

Name of the project: Songbird and small mammal community, population, and behavioral responses to habitat manipulation in a landscape dominated by energy development

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Final Report Project Summary:

Thanks to the Lois Webster Fund, I have successfully met all of my field-work objectives for my research focused on evaluating if differences exist in songbird and small mammal responses to alternative game habitat manipulation treatments (i.e. chaining, hydro-axe, and roller-chop treatments). As of August 2013, the field work for the project was complete. In addition to the valuable data that I was able to collect, with the funding provided to support my mileage costs for the 2014 field season, I was also able to transport field technicians and volunteers out to my remote field locations. This provided several undergraduates from Colorado State University with an invaluable opportunity to gain hands-on wildlife surveying and handling experiences (Fig 1).



Fig. 1. Field technicians marking and measuring individuals from rodent populations in experimental treatment sites.

Aided by the additional mileage funding provided by the Lois Webster Fund, I was able to quadruple my efforts and complete 12 point count surveys at each of the 28 plots, which provided enough data for me to conduct successful occupancy analyses of bird populations in habitat manipulation treatments, including many locally rare species that were not incorporated into the 2012 analysis. I am currently analyzing these data and preliminary results seem to suggest that although habitat manipulation treatments do not appear to be favorable for some bird species, the chaining treatment does seem to support a more diverse community of birds, with species

richness levels nearly equivalent to control treatments (Fig. 2). The hydro-axe treatments also appear to support more diverse bird communities (Fig. 2). I will also be calculating bird species evenness amongst plots, as another metric for evaluating and comparing diversity. In addition, I will be conducting occupancy analyses for each population of birds in the region, which will allow me to obtain a better understanding of individual population-level responses to treatments.

Fig. 2. Burnham Jackknife 2 estimates of species richness of bird assemblages in experimental treatment sites, estimated from 2013 bird survey data. Trends were similar for 2012 bird survey data.

I have also successfully trapped small mammals at all 28 plots. I am currently analyzing these data in a Robust Design Occupancy framework and in Closed Capture Models (for more common species); yet, I have no preliminary results to report at this time. These data will allow me to compare both the use of habitat treatment areas by small mammals and abundance differences amongst treatments by small mammal populations. I will also evaluate community metrics for small mammals utilizing the 2013 data, including species richness and evenness. My species richness estimates from 2012 did not indicate any significant differences exist amongst treatment types. I look forward to sharing these results once I have completed my analyses. Additionally, I have completed vegetation and habitat surveys at all of the 28 plots, which will be used to ascertain habitat selection by small mammals using the treatment sites. Finally, I have completed over 120 tracking surveys of small mammal movement patterns. I am currently using this information to calculate the actual time that small mammal species spend within treatment areas. I will use this estimate to aid in abundance estimation, and to evaluate habitat selection by different small mammal populations.

Once I have synthesized my results, I will communicate my findings to land and wildlife managers in the Piceance Basin, which may aid their decision-making process for future habitat manipulations in the region. This information could be used to select game habitat manipulation strategies that are most beneficial to the non-game wildlife community. To further disseminate my findings, I will also present the final results of this research at several meetings in 2014, including the Society of Conservation Biology national meeting, the Colorado Chapter of The Wildlife Society annual meeting, The Front Range Student Ecology Symposium, and the Joint meeting of American Ornithologists' Union, Cooper Ornithological Society, and Society of Canadian Ornithologists. I also look forward to presenting my complete findings to the LWF Committee at the spring meeting.

The support received from The Lois Webster Fund has played a critical role in the successful completion of this project. Thank you again for this indispensable support!