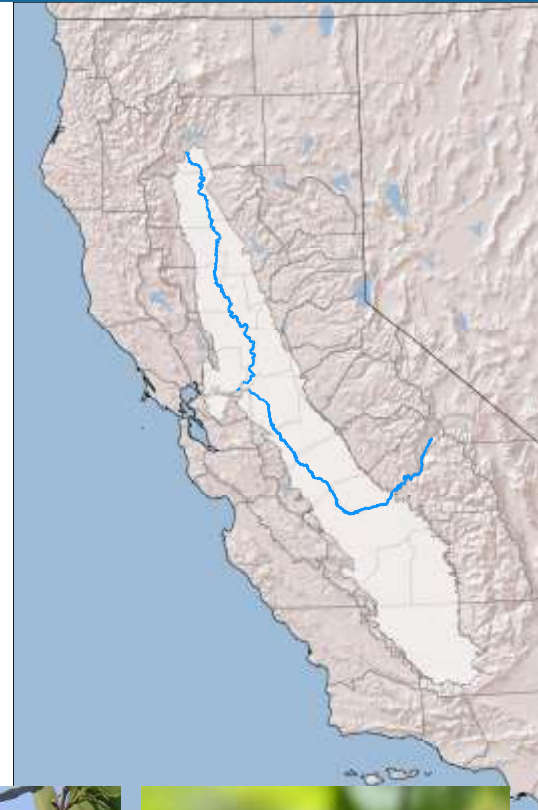
They are targets of conservation action

Across the Central Valley, over 98% of historic riparian vegetation lost in the last 150 years

- Urbanization, Agriculture, Altered hydrology

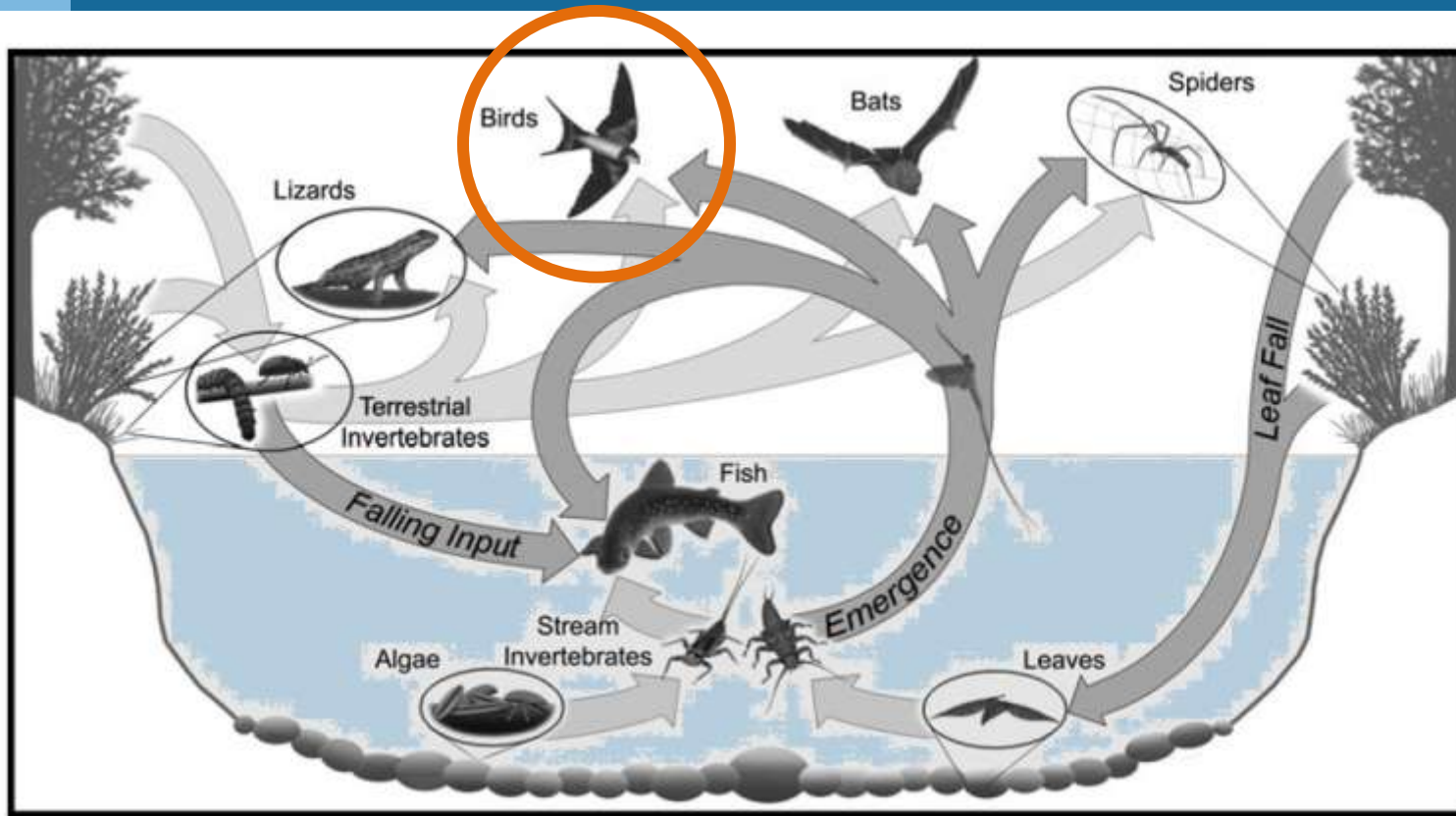
Dramatic changes in wildlife abundance and ecosystem function

Restoration efforts: focal species or guilds



Why riparian songbirds?

They are indicators of ecosystem function



from Baxter et al. 2005, *Freshwater Biology*

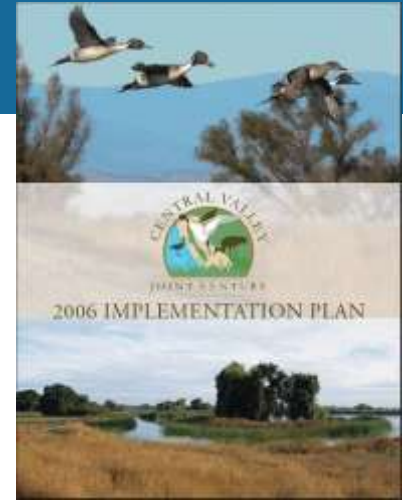
Focal species: selected as surrogates for larger community

Managing for focal birds → Restoring ecosystem function



What do we want?

Targets



Conservation targets motivate why we do monitoring:

Target Density:
Performance metrics for restoration project(s)

Target Population Size: Restoration sum, or how much is enough?

Valley	Basin	Target Birds/Hectare	Restorable Riparian Hectares	Target Population Size
Sacramento	American	1.34	33,491	44,897
	Butte	1.34	57,963	77,704
	Sutter	1.34	83,830	112,380
	Colusa	1.34	32,123	43,064
	YOIO	1.34	27,678	37,105
San Joaquin	Delta	0.38	53,640	20,392
	San Joaquin	0.38	76,240	28,984
	Tulare	0.38	6,408	2,436



Migratory Bird Conservation Partnership

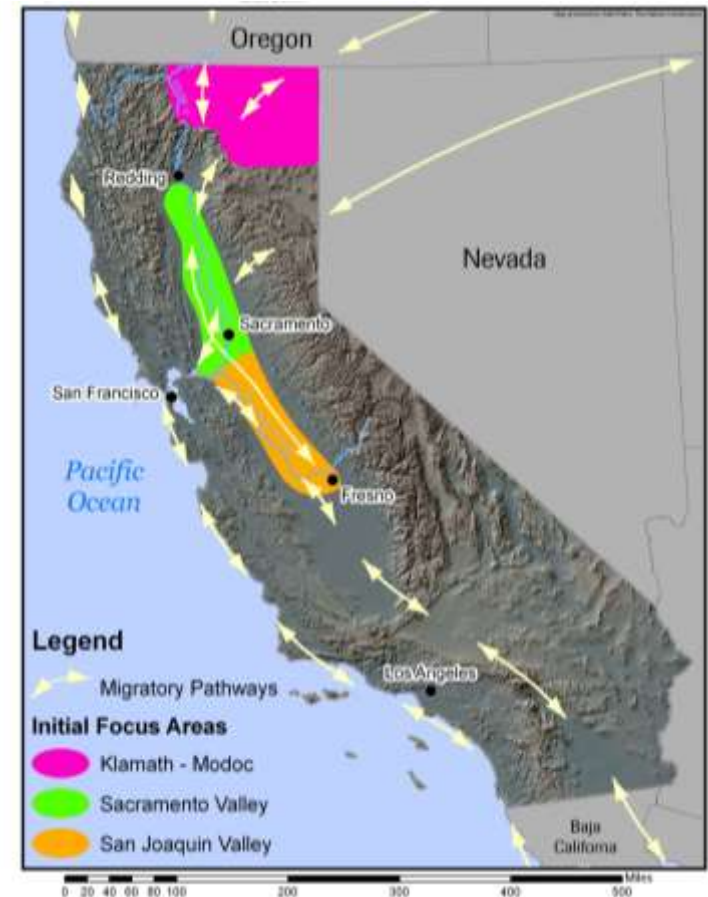


Focus: protect and restore critical habitats for migratory birds in 3 priority regions of California.

Central Valley Floodplain Forest Bird Survey (CVFFBS) is a product of this collaboration

Motivation for survey design –

- Site specific monitoring to evaluate effectiveness of project(s).
- Regional monitoring to show cumulative impact of restoration efforts.



CVFFBS: Survey Objectives

Legacy sites

1) Monitor riparian bird density at restoration sites with long-term monitoring; evaluate restoration project performance

Regional sites (Valley-wide)

1) Estimate regional densities within current riparian forest for as many species as possible

2) Track changes in regional bird populations in a manner that accounts for regional density and total area of riparian forest



CVFFBS: Survey Design

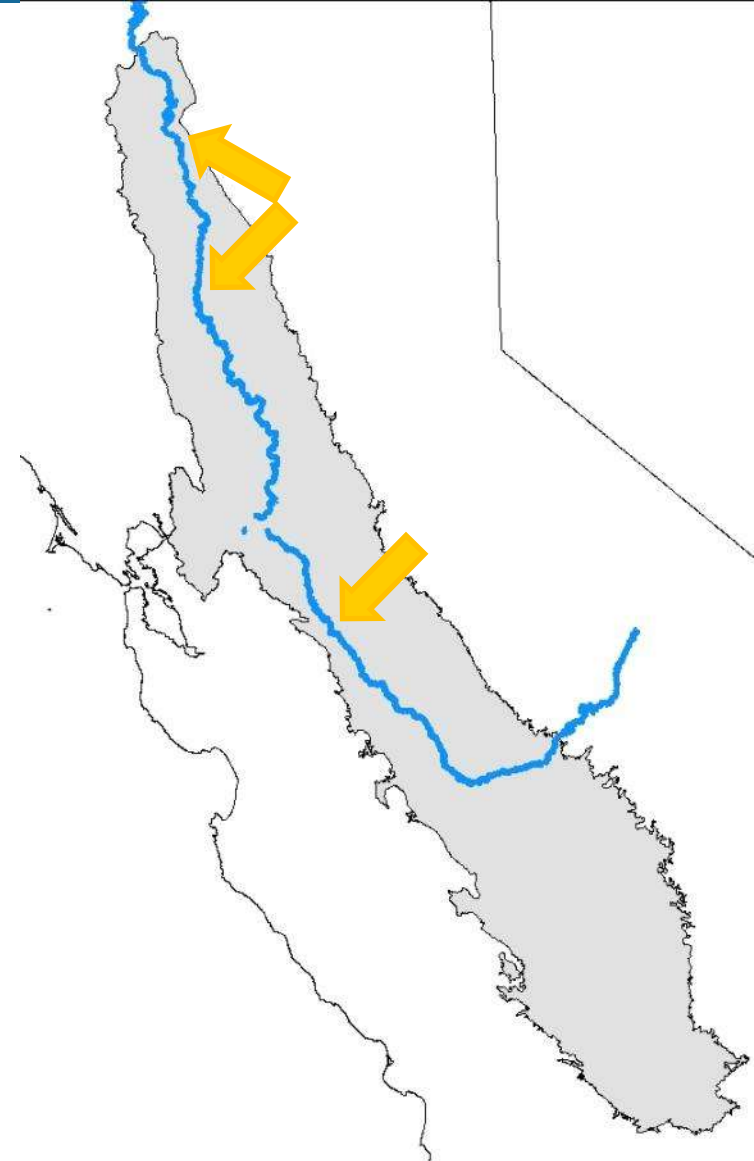
Legacy (Historic) Sites:

- Sacramento NWR complex
- San Luis NWR complex

Key sites: long-term data exist;
Represent a range of conditions

Sacramento Valley =
66 remnant, 77 restored

Over 230 point count locations



CVFFBS: Survey Design

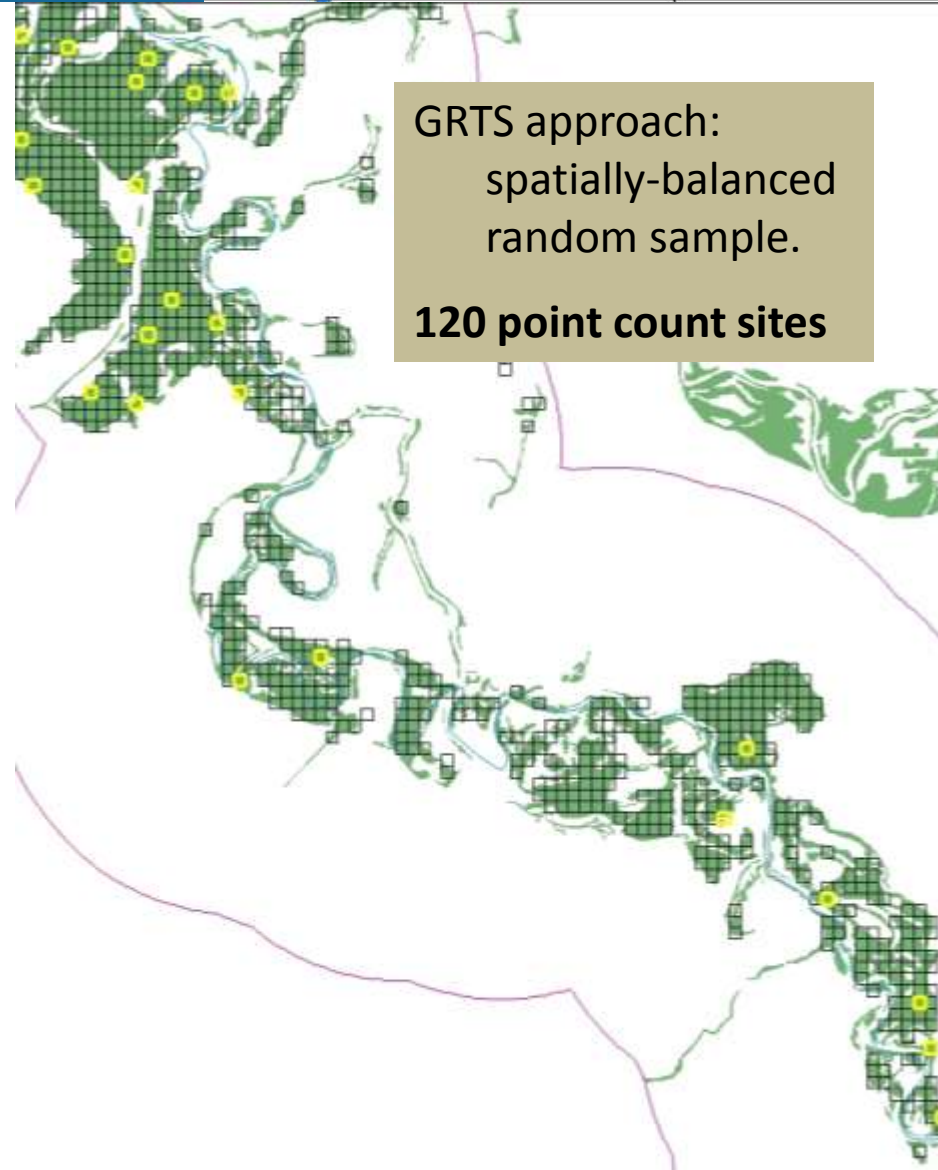
Regional Sites:

- Middle Sacramento River mainstem
- San Joaquin River mainstem

Comprehensive sample: yields **overall density estimates**, regardless of status, ownership, or other factors.

Used information on current riparian vegetation along the rivers:

*Geographical Information Center. 2012.
Medium-Scale Central Valley Riparian Vegetation.
<http://bios.dfg.ca.gov>*



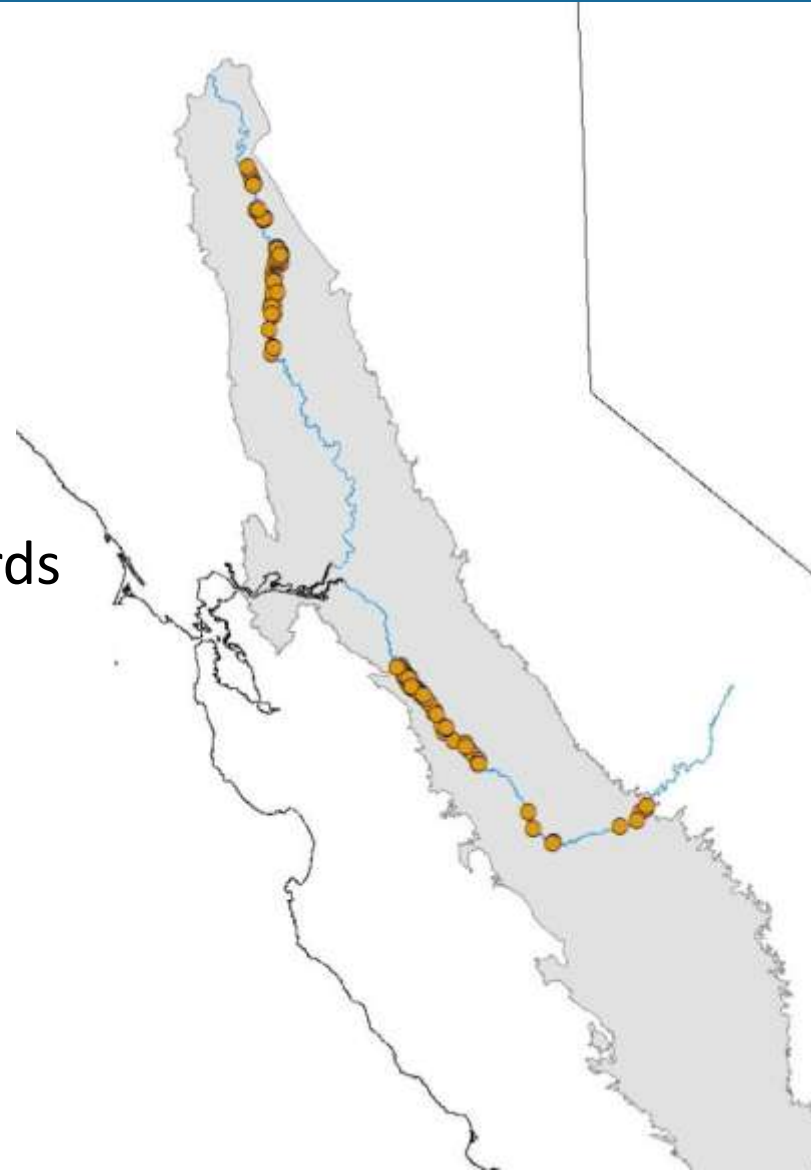
Broad coverage of the Central Valley

Successful survey in 2012:

Essential baseline information

- Breeding season surveys (May-June)
- Point count methods
- Record detections, distances, of all birds
- Analyses: Distance

Legacy + Regional = Over 350 sites
sampled across the Sacramento and
San Joaquin Valleys

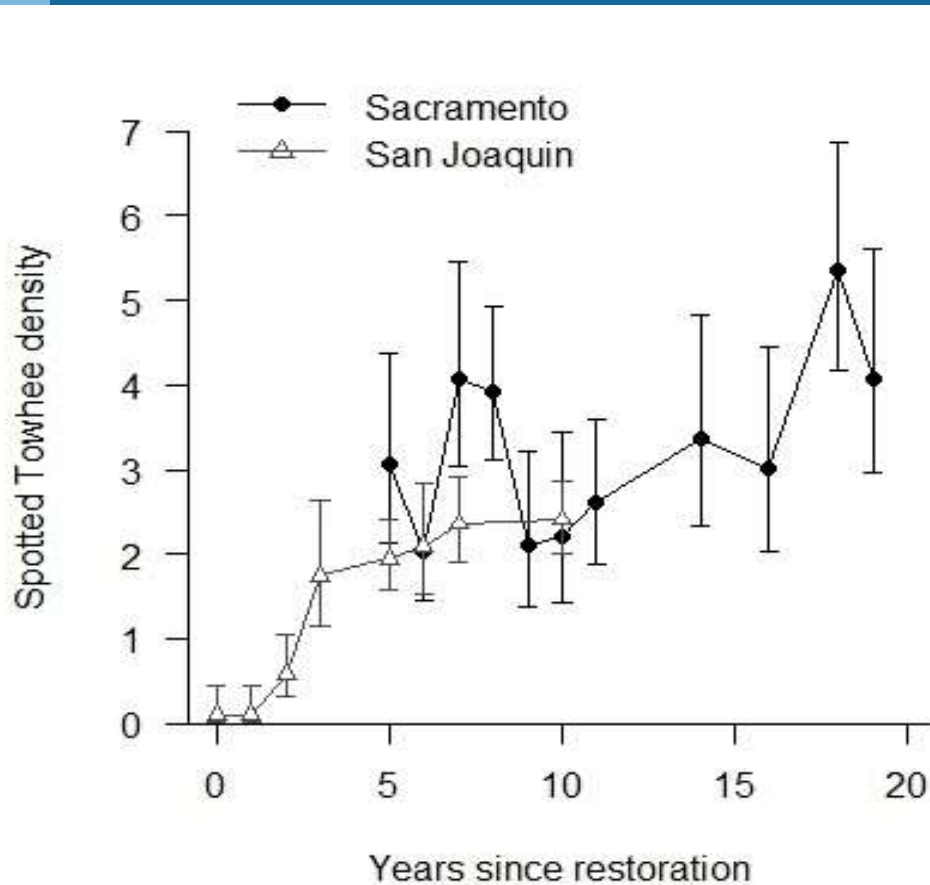


Central Valley Floodplain Forest Bird Survey

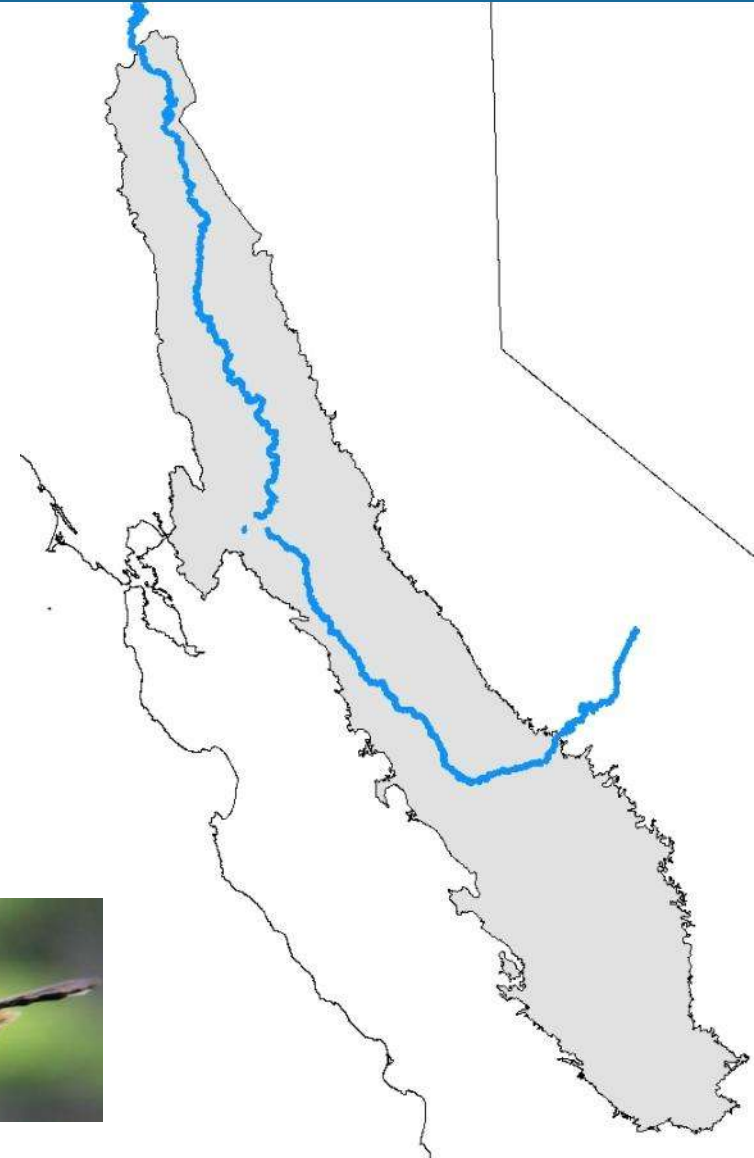
Many uses for these data!

1. Are individual & overall restoration efforts meeting conservation targets?
2. What is the bird community response?
3. *Status*: Regionally, what are focal species densities?
4. *Trends*: How are focal species densities changing?, and is there progress towards conservation targets?
5. Population, size & trends?

Are overall restoration efforts meeting species targets? (YES)



Spotted Towhee density,
by restoration year,
all legacy sites combined.



Riparian Bird Index: Community metric

Restoration Notes

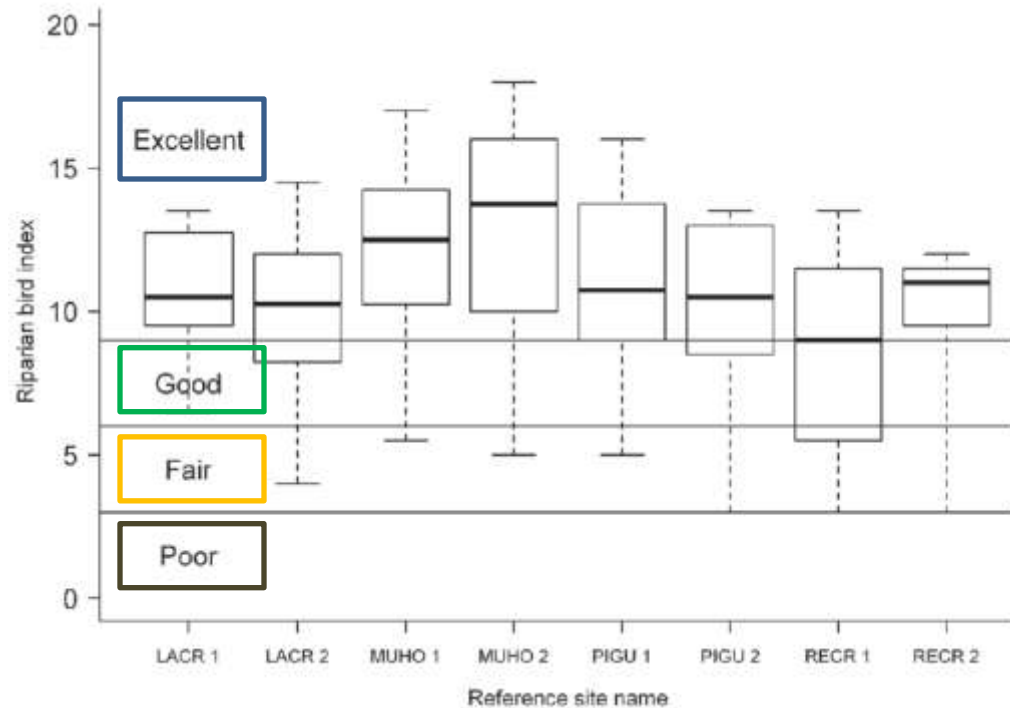
Restoration Notes have been a distinguishing feature of *Eco* geared toward introducing innovative research, tools, technology research results and updates on ongoing efforts. Please direct aesop.rutgers.edu.

Developing a Riparian Bird Index to Communicate Restoration Success in Marin County, California

Nathaniel E. Seavy (PRBO Conservation Science, 3820 Cypress Drive #11, Petaluma, CA 94954, nseavy@prbo.org) and Thomas Gardali (PRBO Conservation Science, tgardali@prbo.org)

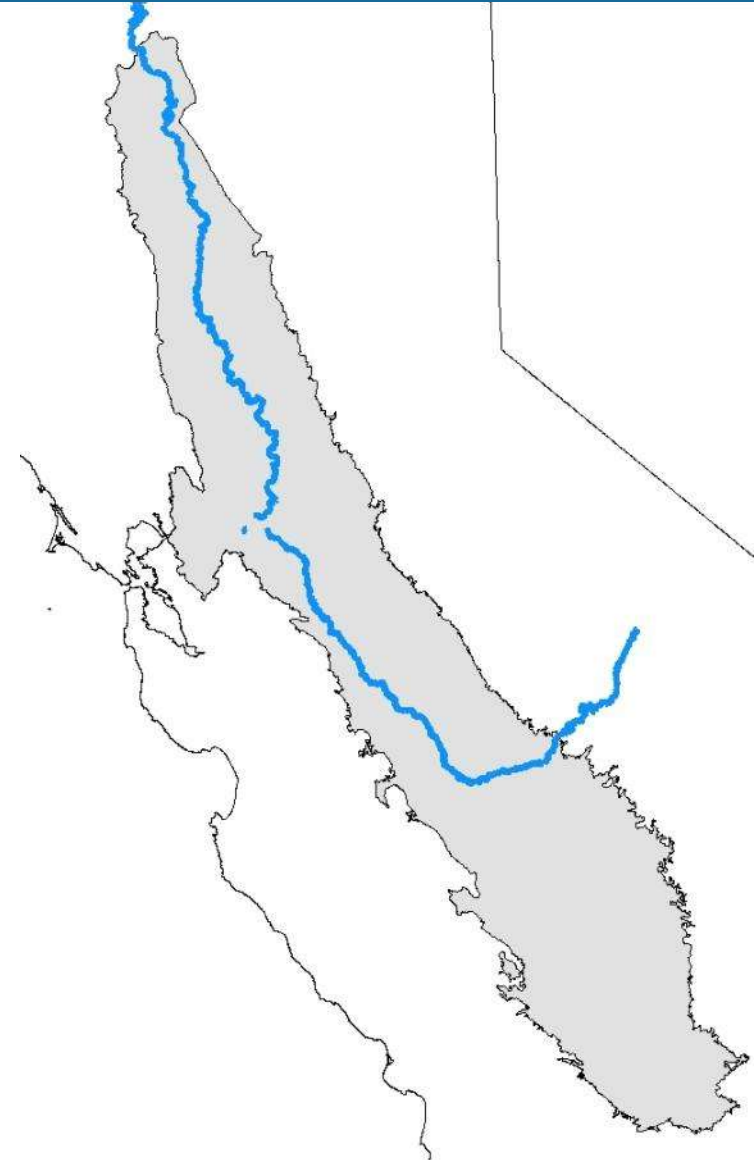
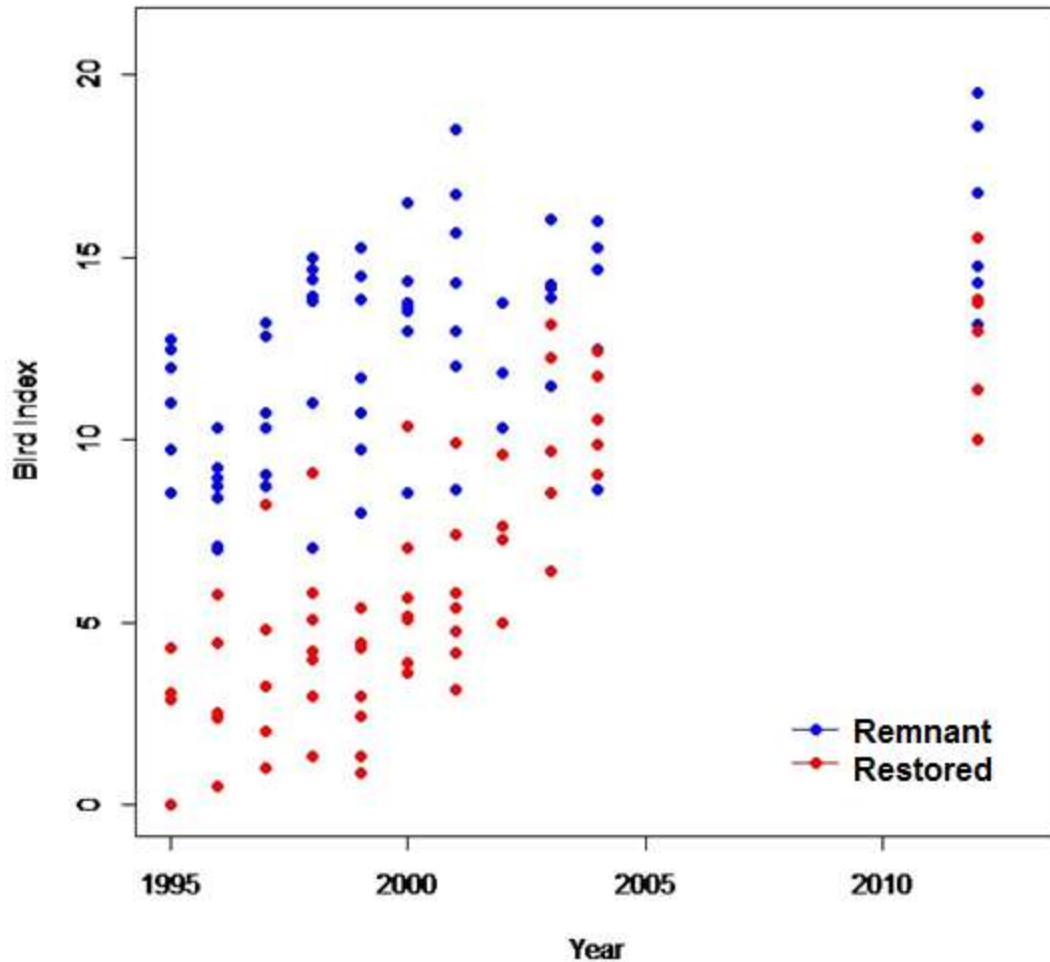
Despite being widely recognized as an important component of successful restoration, ecological monitoring to evaluate project success is often not conducted (Bernhardt et al. 2005). Even when projects are monitored, data may not be used to its greatest capacity, usually because monitoring has been conducted without specific measures of success (Ruiz-Jaen and Aide 2005). As a result, the ability to provide stakeholders with relevant and timely information about restoration progress is limited. There is a need to develop monitoring frameworks

- Species richness, weighted by habitat association



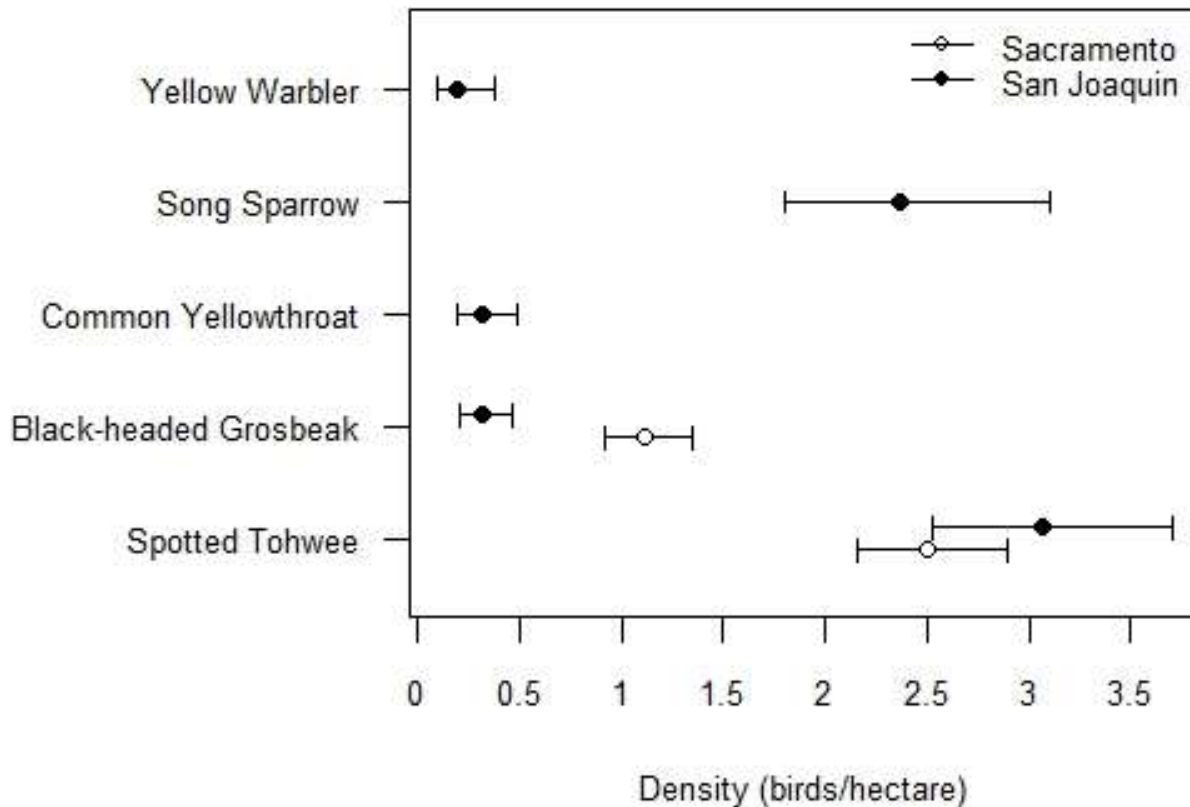
Is the bird community responding to restoration efforts? (YES)

Sacramento River Sites



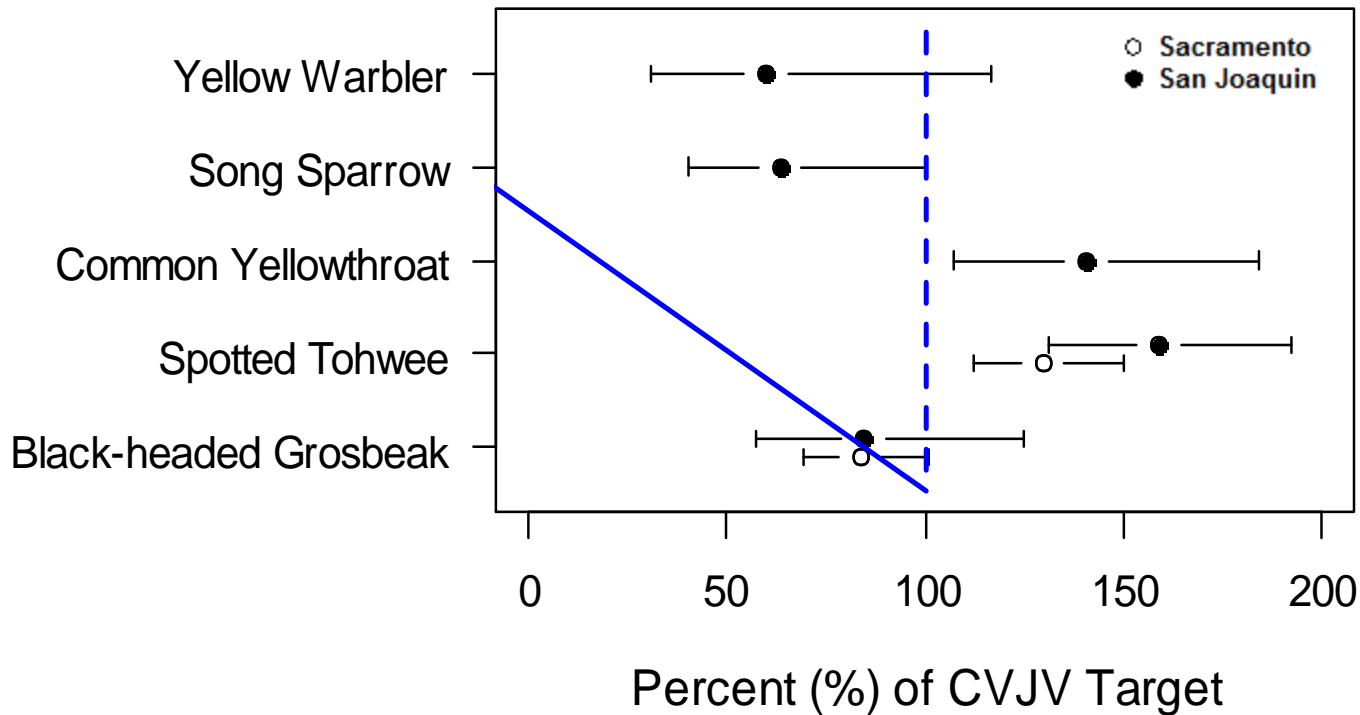
Regional surveys → Regional species status

Focal Species Density Estimates (2012)



Are densities in current riparian close to CVJV targets? (YES)

Focal Species Density estimates (2012) relative to CVJV Targets



Over time, how are focal species densities changing?

Regional Population Size & Tracking

Sacramento River Population Estimate:

<u>Species</u>	<u>Density</u> (birds/ha)	<u>Riparian area</u> (hectares) ¹	<u>Population</u> <u>size</u> (estimated)
Spotted Towhee	2.45	25,960	63,602
Black-headed Grosbeak	1.15	25,960	29,854

*1: CVRMP layer
Area in focal buffer only*

- Long-term tracking: understand how the overall population is changing...
Species-specific responses?
Community stability?



Conservation Application of CVFFBS

A second year of this survey effort is currently underway.

- Evaluating restoration success
- Updating population targets
- Conservation guidance & adaptive management
- Making restoration climate smart
- Focal & common species, community index
- Rare species information



Acknowledgements

Special thanks to Central Valley landowners who allowed us to survey birds on their property.



San Joaquin River Parkway
Explore. Experience. Enjoy!

2012 Fieldwork:

Mark Dettling, Kristin Sesser, Cory Gregory, Justin Bosler, Simon Avery

Contact: Michelle Gilbert – mgilbert@pointblue.org