



Drones are increasingly used in traditional reindeer herding. Foto: E Winje, NIBIO.

AirHerd

Drone use in reindeer herding

The introduction of unmanned aerial vehicles (UAV), or drones, to traditional reindeer herding has - literally - given indigenous Sámi herders a new perspective: the aerial one.

Areas of hard-to-reach reindeer rangelands can now be accessed through drone cameras, and drones can make finding, collecting and driving reindeer easier.

AirHerd

This small-scale project funded by Interreg Aurora Sápmi allowed Mid University (MIU) in Sweden and the Norwegian Institute for Bioeconomy (NIBIO) in Norway to map reindeer herders' experiences with drone

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A light drone fits into a backpack and can easily be used to survey large and inaccessible terrain. Foto: G Wagner, NIBIO.

technology in traditional reindeer herding. The aim is to improve cross-border knowledge exchange and co-create ideas for large scale research projects covering herders' requirements for the future.

Mapping drone use

Drones are light and mobile *ad hoc* tools. They fit into a backpack which can easily be transported into difficult terrain and can fast reach areas dangerous for people or helicopters.



Drones can find and herd reindeer from rangelands towards fences. Foto: T Wagner



A herd is driven into a fence by two drones instead of four ATVs. Foto: T Wagner



Drones can be used to chase animals out of dangerous situations such as avalanche exposed terrain (top left), to monitor animal behaviour at close range in inaccessible terrain or during bad visibility (top right), to find animals in forested areas in which the ground view offers too small a perspective (bottom right) or to find and move animals in large open rangelands (bottom right). Fotos: N O Oskal.

Drone operations support herders in:

- finding and collecting animals in challenging terrain
- moving animals (away from predators, agriculture, avalanche terrain, traffic or between seasonal pastures)
- monitoring predators
- monitoring reindeer behaviour and health
- finding and documenting animal losses
- checking fences and herding infrastructure
- Finding suitable pasture or safe migration routes.

The aerial view of the drone enables significant savings in work time, physical strain, fossil fuels and costs.

Traditional knowledge

Herders further report a gentler approach to driving animals with a drone vs. a helicopter as they themselves can perform drone operations in combination with their traditional knowledge of animal behaviour. They report reduced stress and strain for the animals compared to helicopter use.

Helicopter vs drone

In previous years helicopters were used to find, drive and count reindeer. These costly operations can now at least partly be replaced by drone use.

The potential reduction in CO₂ emissions based on decreased helicopter is significant and could be measured in tens of tons in a best-case scenario. The potential for reduction depends on the type of helicopter and varies in time and space with helicopter type availability.

helicopters will significantly decrease CO₂ emissions and contribute to improved animal welfare and increased health and safety for the herders together with decreased costs due to less fossil fuel use and off-road-vehicle maintenance. Soon drones will soon count reindeer with the help of AI, both in the visible and thermal spectrum.

Challenges include legal obstacles to drone use beyond line of sight, investment costs and operator education.

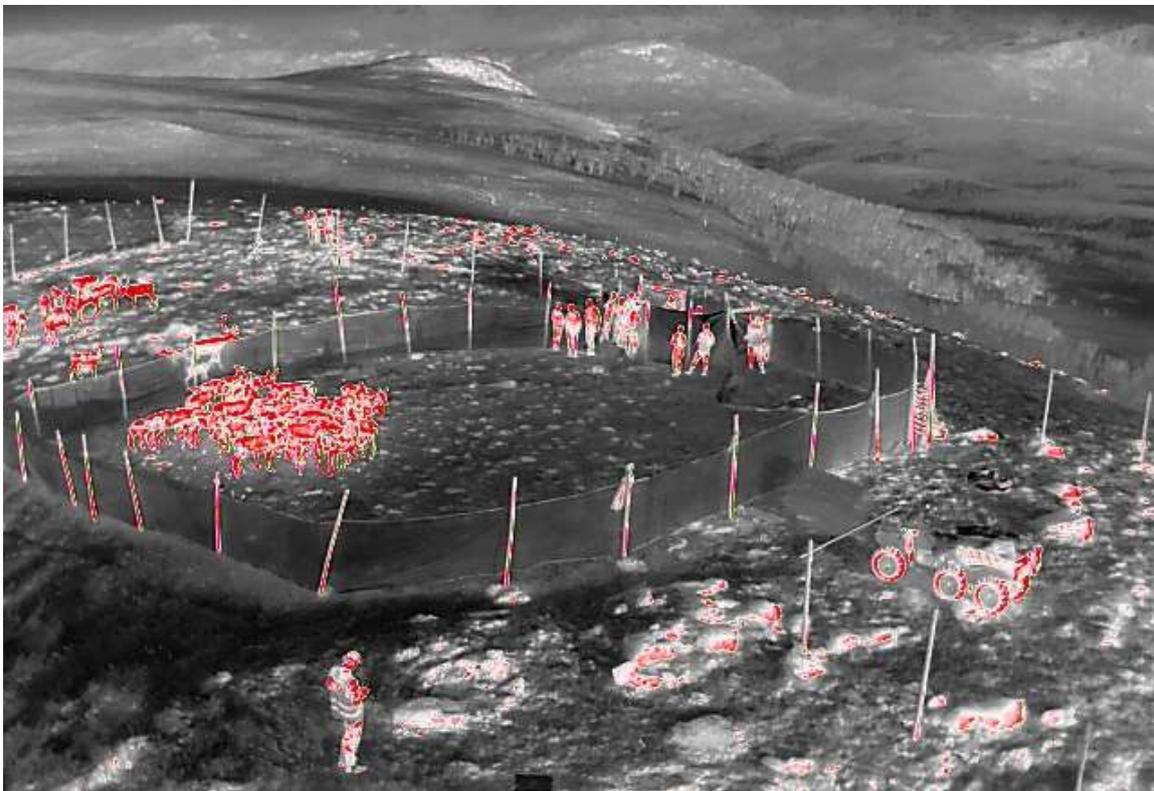
Visions of the future

Using drones instead of

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Infrared picture of herders with a herd of reindeer calves. Will an artificial intelligence algorithm soon be able to count the reindeer? Foto: H H Lislegård, NIBIO.