

# Behavior, Distribution and Density of Red Fox (*Vulpes vulpes*) Subspecies in Central Oregon

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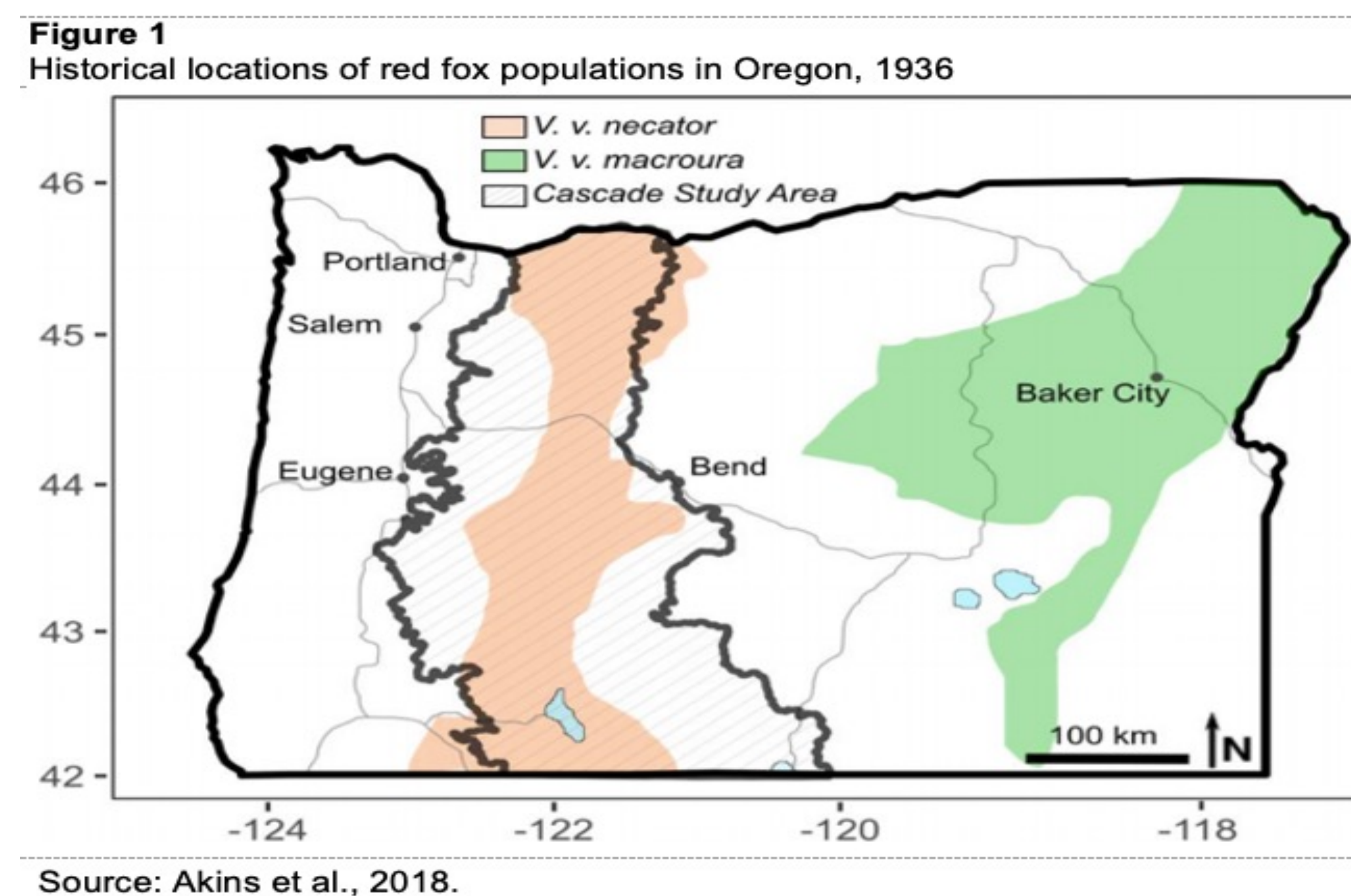
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## Background

Red foxes (*Vulpes vulpes*) have thrived in high elevations in the West coast since the 1930s when they were first recorded in NE Oregon (Aubrery et al., 2017.) That group of red foxes grew to become the Rocky Mountain red fox (*Vulpes vulpes macroura*) subspecies, whose habitat consists of the largest montane ranges on the West coast (Hiller et al., 2017.) Overtime that subspecies dispersed from Oregon and the Sierra Nevada red foxes (*Vulpes vulpes necator*) established the Rocky Mountain population range. The Sierra Nevada red foxes' primary habitat previously consists of the Pacific crest mountains in Oregon and Northern California. However, the Sierra Nevada population has decreased to the point that wildlife conservatives have repeatedly attempted to Red List the species, though with little progress. Fish and Wildlife organizations are currently attempting to document the Sierra Nevada foxes densities in Oregon, as the populations in Northern California are further declining. This is necessary in order to establish a conservation plan and to provide evidence for Red Listing the species.

Recently, Spurr (2020) reported a small population of Rocky Mountain red fox in central Oregon. Given the subspecies was thought to be extirpated from Oregon; this finding is encouraging. However, it also begs the question of why the dispersal from their original range to the Sierra Nevada red fox territories.

**Empirical Question:** *What are the current densities of the Sierra Nevada (*Vulpes vulpes necator*) and the Rocky Mountain red foxes (*Vulpes vulpes macroura*) populations in Central Oregon?*



## Proposed Method

### Target Species

Two subspecies of red foxes in Eastern Oregon are the focal subjects of this exploratory study. The Rocky Mountain red fox population in Mt. Bachelor, Mt. Washington, and Three Sisters areas and the Sierra Nevada red fox population now observed in the Terrebonne and Tumalo areas.

**Image 1**  
Sierra Nevada (*Vulpes vulpes necator*)



Photo credit: Darrell Satzman, KRCW, January 29, 2015

**Image 2**  
Rocky Mountain Red Fox (*Vulpes vulpes macroura*)



Photo credit: Montana Standard Gazette, May 15, 2018

### Materials

**Infrared Observations.** This observational study largely involves 120 Bushnell Rebel™ infrared cameras distributed in designated areas with one camera per every square km. Cameras will be secured using a Python™ locking security cable to metal fencing stakes in designated areas. Each camera will be outfitted with lithium batteries and SD cards. All cameras will be baited with scent tags using, PredatorPee™ Original Fox urine along predicted runs or dens.

**Diet analysis.** Fecal samples will be collected using Dynarex™ Specimen containers, as well as SimpleHuman™ biodegradable, unscented soap for soaking, a 1 mm stainless steel sieve, and plastic petri dishes for drying and packing (Island et al., 2021).

### Design and Procedure

Habitat will be cluster sampled for infrared camera placement using transects protocols. SD cards, batteries and scent tags will be replaced on a two-week schedule from the onset of the study to the conclusion, one year later. Video footage will be coded using a behavioral ethogram to assess behavior for potential denning, mating, and territorial behavior. Further, scat identification and collection will provide a correlate for territorial range, as well as diet analysis. Scat will be collected as available, using the diet analysis protocol reported in Island (2021) to Pacific Identifications in Vancouver B.C.

**Image 3**  
Red Fox Scat



Photo credit: Acorn Naturalists

## Proposed Results

The predictions of this study were to find that both subspecies of red fox have similar diets, but one group travels farther out. This would be a reason for the differing elevations as red foxes typically stick to high elevations. Although, there is a paucity of data on their movements and on red fox density in Oregon. Many false positives are expected, especially in the Rocky Mountain research areas as that is still an area that is being researched to find where the red foxes tend to live in. It is uncharted territory as it is unlike the Sierra Nevada research areas which have been previously researched and thus would capture more sightings with the cameras. A new question that arises is why the Rocky Mountain red fox moved back into Oregon, but specifically central Oregon when they were originally found in NE Oregon.

## Conclusions

It is well known to researchers that the red fox population in the West coast is decreasing at an alarming rate. It is enough of a decrease for researchers to call the species endangered. However, due to lack of concrete evidence that the species is endangered there has not been a move to place red foxes on the endangered list where the species can have conservation strategies urgently put in place. It is important to come up with conservation plans before it is too late. Further research is needed on red fox populations outside of Oregon to take into account more migration patterns.

## Select References

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