Enhancing reindeer husbandry in boreal Sweden

An economic evaluation of the use of GPS collars

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Reindeer feeding on ground lichens during winter in the coastal region. *Ref: Erik Valinger.*

Why use GPS collars in reindeer husbandry?

The use of a GPS tracking system has led to a change in the labour process of reindeer husbandry, as the herd can be monitored and followed remotely on computers. It increases knowledge about migration routes and use of grazing areas as the movements are registered by the tracking devices. With the aid of the GPS tracking system, vehicle mileage could be reduced and predator attacks on the herd can be detected at an early stage. These attacks are a very serious concern for Sami herdsmen due to economic losses.

Female reindeer equipped with GPS collar. *Ref: Erik Valinger.*

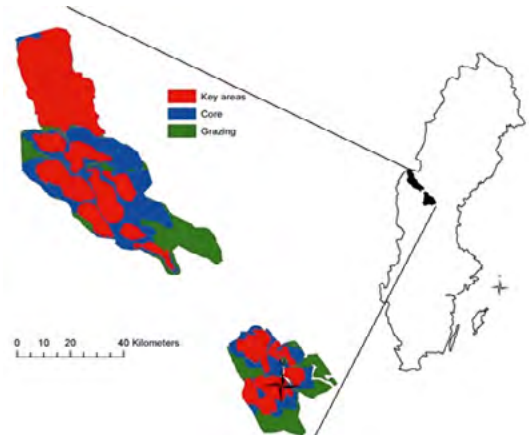
Background

The study was conducted in the area of Njaarke Sami Village in boreal Sweden. In 2014, the Njaarke Sami village consisted of four reindeer husbandry companies. The total area with grazing rights controlled by the village was about 505 000 ha in total, which included about 256 000 ha of productive forest land. The forest land is owned by several owners. The reindeer herd was about 2000 animals during winter.

The forest management in the area consisted of compartment cuttings with a rotation period of about 100-130 years. A forest management plan adapted to the needs of the reindeer husbandry would lead to a possible increased slaughter of 200 reindeer calves per year. In the study, three alternative scenarios were analysed; with or without the use of GPS collars, with no adaption of forest management i.e. business as usual (BAU + GPS or BAU – GPS) and adapted forest management with GPS collars (AFM + GPS).

In 2013, at the initiation of this study, the Sami village had 40 collars in use. The cost for GPS collars depreciated over five years of use, resulting in an annual depreciation per collar of 162 €. The annual cost for maintenance of the GPS system and these collars was €220.

Study area



Map of case study area with classification of areas based on reindeer husbandry plan. Key areas – most used and valuable areas for grazing, Core – regularly used and valuable areas for grazing, and Grazing – available areas but normally not used for grazing

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Advantages

- GPS tracking enables more effective monitoring and reduces the risk of accidents involving reindeer and people in the field, and with the traffic.
- Information about migration routes recorded by the tracking devices provides the basis for better management practice, including consultation with forest owners which is important to improve forest management for reindeer husbandry.
- A further benefit, is that the Sami villagers become skilled in using a new technique.

Several calves gathered before marking.
Ref : Erik Valinger.

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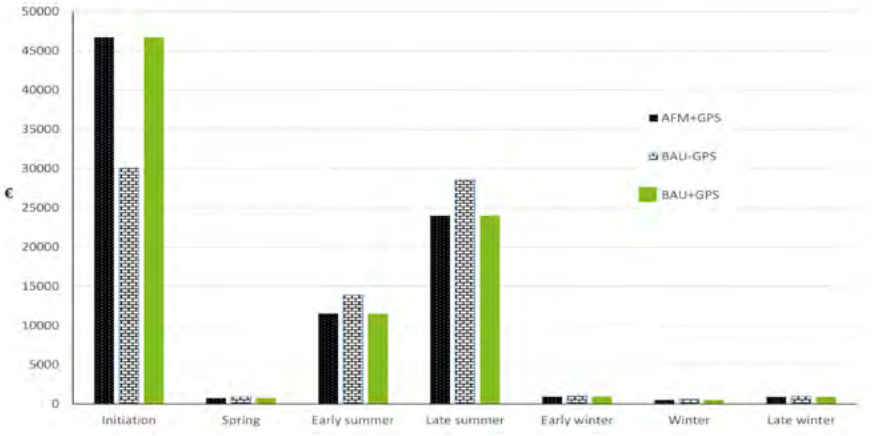
Comparison of costs per scenario with and without GPS

The adaption of forest management was calculated to ascertain the gross value added (GVA) for the reindeer husbandry. No use of GPS collars was estimated to result in increased costs for labour and energy as the extra workload required was 1.4 times a full time employee. The collars facilitated the easier allocation of reindeer to better grazing areas and it also made the operations safer and faster. These advantages were estimated to be worth €4000 in savings per year. However, these savings were not sufficient to cover the current high cost for the GPS system. Costs vary throughout the season. Significant costs are incurred at the initiation of the reindeer year and this accentuates the costs of items such as the equipment, machinery, houses and infrastructure used by the Njaarke Sami village.

	Scenario		
Indicator	**AFM**	**BAU - GPS**	**BAU + GPS**
GVA, 1000 €	115,2	90,0	69,7
Production cost, 1000 €	120,7	107,0	119,6
Labour cost, 1000 €	40,5	43,3	40,5
Employment, FTE	6,9	8,3	6,9

Indicators for three management scenarios for reindeer husbandry: adapted forest management (AFM) and business as usual (BAU) without and with GPS. Note: Gross value added (GVA) = income minus costs for capital, energy, and maintenance activities. Labour costs were thus included in the GVA. FTE = Full time employment unit of one person per year.



Seasonal distribution, across seven parts of the year, of teh costs of three forms of reindeer husbandry: adapted forestry management with GPS (APM+GPS) and business as usual without and with GPS (BAU-GPS and BAU+GPS)

Conclusions

- Use of GPS tracking enables a better monitoring of the reindeer herd.
- The use of GPS, at current prices, did not pay off finanically.
- The benefits of using GPS are easier working conditions, and better-control of the herd, migration routes and tracking of predators.
- Adapted forest management for reindeer herding was calculated to increase the gross value added from reindeer husbandry.

Further information

Berg S, Valinger E, Lind T, Suominen, Tuomasjukka (2016). Comparison of co-existing fo restry and reindeer husbandry value chains in Northern Sweden. Silva Fennica, Vol. 50, No. 5 Article Id 1384. 16 p. Available at http://dx.doi.org/10.14214/sf.1384.

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