



### 2020 MBRWF Grant Executive Summary

**Title of Project:** Variation in seasonal movements, habitat selection, and annual productivity of an irruptive, facultative migrant

**Organization:** Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming

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#### Project Description:

Irruptive, facultative migrants, such as the Great Gray Owl, exhibit less predictable movement, site fidelity, and annual productivity patterns compared to most species. The Great Gray Owl remains a species of greatest conservation need in Wyoming, and understanding how changing resources may influence this species' movements, seasonal ranges, and reproductive success is essential for effective management. Drawing upon existing weather data, fine-scale GPS locations, long-term demographic monitoring, and prey abundance sampling, this research is investigating what drives variation in seasonal movement patterns, habitat selection, and productivity for Great Gray Owls in northwestern Wyoming. This work is being conducted as part of a dissertation through the University of Wyoming in conjunction with Teton Raptor Center.



In 2020 we conducted fieldwork to bolster long-term datasets on Great Gray Owl productivity, prey abundance, and seasonal movements. Using automated recording units (ARUs) and nest check protocols, we monitored breeding territories (n=28) to determine occupancy, nest initiation rates, productivity, and apparent survival. We deployed additional GPS transmitters (n=11) and continued collecting location data from previously tagged individuals, which will be used to assess breeding- and non-breeding-season home-range areas and habitat selection. We also continued long-term data collection of prey abundance and snow characteristics within owl territories (n=17).

We are beginning preliminary analyses assessing how annual productivity, prey, and weather conditions interact to influence reproductive success, annual survival, and movement patterns. Analyses include evaluating vocalizations at occupied, active, and successful nests to improve the efficacy of ARU monitoring protocols. We also will evaluate vocal individuality based on calls. These analyses will expand our monitoring beyond productivity, prey, and individual movement data to collect critical population-level metrics such as apparent survival and territory turn-over rates. Movement analyses will incorporate both breeding and non-breeding habitat selection, both of which are critical periods that influence individual fitness, reproductive success, and survival. Resource selection analyses can be used to identify critical habitat for Great Gray Owls throughout their annual life cycle. Understanding how prey populations and weather conditions may influence movement patterns and habitat selection, territory turn-over rates, and annual productivity and apparent survival can improve understanding of annual variation versus overall population trends for this species in Wyoming.