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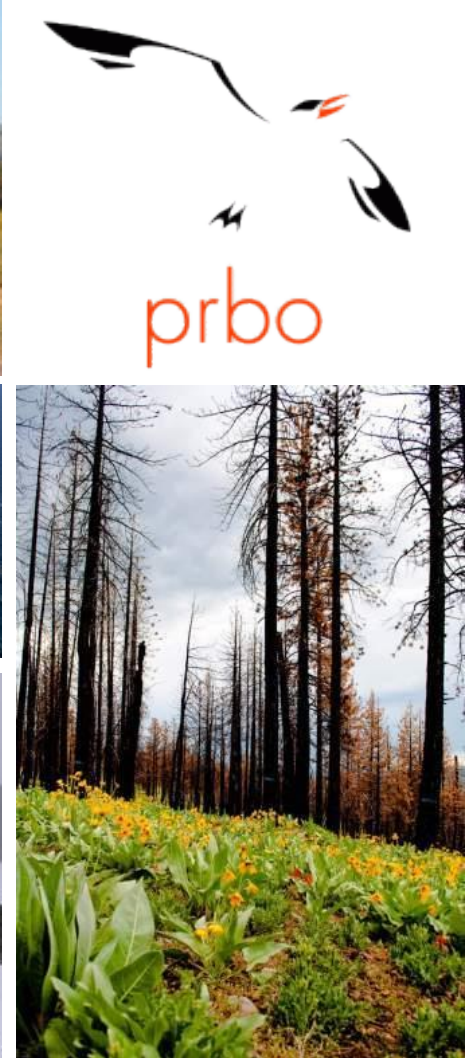
PRBO Conservation Science



Effects of vegetation structure and grazing on winter landbird communities on the Sacramento River National Wildlife Refuge

Nathaniel Seavy, Renee Cormier, Jessica Hammond, Joe Silveira, and Greg Golet

Applied bird and ecosystem science to advance conservation for wildlife and people



Restoration works!

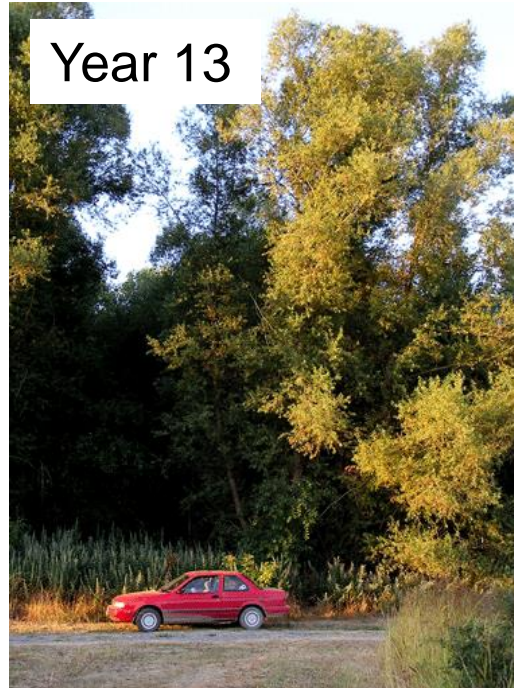
Year 1



Year 3



Year 13



SCIENTISTS CREDIT THE RESTORATION OF THOUSANDS OF ACRES OF HABITAT WITH RESURGENCE OF WILDLIFE POPULATION



A tagged golden-crowned sparrow waits to be released after being caught in a mist net at a wildlife preserve.

Along the Sacramento, songbirds flourish again

By Chris Martin
SACRAMENTO ENVIRONMENTAL WRITER

FRISLAN ISLAND, Colusa County — It may have been doing its part for science, but that didn't make the biologist any happier.

It squawked in protest on a recent overcast day as ecologist Michael Rogers gently blew on its breast plumage, examined its skull and measured its wing feathers, judging its age and health.

"The birds can get pretty irascible," Rogers said as he carefully blew feathers in the small bird's face and released it. "Most of the other species are much more docile."

Rogers and fellow researchers with the Golden Gate Conservancy have been working to protect birds and their ecosystems, starting in 1996 with the 1,000-acre Frislan Island along the Sacramento River corridor — a remarkably high and long island. After years of diligent management by the Conservancy, but the Sacramento River region is an exception. It's a natural refuge of thousands of acres of habitat and still the toughest remaining tract of the nation's greatest conservation legacy.

Rogers and Chris Martin, Chris Martin (left) and Greg Lyall of the State Conservancy work for birds along the Sacramento River.



Talk outline

Restoration beyond riparian forests – new questions about wildlife and management tools

A study design to look at impacts of grazing

Preliminary results for wintering bird communities
habitat associations
grazing effects

Future directions



As restoration moves beyond forests, so do the management questions



How do birds and other wildlife use these grasslands and elderberry savannahs?

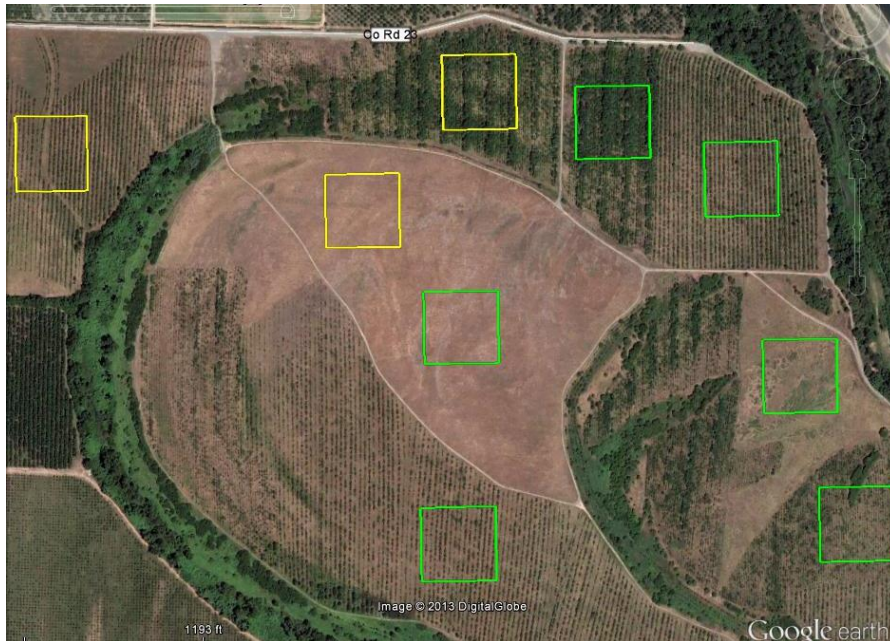
How does bird use vary between winter and spring?

Can restoration designs target specific bird groups?

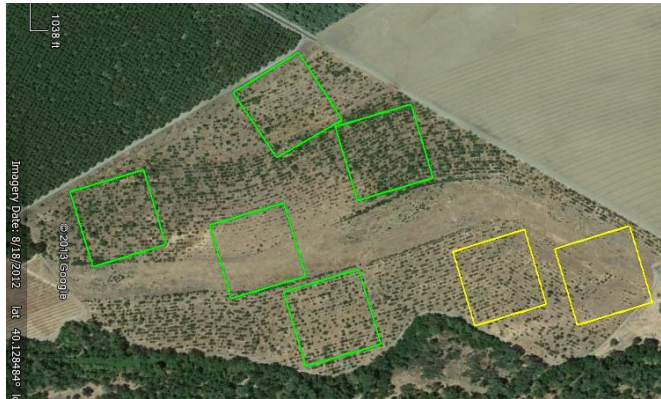
Can grazing achieve management objectives without impacting wildlife benefits?

Study design to evaluate response of wildlife and vegetation to grazing

Sul Norte



La Barranca



Capay



Ungrazed

Grazed

Prescribed grazing



- Spring (May-June) or Winter (January-February)
- Target of reducing residual dry matter to 3-8 inches and removing thatch
- Grazing controlled with movable fencing and carefully monitored

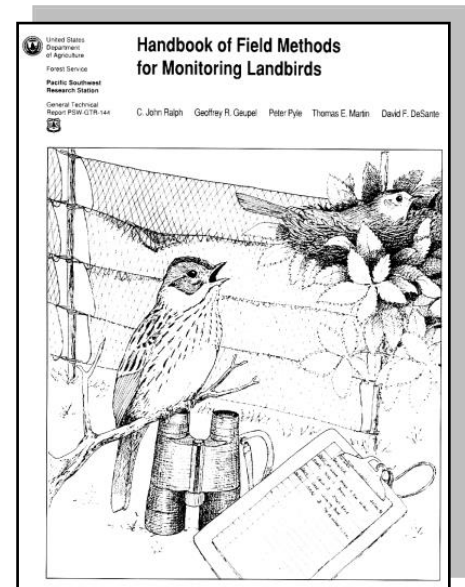
This winter, we conducted vegetation and bird surveys at each plot

Vegetation

- 2 50-m transects on each plot
- Line intercept measurements of shrub and tree cover
- Quadrat sampling of grass cover

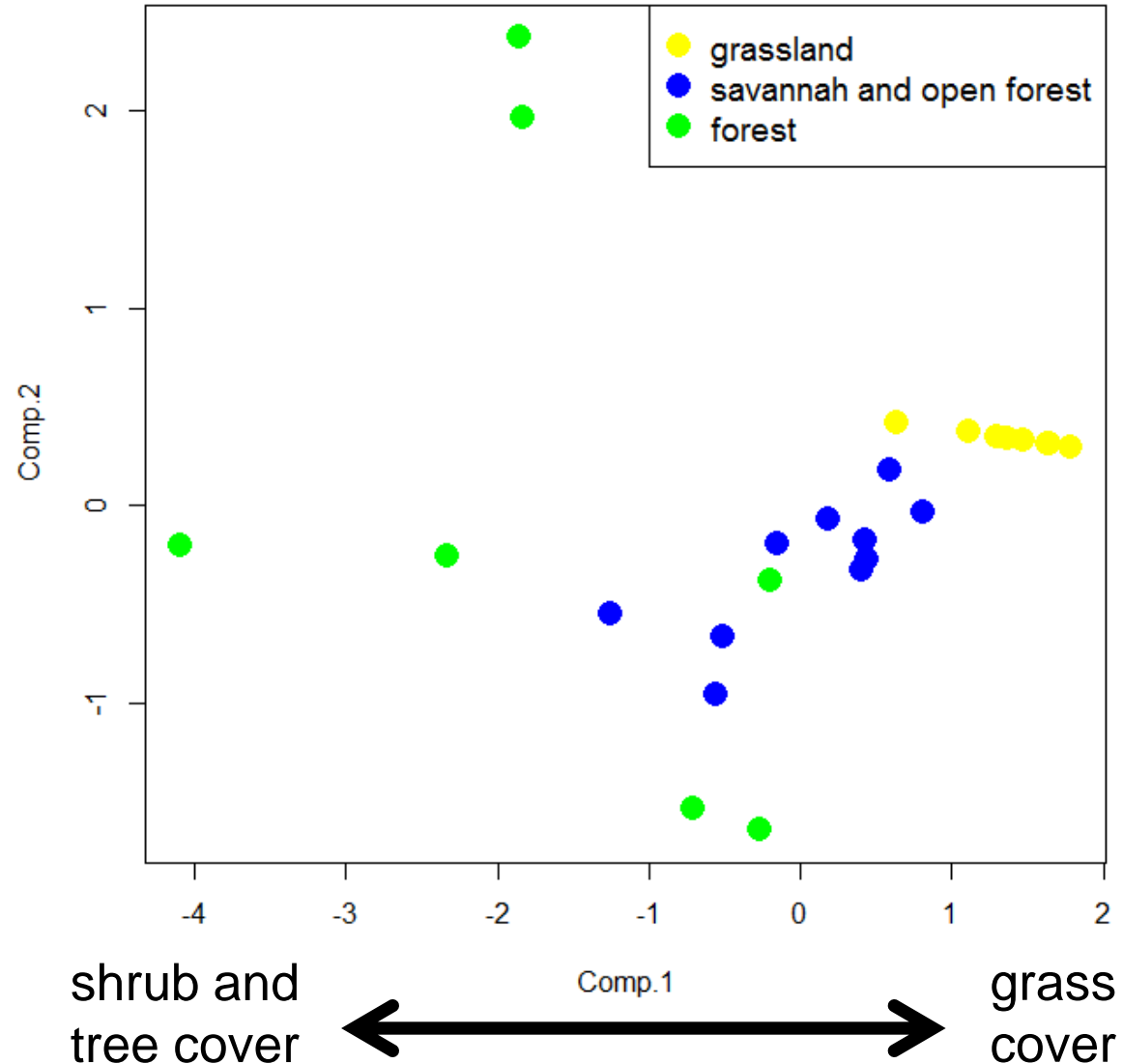
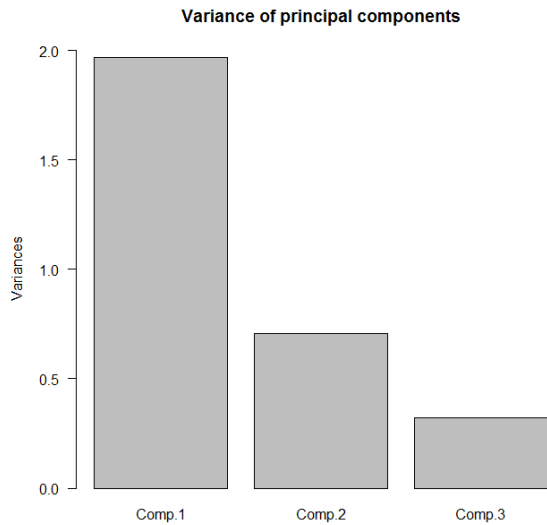
Wintering bird abundance: area search method

- 1-4 ha plot
- Observers spend ~20 minutes covering the area
- All birds encountered recorded
- Flexibility to track down unknown calls, mixed-flocks, etc.



Principal component analysis of three vegetation metrics

% grass cover
% shrub cover
% tree cover



Lumped birds into habitat association guilds

Grassland-associated birds

Western Bluebird

Western Meadowlark

Savannah Sparrow

Shrub-associated birds

California Towhee

Dark-eyed Junco

Golden-crowned Sparrow

Lincoln's Sparrow

Song Sparrow

White-crowned Sparrow

White-throated Sparrow

Northern Mockingbird

Forest-associated birds

American Goldfinch

American Robin

Bushtit

House Finch

House Wren

Lesser Goldfinch

Northern Flicker

Nuttall's Woodpecker

Oak Titmouse

Yellow-rumped Warbler

Brown Creeper

Downy Woodpecker

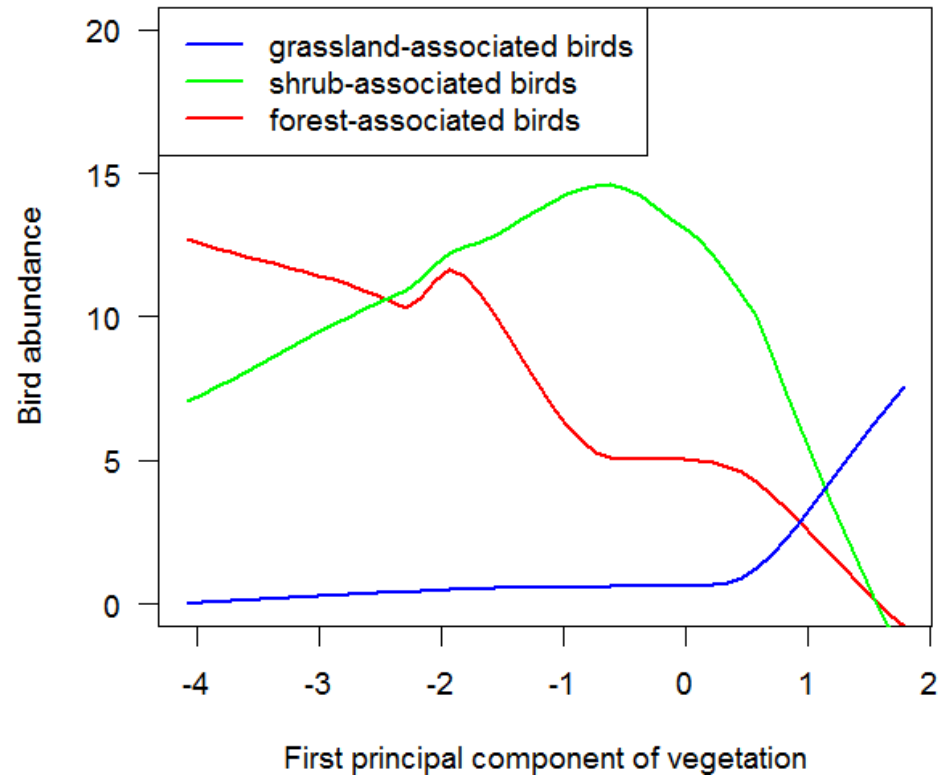
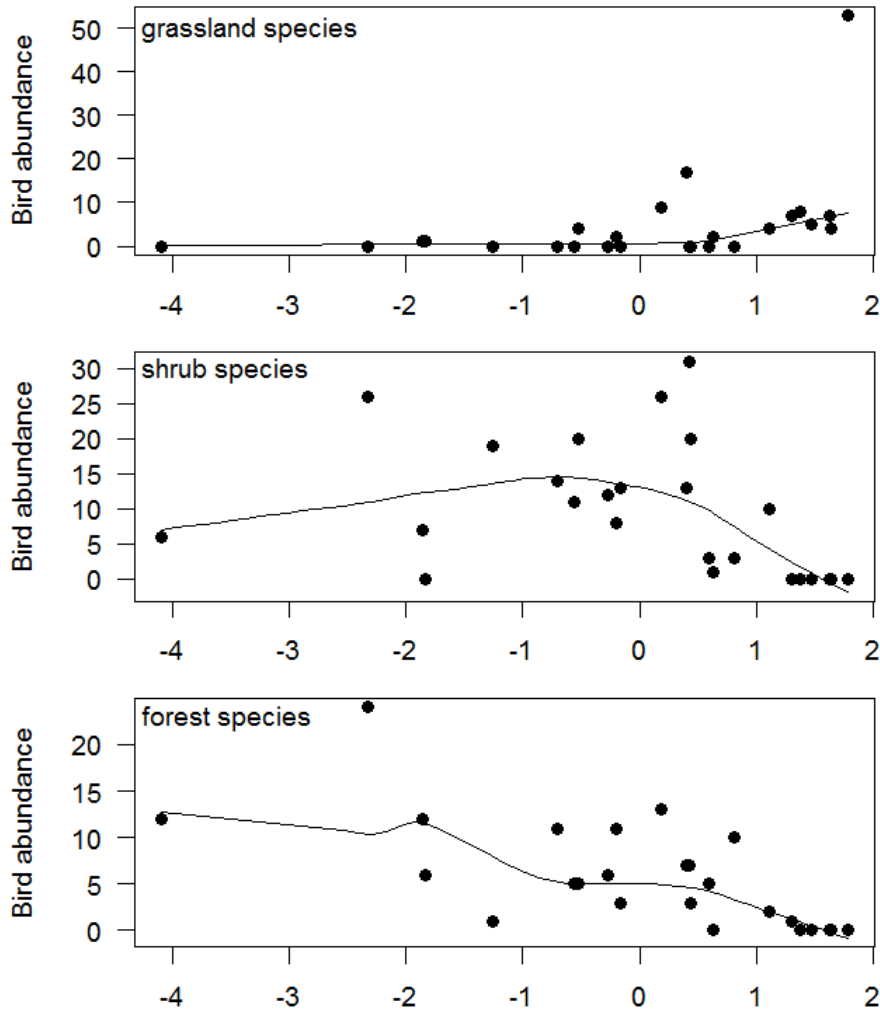
Hermit Thrush

Ruby-crowned Kinglet

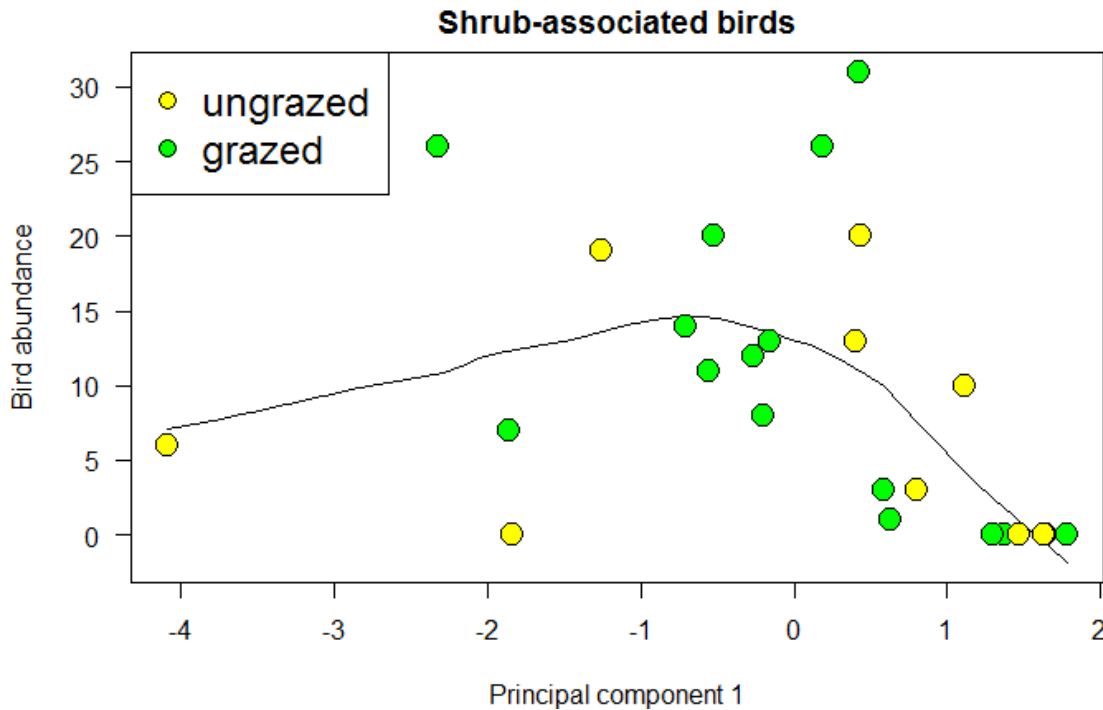
For each guild we used the maximum number of individuals detected over the two surveys as our index of abundance

Simple question: how does bird abundance vary across the habitat gradient?

How does bird abundance vary across the vegetation gradient?



After controlling for vegetation, is variation associated with grazing?



Are residuals of grazed and ungrazed plots different?

Grassland birds; $p = 0.69$

Shrub-associated birds; $p = 0.90$

Forest-associated birds; $p = 0.23$

Conclusions and future work

- Vegetation structure predicts wintering bird abundance
 - breeding bird communities have just been surveyed
- Variation in bird abundance not associated with grazing
 - grazed and ungrazed treatments will be maintained to understand long-term impacts



Acknowledgements



Special thanks to: Karen Holl, Adrian Frediani,
Jennifer Isola, John Hunt