



North Cascades Elk Herd Population Surveys

2023 Survey results published June 2023

The North Cascades Elk Herd is co-managed by the Washington Department of Fish and Wildlife (WDFW) and the Point Elliott Treaty Tribes.

Why do biologists fly aerial surveys, and what do the data tell us?

- Aerial surveys help co-managers estimate the elk herd's population trend and characteristics over time.
- Counting every individual elk in a free-roaming elk herd is impossible, so co-managers for this elk herd use population estimators that require them to collar – or “mark” - several elk in the survey area (Table 1). Biologists then use a helicopter to fly either a single or replicate (two surveys approximately one to two weeks apart) survey in March and count as many elk as can be seen, noting each individual's sex, general age, and whether it was collared or uncollared. Finally, biologists use the data with a statistical model to estimate population size and a ratio for age (i.e., # of calves per 100 cows) and sex (i.e., # of bulls per 100 cows).
- Although replicate surveys are more accurate than a single survey, they are more expensive. Variables such as weather, observers, pilot, and elk detectability can affect the accuracy and precision of population estimates. Thus, population estimates vary year-to-year (known in statistics as “random sampling variation”), so two consecutive survey estimates don't necessarily indicate whether a population is increasing or decreasing. For example, the 2021 population estimate is less than the 2020 estimate (Table 1), but that doesn't necessarily mean the population decreased during that year.
- A single population estimate never tells the whole story; therefore, biologists typically evaluate trends in the elk population over time using estimates from several surveys to make major management decisions.

What is the 2023 population estimate for the North Cascades Elk herd?

- WDFW and co-managers completed a single survey of this elk herd within the defined survey area (Figure 1) in March 2023. The population estimate was 1,621 elk with a 95% confidence interval range from 903 to 2,345 elk (Table 1). The age ratio estimate is 22 calves per 100 cows, and the sex ratio estimate is 18 bulls per 100 cows.
- Although the 2023 estimate lacks statistical precision (see explanation below), the estimate of 1,621 elk is consistent with previous survey estimates (Table 1).
- As stated, wildlife managers rely on trends in elk population estimates over several surveys to make major management decisions.

- The NCEH population objective is 1,700 to 2,000 elk, and the estimate from 2023 falls within this objective. For more information, see the [2018 North Cascade Elk Herd Plan](#).
- Regardless of herd size, WDFW will continue to work with landowners to address elk damage issues while appreciating that elk are significant to Tribal co-managers, hunters, wildlife enthusiasts, and many other Washingtonians.

Table 1. Population estimates by survey type for the North Cascades elk herd within the defined survey area, 2016–2023.

Year	Survey Type	Population Estimate	95% Confidence Interval Range		Collared Cow Elk	
			Low Range	High Range	# Collared Cows	# Collared Cows Seen
2023	Single	1,621	903	2,345	48	12
2022	No survey conducted					
2021	Replicate	1,194	1,108	1,287	61 and 60	28 and 21
2020	Single	1,339	1,026	1,652	42	25
2019	Replicate	1,493	1,390	1,603	46	23 and 26
2018	Single	1,593	877	2,309	23	9
2017	Single	1,163	777	1,549	30	15
2016	Replicate	1,267	1,170	1,374	33	20 and 12

How do we interpret North Cascades elk herd population estimates?

- Once surveys are complete, biologists use a statistical model to calculate a population estimate, which provides an associated 95% Confidence Interval (Table 1). This confidence interval tells us we are 95% sure that the actual—but unknown—population number falls within the range of values around the estimate. Confidence Intervals are essential for managers to understand and interpret survey results because they provide a statistical measure of the estimate's precision or lack thereof. Importantly, the size of the confidence interval range is affected by the sample size (number of collared elk seen during the survey) and represents the degree of uncertainty in the estimate, not the probability of a high or low population number.
- Biologists only saw 12 of the 48 collared elk during the single 2023 survey (Table 1). This caused the confidence interval range to be large, indicating that the population estimate may not be close to the actual population number and is less reliable than previous estimates.

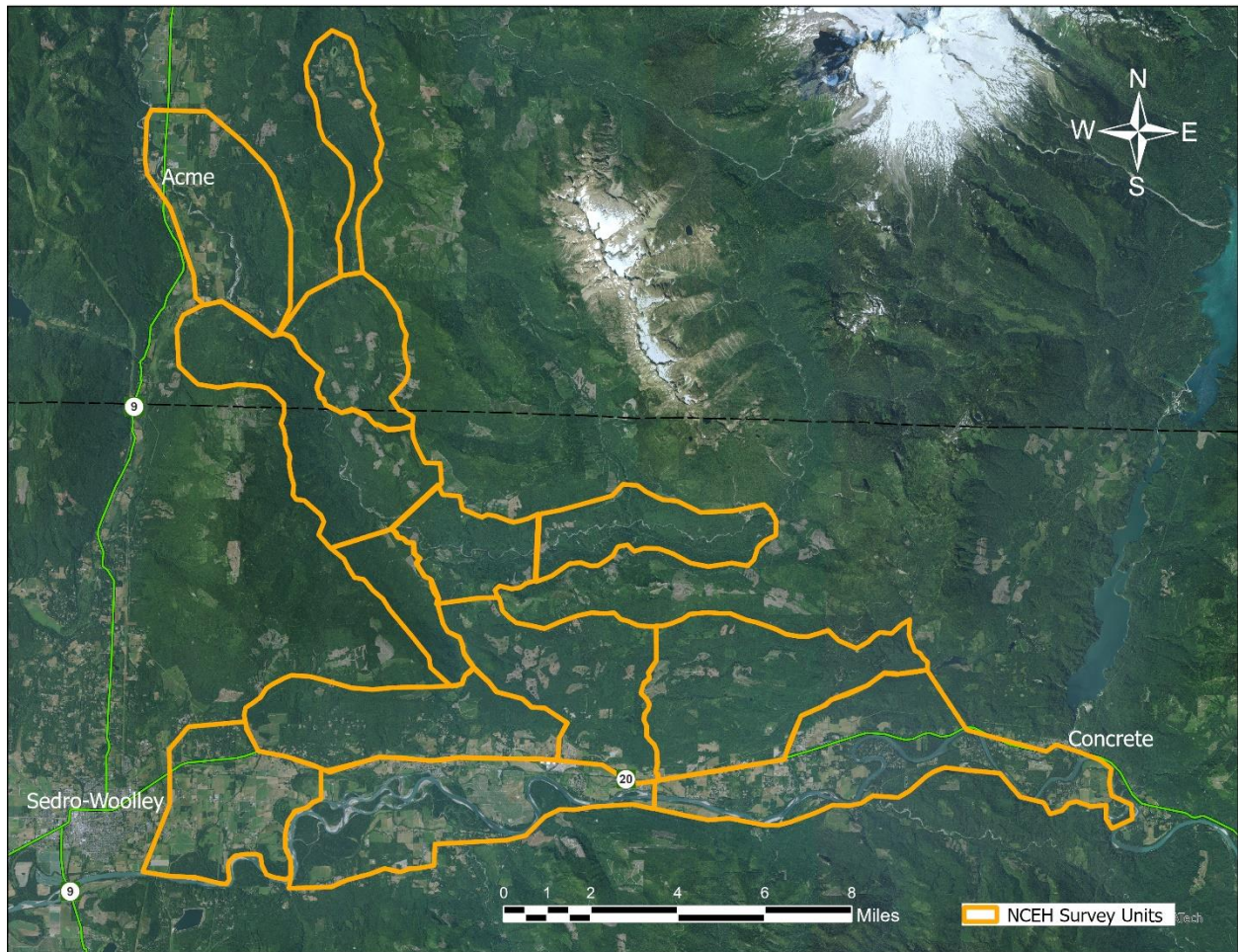


Figure 1. Survey units used to conduct population surveys within the core area of the North Cascades Elk Herd.

For more information on North Cascades elk herd management, including recent reports and damage updates, please see: <https://wdfw.wa.gov/hunting/management/north-cascade-elk>.