# The Impact of Beavers on Bird Communities in Landscapes Affected by Wildfire

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## Background

- Wildfires are increasing in frequency and severity. Birds are heavily impacted by wildfire because birds depend on vegetation for habitat[1]
- Beavers increase riparian habitat and vegetation, increasing overall habitat diversity[2]
- Little is known about the interaction between beavers and wildfires with respect to bird diversity
- Beavers may have the potential to buffer the impacts of wildfire on birds through wetland expansion

## Questions

- How does beaver presence and wildfire history affect bird diversity and community composition?
- Could beavers be used to potentially buffer the effects of wildfire on bird communities?

## Methods

- Study sites located in the Methow Valley and contained all combinations of beaver/fire (Fig 1)
- 10 minute point count surveys conducted from 5 AM to 9AM
  - Species presence, method of identification (sound/sight), and abundance was recorded
  - Hand recorder also used during surveys in order to confirm species identified by song
- Automated Recording Units (ARUs) also deployed at each site for two days
  - Recordings analyzed using the software Kaleidoscope

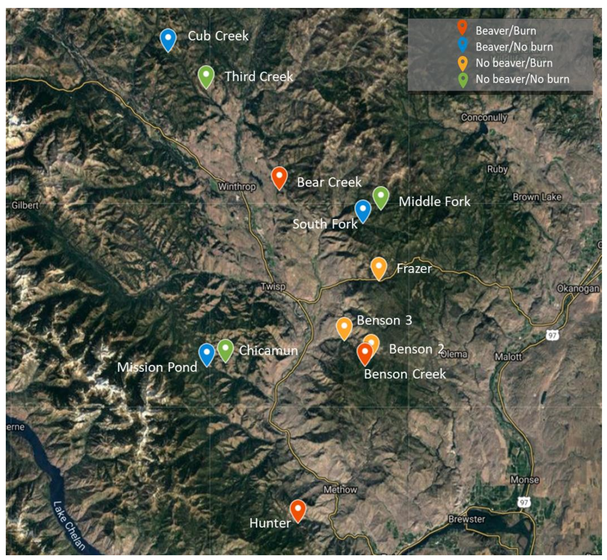


Figure 1. Study sites in the Methow River Valley, located in Okanogan County Washington, east of the North Cascades National Park.

## Results

- No significant effects of beaver (p = 0.38) or burn (p = 0.14) and no interaction (Fig 2a, p = 0.94)
- Burned communities resemble other burned communities more than unburned communities resemble other unburned communities, irrespective of beaver presence. (Fig 2b, Fig 3)
- In burned and unburned sites, beaver replicates support a greater diversity of species than no beaver replicates (Fig 3)

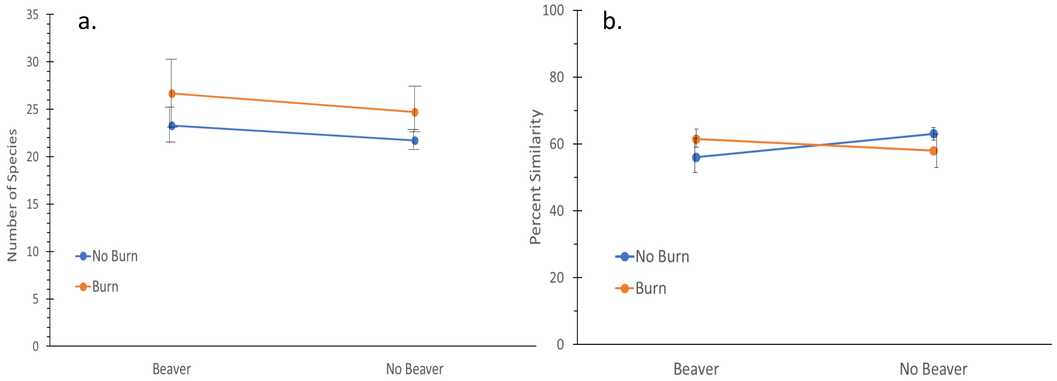


Figure 2. Effects of beaver presence/absence in burned and unburned areas on a. total number of bird species and b. percent similarity of community composition between sites.

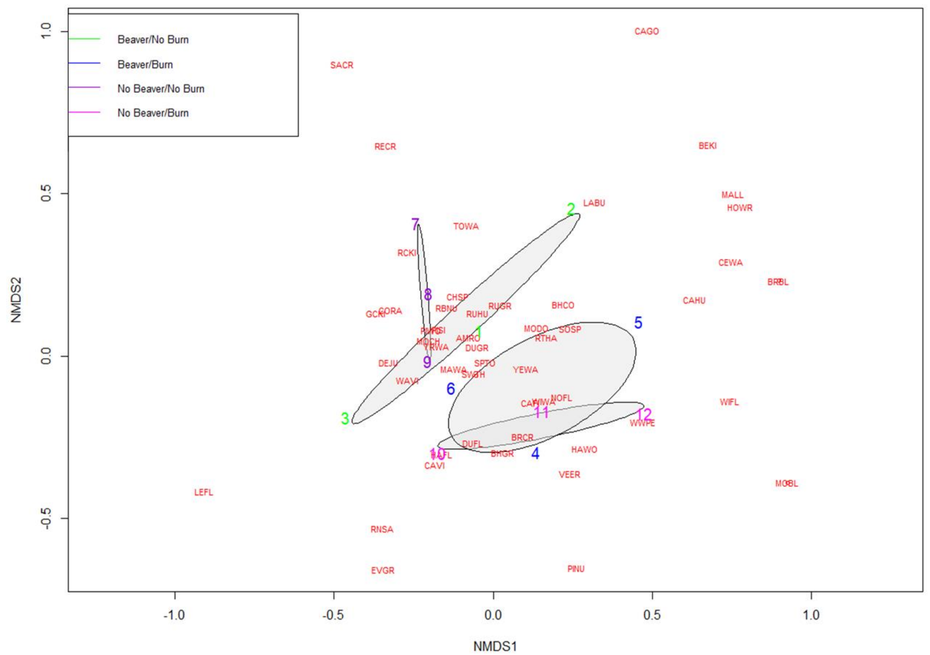


Figure 3. NMDS of bird species composition between four treatment types (stress = 0.1645). Ellipses are covariance ellipses denoting the variance in species composition in each treatment type. Overlapping ellipses indicate similarities.


## Conclusions

- Burn history has a stronger influence on bird community composition than the presence/absence of beavers
- Beavers can expand the diversity of bird species found in a community, thus increasing habitat heterogeneity
- Heterogeneity among sites in elevation and plant community may obscure beaver impacts

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## References

1. Russell, R.E., Royle, J.A., Saab, V.A., Lehmkuhl, J.F., Block, W.M., and Sauer, J.R. (2009). Modeling the effects of environmental disturbance on wildlife communities: avian responses to prescribed fire. Ecological Applications *19*, 1253–1263.
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