

Addressing upland agricultural and environmental challenges

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Leading the way in Agriculture and Rural Research, Education and Consulting

Scottish uplands

Land Capability for Agriculture in Scotland

- Arable
- Mixed agriculture
- Grassland
- Rough Grazing
- Built up areas
- Inland water

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Challenges and Opportunities?

Range of agricultural production challenges:

- Poor nutrition
- Pests and Disease
- Climate change
- Predation
- Low productivity

Low lambing percentages in spring and/or Low survival of lambs through to autumn



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Challenges and Opportunities?

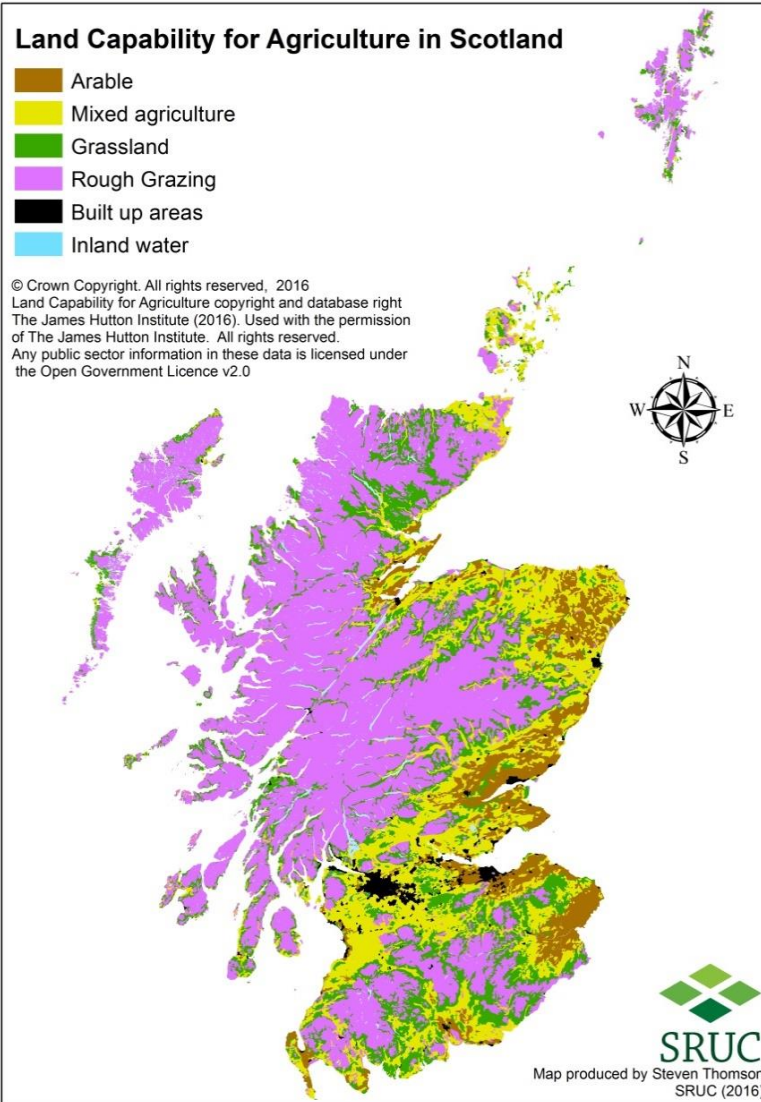
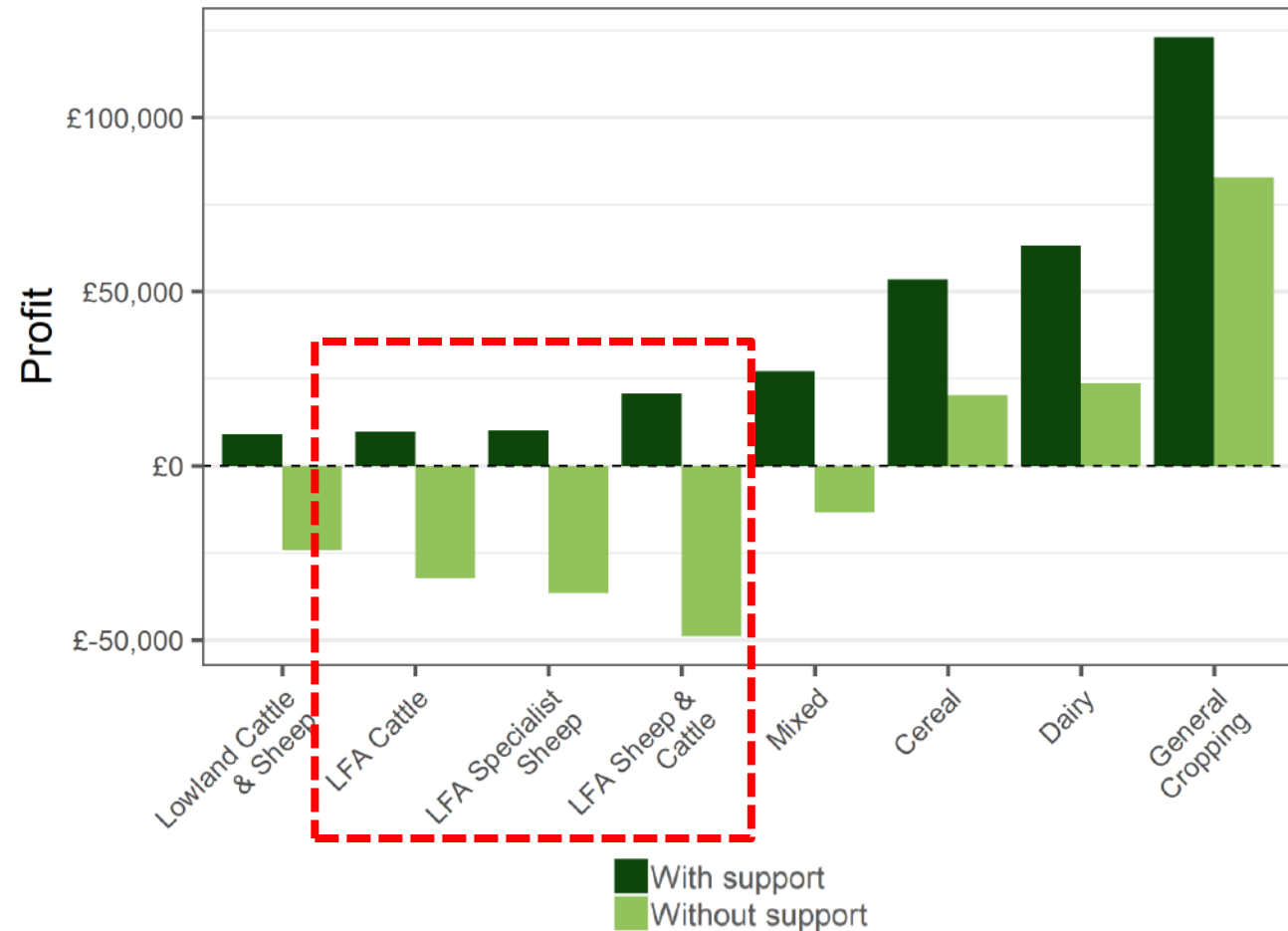


Figure 10 – Average profitability by farm type, 2018-19



Loch Lomond and The Trossachs National Park Boundary

Legend



National Park boundary



Local Authority boundary

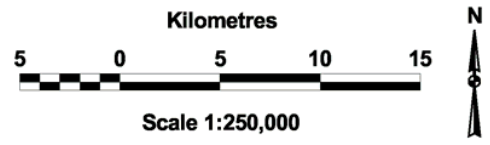
Argyll
& Bute

SRUC Kirkton and Auchtertyre

Perth &
Kinross

Stirling

West
Dunbartonshire



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Examples of tools in the box:



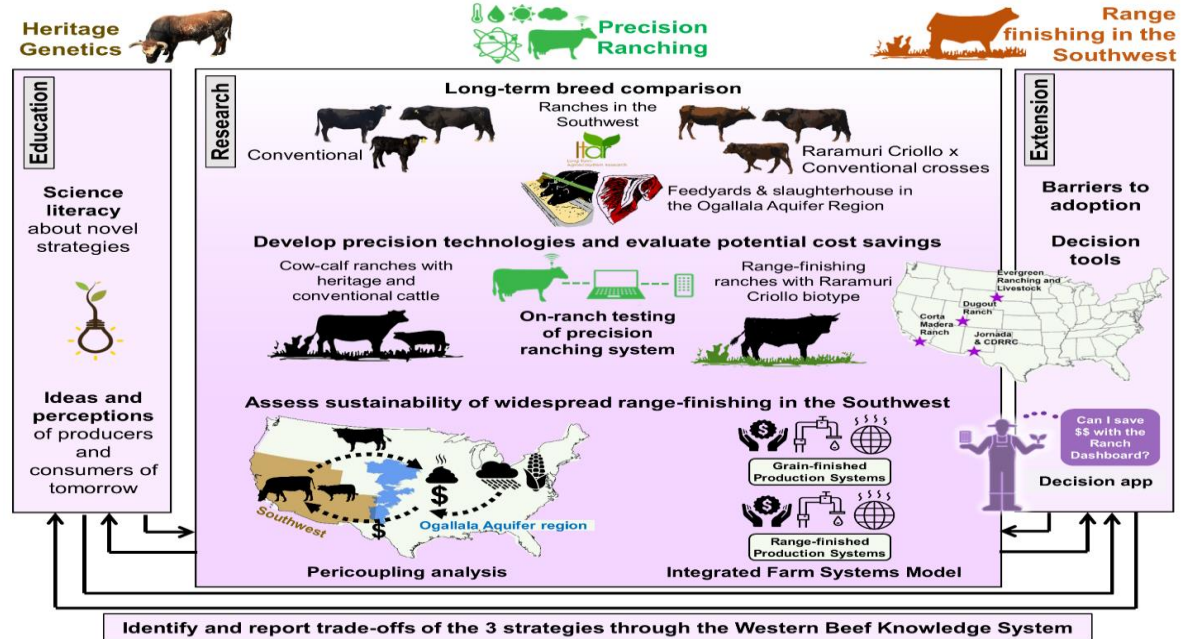
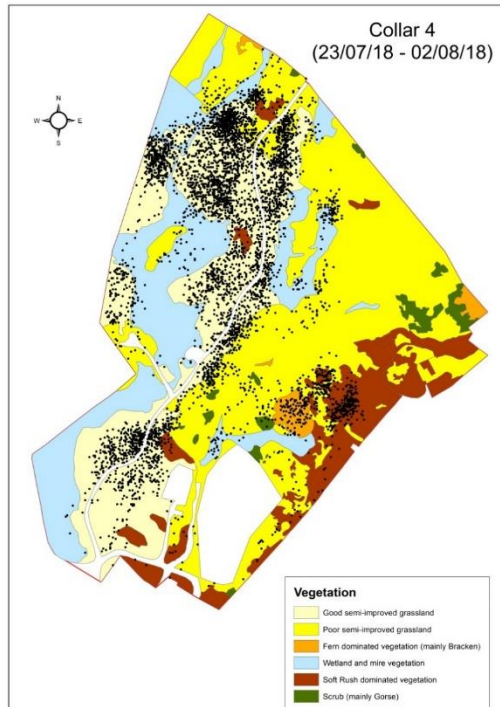
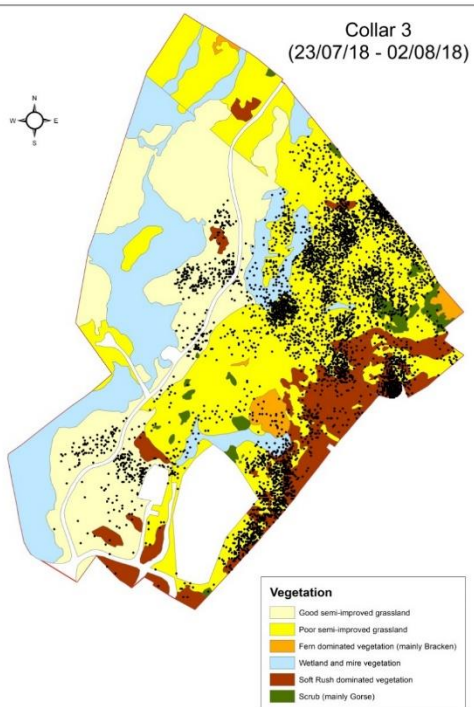
Examples of tools in the box:



Precision Agriculture and the Internet of Things (IoT)



- Minimising costs / maximising production efficiency
- Promoting sustainability
- Livestock welfare
- Economic viability of farms
- Environmental compliance



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Cattle Grazing Rangeland at Opaker Farm, Norway

Meet Arne Wilhelm Omsted from Opaker Farm, and learn about his experiences with Nofence from the grazing season of 2019.

[WATCH VIDEO](#)

Experiences from Bjerke & Opaker Grass-fed Beef Farm

Challenges and Opportunities?

Scale of change needed

Net Zero by 2045

- *Peatland Restoration*
- *Environmental management*
- *Woodland creation*
- *Flood mitigation*

Innovation = Doing Things Differently

Inbye grasslands

- Soil pH and nutrients
- GHG emissions
- Grassland management
- Forage & fodder improvements

Hill grazing

- Bracken control
- Improving hill parks

Sheep Performance

- Genetic selections
- Blackface and Lleyn

Flock Performance

- EID associated kit
- TST worming of lambs
- Comparison of system trade-offs

Auchtertyre flock

- Restocking
- Blackloss
- Yellowwases/Ploch each

Technology

- Virtual fencing
- Drones for assessments

LoRa network

- Tracking livestock
- Sensors

Systems approach to Precision Livestock Farming

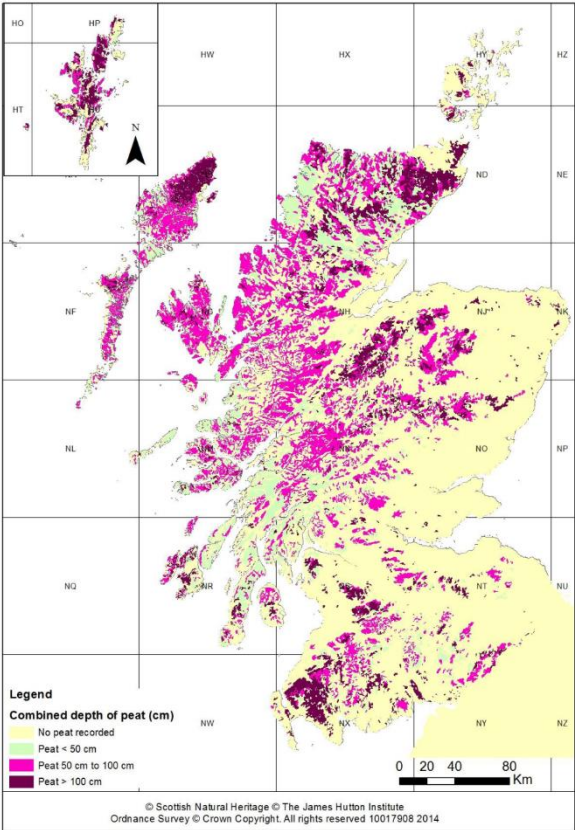


Precision Agriculture and the Internet of Things (IoT)

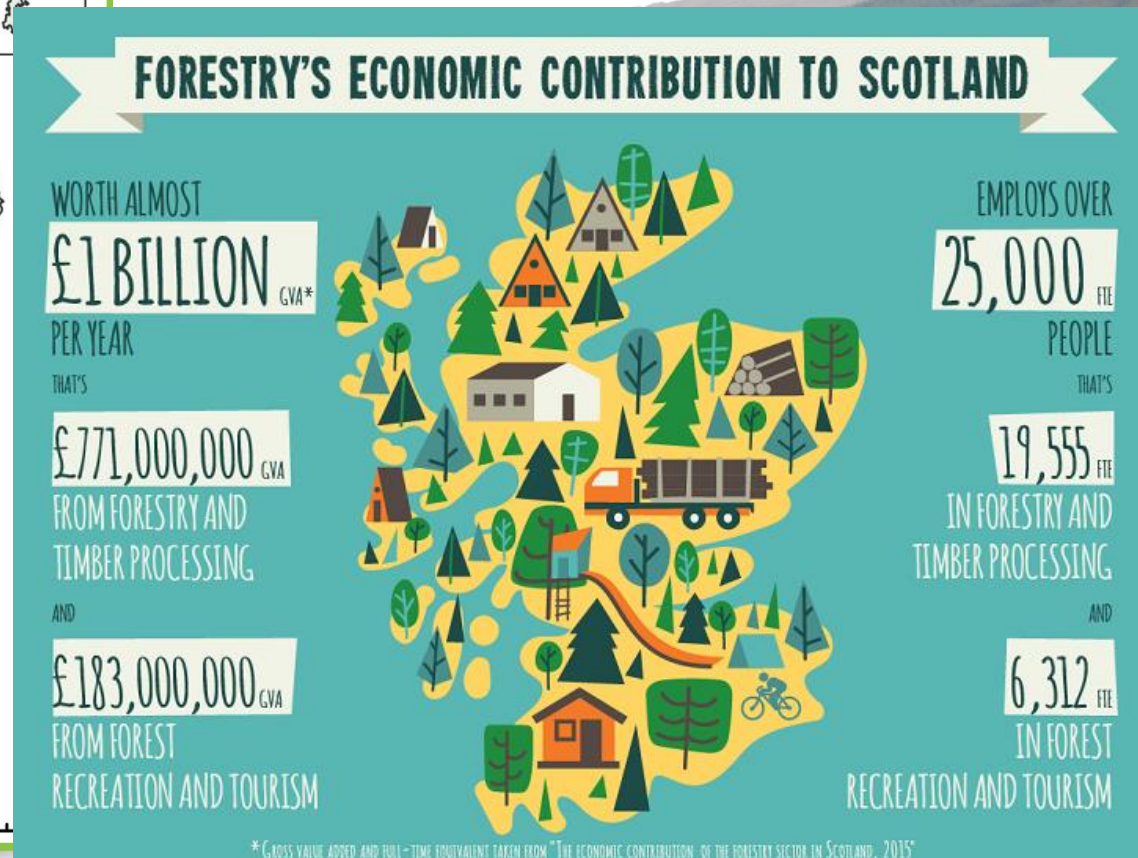
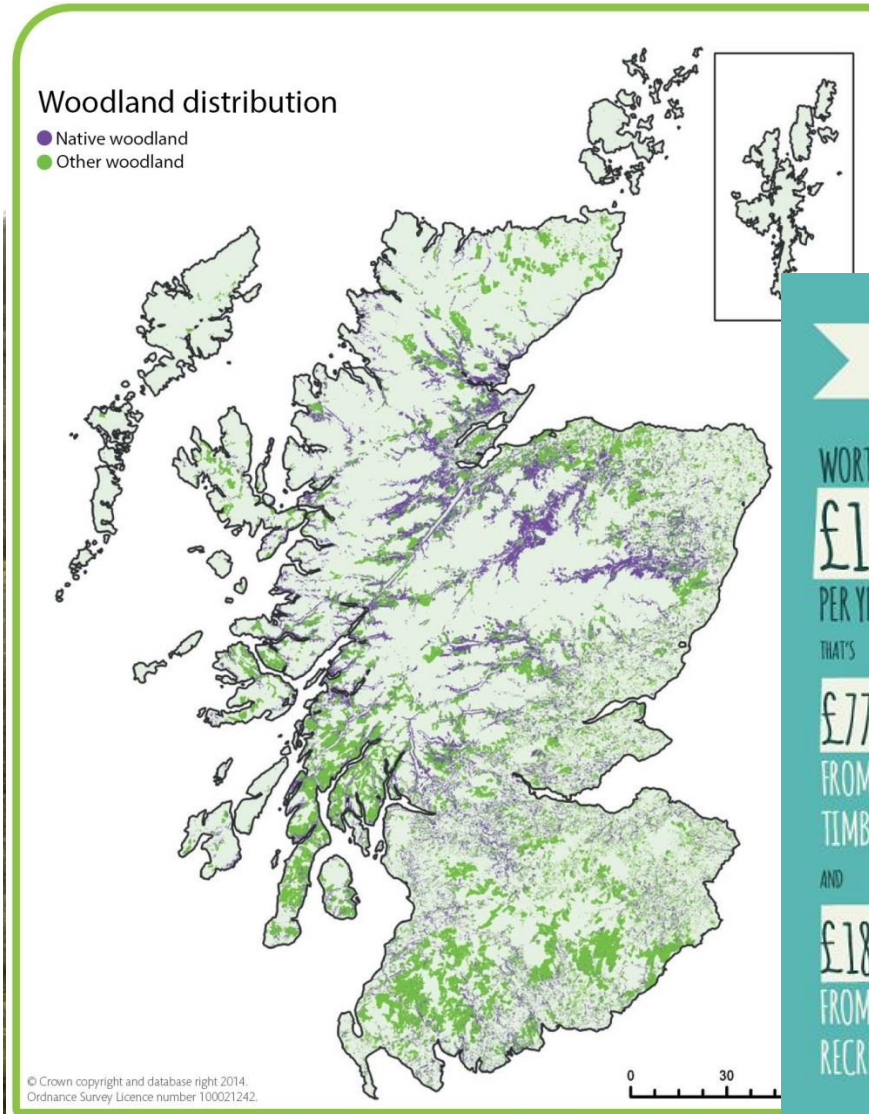
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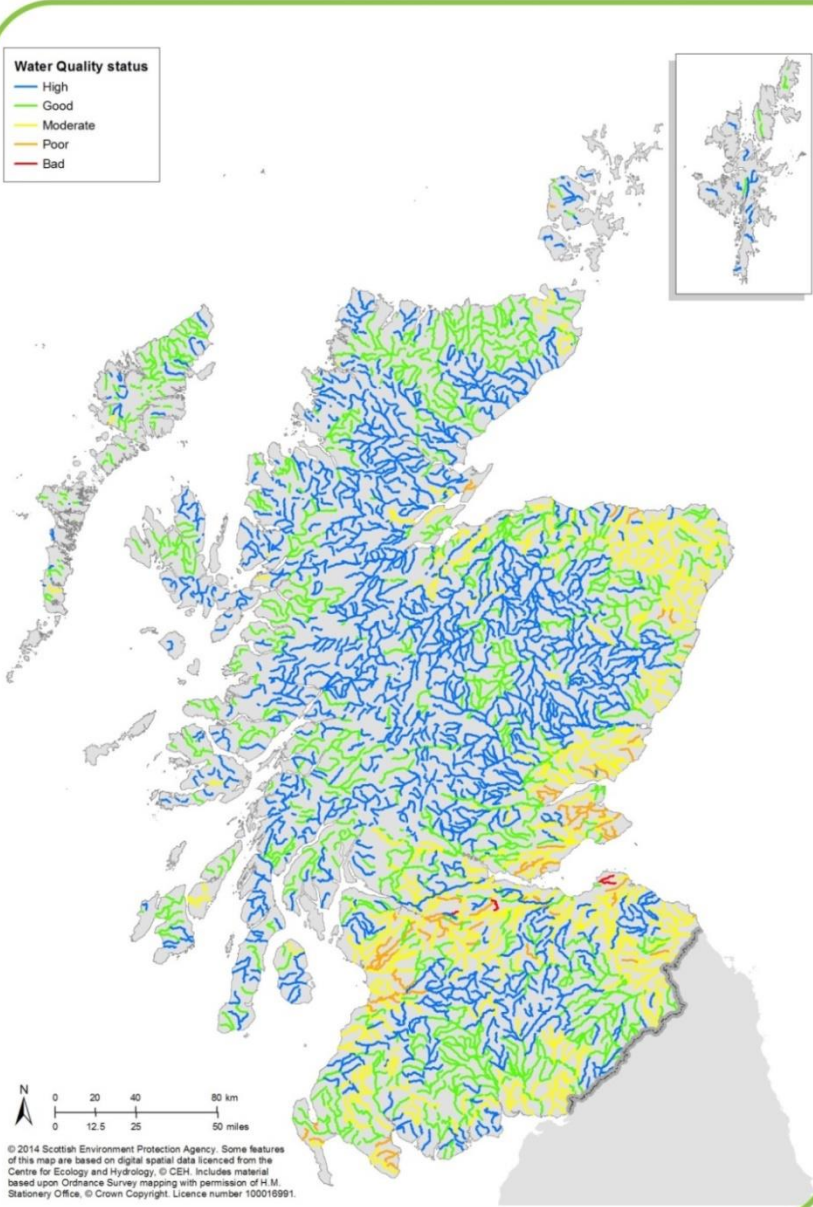
Challenges and Opportunities?



Challenges and Opportunities?



Water Quality



Water Quantity



 **Traffic Scotland** 
@trafficscotland

#A9 not looking good!

Please drive slowly and safely 🚗 twitter.com/whokens/status...

Craig @whokens
@trafficscotland A9 between Perth and Stirling #StormDennis



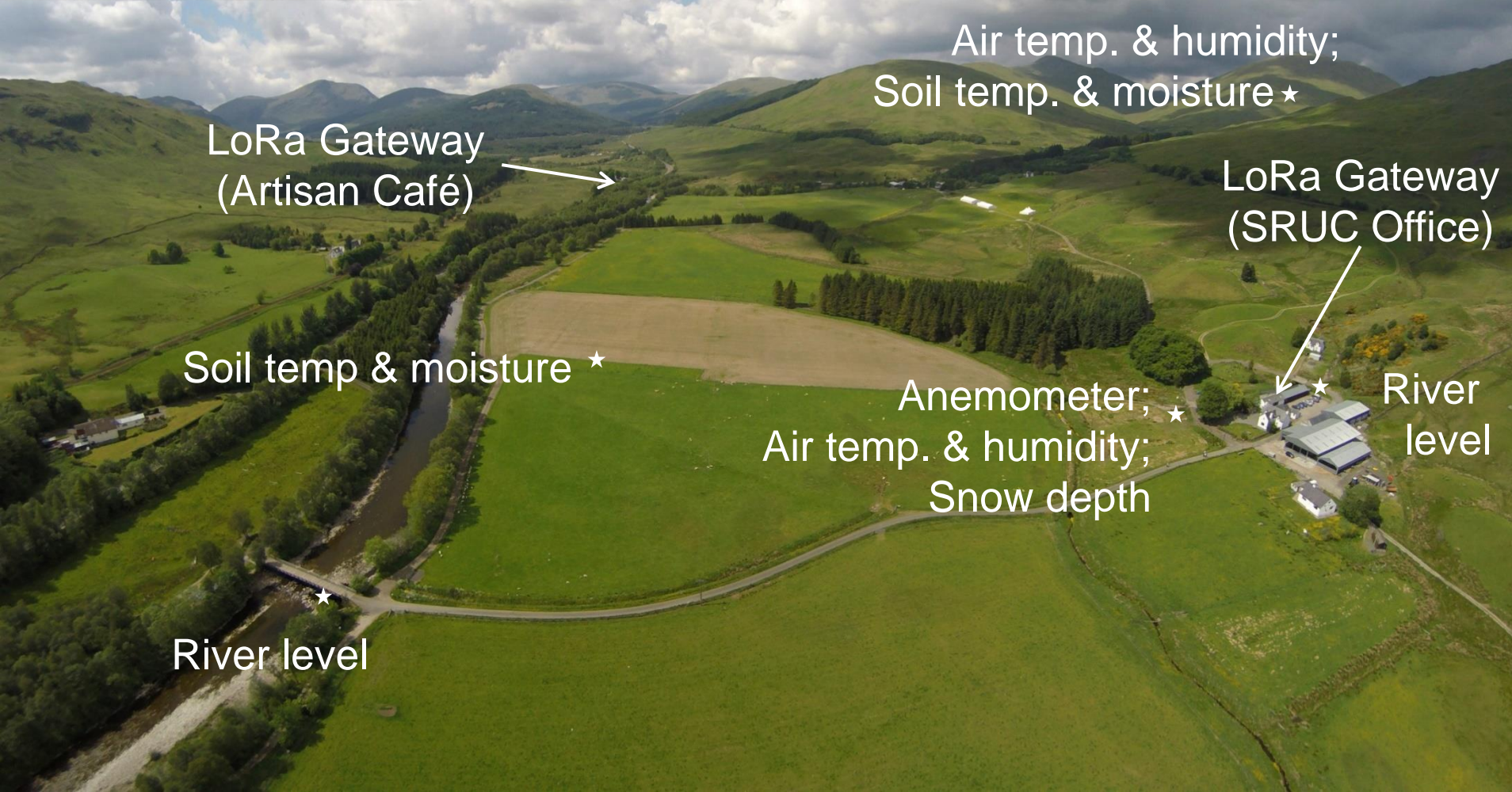
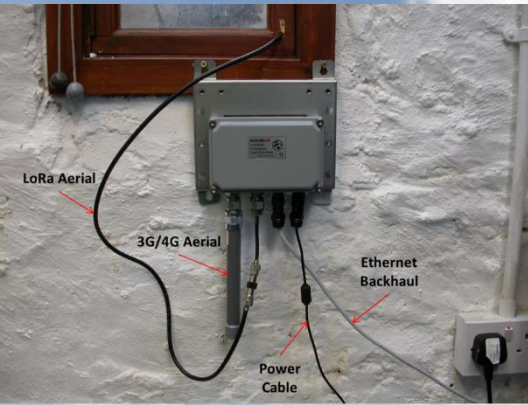
♡ 87 3:57 PM - Feb 15, 2020

You are here: [Home](#) > [Environment](#) > [Water](#) > [Flooding](#)

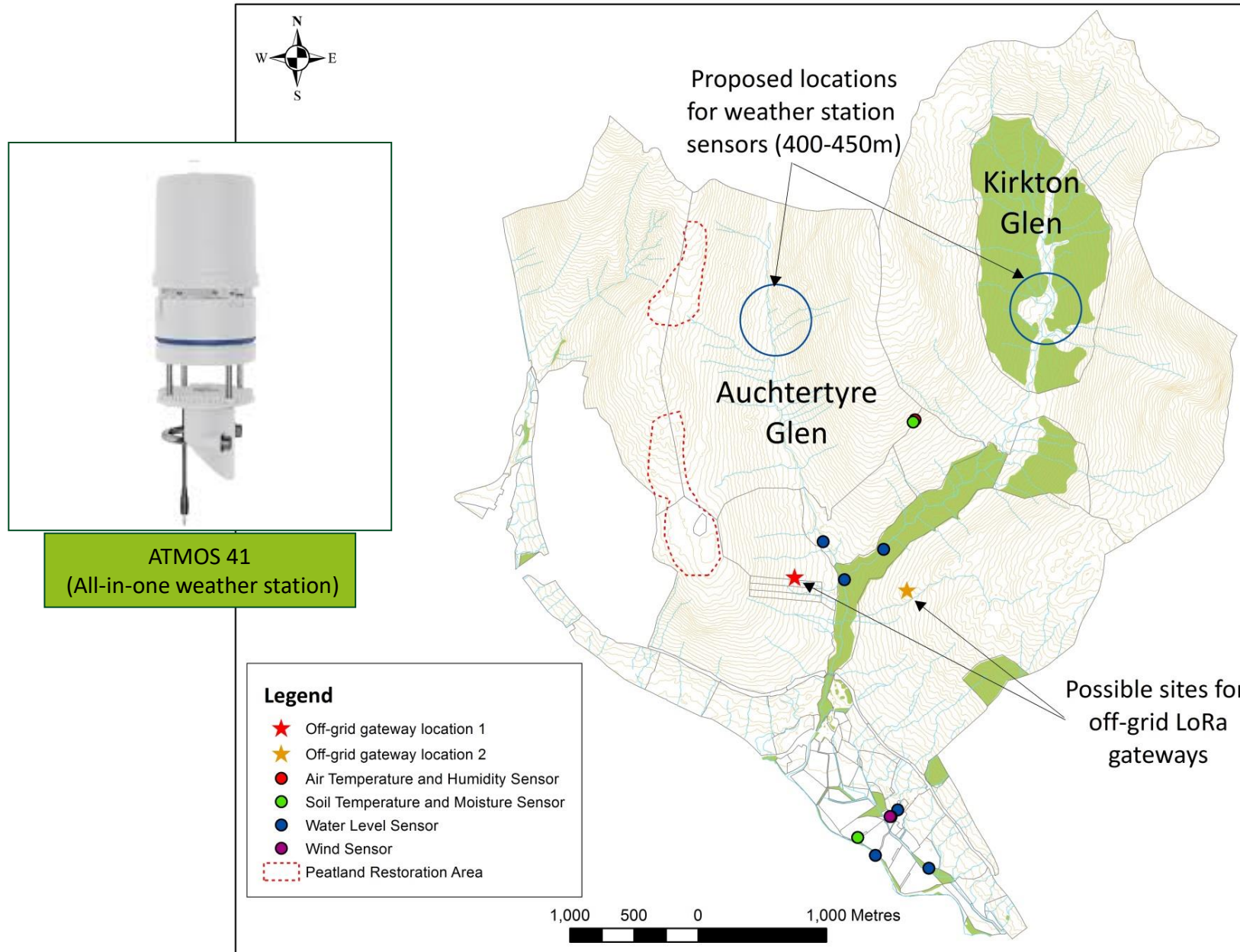
Flooding



SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority.



Additional Sensors & Off-grid Gateways

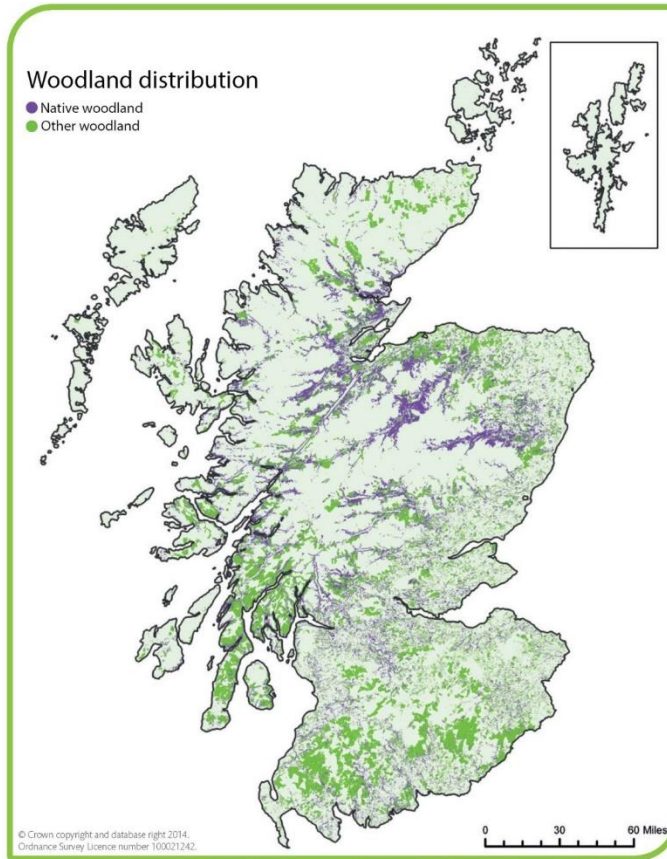


ATMOS 41
(All-in-one weather station)

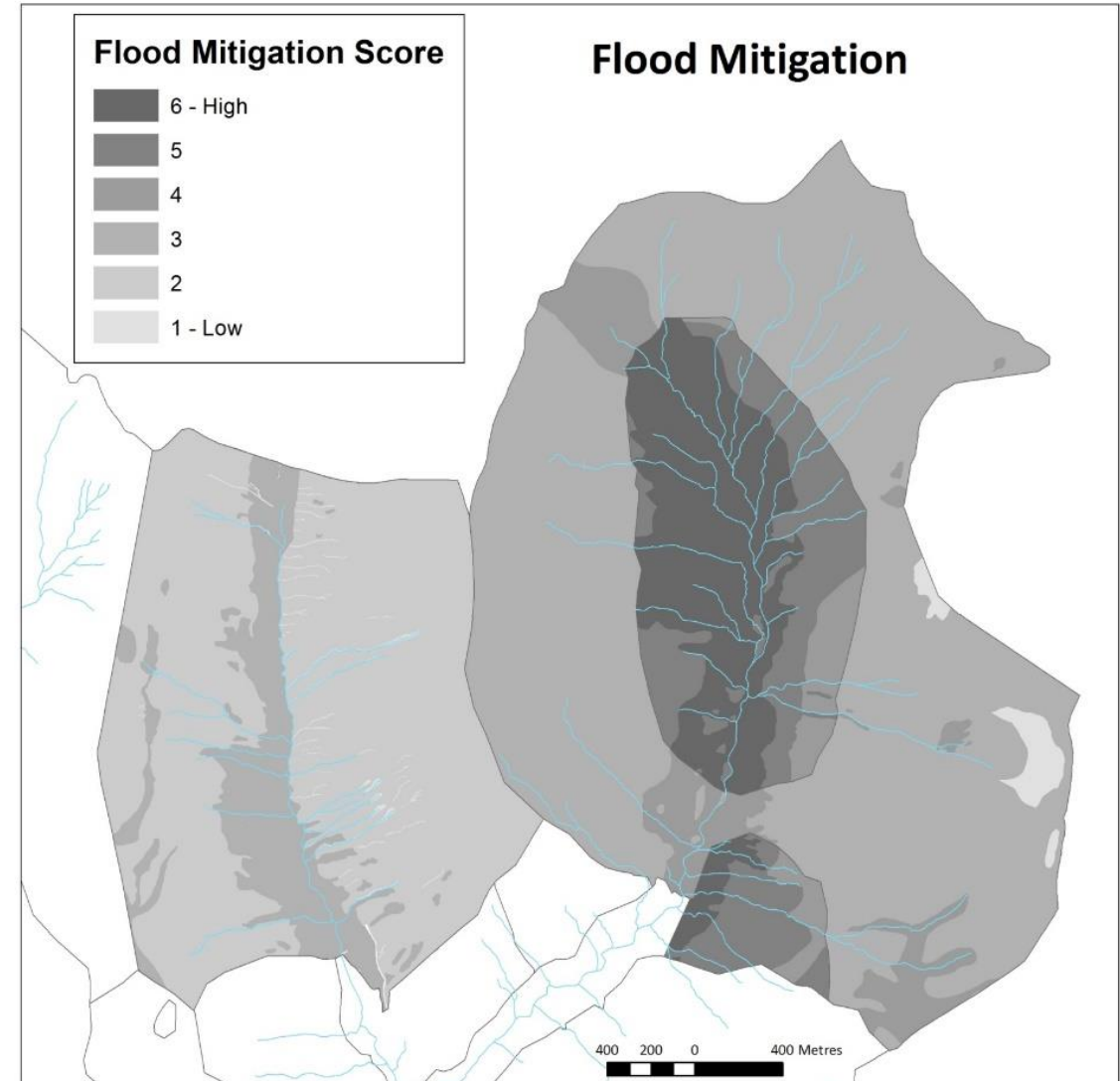
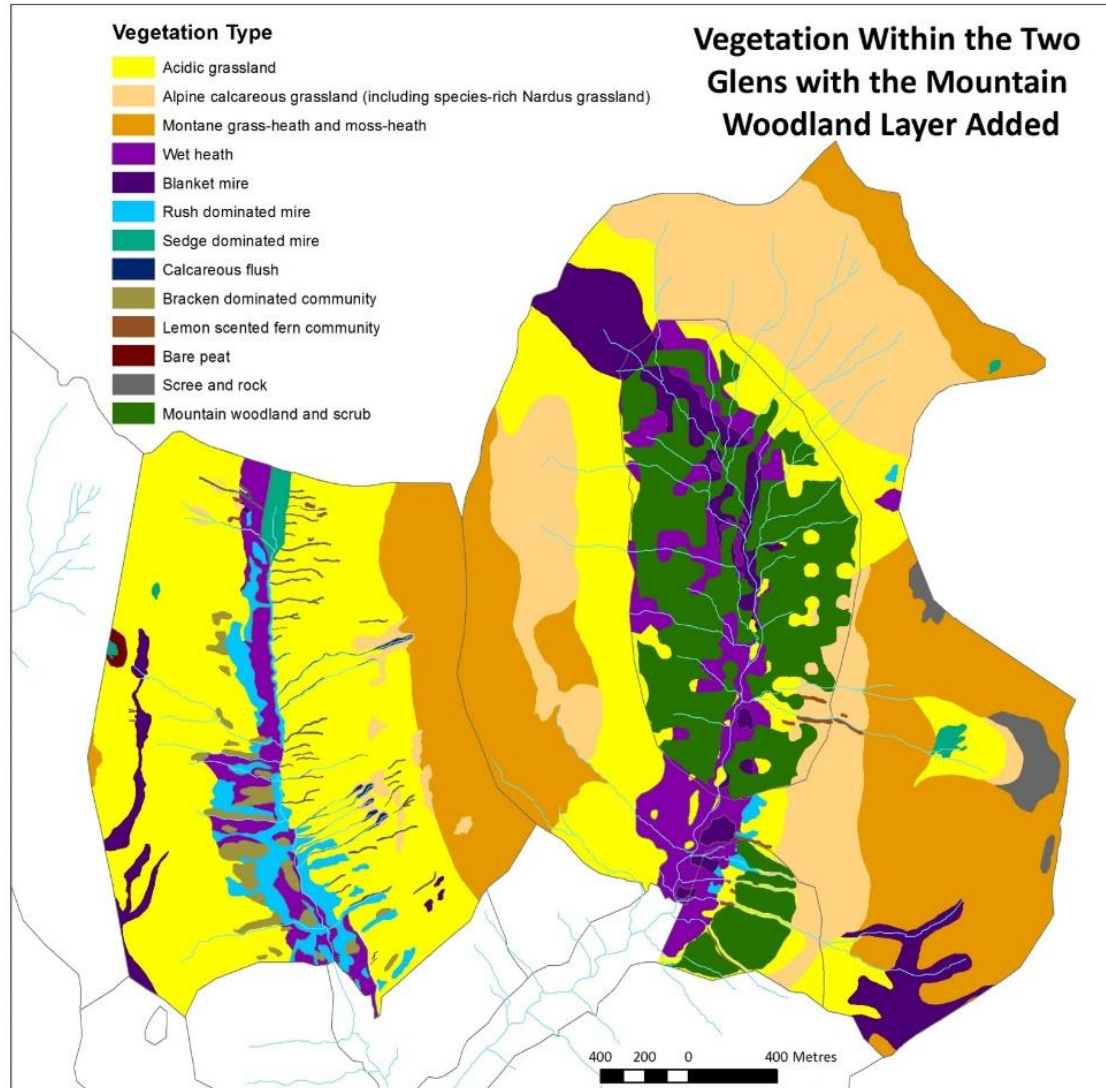


Off-grid LoRa Gateway

Benefits of montane woodland?



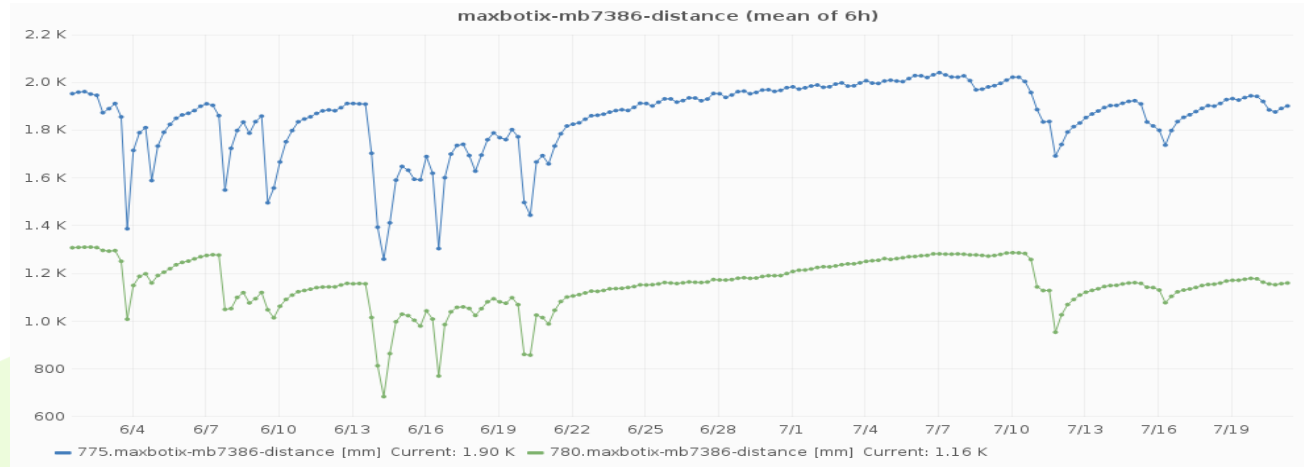
Benefits of montane woodland?



Decentlab Ultrasonic Level LoRaWAN-enabled Sensor (for Measuring River Level)



<https://www.decentlab.com/products/ultrasonic-sensor>



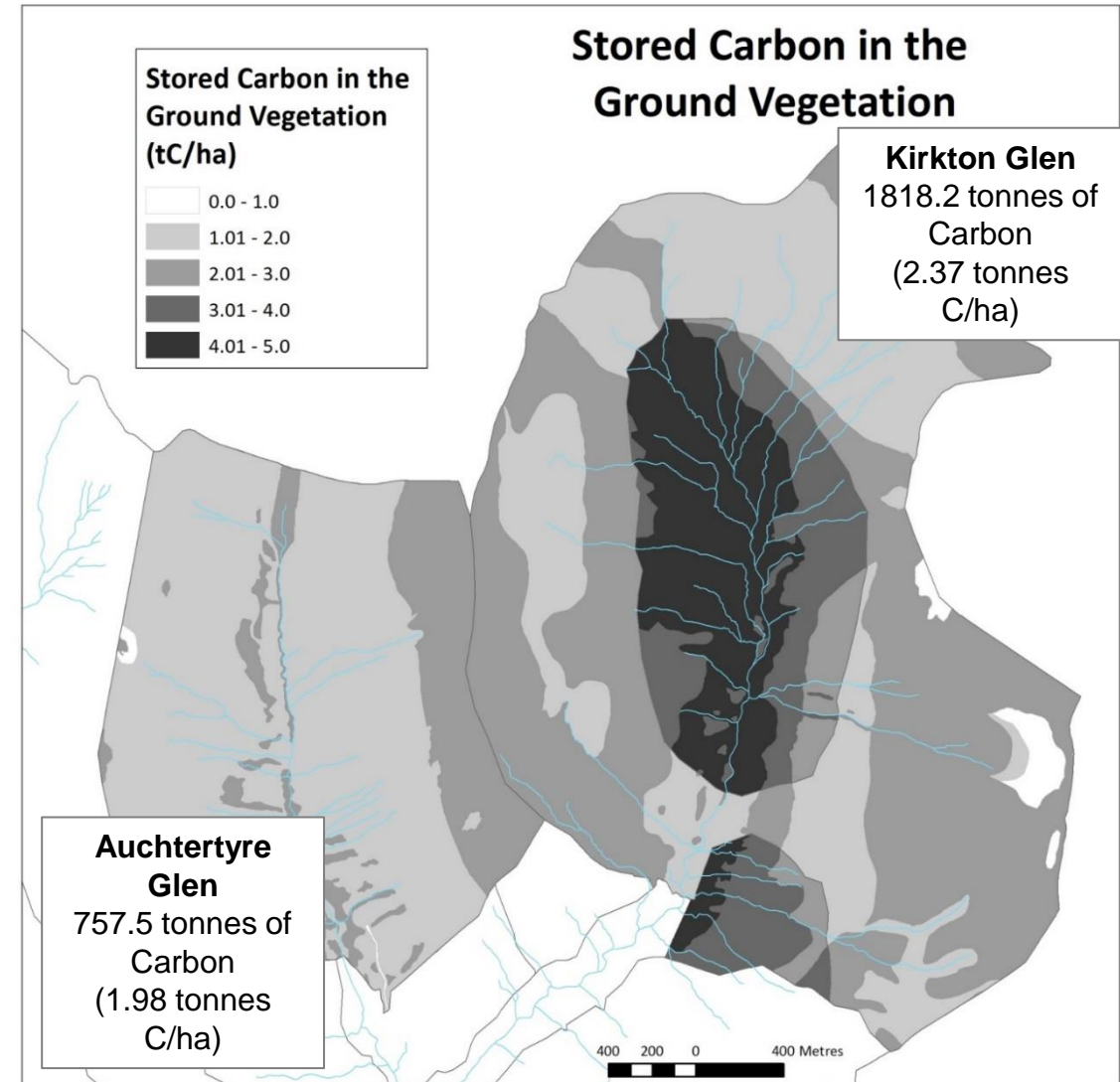
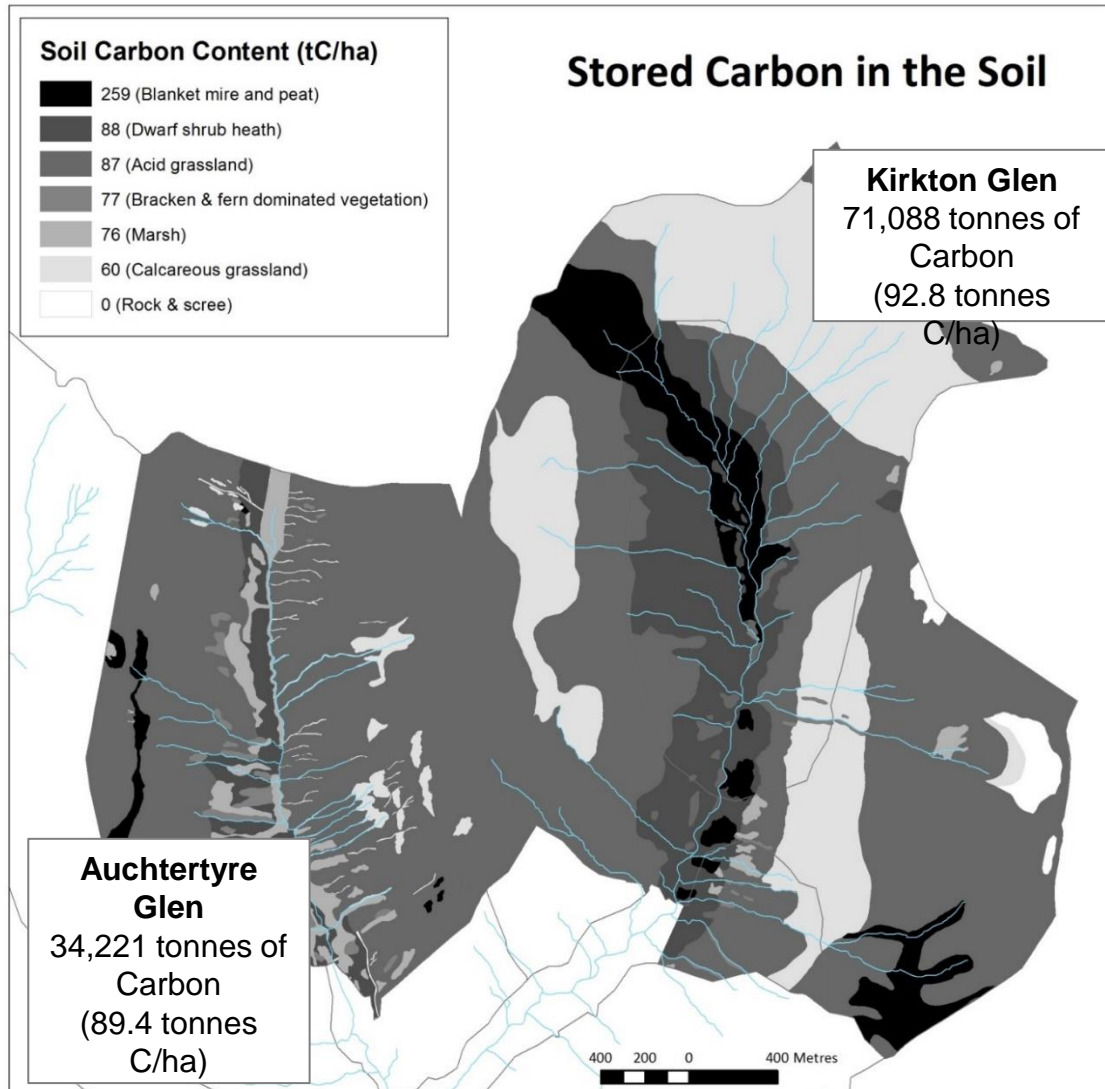
Sensor 775 (170 masl)
(360 m from nearest gateway)



Sensor 780 (170 masl)
(490 m from nearest gateway)



Benefits of montane woodland?



Challenges and Opportunities?



Greater integration with other land uses has to be way forward to increase income, spread risk and increase resilience

Each land-holding has to investigate what options are most appropriate – both individually and in combination with others – for their own situation

Land Use Conference 2018:



Land Use Conference

Rewarding the Delivery of Public Goods: How to Achieve this in Practice?

The 12th Agriculture and the Environment Conference (organised by SRUC, Centre for Ecology and Hydrology, Forest Research, SEFARI, SEPA, Scottish Natural Heritage and The James Hutton Institute), took place in Edinburgh on 28th and 29th November 2018.

LEARN MORE ABOUT THE BACKGROUND TO THE CONFERENCE

This conference sought to help inform and shape the debate about how best to reward farmers, foresters and other land managers for delivering public goods from their land management practices. It provided a forum to help develop thinking of practical implementation on the ground and what that meant for policy development.



Event Rationale:

<https://sefari.scot/blog/2018/11/27/how-might-our-farmers-adapt-to-a-public-money-for-public-goods-regime>

Twenty Presentations:

https://www.sruc.ac.uk/info/120470/land_use_conference

The following short interviews provides thoughts on the conference content obtained from a range of speakers and attendees.

Overview of the event:

<https://www.sruc.ac.uk/news/article/2285/dynamic-backdrop-for-land-use-event>

Twenty-Seven Short Interviews:

<https://youtu.be/76VBqIT64J4?list=PLUIAOo37Qn6LuzlzMuVWZ8Q76PXyprPCr>



Acknowledgements



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- **Global Food Security's 'Resilience of the UK Food System Programme'**, with support from **BBSRC, ESRC, NERC** and **Scottish Government**.



Innovation = Doing Things Differently



Precision Agriculture
and the
Internet of Things (IoT)



Engineering & Technology

Systems & ecology

Knowledge Transfer



Biological Sciences

