

Culm Grassland Natural Flood Management Project Final project report 2016 - 21

This project is part of the Northern Devon Nature Improvement Area Programme

Devon Wildlife Trust, Cookworthy Forest Centre, Beaworthy, Devon EX21 5UX.

Tel: (01409) 221823 E-mail: contactus@devonwildlifetrust.org

Web site: www.devonwildlifetrust.org Registered charity no 213224

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Summary

This report details the progress made against Culm Grassland Project targets for the period October 2016 – September 2021, by Devon Wildlife Trust and project partners. The Culm Grassland Natural Flood Management Project was a major part of the second phase of the Northern Devon Nature Improvement Area (NIA) programme.

This project aimed to help understand, communicate and increase the flood risk and wildlife benefits that Culm grasslands bring to north Devon's communities. Its intention was to produce a well documented and evidenced case study which could inform future natural flood management policy and practice.

The project was led by Devon Wildlife Trust, supported and funded by the Environment Agency (EA), Devon County Council (DCC) and the European Union through Interreg 2 Seas. Delivery was supported by a partnership of EA, DCC, Exeter University and Natural England. The project took place between October 2016 and September 2021.

The project's achievements included:

- Restoration of 468ha of Culm grassland
- Creation of 99.28ha of new wet grassland habitat and detailed monitoring of vegetation change following works
- 19 workshops for landowners and 8 workshops for land use advisors
- PhD on Culm grassland and natural flood management

The following outputs and publications were produced by the project:

- Annual detailed reports on outputs and outcomes
- Culm Grassland Inventory (Devon Biodiversity Records Centre, 2016, updated thereafter)
- Summary document 'infographic' (DWT)
- 'Re-creating the Culm' guide to re-creating species rich wet grassland (DWT)
- Pages for the Environment Agency's [evidence directory on NFM](#) (DWT)
- Summary of Nicola Ellis' PhD (University of Exeter / DWT)
- Report on monitoring of grassland creation (Hannah Gibbons)

A set of maps and a summary table are appended to this report.

Any enquiries about the project, please contact:

Emma Richardson

Devon Wildlife Trust, Cricklepit Mill, Commercial Road, Exeter. EX1 2AB

01392 279244

erichardson@devonwildlifetrust.org



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1. Project outline

The Culm Grassland Natural Flood Management Project was an exciting part of the second phase of the Northern Devon Nature Improvement Area (NIA) programme. The NIA was one of 12 programmes in England designed to achieve a step-change in landscape scale conservation and understand the wider services to communities provided by the natural environment.

Culm grassland (or Rhos pasture) is a nationally important type of purple moor grass and rush pasture, of which a large proportion of the UK's total is in the Culm National Character Area in north Devon (covering the Torridge, Taw, and parts of Tamar and Exe catchments). Despite significant conservation efforts, Culm grassland is still under threat, and the current habitat resource is fragmented across a landscape where farming continues to intensify. However, understanding is increasing about the benefits of Culm grassland to society, for wildlife, water management, carbon storage and more.

The Culm Grassland Natural Flood Management Project aimed to:

- increase the protection, creation and use of Culm grassland in the Culm National Character Area for flood risk, biodiversity and other benefits
- investigate how Culm grassland helps to manage flood risk, and model how this works in the landscape through a catchment pilot

The project was led and implemented by Devon Wildlife Trust, supported and funded by the Environment Agency (EA), Devon County Council (DCC) and the European Union through Interreg 2 Seas. Delivery was supported by a partnership of EA, DCC, Exeter University and Natural England. Devon Wildlife Trust was the lead partner and responsible organisation for delivery of the project and its outputs. The main project was implemented for five years from October 2016 to September 2020, an increase on the originally intended four year project period due to the COVID crisis.

The project built on the research undertaken by Exeter University and Devon Wildlife Trust during 2011-14 to examine how Culm grassland may be able to help manage flood risk and diffuse pollution. It also built on the experience and achievements of Devon Wildlife Trust through their Nature Improvement Area, Working Wetlands and nature reserves programmes. DWT continues to use an innovative mix of landowner advice and training; equipment loans; grazing networks; small grants; cutting edge research and extensive community engagement to promote change on a landscape scale.

The project had four main objectives:



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1. Research the role of Culm grassland and wet grassland in helping to manage flood risk
 2. Increase understanding and value of Culm grassland across the community through a Culm Grassland Network
 3. Protect and restore existing Culm grassland resource across the Culm NCA; increase Culm grassland resource, targeted at potential to help manage flood risk
 4. Share learning with partner projects in the UK, Netherlands and Belgium

Key targets and success measures set at the beginning of the project included:

- 90ha new wet grassland created
- 380ha existing Culm grassland under restoration
- Regular, detailed botanical and hydrological monitoring of at least 8 new wet grassland sites
- 20 workshops held to share knowledge and skills with Culm grassland stakeholders (landowners, commoners, land use advisors and flood risk professionals)
- A wet grassland creation good practice guide and final project report produced
- Monitoring the state of Culm grasslands in the project area through the Culm Grassland Inventory
- Plot-based research and development of a catchment-scale conceptual model, demonstrating how Culm grassland and associated land uses can directly impact flood risk
- A completed PhD study, increasing our understanding of how Culm grassland holds water and identifying how this might be used to best effect as an ecosystem service

2. Preparatory work during 2016

Short contracts were funded by the Environment Agency in the summer of 2016 to prepare the ground for the Culm Grassland Natural Flood Management Project. Richard Knott from the Environment Agency was seconded to DWT for a short time to work towards these, and Hannah Gibbons was employed by DWT to complete practical and advisory tasks. The outputs from this period were:



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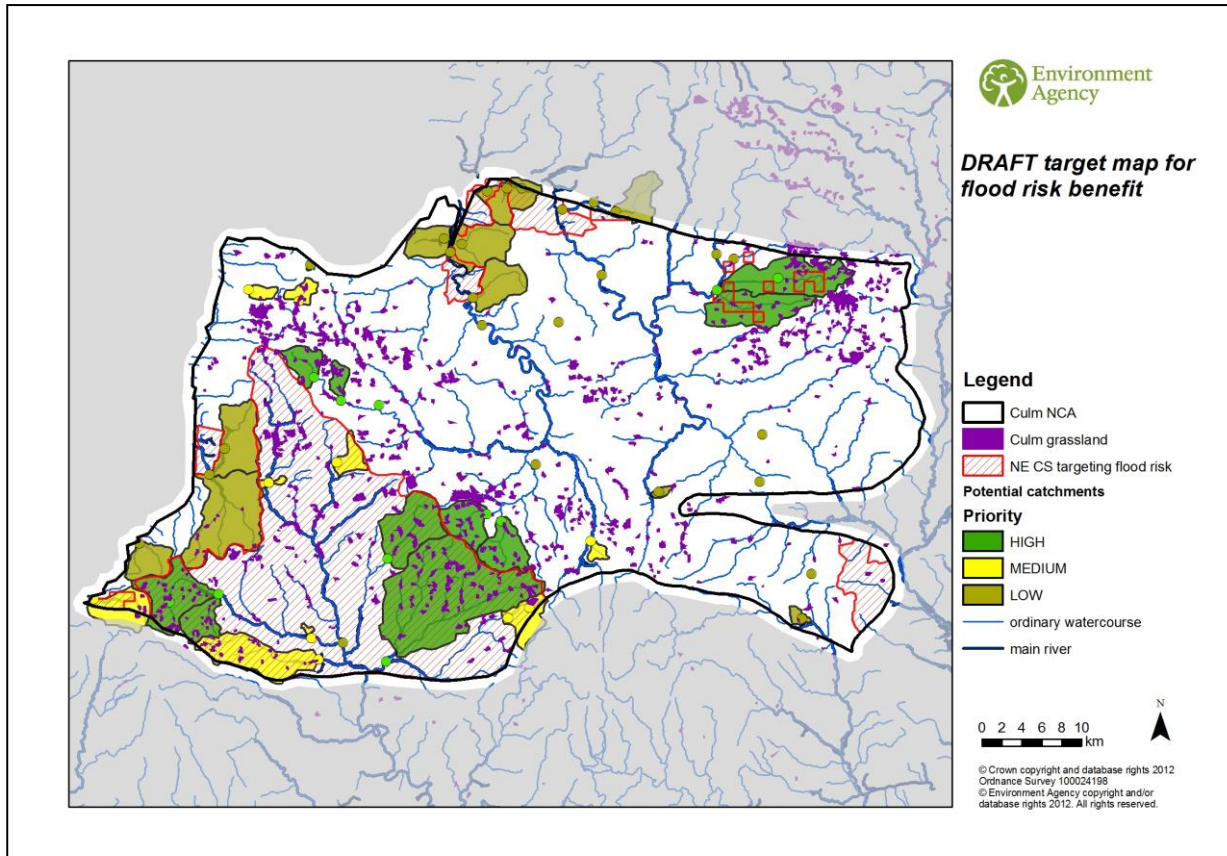
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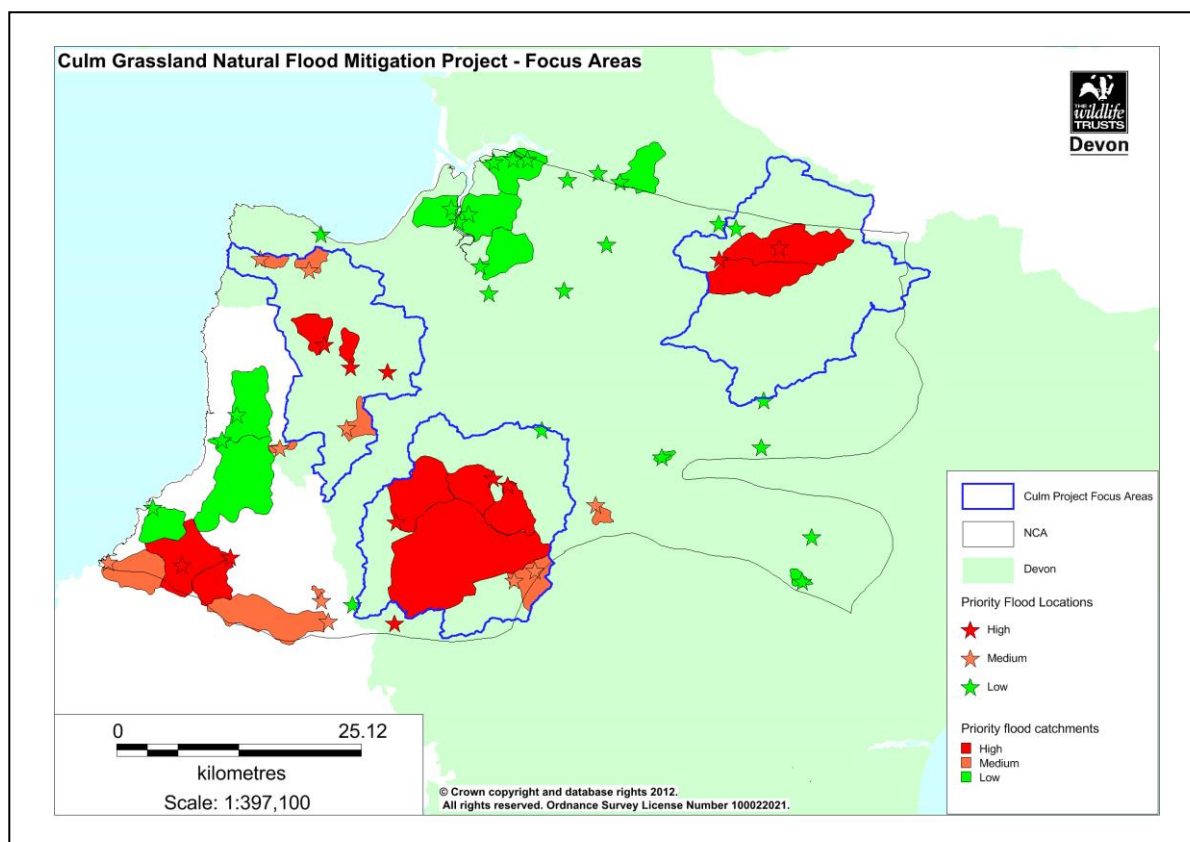
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Flood risk map and target areas for the project

A full analysis of flood risk data for northern Devon was undertaken, with data from both Environment Agency and Devon County Council. With this data he suggested three key project areas to focus grassland management and creation activity, shown in the maps below.



Map 1: Priority flood risk areas identified in 2016



Map 2: Resulting priority sub-catchments identified for targeting by the Culm Grassland project

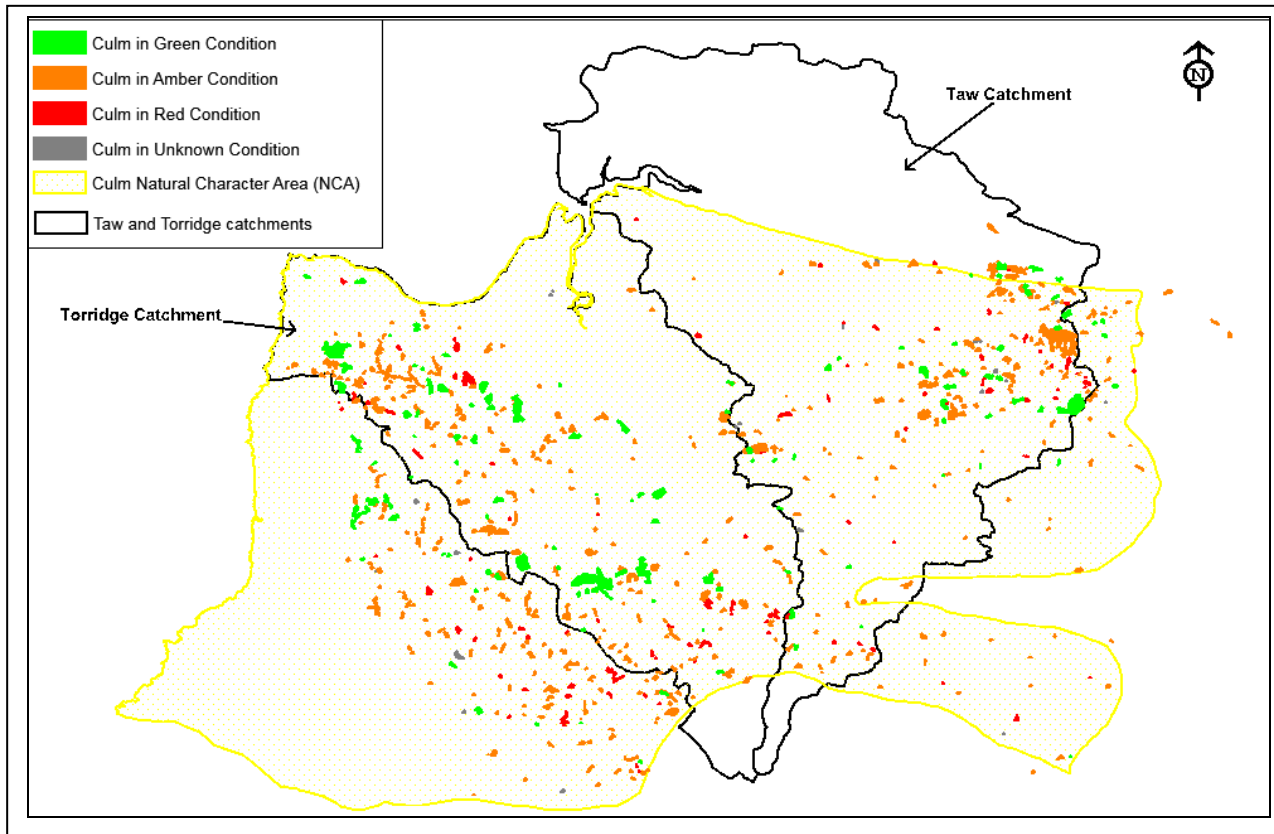
Culm Grassland Inventory

Devon Biodiversity Records Centre drew together the most up to date assessment of the 2016 Culm Grassland resource possible, by amalgamating existing data and undertaking an aerial photography interpretation. The results are summarised below.

Table 1 Comparison with the previous Culm Grassland Inventory (DBRC, 2016)

Culm Inventory	Culm Inventory 2008	Culm Inventory 2016
Number of sites	533	643
Area (ha)	3,863 (includes non-Culm habitat e.g. scrub)	4,950 (total area)* 2,945 (area of Culm)**

* Total area of the site, including any mosaic habitats. **Area of Culm Grassland only



Map 3: Condition of Culm Grassland Sites in the Culm Grassland Inventory (DBRC, 2016)

Literature review

A full literature review was undertaken about natural flood risk management and wet grassland, which was helpful to inform project staff and researchers.

Scoping of landowners and initial works

During the 'development phase' of the project (April – September 2016), 9.73ha of new grassland habitat was created and 26.78ha Culm grassland habitat was brought into favourable management. Two workshops were held, with 23 landowners attending.

3. Overall project budget

Project expenditure and sources for the period October 2016 – September 2021 are summarised as follows:

Environment Agency - Flood risk	237,500
Environment Agency – Water Environment Investment Fund	212,813
Devon County Council - Flood risk	100,000
Interreg - Triple C	287,258
EA carry forward from 2016 project	6,830
University of Exeter	40,000
Government furlough grant/services during 2020	3,724
TOTAL FUNDING	888,125

4. Project staffing and management

The project was achieved through a staff team at DWT of two full time equivalent farm advisors (one with a more technical emphasis to their work and one with a more practical emphasis), time input from two specialist Working Wetlands project staff, a project manager (the NIA manager) and support from finance, fundraising and communications functions.

Staff inevitably changed through the project, but those involved in project delivery were:

Lisa Schneidau (Project Manager)
Hannah Gibbons (advisory)
Tom Parsons (advisory)
Laura Fairs (advisory)
Shanti Smallwood (advisory)
Lisa Butt (advisory assistant)

The research aspect of the project was carried out by Nicola Ellis at Exeter University through a full-time, three year Ph.D. study, supervised by Professor Richard Brazier in the Department of Geography.

Hannah Gibbons worked as a contractor on the grassland creation monitoring work.

The project was supported by a steering group of project partners including Richard Knott, Marie Barron, Siri Frost and Tom Dauben from the Environment Agency, Martin Hutchings, Gemma Cater, Poppy Millar and Mikaela D'Souza from Devon County Council. In addition, the project manager reported to a consortium of organisations involved in the Interreg 2 Seas Triple C project, which was managed separately by Somerset County Council.



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Nicola's research work was overseen and advised by a Research Group of the project partners including DWT project staff, Marie Barron, Siri Frost, Tom Dauben, Sean Arnott, Richard Smith and Jim Faux from the Environment Agency and Gemma Cater, Poppy Millar and Mikaela D'Souza from Devon County Council together with Richard Brazier from the University of Exeter.

Partnership, project management, recording and reporting arrangements continued for the four year project, with the Environment Agency, Interreg Triple C, Devon County Council and Exeter University.

5. Delivery against project objectives

Objective 1: Increase knowledge of the role of Culm grassland and wet grassland in helping to manage flood risk

1.1 Monitor state of current Culm grassland resource

Data on Culm grassland collected by project staff during the course of their work was used to update the Culm Grassland inventory on an annual basis.

Through the project, 15 new County Wildlife Sites (CWS) were designated, 5 CWS have been extended and 4 CWS have been found to be lost or reduced in area. There are 3 or 4 new pCWS to submit to the CWS panel over the winter of 2021-22

The project has provided updates on the status of over 70 Culm grassland sites (CWS and UWS / pCWS) and has indicated numerous previously unrecognised Culm grassland sites (not necessarily of CWS standard) which are now included in the Culm inventory.

1.2 Identify all flood risk within Taw and Torridge sub-catchments

No updates on flood risk data were available from project partners for the majority of the project, and we worked on the basis of targeting the three main flood risk areas identified in 2016. In the latter part of the project the 'NFM Studio' project from EA went live, so further updated information will be available for future project development.

1.3 Sub-catchment modelling pilot

1.4 Plot-based research

These two items were the subject of Nicola Ellis' PhD, *Can unimproved grassland deliver natural flood management alongside multiple environmental benefits?* A summary report on this will be available in late 2021.



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Objective 2: Increase understanding and value of Culm grassland across the community through a Culm Grassland network

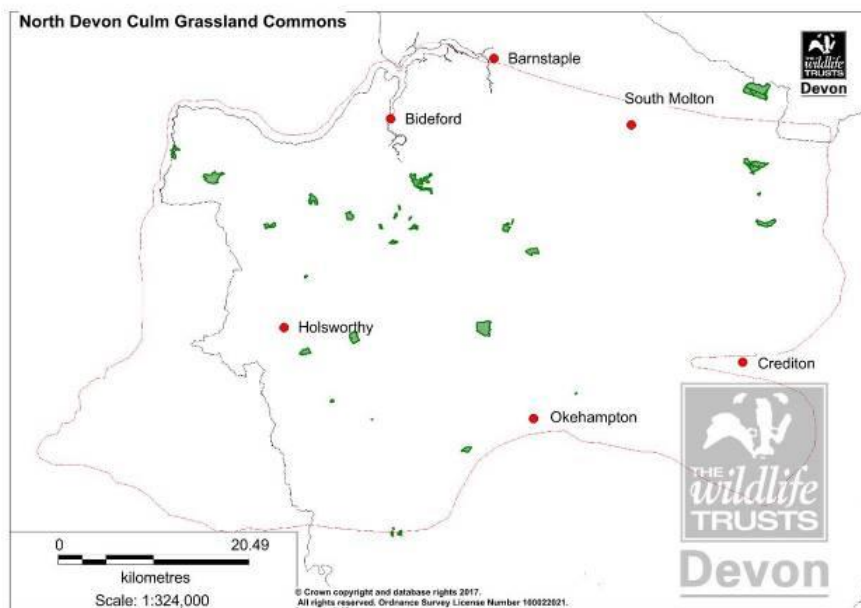
2.1 Increase landowner and contractor skills and confidence

19 workshops were held for landowners during the course of the five year project (including workshops for commoners), with a total of 265 attendances from land managers. The project's original target was 8 workshops. For details, please see individual annual reports from the project.

2.2 Increase effectiveness of land use advisors in the area

8 workshops were held for land use advisors during the course of the five year project, meeting our target. For details, please see individual annual reports from the project.

2.3 Support commons groups in managing Culm grassland common land



Through the project we have actively targeted and supported commons groups who manage Culm grassland, and encourage them to take a more active role in site management. Where possible we have also helped with volunteer time and agri-environment schemes. For details on individual sites, please see project annual reports.



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2.4 Increase use of Culm grassland to manage flood risk, with relevant sectors and professionals

The project has attended a number of national meetings to promote the our work and findings, although these were curtailed towards the end of the project due to COVID -19 restrictions.

In late 2016, the project manager attended a national Environment Agency FCRM meeting and presented the project with discussion around wet grassland as a potential natural flood management tool.

In 2017, the project manager attended a national Natural Flood Management meeting organised by the Environment Agency. A project officer presented our project to an international conference in the Netherlands.

In 2018, DWT hosted a visit of Natural England staff interested in Culm grassland management requirements. A further visit from NE grassland specialists occurred in 2021, with site visits showcasing the achievements of the project and discussion how protection for grassland sites could potentially be strengthened in the future.

The project manager also gave a presentation to Devon County Council's Environment team about the use of Culm grassland to help manage flood risk and the work of the project, in 2018.

In 2019, DWT hosted a soils workshop at Meeth and Ash Moor for EA Devon FCRM staff, to discuss both the project's practical grassland management work and Nicola's PhD research.

Unfortunately an 'advocacy document' was not produced for the project but the end-of-project publications are intended to fulfil this function for different audiences, and to different levels of detail.

Objective 3: Protect, restore and increase Culm grassland resource across the Culm NCA, targeted to areas of flood risk management potential

3.1 Site visits and number of holdings

During the period October 2016 – September 2021, the project made 1168 site visits to 277 different holdings, targeted where possible to the Torridge, Taw and Tamar priority areas. Of these, 57 sites visited were in Torridge focus area (21%), 49 sites visited in Tamar focus area (18%) and 90 sites visited in Taw focus area (32%). 196 out of 277 total sites were in focus areas = 71% of the total. Please see attached maps for details of sites visited and habitat achieved.

We have revisited the Culm grassland inventory to gain some indication of the proportion of Culm grassland resource visited during the project. 141 sites visited had Culm grassland on their holding (38 Culm sites and 534ha in Torridge focus area, 58 Culm sites and 741ha in Taw focus area and



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32 Culm sites and 306ha in Tamar focus area). 1581 ha Culm grassland 'visited' represents 31% of total of Culm grassland inventory. However, please note that Culm grassland sites may have different names, and some 'Culm sites' overlap more than one holding so this data is not precise.

3.2 Summary of project habitat targets met

The following table shows the overall habitat restored and created during the project, with figures for the 'development phase' also indicated for completeness. During the 'delivery phase' considered by this report, the project exceeded its targets for both habitat restoration and habitat creation. **The total length of river influenced was 46312m.**

Reporting year	Ha restored/ maintained		Total restored / maintained	Ha created		Total created
	with agreement	without agreement		with agreement	without agreement	
Dev phase Jan - Oct 16	21.3	5.5	26.8	9.7		9.7
Oct 16 - Mar 17	46.55	13.68	60.23			
Apr 17 - Mar 18	71.44	17.69	89.13	10.02	0.54	10.56
Apr 18- Mar 19	138.28	0.96	139.24	33.17	3.9	37.07
Apr 19 - Mar 20	79.97	20.96	95.68	31.15	0	31.15
Apr 20 - Mar 21	60.84	23.32	84.16	20.5	0	20.5
TOTALS excl dev phase	397.08	76.61	468.44	94.84	4.44	99.28
Targets			380ha			90ha
Project target			380			90

Analysis of works undertaken

For grassland habitat restoration, 20 capital work grants (72.3ha) and 33 Countryside Stewardship schemes (241) ha were secured through the project. In addition, grazing assistance was given on 5 sites (13ha), scrub management assistance by volunteers and staff on 16 sites (19ha), swailing on 11 sites (85ha) and other assistance on 16 sites (64ha: cut and bale, advice, weed wiping, flailing).

Capital works included 15722 m of fencing, 11 troughs, 28 new gates, 400 m water pipes, 2 drinking bays, 2 culverts and 1 water gate.

Our volunteer task force carried out practical habitat management works on 18 different sites (4 cancelled due to Covid, 1 due to weather), including scrub management (15 sites), swaling (2 sites), bracken removal (2 sites) and old fence removal (1 site). Volunteer management work



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influenced 31.5 ha, not including seeds harvested by volunteers (i.e. impact on many ha of habitat creation work, especially in the summer of 2018).

56 volunteer 'events' were carried out in total, many 1:1 with seed harvesting or helping our PhD student with fieldwork). 66 different volunteers came out during the course of the project. They carried out a total of 1496 volunteer hours (not including travel to and from sites).

3.4 Culm grassland management and restoration by landowners

Please see the project's annual reports for details of work on all sites, and maps for an illustration of site targeting and focus areas.

During the five year project period, Culm grassland restoration work was carried out on 95 sites, covering 468 ha. 62% of these sites were at least partially within one of the focus areas.

3.5 Create new Culm grassland habitat

Please see the project's annual reports for details of work on all sites, and maps for an illustration of site targeting and focus areas. Lessons learned in creation new grassland habitat are contained in the comprehensive 'Re-creating the Culm' guide.

Culm grassland creation work was carried out on 32 sites, covering 99.28 ha. This represents 2.1% of area of Culm grassland identified in the updated 2019 Culm Grassland inventory. 80% of the grassland creation sites were at least partially within one of the focus areas.

One new grassland site received green hay only, 15 sites received seeds only, and 19 sites received both seeds and green hay. 395 green hay bales were used and 1390kg of species-rich grassland seed harvested.

3.3 Monitor success of grassland creation methods

The project's two-tier survey methodology was developed in 2016 in conjunction with project partners, and it was followed for four consecutive survey seasons by contractor Hannah Gibbons. There were two levels of survey available: Level 1 (a broad brush technique for all sites), Level 2 (a more detailed technique carried out at two sites per year).

A full report on the monitoring work achieved carried out by contractor Hannah Gibbons, plus her analysis of change indicated to date, is available separately.



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Objective 4: Transnational co-operation

The Culm Natural Flood Management Project formed part of a much wider project, 'Triple C', funded by Interreg 2 Seas (European Union). The purpose of this funding, in addition to achieving positive interventions in land use to help climate resilience, was to engender international co-operation between land management practitioners. The project involved many partners and project from the UK, the Netherlands and Belgium.

The project manager attended a number of meetings with project partners in Kent and Somerset as well as Ghent and Breda. Most of the other projects within Triple-C worked with intensive arable landscapes and the employment of temporary interventions to manage sediment run-off and hold water within the landscape.

In 2018 DWT hosted a Triple C project meeting in north Devon, with many interesting field visits and discussions about the use of grassland (permanent or more intensive) to help manage flooding and pollution as part of farming systems. These discussions have been useful to give perspective on different ways of working with landowners and types of intervention that may be deemed possible – and acceptable by landowners – within different farming intensities.

Objective 5: Awareness-raising and promotion

A dedicated communications plan was drawn up at the beginning of the project, with agreed items and approaches for different audiences.

The project page on the Devon Wildlife Trust website can be found here:

<http://www.devonwildlifetrust.org/northern-devon-NIA/culm-grassland>

Two newsletters per year (nine in total) were produced for landowners and project partners during the year, using MailChimp for distribution to ensure compliance with GDPR.

Significant project update activity was achieved on Twitter and Facebook through DWT's own social media feeds, with other partners connected and credited. Overall 91 social media items about project progress were recorded during the project. One major magazine article was published by Devon Wildlife Trust and a number of local newsletter articles were produced for parishes and interested groups.



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