Grassland Songbird Research Update

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Project Summary

The University of Montana Bird Ecology Lab (UMBEL) is studying songbird reproductive success in managed grasslands on MPG Ranch to evaluate how restoration actions influence breeding birds. We are monitoring nests of Grasshopper Sparrow, Vesper Sparrow, and Western Meadowlark. We conducted a small feasibility effort in 2020 that we expanded in 2021 and 2022 to include three habitat management categories. In 2022, we also deployed Motus tags to document migration routes, wintering locations, and breeding site fidelity. We found fewer nests this year, possibly due to a cool, wet spring. An additional year of field data collection will increase our sample sizes to allow more robust nest survival analysis. We also recommend deploying more tags to build on our initial findings from the tagged birds we detected this fall.

Nest Searching

We searched for nests within three habitat management categories on MPG Ranch separated by cultivation history and current management strategy: native range, exotic forage grass replacement, and exotic forage grass diversification. We found nests by dragging a rope to flush incubating or brooding birds. This method allowed us to cover a large area with just two people. All nests were checked every 3-4 days until they fledged or failed. We measured vegetation characteristics around each nest after nesting was complete.

Nest Numbers

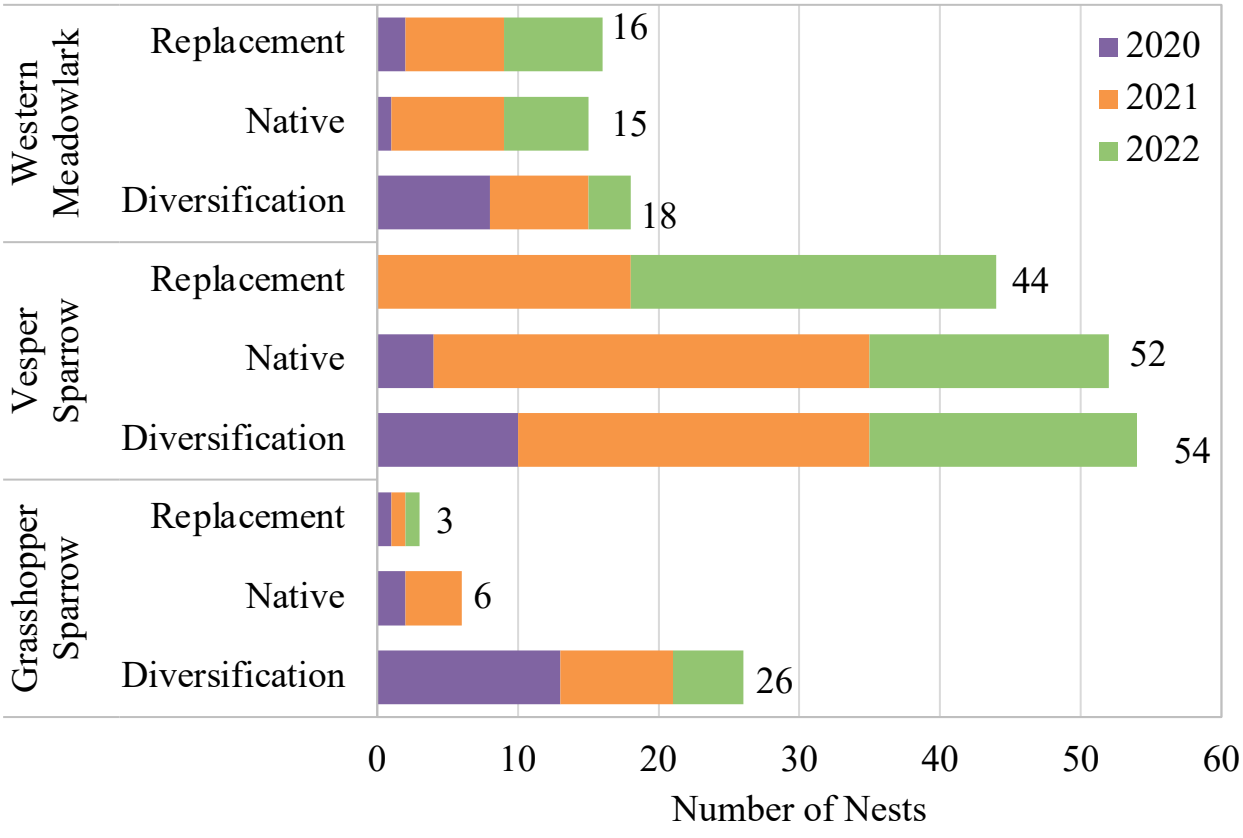
In 2022, we found 84 nests belonging to three focal species across habitat management categories, bringing the total number of nests monitored during the study to 234 (table below). We found fewer nests than in 2021, including fewer than half as many Grasshopper Sparrow nests.

We have sufficient nest numbers to estimate nest success within habitat management categories for Vesper Sparrows, but we need to find more nests to evaluate differences among categories for the other species (figure below). Appendices I-III show nest locations within study plots for each species by year.

Number of nests found by species from 2020-2022				
	2020*	**2021**	**2022**	**Total**
Grasshopper Sparrow	16	13	6	**35**
Vesper Sparrow	14	74	62	**150**
Western Meadowlark	11	22	16	**49**
Total	**41**	**109**	**84**	**234**

*smaller study effort in 2020

Number of nests found in three types of managed grasslands



Tagging Efforts

In 2022, before committing to a larger Motus tagging effort, we tested the feasibility of target netting grassland birds. Catching birds on the open prairie proved challenging because birds can fly in any direction when flushed. It takes patience and luck to get them headed toward the mist-net, but we successfully caught and tagged two of our focal species.

We used solar-powered LifeTags that will provide information on migration as well as nest site fidelity for the life of the bird. We also tested new hybrid solar and battery powered tags on meadowlarks that may improve detections since many songbirds migrate at night when there is not enough light to power a LifeTag.


Tag Deployment

We deployed five solar powered LifeTags on Grasshopper Sparrows (photo on left) and attached five LifeTags and five Hybrid tags to Western Meadowlarks (photo on right). We also had an opportunity to partner with the Smithsonian Conservation Biology Institute to deploy four GPS Argos tags on meadowlarks, contributing to a large multi-partner effort to map migration routes and wintering locations for eastern and western populations across the US. Argos tags send locations via satellite, supplementing our Motus tag findings.

Tag Detections

Two tagged Western Meadowlarks were detected by the Motus network after leaving MPG Ranch this fall. One of the birds was detected in southwest Idaho, the other bird was picked up in northern California (map below). These detections show that at least some meadowlarks from the Bitterroot Valley are wintering in a different location than birds breeding in eastern Montana. We hope that Motus expansion underway in the West combined with additional tagging next year will increase our detections and provide greater insight into unique wintering locations of grassland birds of the Intermountain West.

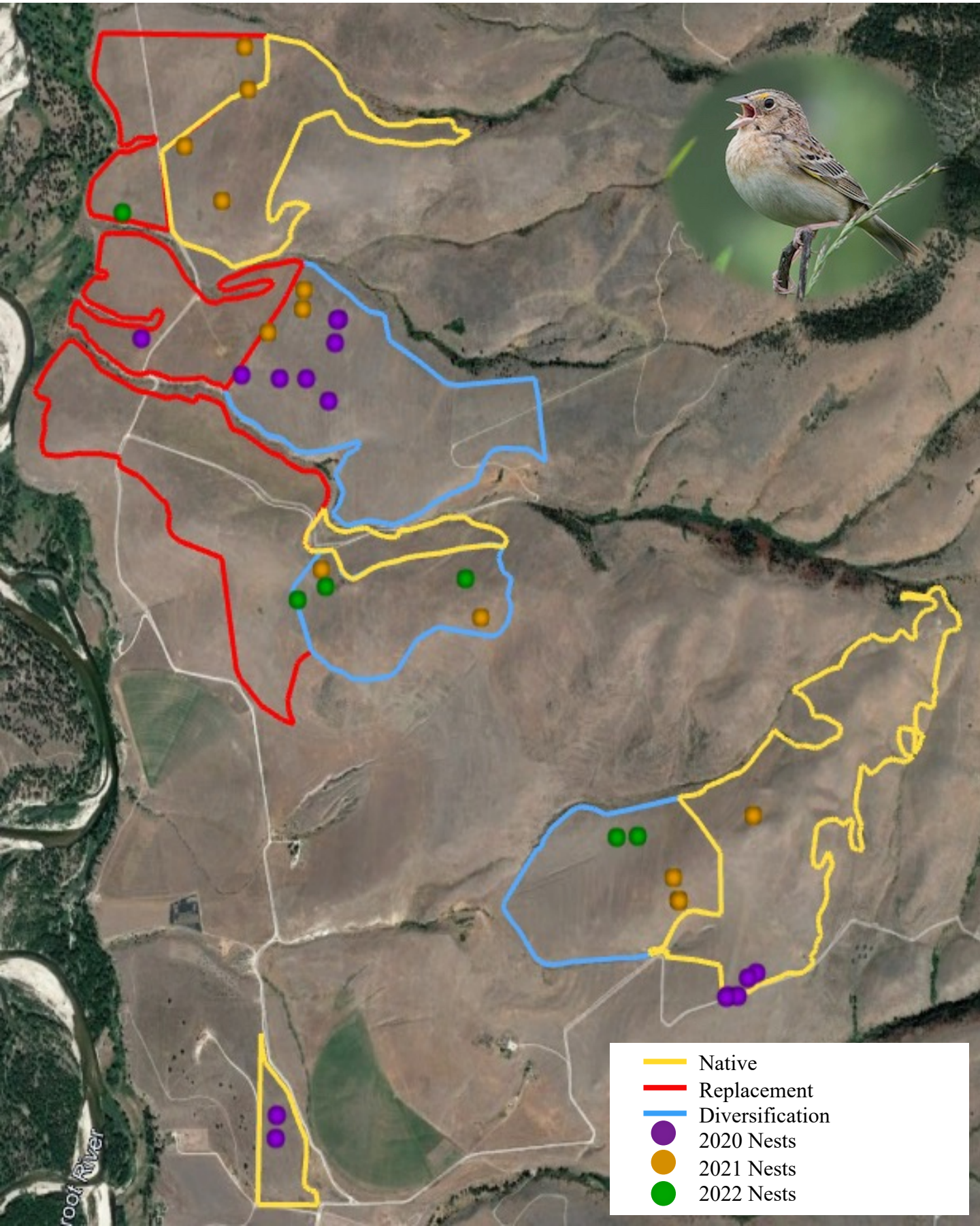
Next Steps

We have completed two full field seasons of data collection across the three habitat management categories (2021 and 2022). In 2022, likely due to cool, wet weather, we documented fewer nests than in 2021, particularly for Grasshopper Sparrows, a species of greatest conservation concern in Montana. We propose conducting another year of field data collection prior to analysis to increase nest sample sizes. We also want to continue our tagging effort in 2023 to better understand migration and wintering locations for these species. Adding one more year of field effort in 2023 will substantially improve the strength of our findings and increase the likelihood of robust results.

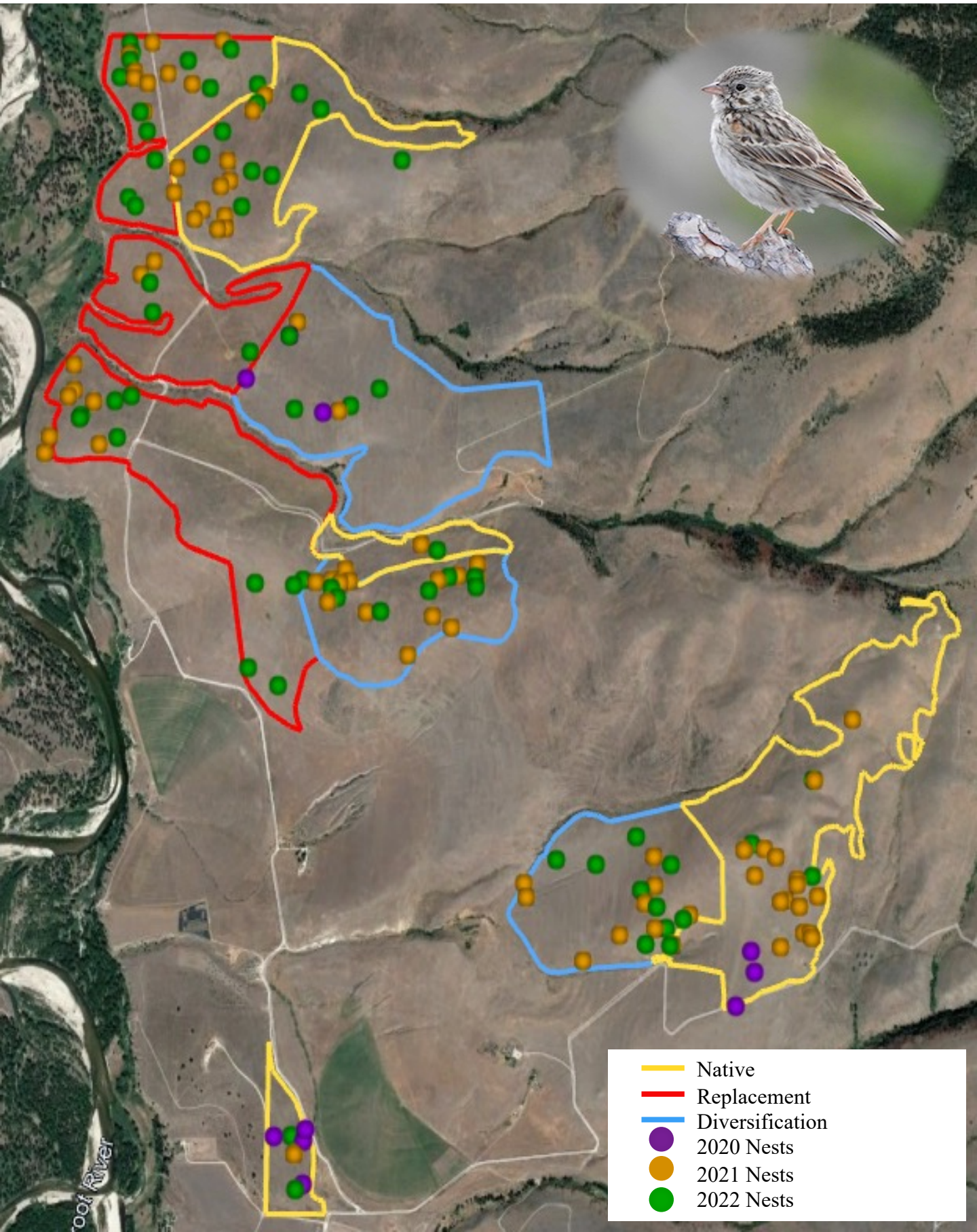
Acknowledgements

A special thanks to Chuck Casper for all his vegetation expertise and collaboration. Claire Mundy and Emma Watson found and monitored nests in 2022. And of course, many thanks to MPG for funding this project.

Appendix I. Grasshopper Sparrow nests found across grassland management categories on MPG Ranch from 2020-2022.



Appendix II. Vesper Sparrow nests found across grassland management categories on MPG Ranch from 2020-2022.



Appendix III. Western Meadowlark nests found across grassland management categories on MPG Ranch from 2020-2022.