Transition to Delivery: River Eden and Motray Water Landowner Catchment Management Workshop

16th of June 2025

The James Hutton Institute

Scientific Services

sustainable cupar

Eden Angling Association Est. 1911

THE CARMAN FAMILY FOUNDATION

NRF NATURE RESTORATION FUND

Net Zero Scotland Scottish Government

LET'S DO NET ZERO

INSPIRING SCOTLAND

Workshop Aim

The James Hutton Institute
Scientific Services

To share views on potential water-related management options to address water-related issues. Exploring how to deliver, resource and monitor identified management options.

The James Hutton Institute

Scientific Services

Transition to Delivery
Project Overview

Project Aim

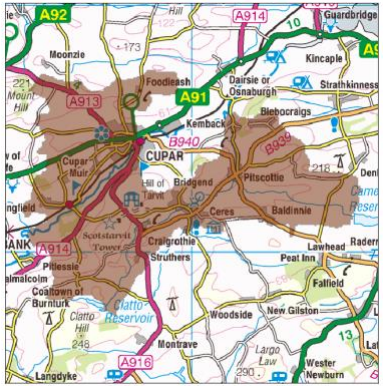
The James Hutton Institute
Scientific Services

To deliver landowner engagement activities to gather local perspectives and expertise to facilitate the identification of sustainable water management projects in the Eden and Motray Water catchments.

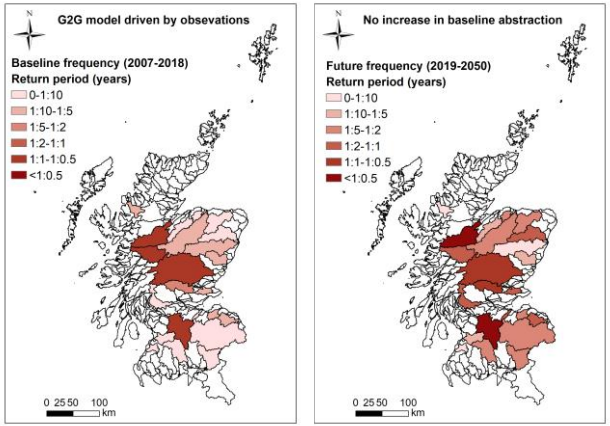
Help make recommendations to the Partnership on how they can prioritise, implement, resource and monitor water management actions.

Why do we need water management?

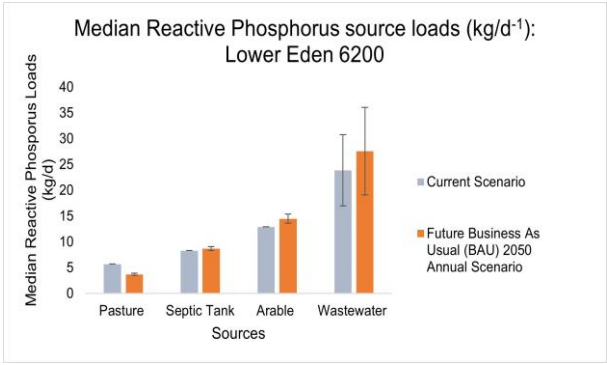
The James Hutton Institute
Scientific Services



Flood risk of 260 residential properties in Cupar; average damages of £1.3m (SEPA, 2015)



Frequency of significant water scarcity events in the Eden increasing from 1 in 5 (currently) to once a year by 2050 (Glendell et al, 2024)



Water quality issues, mainly phosphorus (P) concentrations from wastewater and diffuse sources (Adams et al., 2024)

Why landowners?

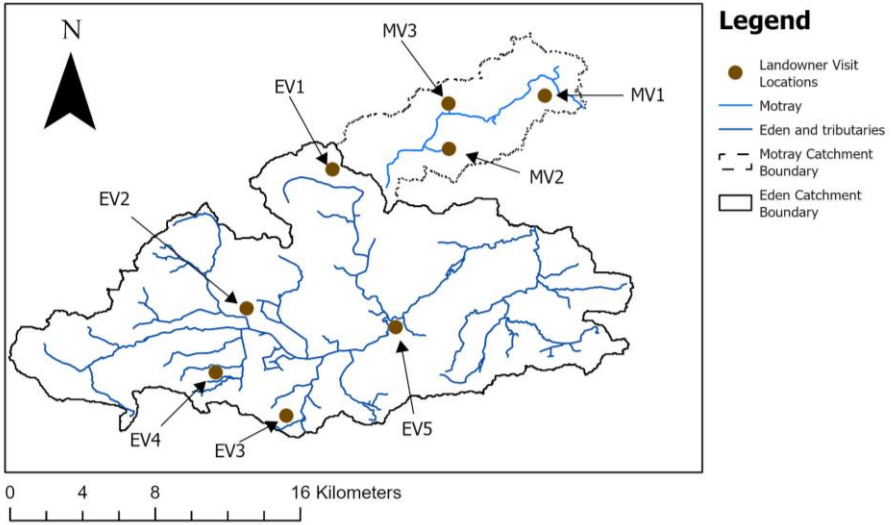
The James Hutton Institute
Scientific Services

- Knowledge of water-related issues.
- Implementation of water management practices.
- Allow access for management activities.
- Ensure that water management is beneficial for nature, society and the local economy.

Methods

The James Hutton Institute
Scientific Services

Review of literature



Landowner visits

Key themes:
Preventing flood risk and riverbank erosion

The James Hutton Institute
Scientific Services

Key themes: Drought risk

The James Hutton Institute
Scientific Services

Key themes:
Retaining nutrients and sediments

The James Hutton Institute
Scientific Services

Key themes: Agroecological practices

The James Hutton Institute
Scientific Services

Key themes: Invasive Species

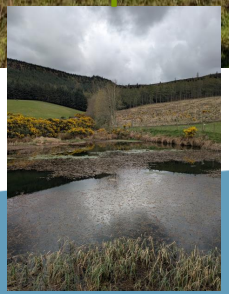
The James Hutton Institute
Scientific Services

Key themes: Historical and future contexts

The James Hutton Institute
Scientific Services

Key themes: A story of two landscapes

The James Hutton Institute
Scientific Services



Source-to-sea approach required

Management Options

The James Hutton Institute
Scientific Services

- We have identified a range of management options
- During the workshop, we will go through them and assess how they can address water-related issues in a sustainable way.

Workshop activities

The James Hutton Institute
Scientific Services

- Discussing and scoring management options.
- Discuss potential trade-offs between management options.
- Discussing implementation, resourcing and monitoring of management options.
- Making recommendations for RESP

The James Hutton Institute

Scientific Services

Discussion:
Are the key water-related challenges described representative of your views?

The James Hutton Institute
Scientific Services

Group activity:

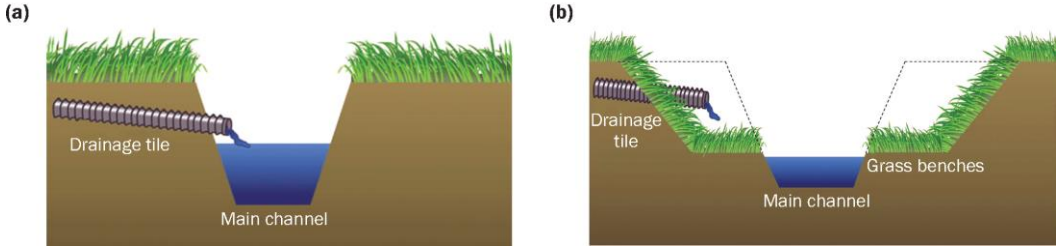
To discuss the advantages and disadvantages of identified management options and score them based on their environmental, social and economic credentials.

Group leaders will capture the range of agreement in the scores, potential barriers and recommendations.

Scoring Example – Two-stage channel

The James Hutton Institute
Scientific Services

Measure	Description	Associated Advantages	Associated Disadvantages
Two-stage channel	A reprofiled channel with flat sides to hold water and capture sediments and pollutants during high flows, as seen in Figure 18.	Reduced flood risk, bank stabilisation, and provides habitat.	Implementation costs, small land sacrifice, limited application in the UK, and temporary water quality habitat during construction.



Environmental						
-3	-2	-1	0	1	2	3

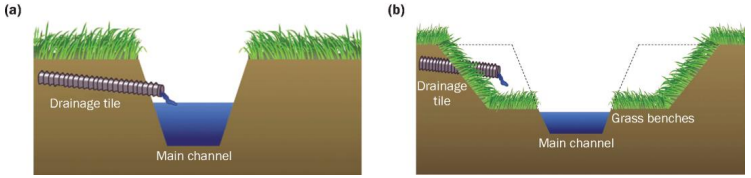
Economic						
-3	-2	-1	0	1	2	3

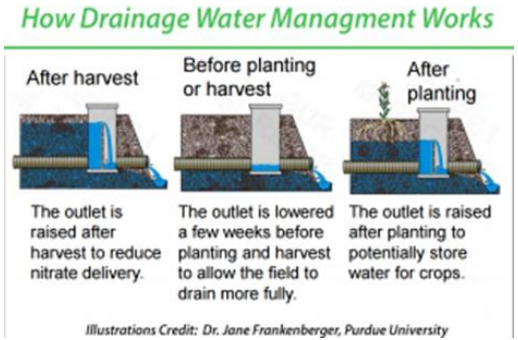
Social						
-3	-2	-1	0	1	2	3

Phase 1: Discuss and score the following management options

The James Hutton Institute
Scientific Services

Measure	Description
Two-stage channel	A reprofiled channel with flat sides to hold water and capture sediments and pollutants during high flows (see diagram (b))
Restoring natural channel morphology	Allowing the river to take its natural course, in the context of the Eden and Motray catchments, would involve re-meandering channelised sections. Natural erosion and deposition processes are reinstated, and flows are slowed compared to straightened channels. Restoration would lead to the loss of agriculturally productive land.
Drainage maintenance	Removal of vegetation and material from drainage channels to support land drainage and increase water flow.
Controlled drainage	A control fitted to major artificial subsurface soil drains used to control the water table, allowing for water drainage, storage and nutrient control.
Removal of constrictions	Constrictions are considered anything that blocks the flow of water and can include weirs, bridges or natural blockages such as fallen trees. Constrictions can cause water to back up or divert the flow of water.



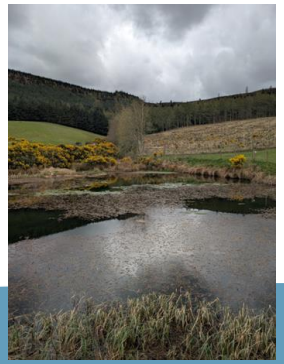


Phase 2: Discuss and score the following management options

The James Hutton Institute

cientific Services

Measure	Description
Leaky barriers	Barriers, often made of natural material, are laid in streams to temporarily store water and reduce flood risk.
Retention ponds & wetlands	The permanent pooling of water to store and treat runoff water nutrients and collect sediment. Placement can be in pockets of unproductive land and can vary in size depending on runoff volumes.
Riparian buffers, field margins, sediment traps and bunds	Used to intercept surface runoff and provide a barrier between agricultural activities and the watercourse to prevent nutrient and soil loss. A 2m, 5m and 10m buffer must be maintained between a field edge and a watercourse for crop cultivation, livestock poaching and slurry or manure applications, respectively. There are multiple options for how buffers are designed and vegetated, as well as how they are integrated with traps and bunds.



Phase 3: Discuss and score the following management options

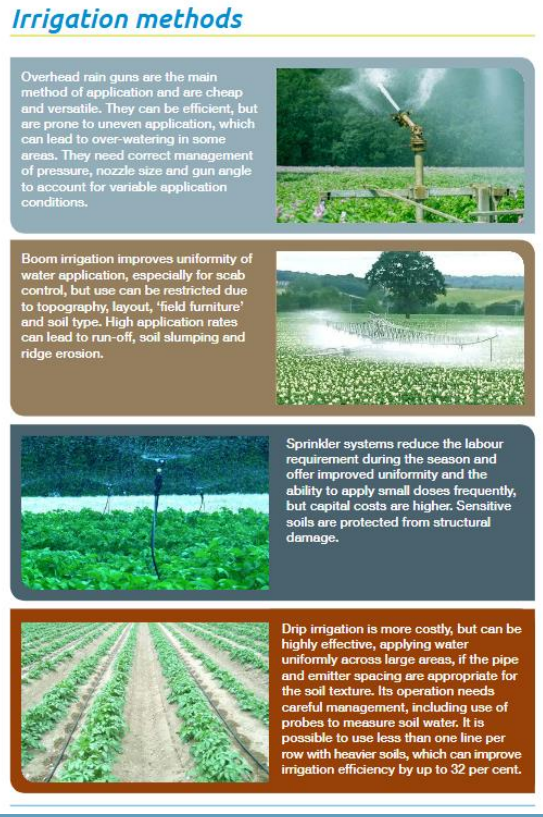
The James Hutton Institute
Scientific Services

Measure	Description
Regenerative agriculture – cover crops, minimum tillage, mob grazing	An agricultural production system that focusses on improving soil health and structure as a basis for food security and delivering ecosystem services.
Aeration/ Mole ploughing	The use of aerator machinery and mole ploughs to remove soil cores to improve soil drainage, reduce waterlogging and runoff, and regenerate soil.
Nutrient monitoring and management planning	Involves the analysis of soil for pH level, Phosphate (P), Potash (K) and soil carbon content at least once every five years, which will inform the creation of a nutrient management plan to optimise nutrient applications under Whole Farm Plan requirements for Region 1 land.

Phase 4: Discuss and score the following management options

The James Hutton Institute
Scientific Services

Measure	Description
Irrigation Lagoons	Constructed reservoirs designed to store water during times of high rainfall or flows for agricultural irrigation during drier months.
Precision Irrigation	Alternatives aimed at increasing the uniformity of water application across fields. Precision irrigation uses alternative irrigation types, such as boom or sprinkler irrigation, and takes account of soil moisture and crop water demand.



The James Hutton Institute

Scientific Services

Open Discussion:
Reflections on management action trade-offs

The James Hutton Institute

Scientific Services

Open Discussion:
How can sustainable management options be resourced, implemented and monitored?

The James Hutton Institute
Scientific Services

Open Discussion:
What recommendations would you make for the River Eden Sustainability Partnership to help achieve the vision?

Thank you

The James Hutton Institute

Scientific Services

- Everyone for their participation in the workshop
- Landowners for welcoming and informative visits
- Moya and the University of St Andrews
- River Eden Sustainability Partnership, Sustainable Cupar & Eden Angling Asssociation
- Neighbourhood Ecosystem Fund and Inspiring Scotland partners

- Our report will be released in September 2025