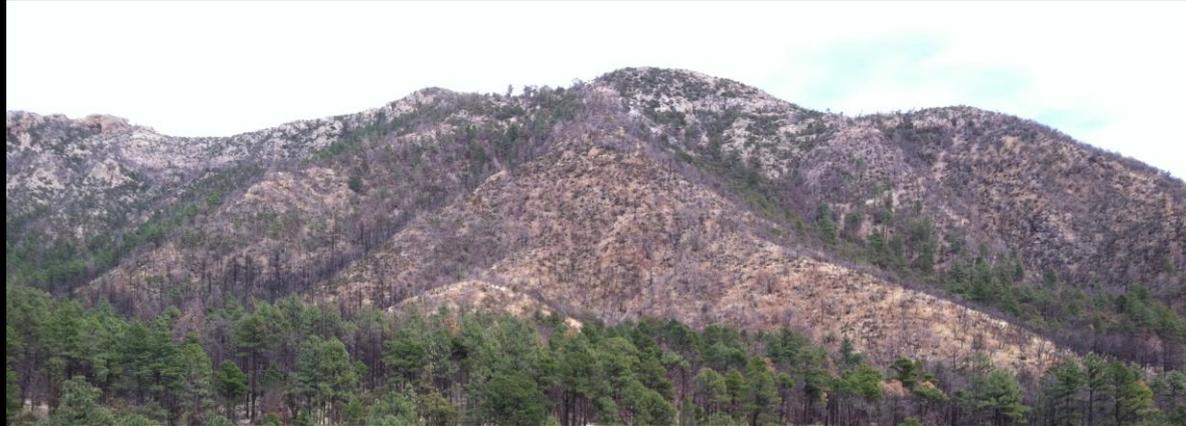




United States Department of Agriculture

Exploring pyrodiversity and biodiversity: effects of fire on bird and small mammal communities of the Southwest



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Forest Service November 19, 2020
Rocky Mountain Research Station

Wildlife Response to Fire



Pyrodiversity and species diversity



- Landscape fire mosaic
 - Time since fire
 - Scale
 - Severity
 - Vegetation type
- Nuanced relationship



Landscape Heterogeneity and Management

- Collaborative Forest Landscape Restoration Projects
- (Example) Four Forest Restoration Initiative goals:
 - Restore structure, pattern, composition, and health of fire-adapted PP ecosystems
 - Reduce fuels and risk of severe wildfire
 - Provide for wildlife and plant diversity
 - Creating sustainable industries



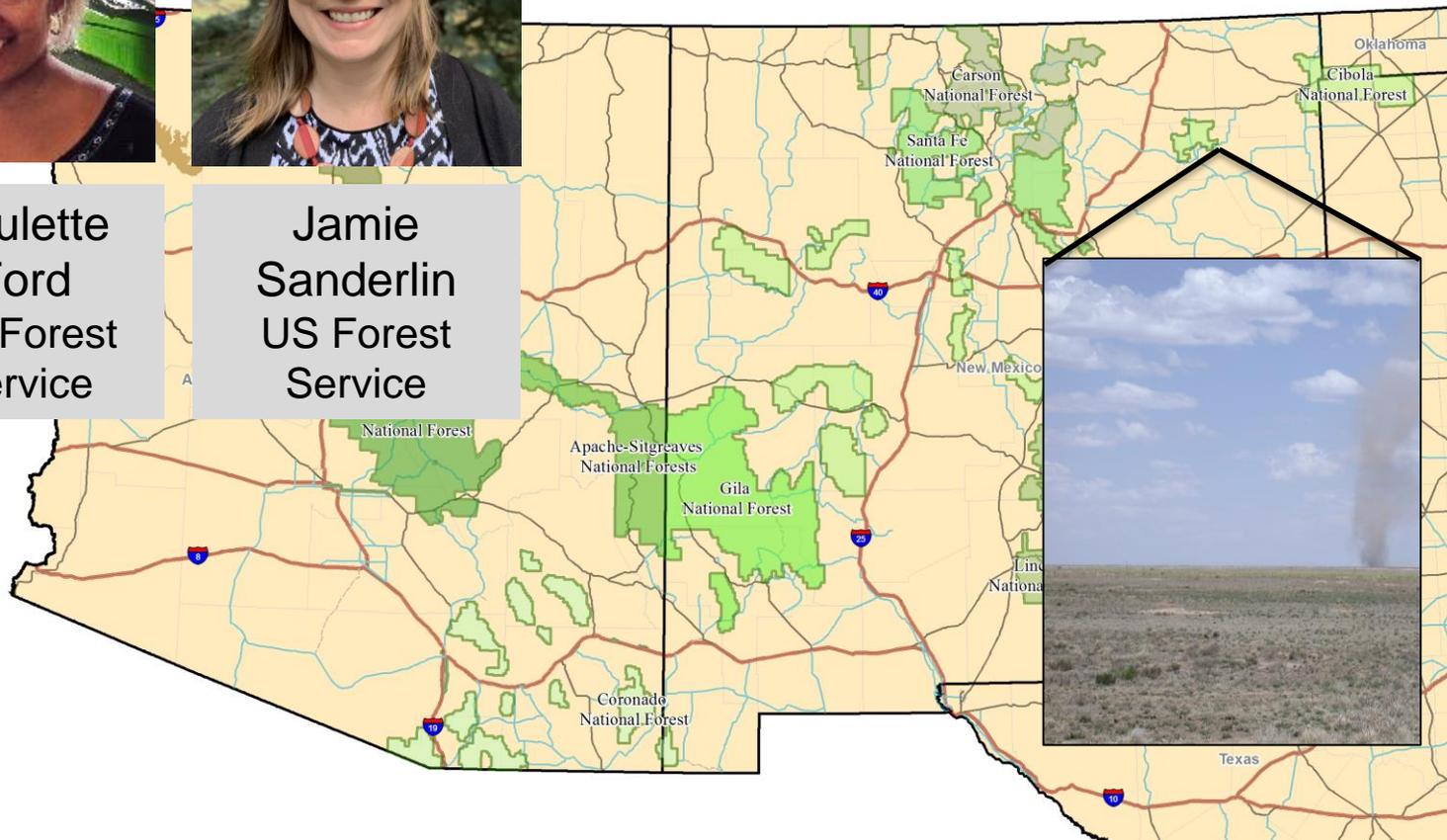
Case study: small mammals



Paulette
Ford
US Forest
Service

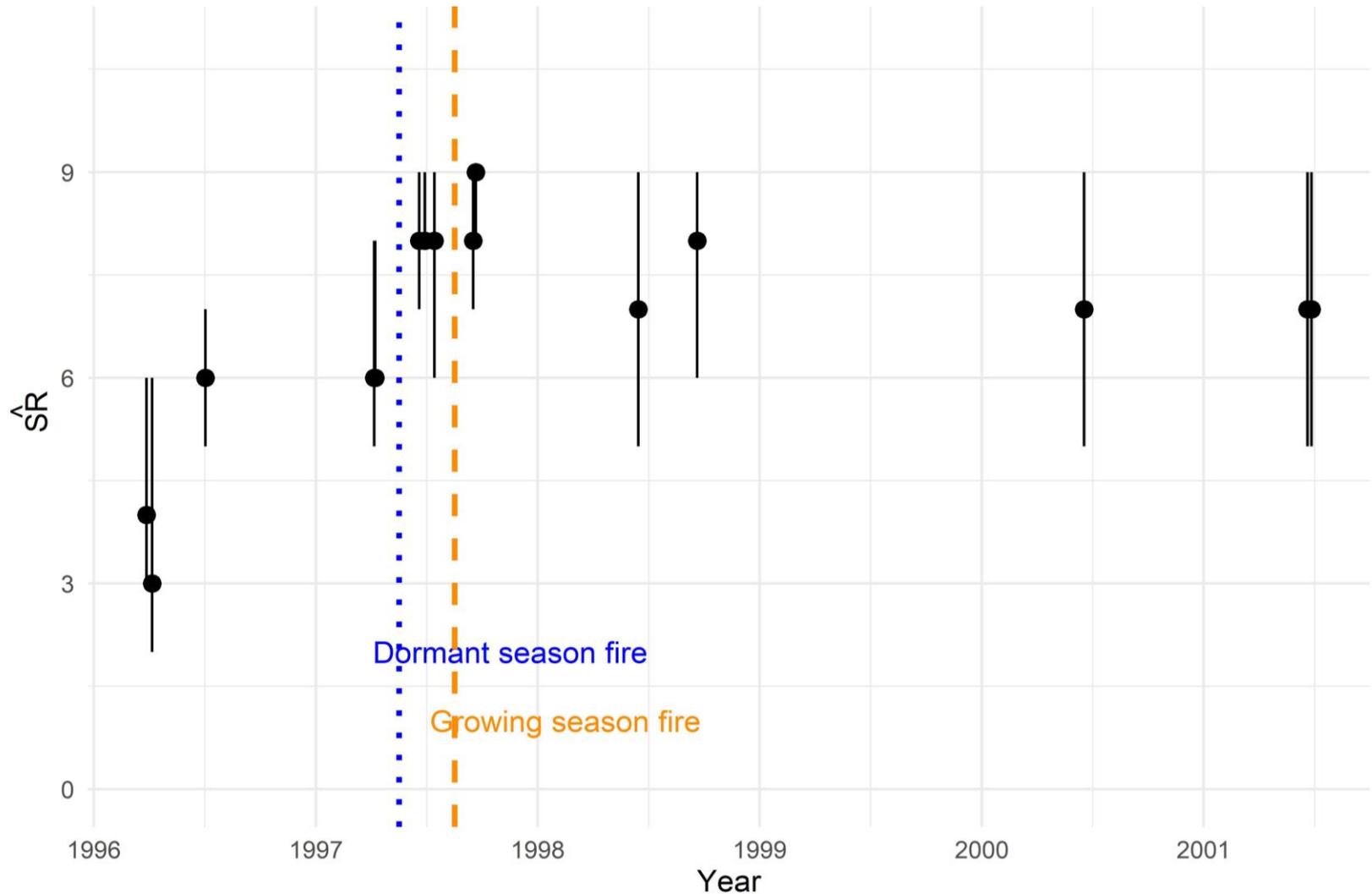


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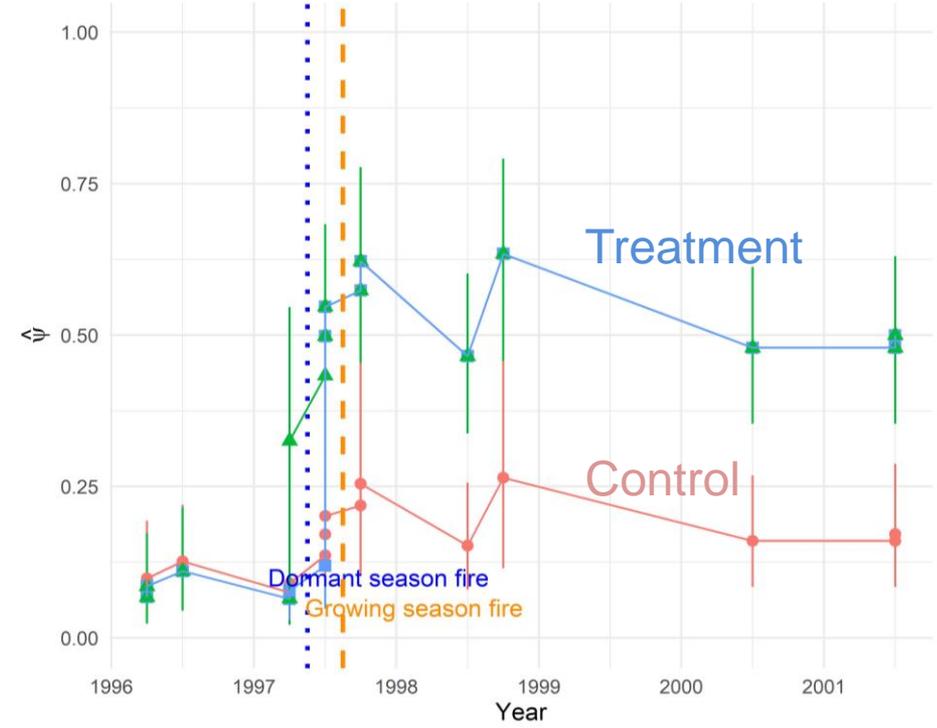
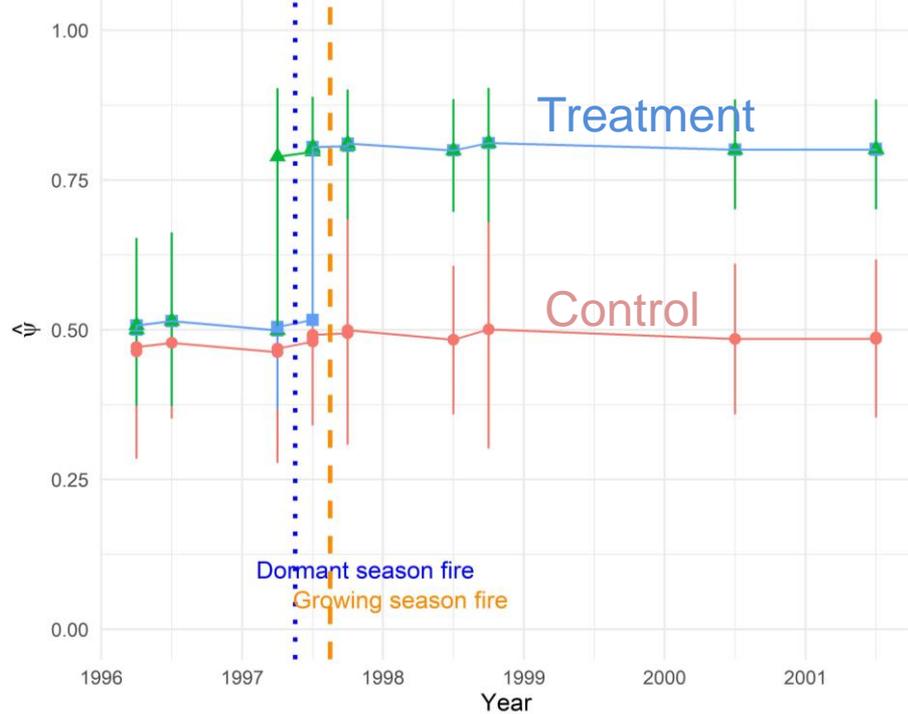
Kiowa National Grassland of Cibola NF

Species richness increases after prescribed fire



Ford and Sanderlin. Effects of dormant- vs. growing-season fire in shortgrass steppe: small mammal occupancy, survival and abundance *In prep.*

Occupancy increases with treatment



Northern Grasshopper Mouse

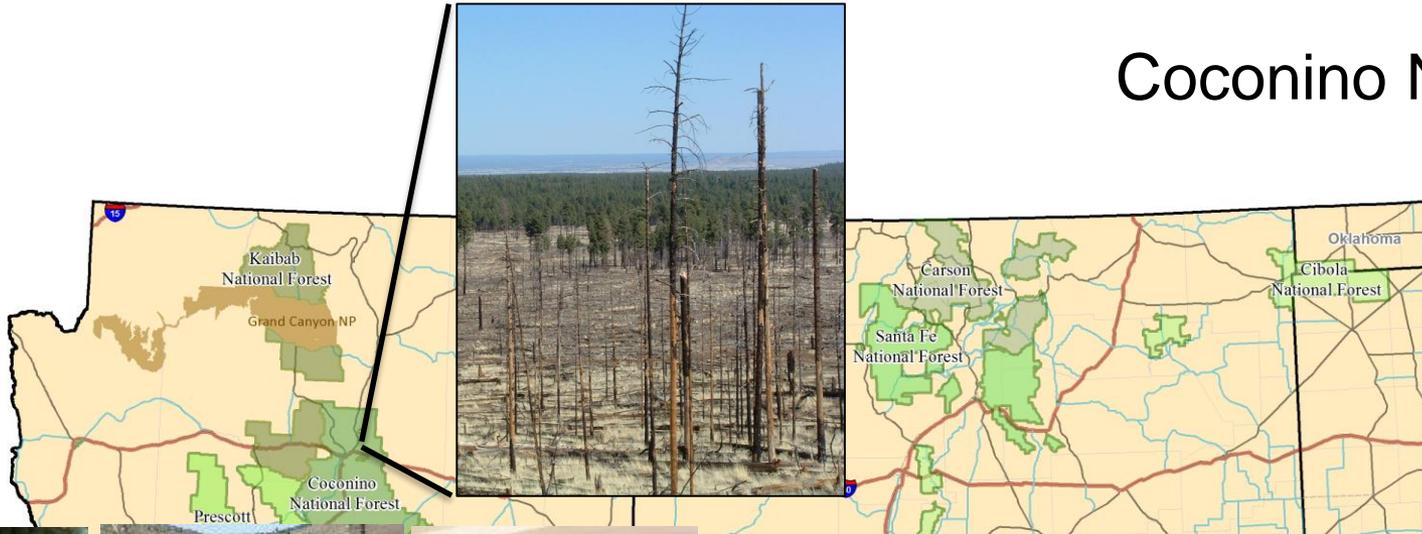


Hispid Pocket Mouse

Ford and Sanderlin. Effects of dormant- vs. growing-season fire in shortgrass steppe: small mammal occupancy, survival and abundance *In prep.*

Case Study: Northern Arizona Birds

Coconino NF



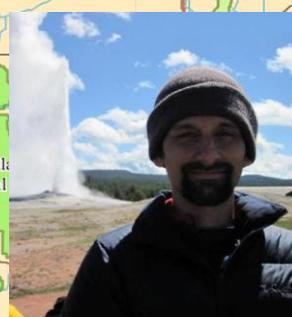
Jamie Sanderlin
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William Block
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Brenda Strohmeier
US Forest Service



Quresh Latif
Bird Conservancy of the Rockies (formally US Forest Service)

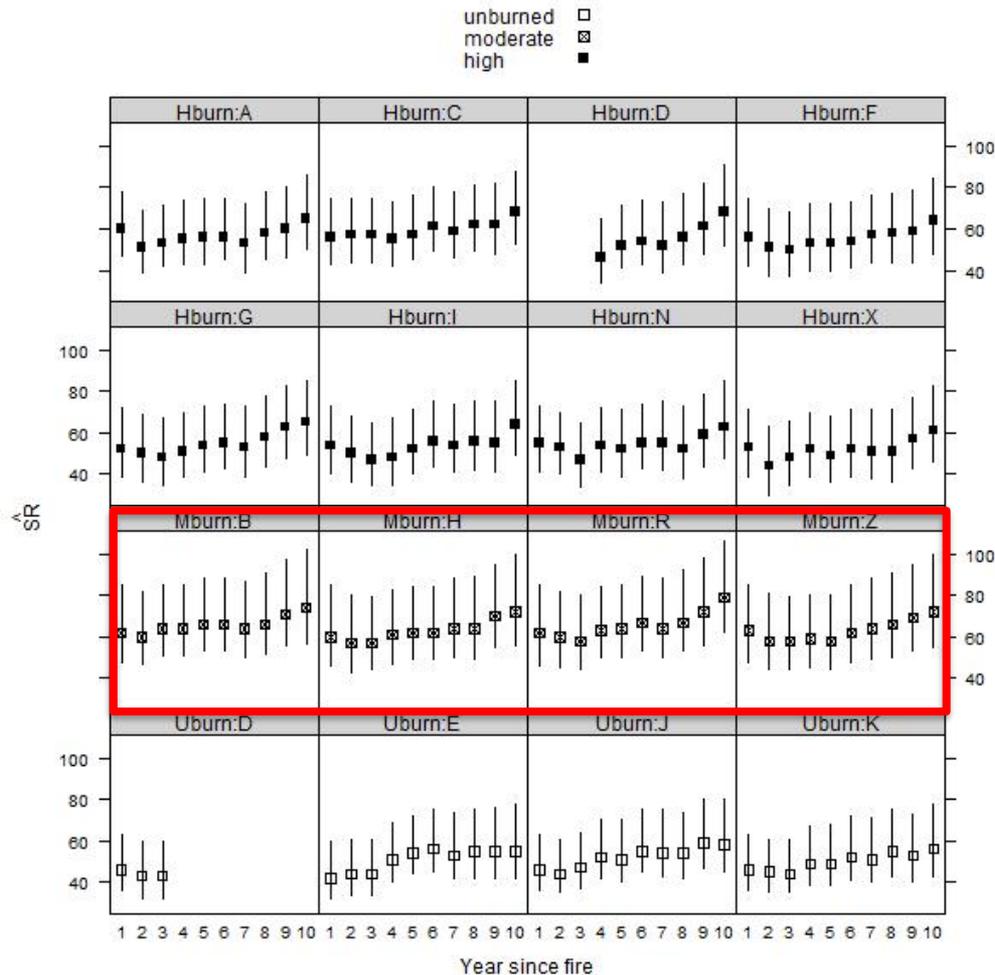


Victoria Saab
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Jonathan Dudley
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Species richness differs by burn severity, time



Moderate severity

Highest SR

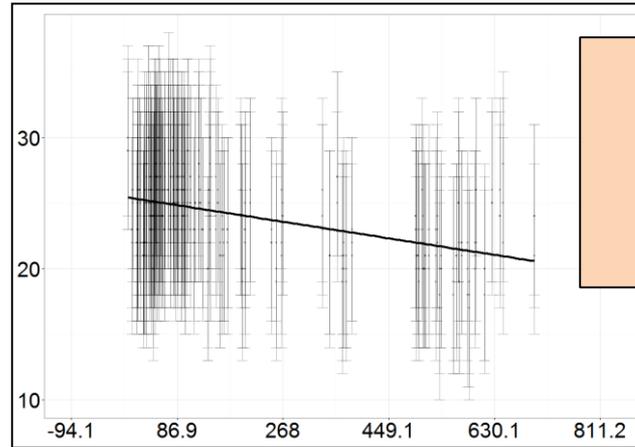
Transect scale

Sanderlin, JS.; Block, WM; Strohmeyer, BE. 2016. Long-term post-wildfire correlates with avian community dynamics in ponderosa pine forests [Chapter J]. In: Ralston, Barbara E., ed. Proceedings of the 12th Biennial Conference of Research on the Colorado River Plateau. Scientific Investigations Report 2015-5180. Reston, VA: U.S. Geological Survey. p. 89-101.

Bird species richness differs with fire regimes

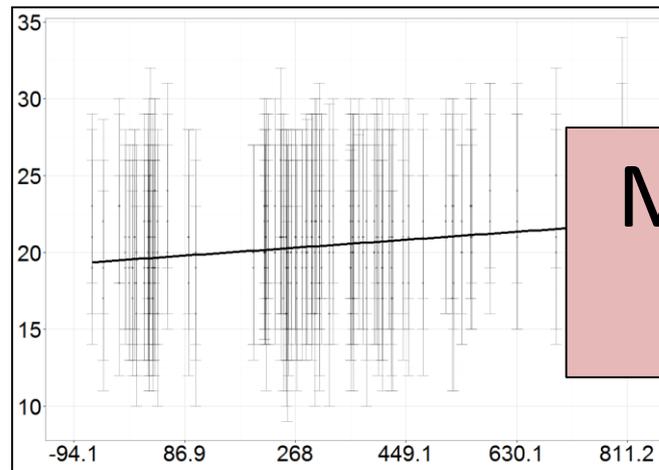


Species Richness



Low-severity
fire regime

Coconino NF, AZ



Mixed-severity
fire regime

Payette NF, ID

Burn severity (Δ NBR)

Point scale

Latif QS, Sanderlin JS, Saab V.A, Block WM, Dudley JG. 2016. Avian relationships with wildfire at two dry forest locations with different historical fire regimes. *Ecosphere*. 7(5): e01346.

Case Study: Birds in the Sky Islands



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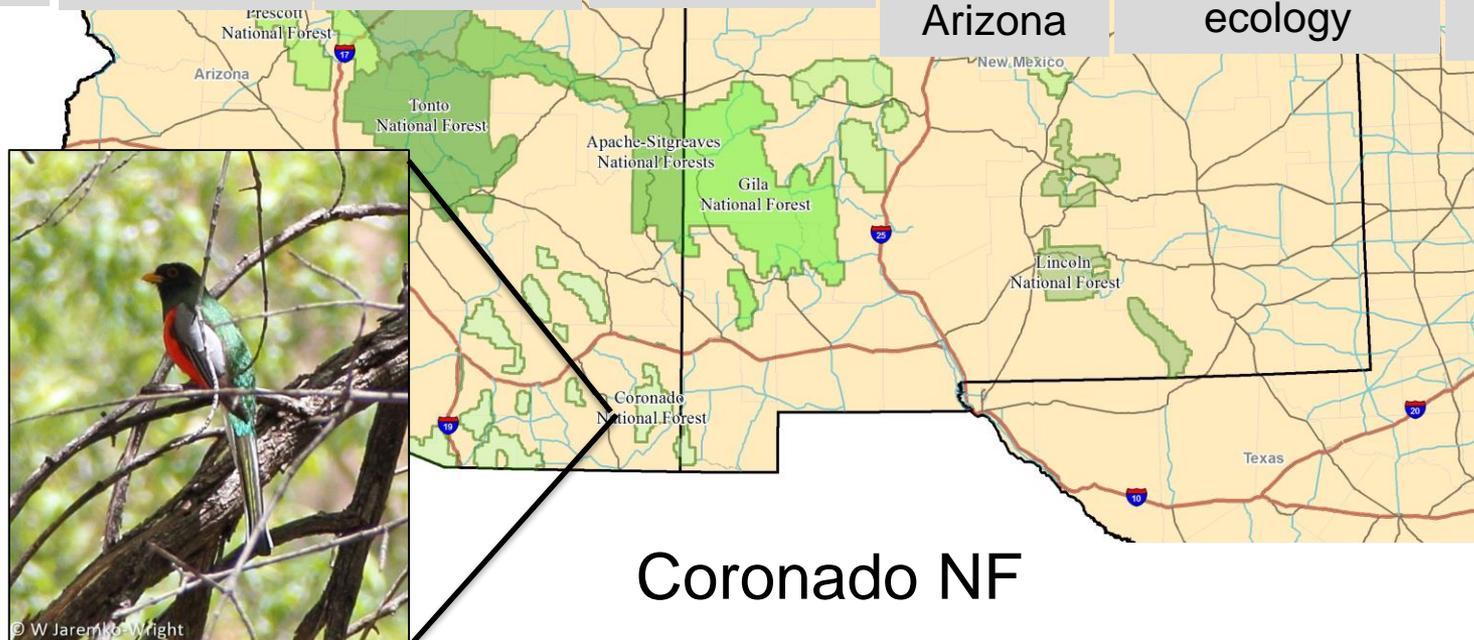
Aaron Flesch
University of Arizona



Sandra Haire
Laboratory Landscape ecology



Miguel Villarreal
US Geological Survey



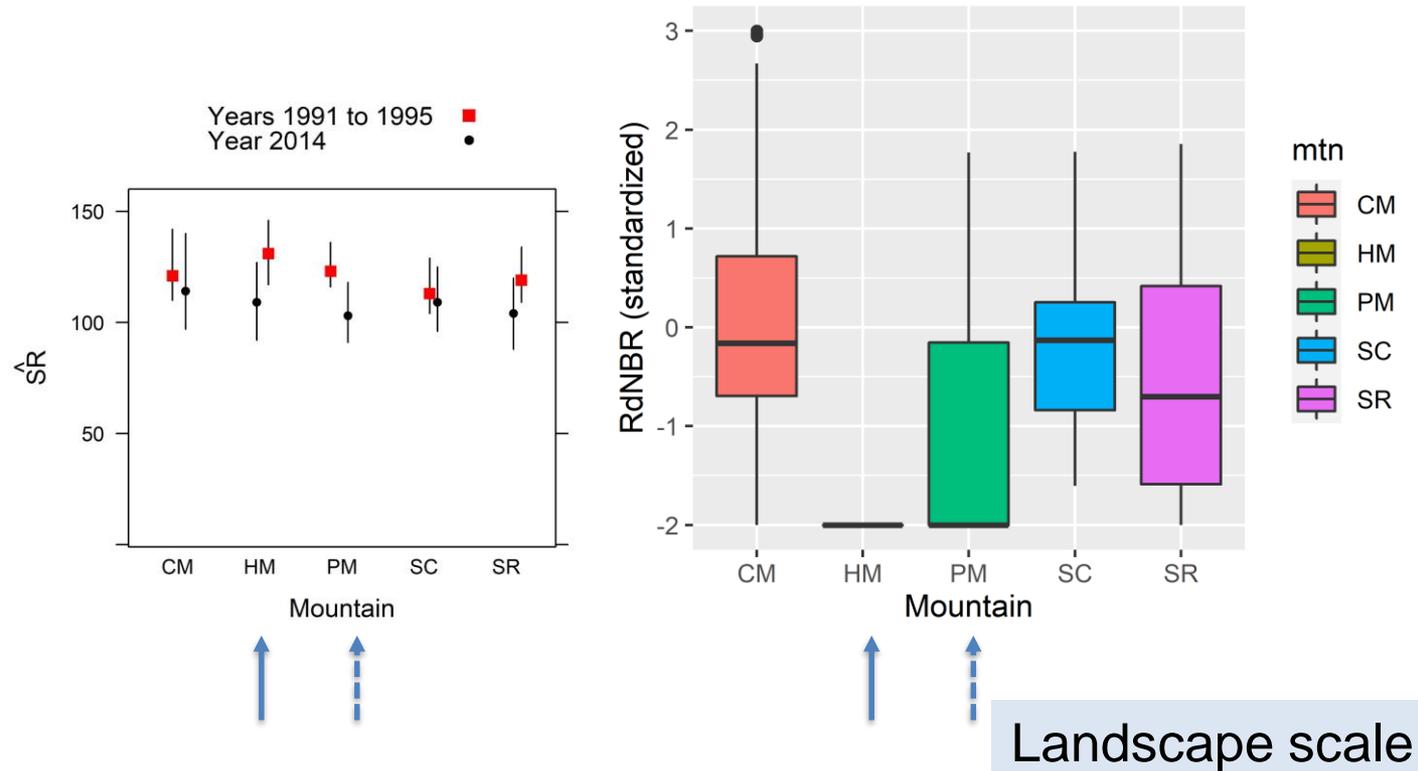
Coronado NF



Sky Islands



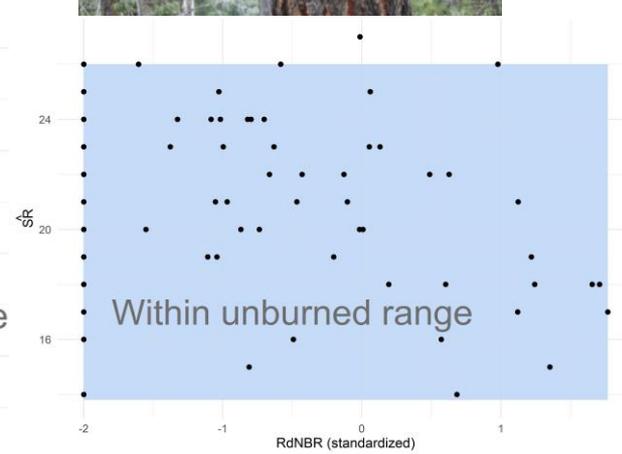
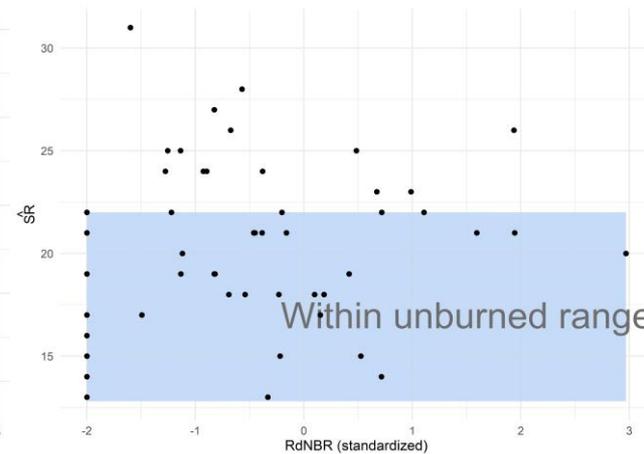
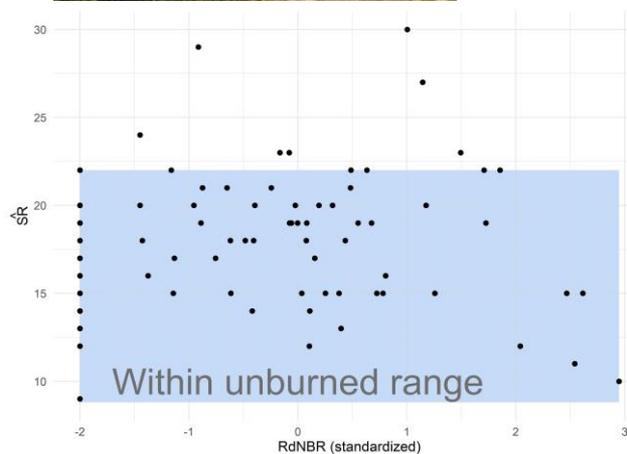
Species richness change differs with fire severity



Sanderlin JS, Block WM, Ganey JL, Iniguez JM. 2013. Preliminary assessment of species richness and avian community dynamics in the Madrean Sky Islands, Arizona. In: Proceedings. RMRS-P-67. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 180-190.

Sanderlin JS, Block WM, Ganey JL, Iniguez JM. Assessing wildfire effects on avian communities in the Arizona Sky Islands. *In prep*

Species richness depends on current vs. historical fire regime



Current vs. historical fire regime

diverges

similar

diverges

Villarreal ML, Iniguez JM, Flesch AD, Sanderlin JS, Cortés Montaña C, Conrad CR, Haire SL. 2020. Contemporary Fire Regimes Provide a Critical Perspective on Restoration Needs in the Mexico-United States Borderlands. *Air, Soil and Water Research*, 13, 117862212096919.

Sanderlin JS, Block WM, Ganey JL, Iniguez JM. Assessing wildfire effects on avian communities in the Arizona Sky Islands. *In prep*

Fire and Wildlife General Themes



- ‘Winners’ and ‘losers’
- Landscape fire mosaic
 - Time since fire
 - Scale
 - Severity
 - Vegetation type
- Importance of historical and current fire regimes for restoration



Acknowledgments



- Friends of Cave Creek Canyon
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- The Nature Conservancy, Fort Huachuca, Santa Rita Experimental Station, Audubon Research Ranch

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