

Evidence essay · Wildlife and ecology

Counting the seals you cannot see

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Fictional author and institute · Editorial demonstration, not peer reviewed

ABSTRACT

Aerial seal counts are interpreted by separating availability to a survey from recognition of an animal that is available. The essay discusses published biologist research on bearded, ribbon, and spotted seals, showing why haul-out timing, weather, season, and demographic group affect the visible fraction. A deliberately invented calculation demonstrates that the same count can imply different totals under different availability assumptions, without proposing correction factors for real surveys. Ringed seals require additional treatment because snow lairs can conceal animals that are already out of the water. The discussion also considers tagging selection, device lifetime, temporal dependence, coverage, and identification error. Better population inference needs representative evidence and propagated uncertainty, while personal observations should retain effort and conditions without approaching wildlife to complete a count.

Keywords: ice seals · haul-out behaviour · availability bias · aerial surveys · abundance uncertainty

Adapted from the Still North field journal. Original article. A source-based editorial text, not a report of original Still North research. Examples and imagery are illustrative.

A photograph can count the seals visible on an ice floe with remarkable clarity. It cannot count the seals swimming beneath it. That simple limit becomes consequential when aerial images are used to estimate a population, or when a visitor compares two days of sightings and concludes that wildlife has increased or disappeared.

The missing animals are not a reason to abandon counting. They are a reason to model how animals become countable. Research on ice seals separates availability, whether an animal is in a position where the survey could see it, from detection, whether the survey actually recognises an available animal. Those are different sources of uncertainty and need different evidence.

Being on the ice is a behaviour, not a constant

London and colleagues' study of bearded, ribbon, and spotted seals used satellite-linked biologists to examine spring haul-out behaviour in the Bering and Chukchi seas. The devices recorded time out of the water. The analysis found strong patterns through the day and season, with effects of wind and temperature, and differences among species and age-sex groups.

Seals were generally more likely to haul out around the middle of the day, in lower winds, and at higher temperatures. Haul-out probability rose through March and April, peaked in May and early June, and then declined. Those findings do not supply a universal correction for every seal in every Arctic region. They show why the conditions of a survey belong in the estimate.

The same count can imply different totals

Use a deliberately invented example to isolate availability. Suppose a survey counts 40 seals in a defined area, and assume, only for this calculation, that it finds every seal on the exposed ice. If half the seals are available, the simple estimate is 40 divided by 0.5: 80. If only a quarter are avail-

able, the same count corresponds to 160. These fractions are not measured haul-out probabilities or recommended correction factors.

The arithmetic reveals the importance of the denominator. It also reveals why uncertainty in availability must carry into uncertainty in abundance. In a real aerial estimate, analysts must additionally address missed animals on the surface, species identification, unsurveyed areas, and the spatial design. Dividing an opportunistic photograph count by a convenient fraction does not turn it into a population survey.

Even a higher count need not mean a larger population. A later visit could coincide with more animals resting on ice, better visibility, or a different route. Conversely, a lower count may be meaningful if effort, coverage, availability, and detection are adequately comparable. The purpose of careful design is to distinguish these explanations, not to make genuine change impossible to recognise.

Ringed seals add a hidden room

Being out of the water is not always enough. Ringed seals use snow-covered lairs on sea ice, so an animal may be dry yet invisible from above. The biologist study explicitly excluded them because that additional concealment requires different treatment. Applying its correction unchanged to ringed seals would cross a boundary the researchers deliberately retained.

NOAA's account of related haul-out and emergence research explains how separate work examines the spring transition from lairs to exposed basking. Emergence timing varies geographically and with conditions. A survey schedule suitable in one part of the region may not capture the same visible fraction farther north.

Better corrections still need representative evidence

Biologgers are powerful, but tagged animals are a sample too. Capture location, season, species, age, sex, tag placement, and device lifetime shape the record. A tag attached to hair may fall off during the moult; a different attachment can continue recording. Multiple consecutive hours from one individual are also related observations, not hundreds of independent animals.

The published study addresses temporal correlation and documents those practical constraints. That makes the method more useful than a single unexplained percentage. Our [open-observations](#) page sets out the same principle for public records: preserve the selection rules and limitations that another user needs to judge a comparison.

For a personal wildlife note, keep the date, duration, route, visibility, and observation method, including occasions when nothing was seen. Do not approach animals to make the count feel complete. Our [wildlife guide](#) connects responsible distance with useful evidence. A count is the start of an explanation. Knowing who was unavailable to be counted is what allows that explanation to reach beyond the photograph.

References

1. London and colleagues' study of bearded, ribbon, and spotted seals (peerj.com)
2. NOAA's account of related haul-out and emergence research (fisheries.noaa.gov)