

PROJECT SUMMARY



Forest Bird Communities in the Southern San Juan Mountains of Colorado: A Citizen Science Project.

Conducted by Volunteers from the Weminuche Audubon Society, Pagosa Springs, CO

(see <https://www.weminucheaudubon.org/bird-community-monitoring/> for detailed reports)



Project Description:

Over the past 5 years, more than 60 volunteers from the Weminuche Audubon Society in Pagosa Springs, CO, have conducted annual surveys of bird communities in the dry-mixed conifer forests in our area.

The primary scientific question addressed by our study concerned the potential impact of wildland fuel reduction treatments (i.e., prescribed fire and shrub-layer thinning) on bird community composition and structure.

Fifteen monitoring points were established in each of four forested sites identified as follows: Jackson Mountain (JM) – no recent logging or thinning; Turkey Springs (TS) – subject to prescribed fire in 2017; Fawn Gulch (FG) – subject to shrub-layer thinning in 2017; and Jackson Mountain North (JMN) – selected for selective tree harvesting in 2024

or 2025 as part of the Adaptive Silviculture for Climate Change program (www.adaptivesilviculture.org).

Teams of volunteer observers visited each monitoring point at least 10 times during a five-week period from late May to early July in each year of the study to record bird species observed by sight or sound for 6-minute sampling intervals. This sampling protocol is consistent with bird monitoring studies reported in the scientific literature.

The FG and JM sites were sampled in each year of the study, with data collected at TS in 2019, 2020, and 2021; and in 2022 and 2023 at JMN.

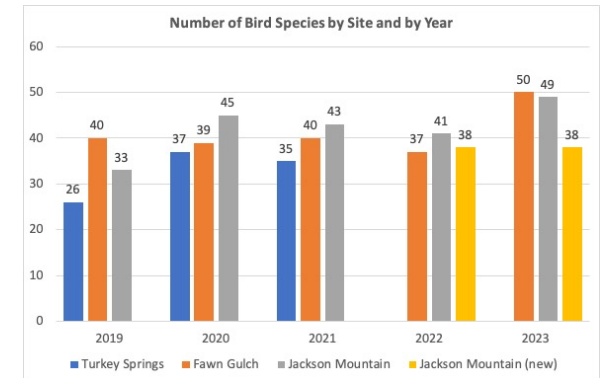


Findings:

Patterns in Abundance -

- A total of 10,020 birds from 88 different bird species were observed across all five years.
- 9 bird species, constituting about 48% of all birds counted, were observed at all three sites in all years of the study.
- 34 bird species were observed across all years of the study, representing about 84% of all birds counted.
- For the two sites sampled in all 5 years of the study, the least altered site – JM – had the highest number of birds counted (3621) compared to FG (3566), but the second highest number of different bird species (61) compared to FG (69).

- Within year patterns in number of bird species counted and abundances indicates that JM is the most diverse of the sites sampled.

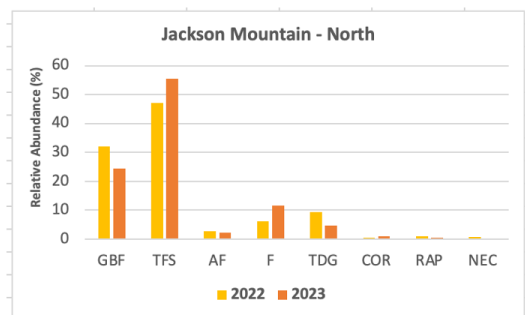
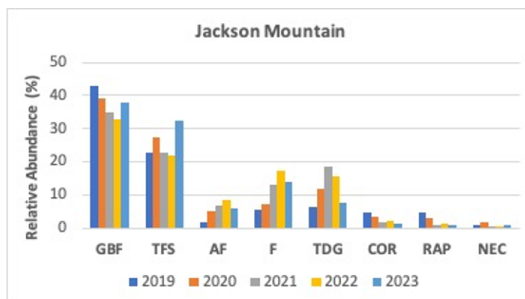
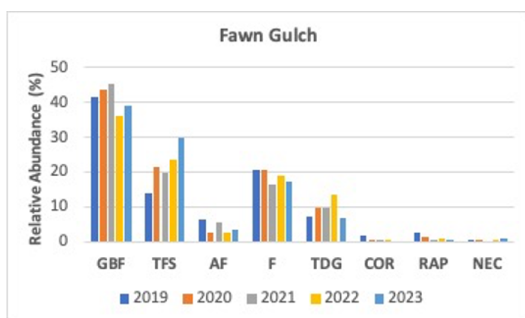


- Patterns in the number of bird species at the TS site (subjected to prescribed fire in 2019), along with the relatively high number of species at the FG site (subjected to shrub thinning in 2017), indicates that the bird communities in these sites recovered quickly after wildland fuel reduction treatments.
- Our general observation is that the condition of the shrub-layer and understory, along with the diversity of canopy tree species, strongly influences the diversity and abundance of bird species in these forested sites.



Feeding Behaviors –

- The majority of bird species observed in our study are insectivorous during the 5-week sample period representing the primary breeding season for most species recorded.
- Ground/Brush foraging (GBF) species were most common at TS (data not shown), FG, and JM.
- Timber Foliage Searching (TFS) species were more common at JMN compared to other sites, indicative of the influence that understory condition and canopy tree species diversity have on quality of habitat for bird species.
- (special note – AF=Aerial Flycatcher; F=Flycatcher; TDG = Timber Drilling/Gleaning; see reports for complete legend)



Nesting Behavior –

- Of the 25 bird species observed nesting in our sites over the 5 years of the study, 14 are declining in population numbers as follows Broad-tailed Hummingbird; Cassin’s Finch; Common Nighthawk; Chipping Sparrow; Cordilleran Flycatcher; Dusky Flycatcher; Hammonds Flycatcher; Northern Flicker; Plumbeous Vireo; Violet-green Swallow; Western Bluebird; Western Tanager; Western Wood-Pewee; and Williamson’s Sapsucker
- 20 species of cavity nesting birds are included in our dataset, with Pygmy Nuthatches; Northern Flickers; Violet-green Swallows, House Wrens; and White-breasted Nuthatches the most abundant.

Commonness vs. Rarity –

- 34 bird species were observed in all five years of this study (48% of birds counted), with 9 species observed at all sites in each year (84% of birds counted).
- The remaining 54 bird species accounted for 16% of the birds counted (about 1600 birds).
- 27 of the 88 bird species observed in our study are exhibiting declines in population numbers.
- Most notable among the bird species observed in our study that are exhibiting steep population declines are the Lewis Woodpecker; Graces’ Warbler; Virginias’ Warbler; Band-tailed Pigeon; Cassin’s Finch; Evening Grosbeak; Pine Siskin; and Olive-sided Flycatcher.

Migratory Species –

- 47 of the 88 bird species observed in our study are resident species, with 44 of these accounted for in our local Audubon Christmas Bird Count.
- 41 of the 88 bird species observed in our study are non-resident species, indicating seasonal migrations to Mexico, Central America, and South America.
- 16 of the 47 resident bird species in our dataset are exhibiting population declines, with 25 of the 41 non-resident bird species exhibiting population declines.
- 14 of the 47 resident bird species (30%), and 12 of the 41 non-resident bird species (29%) were commonly observed in our study.

Closing Remarks –

- Our findings suggest that short-term changes occur in bird communities in response to wildland fuel reduction treatments.
- We need to better understand whether promoting small-scale heterogeneity in forest composition and structure through wildland fuel reduction treatments enhances or reduces bird diversity at the regional scale.

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