

# Mountain Goat Statewide Status and Harvest Management Update

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December 12<sup>th</sup>, 2024



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**FISH &  
WILDLIFE**

A photograph of a herd of mountain goats on a rocky, mountainous slope. The goats are scattered across the terrain, some standing and some moving. The background shows more of the rugged landscape under a bright sky. An orange horizontal bar is located in the upper right corner of the image area.

# **Mountain Goat Ecology 2015-2021 GMP Guidance Statewide Status New GMP Guidance Next Steps**

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Photo Credit: WDFW, W. Moore

# Brief Mountain Goat Ecology

- Long Winters & Altitudinal Migration
- Influences Population Performance
  - Primiparity  $\approx$  4.7 years (3.7 - 5.5)
  - Prime age females 4-9 years old
  - Adult female survival
  - Fecundity  $\leq$  0.8 (Festa-Bianchet et al. 2019)
- *Mountain goat populations have relatively low reproductive potential, requiring careful harvest management*

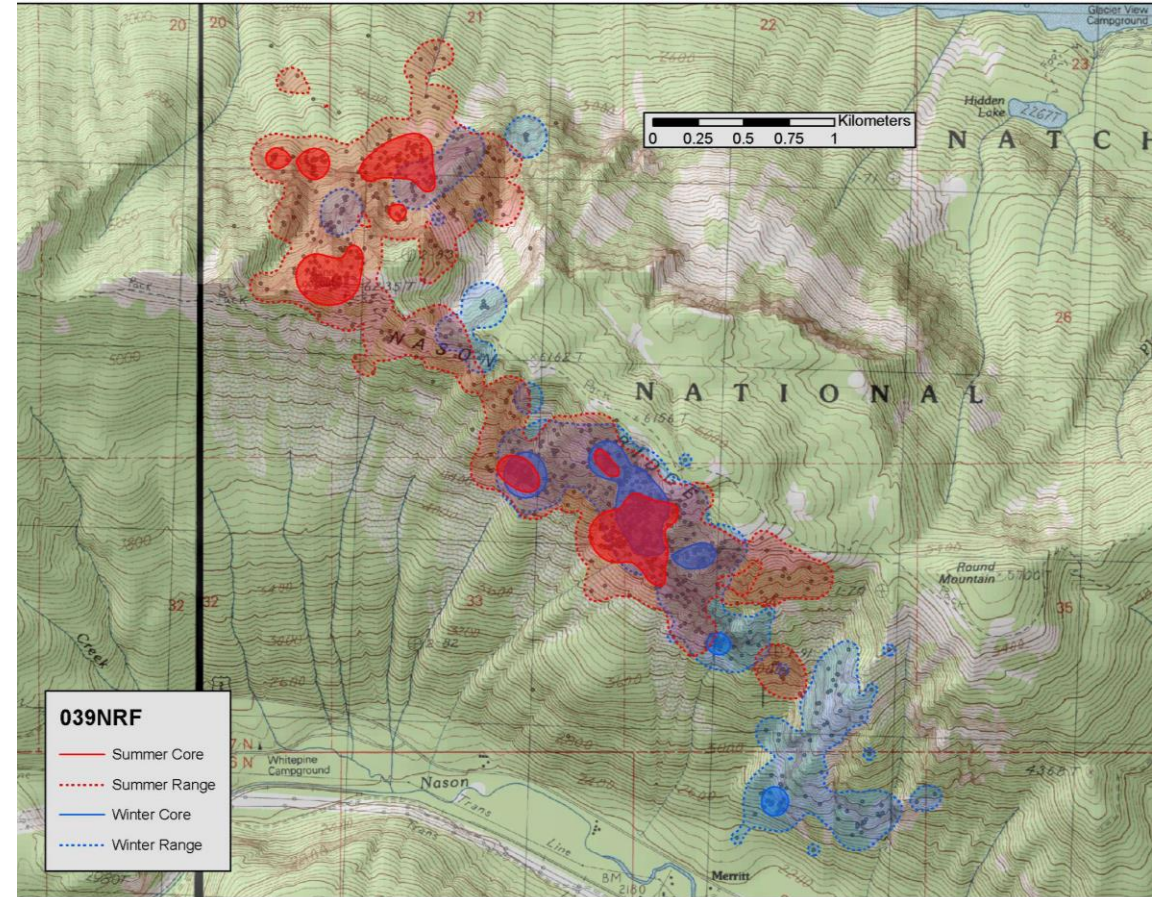
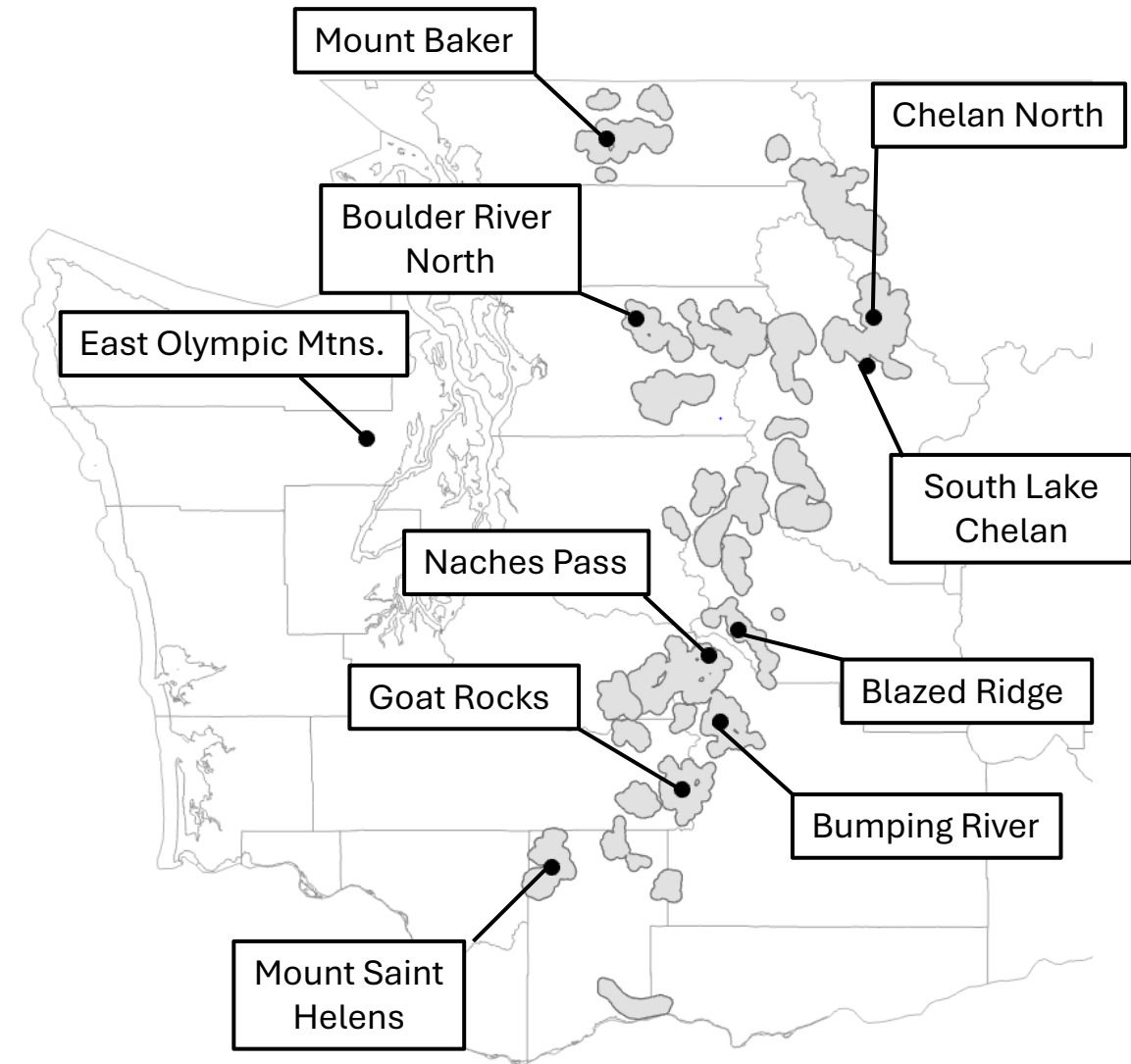


Photo Credit: Cliff Rice, Retired WDFW Research Scientist

# WDFW Managed Populations

- Nine populations are currently being managed, but multiple others are found across the Cascades.
- Additionally, the East Olympics Mtns. population is still under Department management.



# Populations, Harvest Allocation, & Hunt Units

**Population** – Mountain goats typically occur as a meta-population which consist of multiple summer range “habitat islands”. The Department identifies a population as proximal habitat islands which are believed to have consistent interaction.

**Harvest Allocation** – Generated from abundance estimates from survey blocks generally within the hunt areas.

**Hunt Units** – Boundaries which consider access, harvest vulnerability, and allow managers to control the distribution of harvest throughout the population.

**Population:**

Goat Rocks

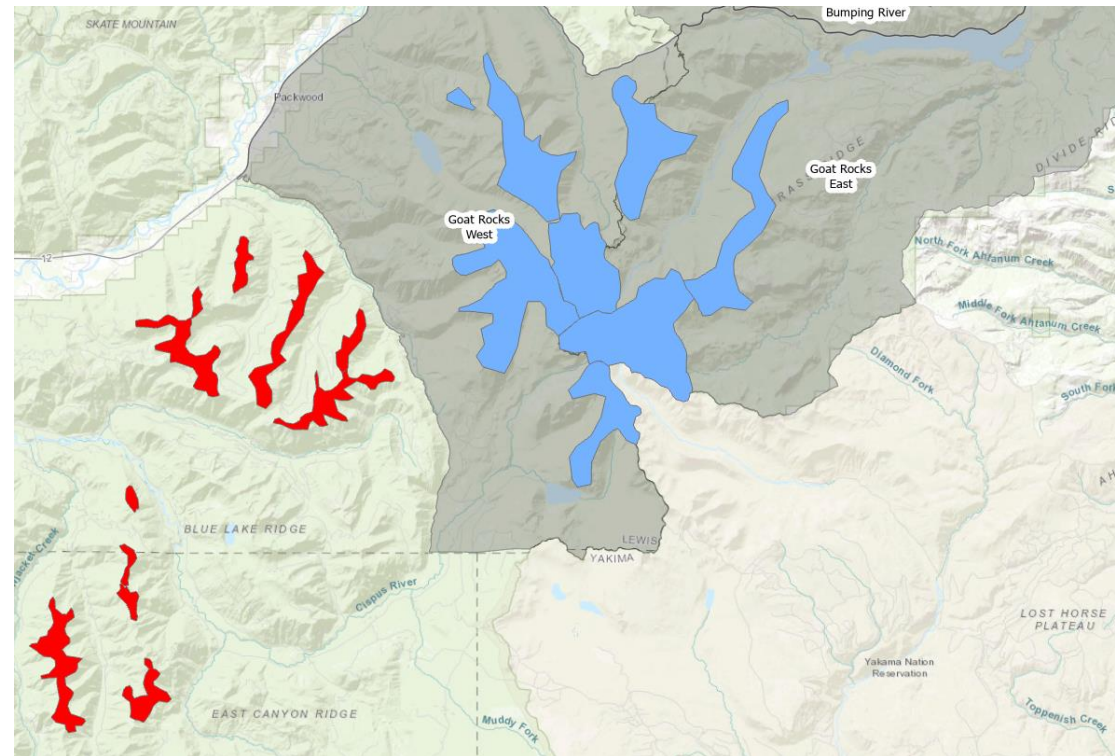
**Abundance Estimates:**

7 survey units

**Hunt Units:**

Goat Rocks West

Goat Rocks East



# Survey Goals and Methods

- Survey overview, corrected for detection bias, and standardization
- Harvested populations are monitored biennially with sufficient precision to inform management within a 4-year period.
- Increase survey when additional funding is available
  - priority is to increase survey frequency for populations of concern
  - secondarily, non-harvested populations which are insufficiently monitored.

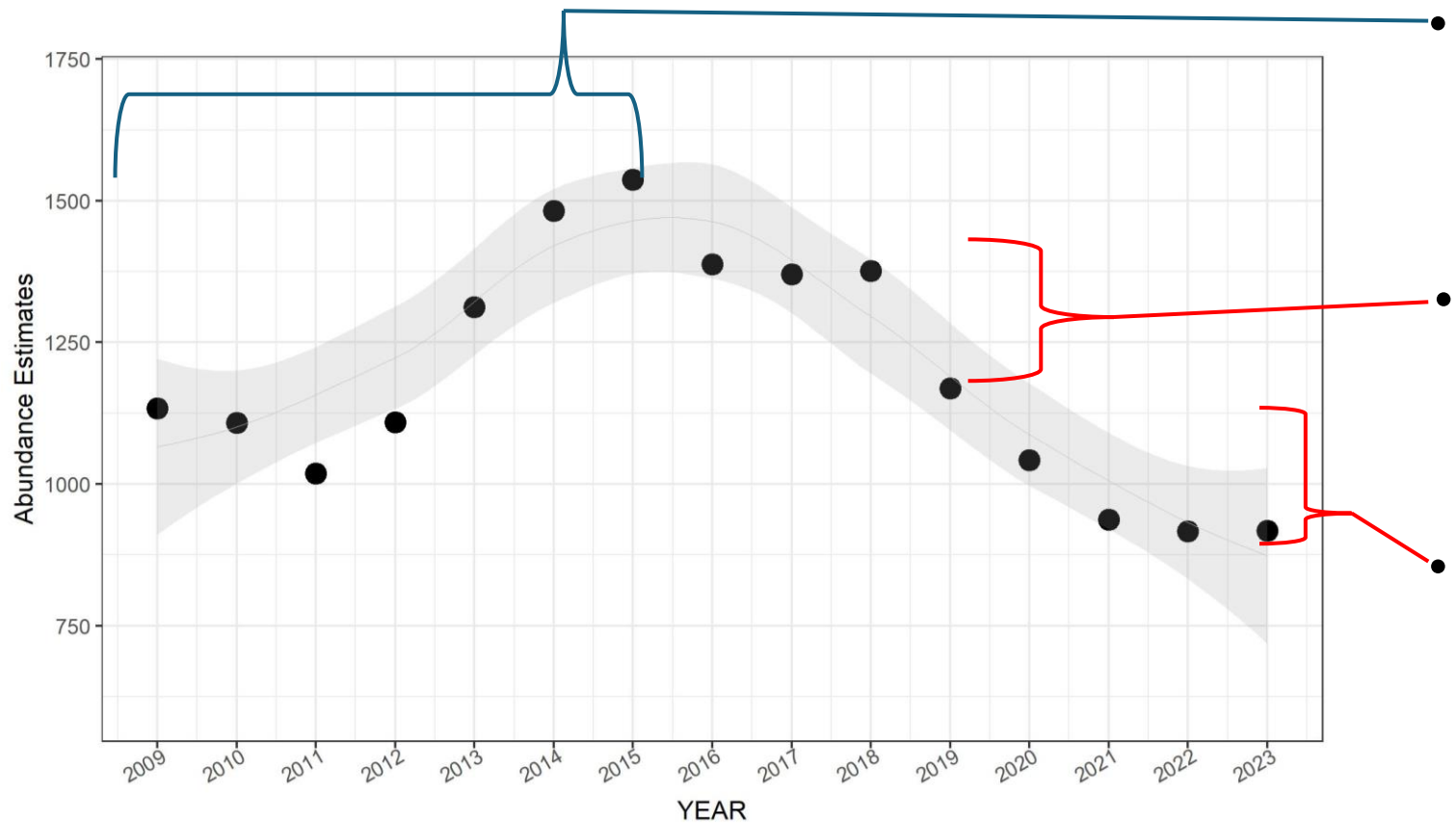


Photo Credits: William Moore & Eric Holman

# 2015-2021 Game Management Plan: Harvest Management Strategies

- Initially, population estimates must be >100 goats within an identified hunting area before that group of mountain goats can be subject to recreational harvest.
- For populations meeting the minimum abundance criteria, permits shall be issued to limit the goat harvest to 4% or less of the estimated population aged one year-old and above (i.e., adults,  $\geq 2$  years old).
- Legal bag limit is one adult goat of either sex with horns 4 inches or longer.
  - Encourage harvest of male goats (Billies) by providing all mountain goat hunters with an educational video on identifying mountain goat gender under field conditions.
  - Require mandatory in-person WDFW inspection to determine sex and age of harvest, as well as collection of biological sample for disease screening.
- Systems of permit allocation: Special Permit and Auction & Raffle

# Monitored Populations Abundance Estimates from 2009 – 2024



2002 & 2015 GMP's similar guidelines supported population growth

Declines were expected after the 2015-16 drought followed by the 2017 winter

Continued declines were not expected or easily explained

Populations: Blazed Ridge, Boulder River, Bumping River, Goat Rocks, Mount Baker, Mount St. Helens (>2013), Naches Pass, North Lake Chelan



# Plausible Explanations: Climate Change Concerns

## Survival of adult mountain goats: season, snow depth, and drought

### White et al. 2011:

↑ winter snowfall & ↑ daily temperatures during the preceding summer influenced goat survival for older age classes and prime age males

### Harris et al. 2023:

↑ mean snow depth & ↑ temperatures during the preceding spring and summer reduced adult survival

- ONP translocated goats were involved in this analysis and their survival was less than resident goats, but overall, both fared poorly from 2016-2022

## Summer temperature effects on space use and activity patterns during annual survey windows

### Michaud et al. 2023:

↑ temperatures result in:

- ↑ in elevation during the hottest portion of the day
- ↓ selection of open alpine habitats and ↑ in selection for snow patches if present and/or forested areas
- ↑ ties to crepuscular activity
- ↑ rates of one activity period during dusk

# Additional Explanations:

## Reduced survival and recruitment due to disease

*Mycoplasma ovipneumoniae* was documented in mountain goats in Nevada.

- Population level impacts were similar to bighorn sheep which includes:
  - Initial all aged die-off followed by poor juvenile recruitment
- WDFW began opportunistic testing in 2013 (i.e., nasal swabs & blood samples)
  - 2015 blood samples from a male harvested within the Goat Rocks herd yielded positive results.
  - Increased monitoring has not identified positive test results, symptomatic individuals, or any indication of disease.

## Recreational Impact:

- increased vigilance
- reduced foraging time
- displacement to less preferred habitats
- increase stress
- reduced reproductive success

## Fire Suppression reducing of alpine meadow habitat

# Individual Population Status and Management Overview

| Population          | Status     | Management Action                                       |                  |
|---------------------|------------|---|------------------|
|                     |            | Special Permit  | Auction & Raffle |
| Blazed Ridge        | Declining  | Closed 2015   | Removed 2023     |
| Chelan North        | Declining  | Reduced 2021-22, Closed 2023                            | Removed 2021     |
| South Lake Chelan   | Declining  | Closed 2023   | Removed 2021     |
| Boulder River North | Declining  | Closed 2023   | NA               |
| Bumping River       | Stable     | Closed 2025 (proposed)                                  | Removed for 2025 |
| Goat Rocks          | Declining  | Harvest $\leq$ 4%                                       | NA               |
| Mount Baker         | Declining  | Harvest $\approx$ 4% [1.4-5%]<br>Closed 2025 (proposed) | Removed for 2025 |
| Naches Pass         | Stable     | Harvest $\downarrow$ from 4 – 2%<br>2018-22             | Auction only     |
| Mount St. Helens    | Increasing | Harvest at $\approx$ 1%                                 | Available 2025   |

# GMP Harvest Guideline Updates

| Management Objective        | 2015-2021 GMP  | Draft GMP Update   |
|-----------------------------|--|--|
| Harvestable Populations     | Initially, population estimate of $\geq 100$ animals | Populations with estimates of $\geq 100$ animals   |
| Allocation Guidance         | Limit harvest to $\leq 4\%$ of the adult population  | <p>Scaled harvest by population size:</p> <ul style="list-style-type: none"> <li>• 100 -199, 3% - 0%</li> <li>• 200 – 499, 4% - 1%</li> </ul> <p>Annually evaluate proportion of male harvest</p> <ul style="list-style-type: none"> <li>• <math>\uparrow</math> % harvest of males,<br/><math>\uparrow</math> harvest allocation</li> </ul> |
| Thresholds to Pause Harvest | No specific guidance                                 | <p>Pause harvest when abundance declines below 100 goats for two consecutive estimates</p> <p>1-year harvest pause for pop. 100-199, if male proportion <math>\leq 50\%</math></p>   |

# New GMP Harvest Guidelines

| Population estimate | Male proportion of harvest (previous three years) | Harvest target (% of total adult population <sup>a</sup> ) |
|---------------------|---|--|
| 100-199             | ≥90%  | 3  |
| 100-199             | 75-89%  | 2  |
| 100-199             | 51% - 74%   | 1  |
| 100-199             | ≤50%  | 0  |
| 200-499             | ≥90%  | 4  |
| 200-499             | 75% - 89%   | 3  |
| 200-499             | 51% - 74%   | 2  |
| 200-499             | <50%  | 1  |

- Most recent population estimate
- Total proportion of males harvested during the three previous license years
- Defines the allocation of harvest of adults within the population

# Decline Response: Increased Monitoring

## South Lake Chelan

- Monitoring Objectives:
  - Sightability covariate validation
  - Winter range estimation & survey timing
  - Disease testing & vet. examination
  - Winter range estimation & survey timing
  - Summer range estimations
  - Survival monitoring
- Planning began in 2022, with capture attempted Jan. 2023 & 2024

## Goat Rocks

- Monitoring Objectives:
  - Disease testing & vet. Examination
  - Assessing alternative range use (e.g., use of more forested habitats) or emigration outside of the survey area
  - Winter range estimation
  - Survival monitoring
- USFS MRDG Process
  - Began in Fall 2022
  - Submitted Spring 2023
  - Expected capture in September 2023
- Effort paused due to wilderness permitting; broadening scope

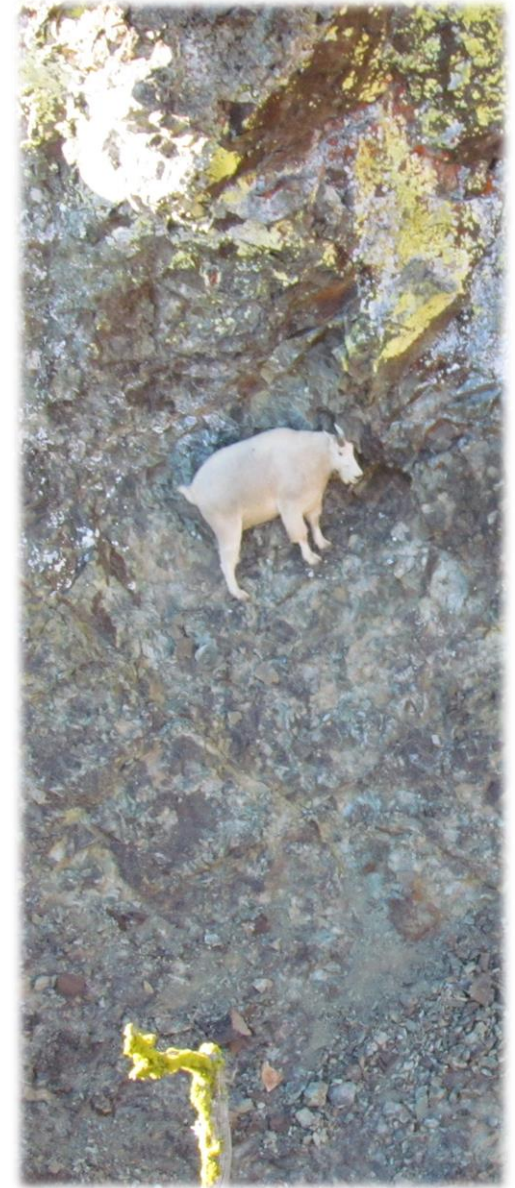


Photo Credit: William Moore

# Partner Collaboration

- **March 2023** – Mountain Goat meeting with Point Elliot Treaty Tribes
- **August 2023** – Mountain Goat meeting with Medicine Creek Treaty Tribes
- **March 2024** – Policy Level meeting with WDFW’s RDs, RPMs, PETT, Medicine Cr. NWIFC, US Forest Service, and National Park Service
- **May/July/Dec. 2024** – Technical working group meetings



Photo Credit: Eric Holman

# Next Steps

**Request for Increased Funding** - to support surveys of non-harvested populations

**Developing a collaborative Technical Working Group** - that will share knowledge, coordinate surveys, and expand monitoring efforts across the Cascades.

**Decision Package Request** – To access Climate Commitment Act funding for a multi-year research initiative. This effort will coordinate with WDFW’s Science Division and external partners to develop and launch targeted research, including but not limited to:

- Adult survival
- Cause-specific mortality
- Population vital rates
- Space use

Additional research objectives will be defined as the project progresses.



# Questions



Photo Credit: William Moore