



Using GPS location equipment to study the behaviour of sheep in summer rangelands

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Introduction

A large part of Icelandic commons is used as summer rangelands for sheep and both soil and vegetation are often adversely affected. For a more sustainable approach to grazing, understanding sheep movement and grazing behaviour is fundamental.

Since 2018 SCSi, in collaboration with ca. 10 farmers, has studied sheep movement in summer rangelands. At each farm the location of 10 ewes is registered every 6 hours over the summer, using GPS collars. The aim of the study is to determine how sheep use the land e.g. in regards to habitat selection and the size of the area the sheep inhabit (homerange).

Here, preliminary results from the years 2018-2020 are presented.



Figure 1. A ewe with a GPS collar and her lamb.

Habitat selection

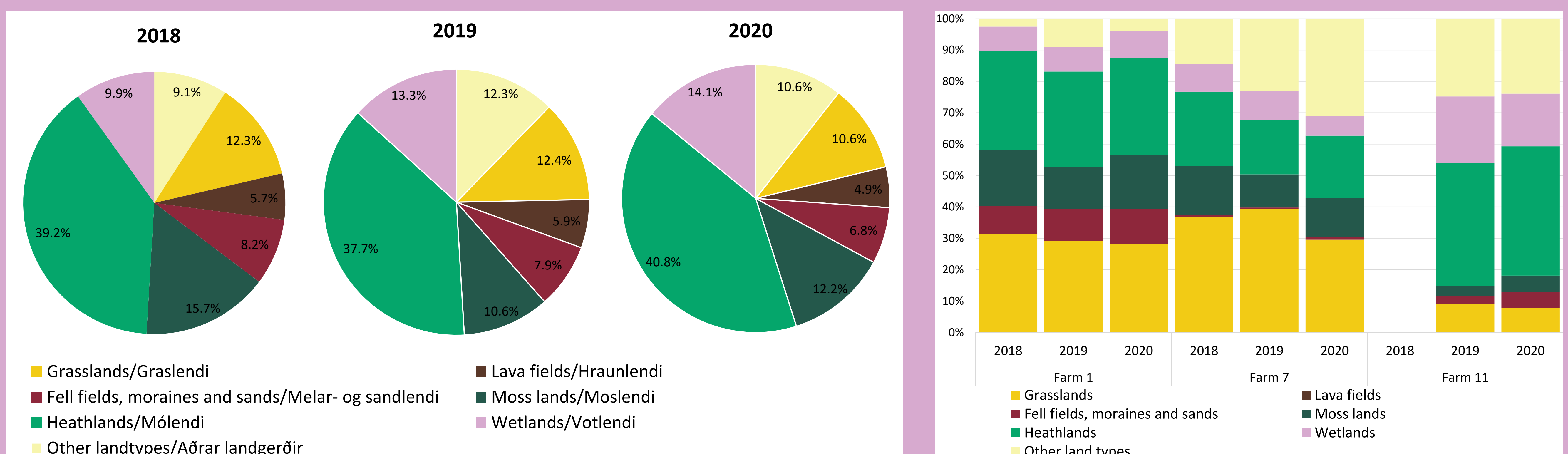


Figure 2. Overall percentage of GPS transmissions from each land type (left) and three examples of individual farms (right), based on average number of observations from each farm. This illustrates which land types sheep preferred over the summer grazing period. Change in overall land preference between years is insignificant. "Other land types" are: exposed aeolian soils (moldir), geothermal areas (jarðhitasvæði), scree and cliffs (skriður og klettur), river plains (eyrar) and woodlands (skóglendi).

The sheep spend most of their time in heathlands, followed by moss lands, grasslands and wetlands (left). There was little difference between years, but observable difference between farms (right). The variation between farms is likely explained by the varied accessibility to different habitats between rangelands. Future analysis includes determining the habitat type preference, and the influence of seasonality and accessibility on preference.

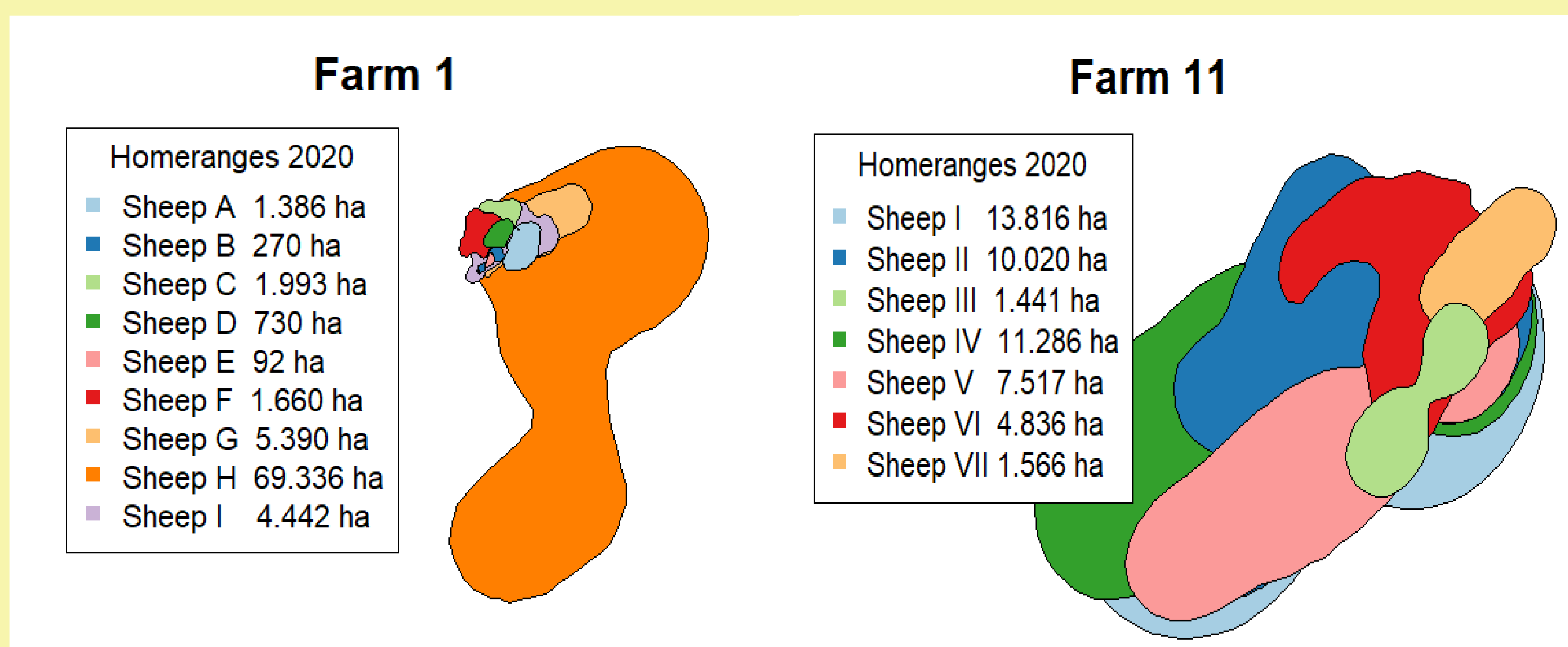


Figure 2. Polygons illustrate the size (ha) and shape of the homerange of sheep on farms 1 and 11 in 2020 in Iceland. Note the large orange polygon of sheep H. This sheep got lost (probably in the fog) just before round-up in the autumn and wandered off, which explains the drastic size difference in contrast with other sheep on the same farm. In such cases, homerange must be re-considered, e.g. by excluding anomalous coordinates.

Homerange

The size of homeranges varies between sheep both within and between farms. Further analysis will include details on temporal variation by analysing early, mid and late summer to determine whether homeranges change through time within the summer season.

Here we only present preliminary results. The dataset is already large and will continue to grow each summer. This offers a range of different studies into sheep movement and behaviour during the summer grazing period. The data gathered can contribute to a more sustainable land management in the future.

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