

IDAHO DEPARTMENT OF FISH AND GAME

Ed Schriever, Director

Project F19AF00803

**Northern Idaho Ground Squirrel Use of Experimentally Treated Forest
Cooperative Endangered Species Conservation**

Interim Report



Performance Period

July 1, 2019 to December 31, 2021

Compiled and edited by: Diane Evans Mack

September 2020
Boise, Idaho

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TRADITIONAL SECTION 6 INTERIM PERFORMANCE REPORT

1. State: Idaho

Grant number: F19AF00803

Grant name: Northern Idaho Ground Squirrel Use of Experimentally Treated Forest

2. Report Period: July 1, 2019 to June 30, 2020

Report due date: September 28, 2020

3. Location of work: Adams County

4. Objectives

This project aims to advance our understanding of the effectiveness of forest habitat treatments, specifically thinning and prescribed fire, on northern Idaho ground squirrel (NIDGS) demography. Our objectives are to:

- 1) Add juvenile squirrels to the sample of individual NIDGS radio collared to examine behavior in relation to habitat variables
- 2) Compare juvenile hibernacula selection and overwinter survival to that of adult squirrels
- 3) Use daily locations (telemetry) to quantify fine-scale use of treated sites by all age classes

5. If the work in this grant was part of a larger undertaking with other components and funding, present a brief overview of the larger activity and the role of this project.

This field project is a collaboration between the Idaho Department of Fish and Game (IDFG) and Dr. Courtney Conway, Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho (UI). It builds on a larger multi-year research effort initiated in 2012 by UI to examine the effectiveness of different forest restoration options (thinning, prescribed fire) at restoring NIDGS habitat and increasing population size. The UI study has, up to now, focused on the adult and subadult portion of the NIDGS population to explore annual survival, diet, reproduction, and selection of hibernacula in relation to treatment (Allison et al. 2019, Goldberg et al. 2017). Earlier work by IDFG suggested that juvenile squirrels could differ from older individuals, specifically with respect to diet and hibernation. The project reported on here complements the larger research effort by incorporating a younger age class into the sample of squirrels being studied to address questions related to use of treated habitat.

The Payette National Forest (PNF) currently has three large-scale (>50,000 ac) projects underway which include a component to improve NIDGS habitat with thinning and prescribed fire. These actions aim to rejuvenate forage plants and create corridors to link

populations. The UI research examines how NIDGS respond to these habitat treatments. This 10-year project works hand-in-hand with IDFG's overall NIDGS population monitoring, with all partners sharing resources and data. Results will be used by the PNF to implement appropriate forest management prescriptions within conifer forests occupied by NIDGS. All partners to NIDGS recovery (i.e., members of the NIDGS Technical Working Group) will use results to assess trajectory toward recovery criteria (USFWS 2003).

The overall study involves biologists, foresters, and fuels specialists on the PNF; species expert Dr. Eric Yensen, retired, College of Idaho; U.S. Fish and Wildlife Service (USFWS) biologists; and private landowners. The UI study has been supported since 2012 by the PNF, USFWS, IDFG, and other partners as part of the national Collaborative Forest Landscape Restoration Program. A previous Section 6 grant supported a portion of the radio collaring effort to address questions related to daily activity patterns. The OX Ranch, a private landholding in Bear, Idaho, supported this project by providing housing for field technicians and access to study sites. The OX Ranch entered into a Safe Harbor Agreement (SHA) with the USFWS and IDFG in 2009 to help meet recovery goals for NIDGS. The SHA covers 4,227 acres on the OX Ranch and encompasses a significant portion of the NIDGS population.

6. Describe how the objectives were met.

During this reporting period, Grant F19AF00803 was used to (1) purchase radio transmitters and light loggers to attach to juvenile NIDGS during the 2020 field season, and (2) support a portion of the field effort to live-trap and radio collar NIDGS.

Juvenile squirrels typically begin to emerge from natal burrows in early to mid-June at our study sites. Thus, they were above ground for only a short time within this report period and had not gained sufficient size or weight to carry a radio collar. All of the 49 juveniles live-trapped prior to 30 June were too small (mean body mass = 65 g). Our criteria for deploying a collar is ≥ 115 g. We added an additional trapping effort in July and August 2020 specifically for juveniles.

Juveniles could be captured at any or a subset of 13 treatment sites. These include 9 thin-and-burn study sites (5 treatment and 4 control study sites) and 4 burn-only study sites (paired treatment and control plots within each study site) in 2020. Two of 5 thin-and-burn treatments were completed prior to the 2020 field season, 1 treatment was partially complete (thinned, but not burned), and 2 treatments were not yet initiated. Three of 4 burn-only treatments were completed prior to the 2020 field season.

Juveniles will be captured in baited Tomahawk live traps set at burrow entrances and with focal traps set at burrows we saw squirrels enter. Each captured squirrel will be marked with 2 metal ear tags (National Tag & Band Co. 1005-1 tags), examined, weighed, and sexed. Up to 40 individuals will be outfitted with a radio collar (Biotack CTx tags) affixed with a light logger (Migrate Technology C65-SUPER geolocator). We will track collared squirrels weekly until we determine they are hibernating (3 consecutive checks at the same location).

We will also locate collared squirrels periodically to assess active-season habitat use. Attaching light loggers to the collars will provide us with exact hibernation immergence and emergence dates for all collared squirrels whose collars we are able to recover in spring 2021 following hibernation (light logger data is stored onboard the logger).

This project will compare juvenile habitat use to that of adults/subadults. As of 30 June, 168 adult/subadult NIDGS had been live-trapped across the 13 study sites. We deployed 14 radio-collars on adult squirrels (7 males and 7 females) at 3 study sites (5 at Steve's Creek, 5 at Fawn Creek, and 4 at Rocky Top). The mean body mass of collared squirrels was 182 g (range = 142 g – 234 g) for the 7 adult males and 148 g (range = 135 g – 155 g) for the 7 adult females. None of the 14 radio-marked squirrels had yet entered hibernation as of 30 June 2020.

We will measure fine-scale site characteristics at each hibernaculum once squirrels have entered hibernation. We will measure slope, aspect, canopy cover, ground cover, snowfall, soil depth, soil temperature, and ambient temperature at hibernacula. We will measure trees, shrubs, logs, stumps, and boulders within 5 m of hibernacula. We will also place motion-activated cameras at each hibernaculum to document overwinter predation events (i.e., excavation by badgers) and hibernacula use following emergence.

We anticipate preliminary analysis of juvenile and adult active-season habitat use and hibernacula site selection for the 2020 field season will be completed in fall/winter 2020 after all collared squirrels have entered hibernation. Snow depth, soil depth, soil temperature, and ambient temperature data, however, will not be available until spring 2021 (following emergence from hibernation and departure from hibernacula). Assessment of hibernation immergence and emergence dates will be completed in 2021 once light loggers have been recovered. This is the first year of a two-year study and, hence, final results and analysis of habitat use (active-season and hibernation) will be completed in 2022, after squirrels collared in 2021 emerge from hibernation. Analysis of data from light loggers will be completed in 2022, once we recover the light loggers deployed in 2021.

7. Discuss differences between work anticipated in grant proposal and grant agreement, and that actually carried out with Federal Aid grant funds.

Work during this report period was completed as anticipated. Success in capturing a sufficient sample of juvenile NIDGS that have obtained the minimum weight to carry a radio-collar will not be known until field work is completed in July and August 2020. By design, squirrels will carry their radio collars and fitted light loggers through hibernation. Radio collars will resume emitting a signal in spring 2021, coincident with squirrel emergence from hibernation. We will prioritize tracking squirrels as early as conditions allow to recover collars and light loggers. After we download data from light loggers, we will commence data analysis.

8. List any publications or in-house reports resulting from this work.

None to date.

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Literature Cited

- Allison, A. Z. T., A. M. Toumpas, A. R. Goldberg, and C. J. Conway. 2019. Effects of forest encroachment on behavior and demography of the northern Idaho ground squirrel: annual progress report 2019. Wildlife Research Report #2019-02. Idaho Cooperative Fish and Wildlife Research Unit, Moscow, Idaho, USA.
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