

# Grant Application



Kalysta Adkins

**Email :** kalysta.i.adkins@odfw.oregon.gov

**Application ID :** A66AK144

**Custom Ref. -**

**Application Start Date:** 2023-10-28 19:31:13

**Application Completed Date:** 2023-10-28 21:00:49

1 Have you previously applied for a grant from the Oregon Wildlife Foundation?

no

2 Has a previously submitted grant application been denied funding support?

no

3 Title of your proposed project

Assessing Distribution of Sierra Nevada Red Fox

4 Name of your organization

Oregon Department of Fish and Wildlife

5 If your organization is not a 501c3 nonprofit, please identify your fiscal sponsor

If do o apply o yo , w N/A

NA

6 Your name or the name of the Project Manager

Kalysta Adkin

7 organization mailing address

Please enter full address with city, state & zip

61374 Parrell Road, Bend, Oregon 97702

8 your phone number or that of the Project Manager

541-993-4628

9 your email address or that of the Project Manager

kalysta.i.adkins@odfw.oregon.gov

10 a brief biographical statement about yourself or that of the Project Manager

Kaly Adkins is the East Region non-game wildlife biologist for Oregon Department of Fish and Wildlife (ODFW). She primarily focuses on Oregon Conservation Strategy species or those of greatest conservation need, spanning multiple taxa and species. She has been employed by ODFW for 6 years and has previously worked for the states of Minnesota and Iowa.

11 social media handles that your organization uses

Enter social handles or URLs such as instagram, facebook, twitter, youtube, etc. so that we can use to cross promote on our channels - if you do not have any, please place N/A

myodfw, Oregon Department of Fish and Wildlife

12 are you currently following Oregon Wildlife Foundation on its social media channels?

- Instagram
- Twitter
- YouTube

13 what is the total estimated cost of your project?

250000

14 Funding that you are requesting from OWF

If you're request s for more than \$5,000, please contact Tim Greseth [tim@myowf.org](mailto:tim@myowf.org) before submitting your application.

15000

15 what type of project are you proposing?

fish or wildlife research

16 will your project address an Oregon Conservation Strategy habitat or species?

yes

16.Y.1 What habitat or species is addressed?

Sierra Nevada Red Fox

17 what is the location of your proposed project?

Mount Hood region, area between Mount Hood and Mount Jefferson Wilderness, North and South of Crater Lake National Park

18 what ecoregion and Conservation Opportunity Area (COA) is your proposed project located in?

See <https://www.compass.dfw.state.or.us/> for the information you need to answer this question

107, 116, 113, 121, 123, 138

19 what is the anticipated start date of your project?

Day/Month/Year

01-01-2023

20 what is the anticipated end date of your project?

31-05-2025

21 has a local, state or federal biologist reviewed this project?

yes

21.Y.1 What is their name and contact info?

Jad Kohn, jad\_kohn@odfw.org or jkohn.gov

22 have you already or will you obtain necessary permit from all requisite agencies applicable to proposed project?

yes

23 what will the funds you are requesting be used for?

this would be a good time to review, if you haven't already done so, our grantmaking guidelines at [www.myowf.org/grants](http://www.myowf.org/grants)

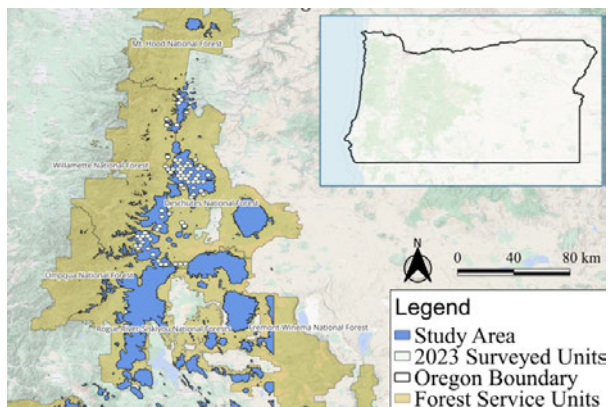
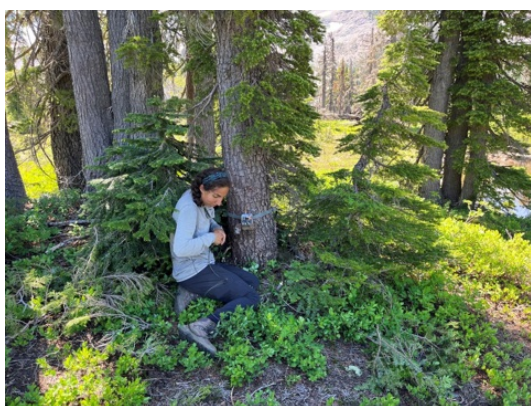
1. Genetic scat analysis for 100 scats - \$12,500.00 2. 1000 AA Energizer Lithium camera batteries for game cameras - \$2,200.00 3. 3 hard drives for photo storage - \$300.00

24 provide us a brief summary of your proposed project

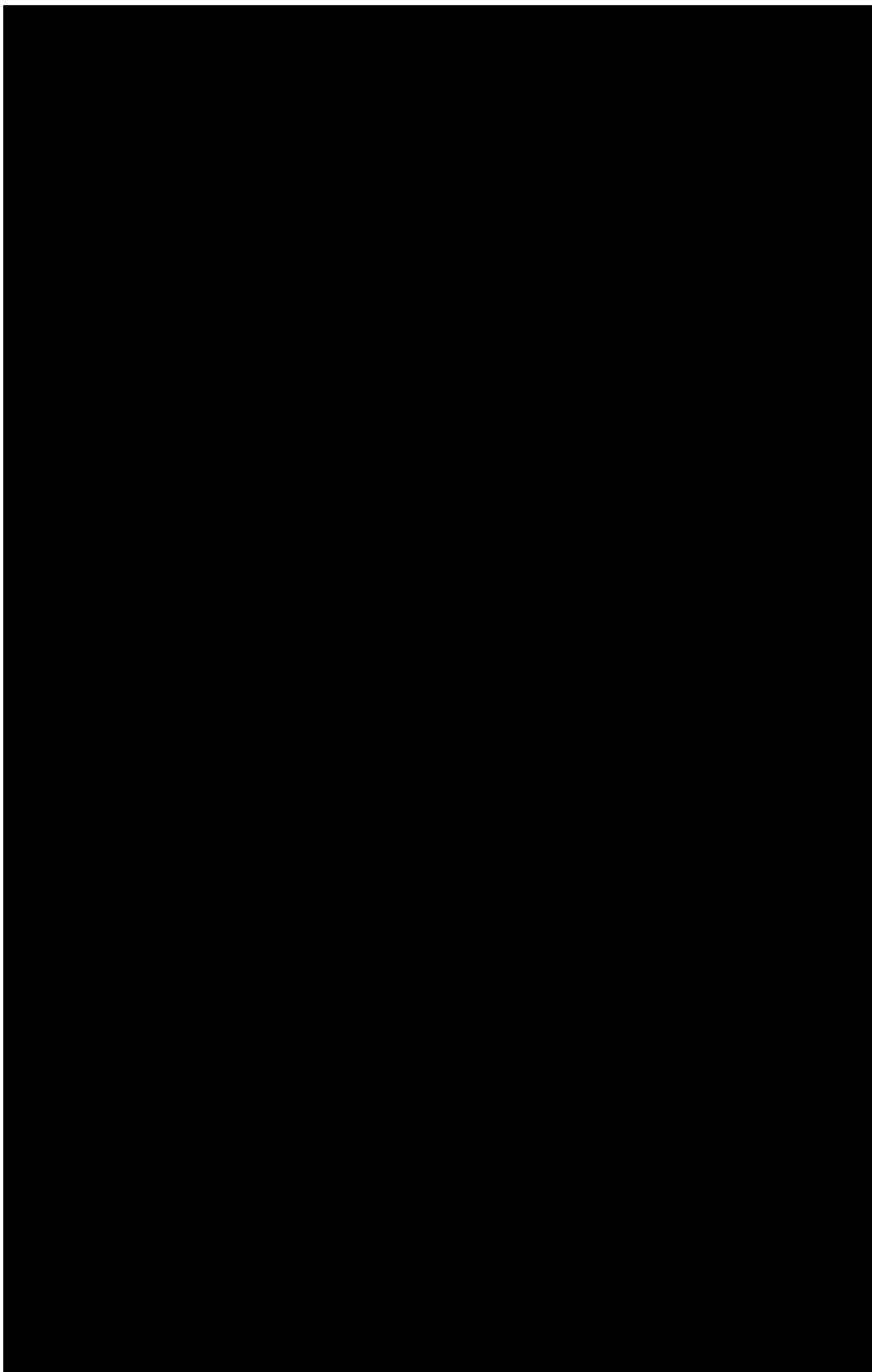
The Sierra Nevada red fox (*Vulpes vulpes necator*) is a native subspecies of red fox that inhabits the Oregon Cascades, Lassen Peak (California), and the Sierra Nevada (California). In the southern extent of their range, Sierra Nevada red fox (SNRF) are listed as endangered and are believed to exist in isolated populations due to lack of habitat connectivity. In Oregon, which constitutes the northern portion of their range, SNRF distribution and habitat connectivity are poorly understood. We plan to use camera trapping and scat analysis to inform development of occupancy models, which will allow us to investigate SNRF distribution, SNRF habitat and climatic associations, and provide information regarding likely population connectivity across their historical range in Oregon. In 2023, we collected over 90 likely SNRF scats and set 150 cameras across the central Cascades region of Oregon. In 2024, work will primarily occur to the south and north of Crater Lake and in the region between the central Cascades and Mount Hood. The outcomes of this work will provide conservation planners with a more complete understanding of SNRF distribution and drivers of that distribution in Oregon.

25 upload pre project picture or a video

By submitting these photos or video I warrant that I am the legal owner of this media and grant the Foundation permission to reproduce, exhibit, or publish them for all general purposes in relation to Oregon Wildlife Foundation's work. If you have questions about photo or video submissions please refer to [myowf.org/grants](http://myowf.org/grants) for guidance.



26 fill out our budget form



27 upload a narrative of your proposed project

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Please make sure your narrative is no more than 7 pages long, single spaced, 12 pt. font (Calibri preferred).

1 Document Uploaded

28 upload letters of support

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Letters of support are strongly encouraged. In particular a letter from a supervising biologist

1 Document Uploaded

29 I understand that I am required to submit a Project Completion Report, copies of any publications or social media posts crediting the Foundation's support, and post-project pictures at the completion of my project

yes

Powered by **Submit.com**

— Grant Application

Ka ysta Adk ns

Application ID: **A66AK144**



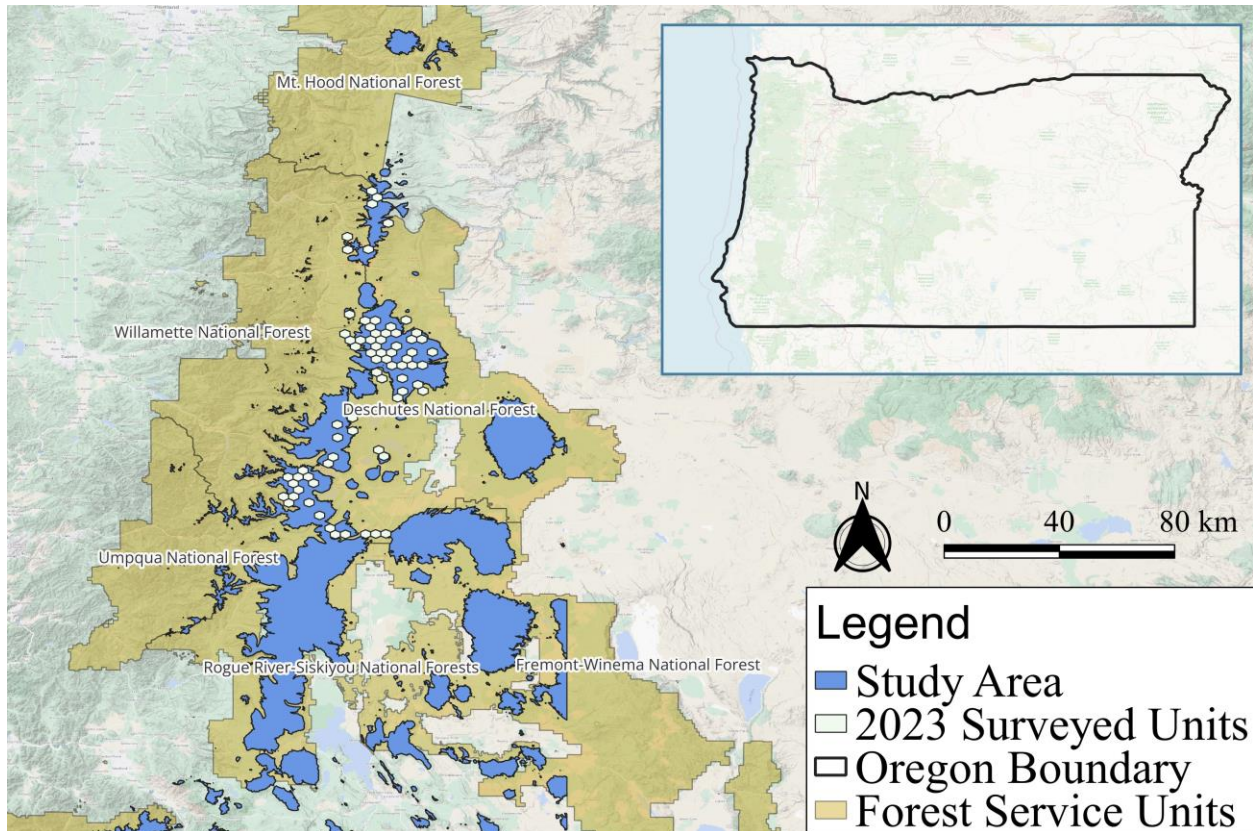
## **BACKGROUND AND NEED**

In Oregon, the Sierra Nevada red fox (*Vulpes vulpes necator*) is managed as both a recreationally harvested furbearer and as a Strategy Species in the Oregon Conservation Strategy (<https://www.oregonconservationstrategy.org/>). Historically, Sierra Nevada red fox (SNRF) were distributed throughout alpine, subalpine, and montane environments of California and Oregon. In California, the Sierra Nevada Distinct Population Segment was listed as endangered under the Endangered Species Act in 2021. Red fox populations in Oregon are not federally listed, though they have experienced a decline over the past century characterized by smaller populations and a more fragmented distribution.

Although research over the past several years has begun to document red fox distribution and habitat suitability in Oregon, key information on contemporary red fox occupancy, abundance, distribution, population status and connectivity is urgently needed to help inform decision making processes. Our study will utilize funds from the Oregon Conservation and Recreation Fund and the Pittman Robertson grant to target 3 regions of historical SNRF range and suitable habitat conditions. In 2023, we initiated a camera and scat-based study in the central Oregon Cascades. In 2024, we will target 2 survey areas, including zones to the south and north of Crater Lake, and in the region between the central Cascades and Mount Hood. Suitability models suggest a high potential for red fox in these regions, but with scant documentation of fox presence.

Collecting data on an elusive, sparsely distributed, and widely-ranging species presents a difficult challenge for wildlife managers and scientists. We will employ a passive, trail-based, camera design that has proven effective at surveying low density montane carnivores at large scales in Washington and Montana (e.g., Canada lynx) to document SNRF in the present study. We will complement the camera data with collection and genetic analysis of scat samples to identify SNRF. Using camera detection data alongside scat analysis data will be critical for gathering enough information to accurately depict SNRF distribution throughout the Oregon Cascades. Oregon Wildlife Foundation's grant will allow us to gather additional genetic data for SNRF, as well as document SNRF presence and habitat use. Camera and scat data will be used in an occupancy modeling approach to estimate red fox presence (corrected for detectability) and distribution. Occupancy models will be used to examine hotspots of presence (core habitat), and to evaluate key environmental drivers of fox distribution patterns (e.g., recreation, competition, climate, topography, habitat). The overarching goal of this work will be to generate a more complete understanding of red fox distribution and drivers of that distribution, detail the degree to which populations of SNRF in Oregon may be connected, and assess the utility of camera and scat-based methods to serve as a component of a large-scale monitoring framework (via analysis of detection probabilities, cost, total area surveyed). This study will provide key data on the current status of foxes in Oregon, which will be critically important for wildlife managers engaged in conservation planning and management of this species.

## **STUDY AREA & SURVEYED UNITS (2023):**



### OBJECTIVES:

- 1) Document SNRF in 3 regions of the Cascade Mountains in summer of 2023 and 2024
- 2) Estimate distribution and occupancy of SNRF in Oregon
- 3) Evaluate the effectiveness of camera and scat surveys as part of large-scale monitoring efforts
- 4) Provide partners with data and management recommendations to inform conservation planning

### METHODS:

In the summer seasons of 2023 and 2024 we will randomly select a total of one hundred and twenty 10.4 km<sup>2</sup> hexagonal grid cells across elevational gradients that SNRF are likely to be found (>1400 meters). In 2023 we successfully sampled 70 cells within the central Cascades study region. In 2024, we will sample the Cascade region to the south and north of Crater Lake and the region between the Central Cascades and Mount Hood. Within each grid cell, we will place 1-3 cameras along roads and trails at least 1 km apart. Cameras will be deployed for approximately 30-62 days depending on environmental conditions (like snowpack persistence and fire danger). For cells that require access via hiking, a thorough scat survey will be conducted along the entire trail, to collect likely SNRF scats that will be processed for species level identification in an experienced genetics lab.

We will then use occupancy modelling to estimate fox presence and detectability. Occupancy models are the preferred approach for dealing with large-scale data on species presence and absence because they can account for the fact that species will not be detected 100% of the time in sites where they are present (MacKenzie et al. 2002). Through repeated surveys of a site, a detection history for each site can be generated. These detection histories can then be used to estimate probability of occupancy and detection. Covariates can be input into the occupancy models to assess their effect on probability of detection and occupancy. For our study, these covariates will include variables related to land cover type, snowpack persistence, topography, recreational use, and prey availability. Continuous variables will be averaged across the entire hexagonal cell using ArcGIS and R statistical software. We will fit occupancy models and assess the influence of environmental and methodological variables on occupancy and detection using the R package unmarked.

## **EXPECTED RESULTS & PROJECT BENEFITS**

This study will provide important occurrence and distribution data needed to inform management actions for SNRF. The project will inform future monitoring efforts, and the results of this study will support range-wide conservation planning for a species that is federally listed in portions of its range. Management actions that support foxes in Oregon will help ensure the future of this species by identifying core-range habitat areas with abundant fox populations. Deliverables include a finalized SNRF observational dataset, spatially explicit occupancy/detection probability estimates, environmental covariate effect sizes, SNRF distribution map, an MS thesis, final research publications or reports/manuscript to include management recommendations and survey effectiveness metrics.

Oregon Wildlife Foundation's funds would support additional genetic scat analysis at a larger scale than we were able to complete in 2023. In 2023, scat collection was proven to be a successful technique for documenting SNRF. Therefore, we require additional funds to complete genetic analysis on scats collected in 2024, which will allow us to gather a more complete understanding of SNRF distribution across Oregon.



# Oregon

Tina Kotek, Governor

## Department of Fish and Wildlife

Deschutes Watershed District Office  
61374 Parrell Rd  
Bend, OR 97702  
(541) 388-6363  
Fax (541) 388-6281

October 28, 2023

Oregon Wildlife Foundation  
2337 NW York St. #201C  
Portland, OR 97210

To Whom it May Concern:

I have had the pleasure of working as the supervisory biologist and a committee member for Marwa Mahmoud on her master's project regarding modeling the distribution of Sierra Nevada Red Foxes (SNRF) in Oregon. This project has been highlighted as a research priority of the agency through an internal selection process by wildlife division leaders. This project was developed internally by members of the conservation program in consultation with Dr. Dan Thornton of Washington State University. It was selected to receive funding for a graduate project through a Pittman-Robertson grant.

Marwa's work expands upon an existing body of work by Oregon Department of Fish and Wildlife on this elusive forest carnivore species and provides essential information for management of the species through clear delineation of its distribution throughout the Cascades. Part of this project's work is to collect scat samples coupled with deployment of trail cameras to determine occupancy and distribution of SNRF. Marwa and her team of volunteers were so successful this summer in collecting scat that we obtained far more viable samples than anticipated and budgeted for in her first field season. While having a surplus of viable samples is a great problem to have, we do not currently have enough funding to analyze all potential SNRF samples collected, let alone samples that may be collected in the second field season. Having supplementary funding to complete all scat analysis will provide more information on species presence throughout the study area and strengthen the conclusions of this work and therefore management actions we are able to take as a result of this work. Additional financial support from Oregon Wildlife Foundation would insure that we have enough resources to fully execute this project.

Thank you for your consideration. If you have any questions regarding this Application, please contact me at (541) 993-4628.

Sincerely,

Kalysta Adkins  
Oregon Department of Fish and Wildlife  
East Region Conservation Wildlife Biologist





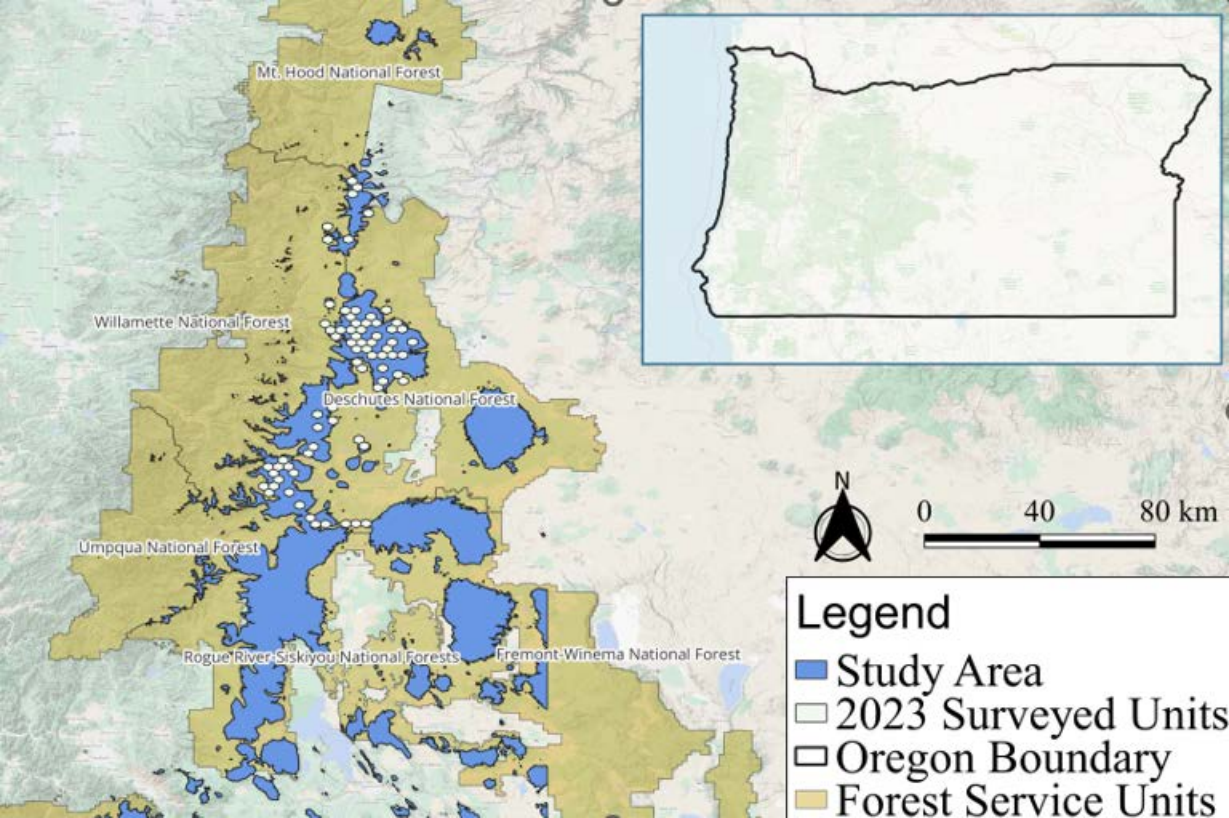




20230904MM504  
VVU







| Project Revenue   | Cash          | In-Kind                      | Committed / Pending |
|---|---------------|------------------------------|---------------------|
| Oregon Wildlife Foundation Request                                  | 15000         |                              | Pending             |
| Pittman-Robertson (PR) Grant  | 117271        |                              | Committed           |
| PR Grant Match  |               | 39,093                       | Committed           |
|   |               |                              |                     |
|   |               |                              |                     |
|   |               |                              |                     |
|   |               |                              |                     |
|   |               |                              |                     |
|   |               |                              |                     |
|   |               |                              |                     |
| <b>REVENUE</b>  | <b>132271</b> | <b>39,093</b>                |                     |
|   |               | <b>TOTAL PROJECT SUPPORT</b> | <b>171,364</b>      |
|   |               |                              |                     |
| Project Expenses  | Cash          | In-Kind                      | Total               |
| Genetic Analysis for 100 scats (OWF Request)                        | 12500         |                              | 12500.00            |
| 1000 AA Energizer Lithium batteries for game cameras (OWF Request)  | 2200          |                              | 2200.00             |
| 3 hard drives for photo storage                                     | 300           |                              | 300.00              |
| MS student salary and benefits for 2 years (PR Funds)               | 52,024        |                              | 52024.00            |
| MS student tuition for 2 years (PR Funds)                           | 23,901        |                              | 23901.00            |
| Field technician salary and benefits for 2 field seasons (PR Funds) | 16,546        |                              | 16546.00            |
| Game cameras (PR Funds)   | 750           |                              | 750.00              |
| Vehicle field costs for 2 field seasons (PR Funds)                  | 7,106         |                              | 7106.00             |
| Lodging for student and technician for 2 Field Seasons (PR Funds)   | 6500          |                              | 6500.00             |
| WSU and ODFW indirect costs (PR Funds)                              | 10,444        |                              | 10,444              |

|   |                               |                  |
|---|-------------------------------|------------------|
| 195 hours of volunteer time at \$31.09/hour (PR Funds)      | 6063                          | 6063.00          |
| ODFW Camera Supply Match (PR Funds)                         | 1350                          | 1350.00          |
| Partner Staff Match (Supervisory Professor Time) (PR Funds) | 13,734                        | 13734.00         |
| ODFW Staff Time Match (PR Funds)                            | 17,946                        | 17946.00         |
|   | <b>TOTAL PROJECT EXPENSES</b> | <b>171364.00</b> |
| <b>Balanced budget? This cell should read "0" &gt;</b>      | <b>NET</b>                    | <b>0</b>         |