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

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Applied bird and ecosystem science to advance conservation for wildlife and people
Restoration works!

Year 1

Year 3

Year 13
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
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
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