Dartmoor: Independent Evidence Review

Response to questions

Date: October 2023

www.gov.uk/natural-england

A number of the questions posed to Natural England have been grouped to facilitate better understanding.

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Q39 To what extent may some of the changes on the SSSIs relate to climate change/nitrogen deposition and historical changes on the Moor (e.g. drainage)

Q18 What are the wild bird population trends on Dartmoor (breeding species of target upland habitats)?

Q19 Is there a collation of ecological evidence?

Q20 What is the condition of soils on Dartmoor? Is this associated with changes to the vegetation and what needs to be done to soil function appropriate to the target habitats?

Q21 What vegetation communities occur across the whole of Dartmoor now, and how does this compare with previous decades? Has the extent of Molinia, bracken, gorse, heathland that still has a heather component, been mapped?

Q22 Vegetation change - Evidence for past condition and change in heather/Molinia cover over time.

Q23 What are the BAP priority species for Dartmoor and where are they located

Q25 What numbers of livestock are there? How have these changed, why and when?
Q26 To what extent / how these rates (and rate changes) relate to whether the sites are now classified as green, amber or red. Do these problem issues relate more to sheep, cattle or pony grazing?

Q30 Is it possible to attain ideal stocking rates (with the appropriate stock grazing the sites at the appropriate times) within the SSSIs given the unfenced common boundaries, presence of SSSI/non SSSI, HLS agreement and non agreement land, different land owners and stock managers? What are the barriers to achieving the ideal? (time or cost resources, skills, knowledge?)

Q27 Impacts of overwinter grazing on the status of SSSIs

Q28 Where is the evidence that reduced grazing has improved the status of SSSIs and what grazing regimes have been applied to those areas

Q29 What stocking rates does NE advise to recover the target habitats? (Does NE advise on stocking type, rates and timings for SSSI's?) Do these rates adjust for the SW location, effects of N deposition and warming climate with extended grazing seasons? Will proposed stocking levels address both over-grazing & under-grazing (Molinia) concerns?

Q31 What are the environmental, social and economic consequences of requiring further livestock reductions?

Q32 What information has underpinned decisions around setting the proposed new grazing regimes? What is the likelihood/level of confidence that new stocking levels will deliver success? or will other management actions also be needed? How quickly might favourableness be obtained? Have potential risks or unintended consequences been assessed?

Q33 What relevant case studies are there (for Dartmoor and comparable common land) and what have they demonstrated?

Q34 Examples of optimised grazing regimes (and what those regimes have been) that have improved the habitat status with quantitative evidence-

Q35 What swaling regimes have been granted on SSSIs under the HLS areas
Q36 What are the risks of swaling given current conditions of the vegetation? What measures can be put in place to address these?

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Q38 Who would be expected to control bracken? why? and how would it be resourced?

Q40 What is the extent of the area of peatland that can be rewetted?
Q41 How much peatland restoration has been done and is planned and budgeted for (what is the timeline)?
Q42 How quickly will peatland rewetting result in better SSSI condition, over what extent and how long will this take?
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Q45 Is there a relationship between wetting and grazing and the condition of SSSI's?

Q46 Who are the people and what are the skillsets needed to deliver healthy ecosystems across Dartmoor?
Q47 What structures and support need to be in place to enable success? What is the current situation and the strength, weaknesses and threats associated?
Q48 What financial support is needed?
Q49 Are all the parties involved able and willing to work collaboratively? What resources and support, etc do different parties require to achieve this?
Q50 Are the current structures and arrangements, including the CS agreement structure, fit for purpose. What alternatives are there?

Q51 Archaeology? (Are any proposed management changes to improve SSSI favourableness in conflict with protecting archaeological sites)

Question 1
Q1.Briefing on the statutory environment that NE operates within: what powers does it have and what are its regulatory obligations?

Response

Natural England has over 500 powers and duties to help achieve our statutory purpose.

Natural England (NE) is a body established under the Natural Environment and Rural Communities (NERC) Act 2006. We are the statutory adviser to Government on the natural environment. Our purpose is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Natural England's Vision

Our vision at Natural England is of thriving nature for people and planet.

Our ambition is not just to improve nature, but to see it thriving, everywhere, because a healthy natural environment is fundamental to everyone's health, wealth and happiness.

Our definition of nature encompasses:

- natural beauty
- wildlife
- the geology that underpins natural character and habitats
- our cultural connections with nature

We include the whole natural world on earth and at sea and in towns and cities, as well as the countryside.

Nature encompasses natural beauty, wildlife and the geology that underpins landscape character. It includes habitats on which our most precious species depend. Nature also includes our historic and cultural connections with nature - through art and literature - and other opportunities we have to connect with the environment. Nature also provides us with clean air and water and the ability to capture carbon and create resilience to climate change.

Our understanding of nature covers the whole natural world on earth and at sea, and encompasses the natural environment in our towns and cities as well as the countryside. This was the scope upon which Natural England was founded and is set out in the legislation.

Establishment, purposes and powers

Natural England's general purpose, set out in section 2(1) of the NERC Act, is to:

"ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development."

This general purpose includes, as set out in section 2(2) of the Act, the following:

- promoting nature conservation and protecting biodiversity
- conserving and enhancing the landscape
- securing the provision and improvement of facilities for the study, understanding and enjoyment of the natural environment
- promoting access to the countryside and open spaces and encouraging open-air recreation

- contributing in other ways to social and economic well-being through management of the natural environment. This may, in particular, be carried out by working with local communities.

Natural England's general powers and duties stem from Part 1, Chapter 1 and Schedule 1 of the NERC Act, with specific functions conferred by certain other provisions of that Act and by other enactments. This legislation establishes Natural England as a statutory adviser on the natural environment to Government and as a regulator.

In addition, Natural England has also been given advisory, regulatory and delivery functions, duties and powers through other legislation and mechanisms.

There are over 500 duties and powers established under other enactments including:

- the National Parks and Access to the Countryside Act 1949
- Wildlife and Countryside Act 1981
- Countryside and Rights of Way Act 2000
- Marine and Coastal Access Act 2009
- The Conservation of Habitats and Species Regulations 2017
- The Environmental Impact Assessment (Agriculture) (England) (No.2) Regulations 2006
- The Environment Act, 2021 (see below)

The Environment Act sets out a new framework for environmental governance following the UK's exit from the European Union. There are a number of commitments set out in the Environment Act which impact on the duties and expectations of Natural England. These include:

- a framing of how Natural England works with a number of key stakeholders to deliver the Nature Positive 2030 and the Nature Recovery Network (NRN) commitments
- duties to support the formulation of Environmental Improvement Plans (EIPs) and Environmental Principles
- duties to advise on the development of legally binding targets for air quality, water, biodiversity and waste with the intention of halting the decline in species abundance by 2030
- a central role in the development of Local Nature Recovery Strategies to inform and underpin the national NRN
- a new power to prepare and publish Protected Sites Strategies to improve conservation and management of protected sites and manage impacts upon such sites

Duties in respect of Sites of Special Scientific Interest (SSSI)

Natural England has a duty to notify under S28 of the Wildlife and Countryside Act 1981 any area of land that in its opinion is of special interest by virtue of its flora, fauna, geological or physiographic features.

Notification must be given to all owners and occupiers of land, the local Planning Authority and Secretary of State (SoS) to include:

- A Citation, which describes the special nature conservation interest for which the site has been selected as a SSSI
- A Map showing the extent of the SSSI boundary
- A List of Operations that require Natural England's consent ('ORNECs') (also previously referred to as 'Operations Likely to Damage' ('OLDs')
- Natural England's views about the management of the site

The Wildlife & Countryside Act 1981 and subsequent amending legislation. places a legal duty on Natural England to take reasonable steps, consistent with the proper exercise of its functions, to further the conservation and enhancement of the special scientific interest of SSSIs.

In order to provide all SSSIs with protection from potentially harmful activities, the Act requires:

- owners and occupiers of SSSI land proposing to carry out or permit operations damage the special interest of their SSSI and on the list of such operations referred to above, to first apply for Natural England's consent
- public bodies proposing to carry out operations which they consider are likely to damage the features of special interest of a SSSI (whether within or outside the boundary of an SSSI) must first notify Natural England
- public bodies proposing to authorise or permit others to carry out operations that may be likely to damage the special interest of a SSSI (whether within or outside the boundary of an SSSI) to first seek Natural England's advice

Natural England's objective is to achieve 'favourable condition' status for all SSSIs. Favourable condition means that the SSSI's habitats and features are in a healthy state and are being conserved by appropriate management.

Our vision for SSSIs is that the SSSI series is naturally functioning and resilient; individual sites are ecologically coherent in the context of their immediate landscape; are in favourable condition for their geodiversity and biodiversity; and are central to driving nature recovery on land and sea, contributing to the wellbeing of wider society.

In respect of SAC and SPA

Special Areas of Conservation (SAC) and Special Protection Areas (SPA) in the UK form parts of a national site network on land and at sea, established by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

Maintaining a coherent network of protected sites with overarching conservation objectives is required in order to:

- fulfil the commitment made by government to maintain environmental protections
- continue to meet our international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions

Terrestrial SAC and SPA are almost always also SSSI, and it is the SSSI designation through which Natural England engages with land managers to achieve favourable condition of the designated features.

When exercising its own statutory decision making powers on SSSI, that are also SAC and SPA, Natural England is the 'competent authority' in respect of the 'Habitats Regulations' and must carry out a Habitats Regulations Assessment of 'plans or projects'.

In respect of National Parks

Under the National Parks and Access to the Countryside Act 1949, Natural England has a duty to:

- consider which areas in England meet the criteria for designation as a National Park
- determine in which order they should be designated
- designate suitable areas
- take account of the purposes of National Parks in its work

Natural England also has the power to issue a variation order, to change an existing National Park boundary under the Wildlife and Countryside Act 1981.

Natural England also has further responsibilities to:

- advise government ministers on any actions that need taking under National Park and planning legislation

- review the success of National Park purposes and to make recommendations to ministers, National Park Authorities (NPAs), local authorities or others
- make recommendations to ministers on proposals to develop land in National Parks that appear inconsistent with their objectives
- recognise the objectives of National Park designation when making decisions and undertaking activities which affect them
- periodically issue guidance to NPAs on mapping areas of mountain, moor, heath, woodland, down, cliff or foreshore (including any bank, barrier, dune, beach, flat or other land adjacent to the foreshore) within their boundaries

In respect of Agri-Environment Schemes

Natural England acts as a technical adviser to the Rural Payments Agency (RPA) about delivery of agri-environment agreements under the Higher Level Stewardship Scheme (HLS) and Countryside Stewardship (CS). Natural England advises the RPA about the suitability of HLS agreements for extension according to criteria set out by the RPA. Natural England is required to inform RPA where breaches of agreement prescriptions are identified.

In 2018 the Rural Payments Agency (RPA) took over responsibility for the administration of HLS agreements, with Natural England acting as a technical adviser to the RPA. The Memorandum of Understanding and Target Operating Model between NE and RPA demonstrating these levels of responsibility is available in the Evidence Folder (DR009 and DR010). As technical adviser Natural England advises the RPA and agreement holders on agreement performance and whether agreements are suitable for extension.

Environmental Improvement Plan (EIP)

The EIP contains a government commitment to restore 75% of protected sites to favourable condition by 2042. There are also new interim targets for all sites of special scientific interest (SSSIs) to have an up-to date condition assessment; and for 50% of SSSIs to have actions on track to achieve favourable condition by 31 January 2028.

Question 2

Q2. Appreciation of other outside pressures being exerted on Natural England

Response

We deliver statutory services according to our powers and customer service values using our evidence of what works from across the natural and social sciences to assure decision making and best practice.

Natural England (NE) is an executive non-departmental public body, sponsored by the Department of Environment, Food and Rural Affairs (Defra). Natural England's overarching role is as an adviser to the Government on the natural environment.

Natural England has a range of statutory duties set by Parliament or government. These include a duty in law to notify and protect Sites of Special Scientific Interest (SSSI). The UK also has international commitments in law that it needs to adhere too. We're accountable to those commitments, and Natural England has an incredibly important role in making sure that we, as a nation, deliver against these. Alongside those we advise government in the development and implementation of policy. We do this as an impartial, evidence-led and expert organisation.

As a public body Natural England needs to be conscious of, and respond to, the priorities of government. We are not immune to the current pressures affecting society as a whole, many of which affect our staff, as well as the people we work with.

Where we engage with the rural and farming communities we do so in the context of the pressures on those communities and individuals, for example from increasing costs and changes to agricultural support, and those influence the dialogue.

We also recognise that we are operating in times of unprecedented public concern for the environment and nature. There is considerable government commitment demonstrated in the Environmental Improvement Plan, through which there is a policy commitment to restore 75% of protected sites to favourable condition by 2042, as well as supporting a transformation in the management of 70% of our countryside by incentivising farmers to adopt nature friendly farming practices. (Environmental Improvement Plan 2023 - GOV.UK (www.gov.uk).

Many of the decisions we make are complicated and difficult, never more so than in cases where our most important sites for nature, are on land which farmers depend on for their income. In these cases, we work closely with farmers and landowners to identify and support management practices that bring these designated sites towards favourable condition, and which support sustainable land management businesses over the longer-term.

Natural England is sometimes lobbied by campaigning organisations to take action using its regulatory powers We take care to avoid being unduly influenced and to make our decisions based on the facts of the case and the evidence available.

Question 3, 4, 13, 14
Q3. History of SSSI designations on the main Dartmoor sites – • what has changed over time • which elements are included (flora, fauna and geology). • what was the condition of the SSSIs at the point when they were designated? Q4. Has favourable condition ever been achieved on any scale on the non-woodland sites? Q13. When condition assessments were first introduced, what was the status of the SSSI units? When was this? Q14. What is the current condition of the SSSI units & how regularly has this been assessed?

Response

Dartmoor includes nationally and internationally important protected areas. SSSI condition varies across Dartmoor and some sites have never achieved favourable status

Q3. History of SSSI designations on the main Dartmoor sites

The first designations of SSSI on Dartmoor were in 1952 with further designation in 1976. The current suite of SSSIs were designated in 1987 and 1989 with renotification and extension of the original sites under the Wildlife and Countryside Act, 1981.

East Dartmoor SSSI (2,088.1 ha) was first notified in 1976 and notified under the 1981 Act in 1987 with amendments to the boundary including extensions and deletions.

South Dartmoor (9,668.2 ha) was notified in 1952, revised in 1976 and notified under the 1981 Act in 1989, with amendments to the boundary including extensions and deletions. The SSSI name has been changed from Central South Dartmoor. The site now includes High-house Waste, which was formerly part of Hawn's Wood and High House Moor SSSI (now Dendles Wood SSSI). Part of the site originally notified in 1951 has since been renotified as part of the Holne Woodlands SSSI.

North Dartmoor (13,413 ha) was notified in 1952, revised in 1976 and notified under the 1981 Act in 1989, with amendments to the boundary including extensions and deletions. The extensions include the formerly separate Gidleigh Common SSSI and Black Tor Copse Forest Nature Reserve.

The Dartmoor Special Areas of Conservation (SAC) was designated in 2005. It is 23,158 ha. The site network Standard Data Form is here: UK0012929.pdf (jncc.gov.uk)

The earliest reference to the special features on Dartmoor, dated June 1950, refers to the effects of grazing, burning and drainage impacting on the condition of the habitats. The rationale for notification, nascent in the 1950's, and better developed by the 1980's, was to notify a large area to include examples of vegetation types that are distinct from other parts of Britain. It was recognised at the time of renotification in the 1980's, that a large proportion of the SSSI land supported degraded examples of habitat, but, that these were the best examples available and were sufficiently intact to be of special interest. At the time the potential for recovery was recognised and this is now reflected in the ambitions for nature recovery and improvement in condition to meet government's targets for SSSI.

DESIGNATED FEATURES

East Dartmoor
Assemblages of breeding birds - Submontane grasslands and heaths
Blanket bog and valley bog (upland)
EO - South-West England Igneous
Short sedge acidic fen (upland)
Soakaway and sump (upland)
Subalpine dwarf-shrub heath
Transition mire, ladder fen and quaking bog (upland)

South Dartmoor
Acid grassland (upland)
Atlantic salmon, *Salmo salar*
Blanket bog and valley bog (upland)
FB - Quaternary of South-West England
Otter, *Lutra lutra*
Short sedge acidic fen (upland)
Soakaway and sump (upland)
Subalpine dwarf-shrub heath
Wet heath (upland)
Transition mire, ladder fen and quaking bog (upland)

North Dartmoor
Acid grassland (upland)
Assemblages of breeding birds - Upland moorland and grassland with water bodies
Assemblages of breeding birds - Upland moorland and grassland without water bodies
Atlantic salmon, *Salmo salar*
Blanket bog and valley bog (upland)
FB - Quaternary of South-West England
Lichen assemblage
Nationally rare and scarce dragonfly species - *Coenagrion mercuriale*, Southern Damselfly
Otter, *Lutra lutra*
Short sedge acidic fen (upland)
Subalpine dwarf-shrub heath
Upland oakwood
Wet heath (upland)
Soakaway and sump (upland)
Lowland dry heath

Condition of the SSSI when the sites were notified.

SSSI condition was not assessed when the Dartmoor SSSIs were notified in the 1950's. There are no records of condition from the 1970s when there were extensions to the two SSSIs notified in the 1950's and the new notification at East Dartmoor. There are some documentary records* from both the 1950's and 1970's that allow us to infer that at least part of the SSSI area sites would not then have been in favourable condition by standards applied now.

*File note 19th December 1972 (S D Ward, Montane Grassland Habitat Team) and File Note 1950's by V Conway

Q4. Has favourable condition ever been achieved on any scale on the non-woodland sites?

The current condition status of the SSSI is shown in the table below. The tables below show the change in condition category over time. Unfavourable recovering condition was applied to a number of sites where there was an agri-environment agreement in place, which, if the actions within the agreement were carried out, would have resulted in an improvement to the site's condition, although not necessarily leading to favourable condition (see for example North Dartmoor). SSSI condition may change between assessments for a variety of reasons including change in management or if burning has taken place.

SSSI	SSSI Area ha	Favourable %	Unfavourable recovering %	Unfavourable no change %	Unfavourable declining %
East Dartmoor	211.36	40.03	47.00	0.00	12.97
North Dartmoor	13559.36	0.22	46.28	53.50	0.00
South Dartmoor	7113.77	4.48	51.72	22.35	21.45

SSSI selection is based on the presence of the particular features of interest, and not the condition of those features. It operates on a principle of establishing a network of sites representing in total those parts of Great Britain in which the features of nature are most highly concentrated or of highest value (Nature Conservancy Council, 1989). The vegetation of Dartmoor is of particular interest in that it combines western oceanic communities with a more northern, upland component. This includes extensive areas of internationally important blanket mire and some of the best areas of wet heath in England. These wet and predominantly western communities occur with dry heath including the upland *Calluna-Vaccinium* heath and the lowland *Ulex- Agrostis curtisii* heath. The extensive valley mires are also of significant interest (Natural England, 1997).

The earliest reference to the special features on Dartmoor, dated June 1950 (Natural England file note by V M Conway), refers to the effects of grazing, burning and drainage impacting on the condition of the habitats. The rationale for notification, nascent in the 1950's, and better developed by the 1980's, was to notify a large area to include examples of vegetation types that are distinct from other parts of Britain and to represent adequately the full range of variation in vegetation on the moor. It was recognised at the time of the notification under the Wildlife and Countryside Act in the 1980's that a large proportion of the SSSI land supported degraded examples of habitat but that these were the best examples available and were sufficiently intact to be of special interest (Wolton, undated). At the time the potential for recovery was recognised and this is now reflected in the ambitions for nature recovery and improvement in condition to meet government's targets for SSSI.

Q13. When condition assessments were first introduced, what was the status of the SSSI units? When was this?
Q14. What is the current condition of the SSSI units & how regularly has this been assessed?

Condition history for the three Dartmoor SSSI is summarised in the tables below.
The tables show the current condition of the SSSI units and how regularly they have been assessed. Some years are grouped to simplify the presentation. SSSI units for South and North Dartmoor SSSI have been revised so unit numbering is not sequential. Earlier data for North Dartmoor are not available.
Condition categories are:

F	Green	Favourable
Unf R	Pale green	Unfavourable – Recovering.
Unf N	Amber	Unfavourable – No Change
Unf dec	Red	Unfavourable – Declining

SSSI Unit Condition History – East Dartmoor SSSI

Unit	Assessment Period

Unit	SSSI Condition Reports												Overgrazing reports		Unit/site name
	1993	1999	2000-2002	2003-2005	2007-2008	2009	2010	2011	2012	2013-2015	2020-2021	2022	2004	2005	
1	F	F		Unf R	Unf N		Unf R		Unf R		Unf R				
2	F	Unf D		Unf R		F			Unf R		Unf R				
3	Unf N	F				F			Unf D	Unf R	Unf R				
5	F	F		Unf R		Unf R		F					Unf R[1]	Unf R[1]	Chagford Common
7	F		F		F		F								
8	F		Unf dec	Unf R		F				Unf D					
9	Unf N		F			Unf R				Unf D					
10	Unf D		Unf D	Unf R		Unf R			F						
11	F		F			F	F	F							
12	F		F		F	F						F			
13	F		Unf D	F			F	F							
14	F		F			F		F							
15	F		F		F			F							
16			F		F				F						
17			F		F					F					
18			Unf N	Unf R				Unf R							
19			F		F		F	F							
20			Unf D	Unf N	Unf R	Unf R		Unf R			Unf R				
21			F			F		Unf R			Unf R				
22			Unf D		Unf N		Unf R		Unf R		Unf R				
23			Unf D			Unf R			Unf R						
24			Unf N	Unf R		Unf R			Unf R						

[1] Quote: In general, the vegetation on the Kestor section of Chagford Common has shown significant improvements in condition since 2000 but grazing intensity on Heather was still relatively high.

[2]Quote (para 1.5): “Since 2000 there has been a significant decrease in the mean percentage of Heather showing growth forms indicative of heavy grazing and a significant decrease in the percentage of sampling points containing detached Heather.”

SSSI Unit Condition History – South Dartmoor SSSI

Unit	Assessment Period																
Unit	SSSI Condition Reports												Overgrazing reports				Unit/site name
	1993-	1997	1999	2000	2002-	2005-	2009	2011	2013-	2017	2019-	2021-	2002	2004	2002-	2014	
	1996				2004	2007			2014		2020	2022			2007		
3	F	Unfdec			Unfdec		F	F				F					
8	F				Unfdec	Unf R	Unf R	Unf R			Unf R	Unf R					
9					Unf R		Unf R	Unf R			Unf R						
10	F		F	F		Unf R		Unf R	Unfdec			Unfdec					
21					Unf R	Unf R	F										
57									Unf R								
58									Unf R	F	Unf N						
59									Unf R		Unf N						
60									Unf R		Unf N						
61									Unf R		Unf R	Unfdec					
62									Unf R								
63									Unf R				Unf	Unf N[1]	Unf	Unf	Ugborough and Harford Commons
65									Unf R			Unf R					
67									Unf R				Unf[1]				Holne Moor

[1] See Table 2 below

[2] Report quote: The results of the survey indicate that appropriate vegetation management is being carried out on Holne Moor. However, management operations have to date not produced the desired range of heath structure and age.

SSSI units have been revised this results in unit numbers being non-sequential.

Table 2: North Dartmoor SSSI, Site Unit information Ugborough and Harford Moors (from English Nature, 2004)

Unit No.	Area (ha)	Main Habitat	Condition	Reason for adverse condition	Last assessment date
11	209	Bogs	Favourable	N/A	6 May 1999
12	44	Dwarf-shrub Heath Upland	Unfavourable, declining	Overgrazing	6 May 1999
13	240	Bogs	Unfavourable, recovering	N/A	6 August 2002
14	80	Dwarf-shrub Heath Upland	Unfavourable, no change	Overgrazing	6 August 2002

Table form Ugborough & Harford Overgrazing report (before changes to unit numbers: Units 11-14 in Table 2 correspond to current unit 63).

SSSI Unit Condition History – North Dartmoor SSSI

Unit	Assessment Period												
Unit	SSSI Condition Reports				Overgrazing reports								Unit/site name
	2013	2018	2019	2021	2003	2004	2005	2006	2007	2008	1999 - 2008	2014	
74	Unf R						Unf R?[1]		Unf R				Tavy Common
75	Unf R		Unf R	Unf R									
76	Unf R			Unf R									
77	Unf R	Unf R		Unf R									
78	Unf R	Unf R				Unf N		Unf [2]			Unf	Unf	Okehampton common
79	Unf R			Unf R	Unf [3]								Belstone Common
80	Unf R			Unf R									
81	Unf R		Unf R	Unf R			Unf N						Throwleigh Common
82	Unf R		Unf R	Unf R		Unf R[4]							Gidleigh Common
83	Unf R		Unf N										
84	Unf R		Unf N										
85	Unf R		Unf N										
86	Unf R		Unf N										
87	Unf R		Unf N				Unf N						Cut Hill
88	Unf R		Unf N										
89	Unf R		Unf N										
90	Unf R		Unf N										
91	F		F										
										Unf			Black Dunghill (part in SSSI?)

[1] Not specific mention of condition but "A comparison of the results from the 2003 and 2005 surveys indicates that there has been a significant decrease in the grazing pressure on this common with subsequent positive changes in vegetation condition. However, some results (particularly the proportion of sample points classed as heavily grazed) indicate that grazing pressure is still having a negative effect on condition."

[2] It says grazing is fairly heavy BUT management has succeeded halting overgrazing!

[3]The report does not mention condition but it says: "Belstone Common is significantly overgrazed, and does not meet the Environmental Cross Compliance provisions attached to livestock subsidy payments"

4 Gidleigh Common Overgrazing Report summary table

Table 2: North Dartmoor SSSI, Site Unit information Gidleigh Common (English Nature, 2004)

Unit No.	Area (ha)	Main Habitat	Condition	Reason for adverse condition	Last assessment date
12	450	Bogs	Unfavourable, recovering	N/A	25 February 2004
13	240	Dry Heath	Unfavourable, recovering	N/A	27 October 2003
58	77	Upland acid grassland	Unfavourable, no change	Overgrazing / burning	10 April 2002

North Dartmoor SSSI units were revised in 2013 - condition data prior to 2013 are not available.

References

Natural England (1997) The vegetation of mountains and moorlands of England: national assessment of significance (ENRR218) The vegetation of mountains and moorlands of England: national assessment of significance - ENRR218 (naturalengland.org.uk)

Nature Conservancy Council (1989) Guidelines for the Selection of Biological SSSI

Wolton (n.d. but c. 1988) Briefing note for NCC staff: In defence of the large size of the major Dartmoor moorland SSSIs. NCC File note.

Question 5 and 16
Q5. How are SSSI assessments carried out and what ecological advice is available to be called on by the field officers? Q16. Why SSSI are units are graded as red, amber, green (condition assessment methodology). Were all SSSIs green/favourable in the past? - and when was this?

Response

Natural England carries out SSSI assessments using a SSSI Monitoring, Assessment and Reporting operational standard.

Q5. How are SSSI assessments carried out and what ecological advice is available to be called on by the field officers?

Natural England uses a range of sources and a variety of techniques to gather information to assess or validate the condition of designated features on SSSIs. Formal assessment follows Common Standards for Monitoring (CSM) and the associated guidance for feature assessment agreed by the UK country agencies and the Joint Nature Conservation Committee (JNCC). We also draw on earth observation data, partner and 3rd party data, DNA evidence, land manager & volunteer data, rapid targeted assessments and site checks. Formal assessments since 2005 have used the JNCC CSM methodology.

CSM also sets out the condition categories that are used:

- Favourable
- Unfavourable – Recovering.
- Unfavourable – No Change
- Unfavourable – Declining
- Destroyed / Part Destroyed

These are defined by JNCC as follows. Categories in italics are optional and are used as qualifiers to indicate a trajectory of change.

- Favourable. An interest feature should be recorded as favourable when its condition objectives are being met. This includes biological (species and habitats), geological and geomorphological features.
- *Unfavourable - recovering. An interest feature can be recorded as recovering if it has begun to show, or is continuing to show, a trend towards favourable condition.*
- Unfavourable. An interest feature should be recorded as unfavourable when its condition objectives are not being met.
- *Unfavourable - no change. An interest feature may remain in a more-or-less steady unfavourable state/deterioration; it is unfavourable but neither declining or recovering. In rare cases, an interest feature might not be able to regain its original condition following a damaging activity, but a new stable state might be achieved.*
- *Unfavourable - declining. Decline is another possible consequence of a damaging activity. In this case, recovery is possible and may occur either spontaneously or if suitable management input is made.*
- Partially destroyed. It is possible to destroy sections or areas of certain features, or to destroy parts of protected areas with no hope of reinstatement, because part of the feature itself, or the habitat or processes essential to support it, have been removed or irretrievably altered. In such instances it is usual for a condition assessment to be carried out on the remaining, intact feature.
- Destroyed. The recording of a feature as destroyed will indicate the entire interest feature has been affected to such an extent that there is no hope of recovery, perhaps because its supporting habitat or processes have been removed or irretrievably altered.

Natural England produce a Monitoring Specification (previously known as Favourable Condition Table – see Evidence Folder DR003 – DR005) which sets the attributes and targets used to monitor the current state of features of interest 'in the field'. These are usually based on the JNCC CSM methodology for the habitats found at the site. The inherent dynamism of habitats and species populations is recognised in the development of Monitoring Specifications for each site which guide how SSSI condition is assessed.

There is no legal requirement to monitor SSSI, but it is a recommendation of the Public Accounts Committee and there is an Environmental Improvement Plan target, that by 31 January 2028 we will have an up-to-date condition assessment for every SSSI feature, and that 50% of SSSI features will have actions underway and on-track to get them into favourable condition.

Hitherto SSSI have been divided into one or more 'units', which typically separate different areas of habitat and/or land ownership. We have been able to link the condition of a designated site feature to the risks, remedies and management relevant to a particular part of that site. Most SSSI assessments available on Dartmoor carried out to date are based on units.

We use 'site checks' to check current status of SSSI features and detailed surveys, usually based on CSM, to identify and validate a change in condition between favourable and unfavourable.

Natural England provides advice to land managers about the measures needed to ensure that the condition of Unfavourable Units improves and thereby contributes to delivery of Natural England's statutory purpose and international and national objectives.

We are changing the basis of assessment to 'Whole Feature Assessment', and this will be the basis for the round of monitoring currently being commissioned. Whole feature assessment allows monitoring at a scale that makes better ecological sense and reflects ecological function. This formal monitoring will be complimented by more locally based site checks, which will allow us to assess progress in achievement of agreement objectives. Whole feature assessment will continue to be based on Common Standards Monitoring methods and we are confident that results from it will be consistent with previous unit-based approach.

Whole feature assessment will enable us to set protected sites in a wider landscape context and be at the heart of the Nature Recovery Networks. This change to feature based reporting has been acknowledged by government and is incorporated into the interim targets of the Environmental Improvement Plan, which include the delivery of an up-to-date condition assessment for every SSSI feature by end of January 2028.

In addition, we are making other changes to SSSI monitoring, in part to address the need to account for environmental change. We are developing new metrics to trial next year, which consider natural ecosystem function indicators, this involves looking at the site as a system and includes things like the connectivity into the wider landscape and the extent to which the site is modified and managed.

In 2023 we are introducing a climate change risk assessment for all features and for those which score as high risk, we will start to develop adaptation plans, intended from 2024 onwards.

For the future we are developing a risk-based monitoring plan, where the frequency of monitoring is based on a feature's sensitivity to change and vulnerability to interventions. We will link this to when a change in condition is expected. We will improve our tracking of progress of condition change for features where the shift from unfavourable to favourable can take decades, through the development of interim milestones. This will allow us to assess whether agreed management is successful and recommend adjustments where required.

Changes to our approach to monitoring and how we assess condition will not change Natural England's legal requirement to secure habitat features in the best possible ecological condition.

For SACs (Special Areas of Conservation) we produce Conservation Objectives and Supplementary Advice for each European feature to help define site integrity and their contribution to favourable conservation status. The attributes that define integrity are broader than those used for monitoring. The Conservation Objectives form the basis for assessing 'plans or projects' as required by the Habitats Regulations. There is a legal requirement to produce Conservation Objectives and a recommendation that Supplementary Guidance is produced to aid implementation of the Habitats Regulations.

Site assessments may be carried out by our local advisers, by our national Field Unit or they may be carried out by contractors. Those carrying out and interpreting surveys are able to call on support from locally based Senior Advisers and nationally based Specialists. There is an Upland Network managed by staff in our Strategy and Government Advice Team, which provides more general support for all staff engaged in upland work and there is an 'Upland Team Leads' group, which meets regularly to share information about topical issues.

In the wider environment outside protected sites, Natural England is carrying out a Natural Capital and Ecosystem Assessment, a programme of assessing condition of habitats in the landscape which will provide real insights into the state of nature in the round.

Q16. Why SSSI are units are graded as red, amber, green (condition assessment methodology). Were all SSSIs green/favourable in the past? - and when was this?

SSSI condition is recorded against the criteria described above. In our 'Designated Sites Views' system, we use colour coding to represent units that are in different condition categories as follows:

Favourable	Green
Unfavourable – Recovering.	Pale green
Unfavourable – No Change	Amber
Unfavourable – Declining	Red

This colour coding has no formal significance and serves only as a visual highlight.

The condition of units may vary over time and may change in either direction. Some units have not been favourable at any time over the period that this method of categorisation has been in use.

Question 6, 7, 9 and 24
Q6. How do these SSSI Assessments read across to consideration of HLS performance? How fully are the SSSI citations reflected in HLS agreements? Q7. Do commoners understand what is being asked of them? Q9. Linked to the above, how does the protection of individual sites coalesce to create a strategic vision for the whole of Dartmoor? Q24. Current management of the SSSI units

Response

HLS agreements are contractual and include Indicators of Success that relate to SSSI condition. Natural England work hard to ensure all agreement holders understand what is being asked of them.

Q6. How do these SSSI Assessments read across to consideration of HLS performance?

Site of Special Scientific Interest (SSSI) condition assessments are used to contribute to the development of Higher-Level Stewardship (HLS) Indicators of Success and prescriptions. Where HLS agreements are on SSSI land, it is an objective of the agreement to achieve favourable or recovering SSSI condition. Agreement prescriptions are intended to set out the management required to maintain or achieve SSSI favourable or recovering condition and other Indicators of Success. During the lifetime of the agreement Natural England undertakes site checks and/or monitoring, the conclusions of which are used to assess agreement performance and, if necessary, to review management prescriptions. Where Natural England advises that amendments to the management prescriptions are required, this is negotiated with the agreement holder. On conclusion of these negotiations Natural England will inform the RPA. This same approach is followed at the end of the agreement should the agreement holders wish to extend their agreement. All new agri-environment agreements subject to change are likely to need a habitat regulations assessment which requires NE to provide evidence of no adverse effect on integrity of the site.

How fully are the SSSI citations reflected in HLS agreements?

The SSSI citation sets out the reasons for the notification of the SSSI. Agreement Indicators of Success and prescriptions reflect the aim to maintain or achieve favourable condition of the notified features described in the citation.

Q7. Do commoners understand what is being asked of them?

Our experience is that there is inconsistent understanding by commoners, across the various sites, of the objectives of the agri-environment schemes they are party to. This is despite a long history of agri-environment schemes on Dartmoor and a range of processes to support management that delivers these objectives.

The Dartmoor SSSIs have been in place in their current form since 1987 and there has also been a long history of agri-environment schemes on Dartmoor. The Dartmoor Environmentally Sensitive Area (ESA) was established in 1996. This scheme, which had a very high uptake, offered incentives to encourage farmers to adopt agricultural practices that would safeguard and enhance areas of high landscape, wildlife or historic value. The Dartmoor ESA scheme ran from 1996 to 2005 and was replaced by Environmental Stewardship in 2005. As ESA agreements came to an end most commons associations applied for an HLS agreement. Many commoners have therefore been active participants in agri environment schemes for over 20 years.

All agri-environment agreements, including HLS, are contractual arrangements entered into voluntarily. Under these agreements, agreement holders receive a payment that supports management to deliver specific environmental outcomes.

As signatories to an agreement, it is reasonable to expect agreement holders will have assured themselves that they both understand their legal commitment and what is required by the agreement both in terms of the management prescriptions and the agreement outcomes as set out in the agreement Indicators of Success. Natural England is available to support and advise agreement should they require clarification.

On the Dartmoor commons, Natural England invested significant resource working with commoners and landowners in setting up HLS agreements. During this time numerous detailed discussions and meetings were held to understand the objectives of commoners, landowners, Natural England and other parties, such as Historic England. The initial discussions were then followed by negotiations to establish the detail and environmental outcomes expected from the agreement. Due to the complex nature and the number of parties involved, each HLS commons agreement took a minimum of several months to negotiate. Some of the most complex agreements, such as the Forest of Dartmoor agreement, took 12 months.

As there are usually multiple parties involved in a commons agreement. All parties (active graziers, non-graziers and landowners) must have confirmed approval of the requirements before the agreement can be signed and the contract entered. For an agreement to be offered the application must be accompanied by an Internal Deed signed by the commons' association and landowner.

Agreements were supported by an implementation plan to support and guide the management of the first 5 years of the agreement. These were followed by workplans intended to be simpler for agreement holders to follow.

Alongside the significant amount of support and advice provided when the agreements were set up, Natural England has engaged in on-going dialogue over the course of the agreements. Engagement has included developing additional management plans, considering proposals for burning, following up when timetabled management was overdue, dealing with requests for derogations or identification of breaches and providing feedback when following monitoring visits.

An anonymised example of a Dartmoor HLS agreement (see Evidence folder DR002) has been provided separately to demonstrate the format by which the general conditions, prescriptions and indicators of success are presented to agreement holders.

Dartmoor Farming Futures

There have been a range of initiatives where Natural England has engaged with commoners. Perhaps the best-known example was 'Dartmoor Farming Futures' (DFF), (see Evidence Folder DR006) facilitated by the Dartmoor Commoners Council (DCC) and the Dartmoor National Park Authority (DNPA).

The trial was established to address concerns amongst some commoners that the HLS agreements were prescriptive and did not consider the future viability of hill farming and commoning. DFF trialled a new approach to delivering environmental benefits, whilst operating within the terms of the existing HLS agreements. During 2010-2012 NE invested significant effort in the development of Dartmoor Farming Futures with the aim of supporting agreement holder delivery.

At the outset of the trial, it was agreed that engaging agreement holders in assessment of SSSI condition was a key outcome, as was improving SSSI condition. Natural England put significant effort in supporting agreement holders so they could undertake condition monitoring themselves based on a clear understanding of what SSSI favourable condition looked like.

DFF was helpful in demonstrating the importance of facilitation. The self-assessment trialled has potential to improve engagement by agreement holders, and where this is supported by trusted and/or independent ecological advice, agreement holders can not only understand whether outcomes are being met, but also how management is impacting on the delivery of those outcomes.

However, DFF also demonstrated that self-assessment has its limitations. During the trial, agreement holders tended not to account for the effect of their management on the delivery of scheme outcomes, in particular those relating to SSSI condition. There is little evidence that the farmer led approach resulted in better delivery of environmental outcomes, though agreement holder assessments tended to support Natural England's assessments of SSSI condition. It is unclear whether agreement holders failed to understand the impact of their management on SSSI condition or whether management decisions were driven by agricultural objectives. It could be concluded that securing consensus to support management adjustments in response to non-delivery of agreement outcomes is difficult where multiple graziers (up to 80 active commoners in the case of the Dartmoor Forest) and other parties are involved.

Natural England understands that there are particular challenges with agreements on commons. While the internal arrangements for each common fall outside of the remit of Natural England, we recognise that successful agreements on common land do require that the parties involved have a robust and effective governance structure in place.

Q9. Linked to the above, how does the protection of individual sites coalesce to create a strategic vision for the whole of Dartmoor?

SSSI condition is a critical aspect of a strategic vision for Dartmoor and nationally. Agri- environment schemes are expected to contribute at least 50% of the target of bringing 75% of protected sites into favourable condition by 2042 (Environmental Improvement Plan (publishing.service.gov.uk).

HLS agreements address multiple outcomes and Natural England considers that achieving favourable condition on individual SSSIs is likely to underpin delivery of other public benefits across Dartmoor. For example, blanket bog habitat in good condition is likely to support water supply, deliver natural flood management and be resilient to wildfire and environmental change. A strategic vision for the whole of Dartmoor that embraces SSSI favourable condition, as part of a network of functioning and resilient ecosystems, would therefore support the delivery of a wide range of objectives.

To address Farmers' concerns a Vision (The Moorland Vision | Dartmoor) of how the statutory agencies would work together in balancing the management of multiple statutory interests within the context of a 25-year vision for Dartmoor's moorland was developed in 2005. Farmers had articulated that they wanted a clearer picture of what land management was required, and they wanted to be part of the solution. They wanted to be confident that those statutory agencies charged with protecting the moor all shared the same vision.

The Vision is for Dartmoor moorland to remain the largest open space in Southern England with its varied habitats - blanket bog, mires, heather moorland and western heath in optimum condition. The Vision identified that the future was a grazed landscape, and confirmed the role that farmers play. It also helped resolve issues of potential conflict between management for the historic environment (including archaeology) and the natural environment. Later reviews also took account of additional elements, such as access and resources including water and carbon storage.

The Vision map (PDF) provides further detail.

More recently the Dartmoor National Park Authority published its Dartmoor Partnership Plan (National Park Management Plan) (Partnership Plan | Dartmoor).

Q24. Current management of the SSSI units

Current land management practices have a critical impact on SSSI condition on Dartmoor.

The current management of SSSI unit is set out in the HLS management agreement prescriptions and stocking calendars. The function of the agreements is to give clarity to the commoners and other agreement holders about the requirement for management of the agreement land. On land where there

is no agri-environment agreement, there will be a separate discussion about management that is consistent with SSSI objectives. Some land managers, but not commoners who are not notified owner/occupiers, operate under SSSI consents (Wildlife and Countryside Act, 1981).

Much has been said of the influence of external factors, climate change, air pollution and the impact of heather beetle as the reasons for failing condition on the moorland SSSIs on Dartmoor. The influence of multiple factors is well understood and, while these external factors have played a role in current SSSI condition, the degree to which they have impacted on SSSI condition has been compounded by the sub-optimal condition of the SSSI features. Sub-optimal condition of these features is driven primarily by changing patterns in grazing management and the lack of progress in large-scale restoration of peatland habitats. Positive management at the site level is critical, not just in having a direct bearing on SSSI condition, but importantly in mitigating potential impacts from external factors. Positive management of SSSI features builds resilience to changing external influences, while inappropriate management can lead not only to the direct loss of features, but also increase the vulnerability of features to the externally driven pressures.

The disruption of hydrological function in areas of blanket bog and valley mires, combined with a reduction in early summer cattle grazing pressure, will have favoured the expansion of *Molinia* over the more open wet heath and mire/bog vegetation that would be present in intact areas of peatland. Air-borne nitrogen deposition may have further compounded conditions to the advantage of *Molinia* but cannot be viewed as the primary driver in the overdominance of *Molinia* on areas of degraded peatland. Similarly, the loss and fragmentation of dry heathland is primarily a feature of recent grazing management, changing patterns of seasonal grazing, shepherding and stock breeds. The presence of extensive areas of dwarf shrub heath communities on some commons, but not on others, highlights the role management plays in determining the condition of these SSSI features.

The impact of winter sheep grazing on dry heathland vegetation is visually demonstrated in the condition of those communities on commons with high levels of wintering sheep numbers. The grazing exclosures on Okehampton Common clearly demonstrate how heathland can recover when grazing pressure is reduced and how recovery is quickly lost when grazing is reintroduced. If factors such as heather beetle, climate change and nitrogen deposition were the primary drivers, we would expect to see similar loss and fragmentation across all areas on Dartmoor.

Question 8
Q8. How far can NE pursue a consistent vision, and consistent agreement objectives, over time in the face of shifting public policy priorities?

Response

Natural England's purposes and objectives are set by Parliament and may change over time.

In practice, in the decades that NE and its predecessor bodies have existed, there has been a steady strengthening of concern for the environment, that has been reflected in legislation and Government policy. Inevitably, superimposed on this trend, there have been shorter term fluctuations as Governments respond to circumstances and try to balance short term issues, with the longer-term objectives for the environment.

However Natural England has a clearly defined role and continues to fulfil that role. We are evidence-led and aim to carry out our role as adviser to government and as a delivery body informed by the best evidence available. Despite the short-term pressures there remain powerful ambitions in government for agriculture and the natural environment, including as set out in the Net Zero Strategy and the Environmental Improvement Plan and we focus on that. Driving improvements to SSSI condition is a key ambition for Natural England and is reflected in government policy.

Question 10 and 11
Q10. What would NE's response be if a significant number of commons came out of agreement at this point or, more fundamentally, if there was a significant reduction in the number of commoners active on the moor? Q11. How does NE manage relationships and communications with commoners?

Response

Q10. What would NE's response be if a significant number of commons came out of agreement at this point or, more fundamentally, if there was a significant reduction in the number of commoners active on the moor?

Agri-environment schemes are a significant mechanism to secure favourable SSSI condition and Natural England will encourage land managers to engage with them so that they are properly rewarded for improving their condition.

Natural England works with land managers on SSSIs in a wide range of land management or tenure arrangements to discharge our statutory duties and support Government targets for nature recovery.

Agri-environment schemes are a significant mechanism to secure favourable SSSI condition and Natural England will encourage land managers to engage with them so that they are rewarded for undertaking management to improve their condition.

For commons that are designated as SSSI, Natural England has a statutory role through its responsibilities under the Wildlife and Countryside Act, 1981 and these provisions apply whether the land is in agreement or not.

On the Dartmoor commons Natural England wants to engage positively with farmers looking after SSSIs as well as other important environmental outcomes. We recognise the important role agri-environment schemes play in delivering multiple environmental and social benefits. We are actively working to engage with agreement holders to move forward with extensions to their agreements. The voluntary nature of these schemes does mean it is a matter for the commoners and landowners on each common agree among themselves whether to apply and enter into an agreement.

On Dartmoor not all commoners have chosen to enter into an agri-environment agreement. Some have come out of agreement having been in one previously. This does not mean positive and sustainable management of SSSIs or other environmental interests does not take place. There are examples of commons, or other areas of moorland, where there is no current agri-environment agreement in place, but positive management is taking place such as on Widecombe Common and North Bovey Common . Given our statutory SSSI regulatory role, we continue to work with these commoners and monitor the condition of these commons. We assess applications for consent of activities on the SSSI. We have also provided advice on a Farming in Protected Landscapes (FIPL) application submitted by Widecombe, which we have supported through our role as an adviser on the FIPL panel administered by Dartmoor National Park.

The map presented in the Evidence Folder (DR007-Dartmoor SSSI unit condition A1 140) shows the extent of common land and the SSSI, with condition status.

Active commoners may be those who graze livestock on the commons, engage in other management activity or do neither but continue to take an interest in management of the common. We are aware that there are many commoners who do not graze livestock in the commons or who have become disengaged from the commons associations. The interests of all commoners need to be considered lest there is a risk of disenfranchising some.

Barriers to active participation of all commoners may prevent more inclusive and broader based decision making. There needs to be space for more progressive voices who do not take part in public debate and the dominance of the agenda by a minority is a barrier to change in itself. Improved facilitation and professional support to put commons associations on a more professional footing would improve governance and delivery of agreement commitments.

Q11. How does NE manage relationships and communications with commoners?

Natural England engages with partners, farmers and commoners on Dartmoor for a wide variety of reasons and on a range of subjects. Agri-Environment schemes are a significant, but not exclusive reason for the engagement and management of relationships and communications with commoners and other interested parties. Indeed, Natural England aims to have a continuing dialogue with agreement holders through a range of interactions. These vary from meetings and communications with individuals, Commons Associations, and commons owners to engagement with a variety of boards, projects and groups, on which commoners and representatives of commons associations also sit.

While it is not always practical to meet all commoners individually, for example there are c200 commoners with rights on the Forest of Dartmoor, of whom about 80 are active, we aim to maintain contact with agreement holders through each commons association. This contact is usually through the Chair and / or Secretary. We also engage with the Dartmoor Commons Council.

Natural England engages with agreement holders throughout the term of HLS agreements. Some commons agreement had an implementation plan for the first 5 years, developed in discussion with the agreement holder, to support and guide the management of the site. These were followed by simpler workplans to help guide routine management works. Other contacts include supporting and advising about updates and delivery of management plans, implement burning plans and, where breaches have been identified, to remedy any impact.

Alongside the regular contact with individual agreement holders, Natural England staff are also engaged in a wider suite of communication with commoners. The following are examples: of our representation and participation:

- The Foundation for Common Land ‘Our Common Cause’ Board (2018-present)
- Dartmoor Landscape Recovery bids (East Dartmoor Landscape Recovery Project (2021-present - current projects being developed for the second application round)
- MoD Dartmoor Steering Group (since 1994)
- South West Peat Partnership Steering Group (since 2002)
- Defra Test and Trials Board, facilitated by Dartmoor National Park (2021-present)
- Support and advice to Dartmoor National Park re Farming In Protected Landscapes (2021-present)
- DNP Natural Environment Group (since 2019)
- Dartmoor Headwaters Project (2019 - present)
- Dartmoor Curlew Headstart Project (2019 - present)
- Dartmoor Landowners Association (since 1990’s as landowner of Trendlebere Common)
- Dartmoor Pony Groups

In 2018 The responsibility for the administration of AE schemes moved from Natural England to the RPA. Natural England's role became one of a technical adviser to the Rural Payments Agency (RPA). As part of our role as technical advisers to RPA we must report breaches to the RPA when they are identified, and we provide advice to support the RPA in assessing the severity of these.

Despite the transition of responsibility for the administration of schemes from NE to the RPA many

agreement holders still come to NE with queries about their scheme. Given our role as both statutory regulators for SSSI and technical advisers to the RPA on agri-environment schemes, Natural England is a point of entry for advice and farmers and other stakeholders on the Dartmoor commons often reach out to us for information on a range of policy matters and sometimes express their frustration. This can result in Natural England being criticised for things outside of our remit or over which we have no control.

Some relationships between NE and farmers on Dartmoor have been challenging for some time and this is covered in more detail in our response to Q12.

Question12
Q12. How is NE's resource profile being flexed to reflect the very real challenges it faces on Dartmoor?

Response

Natural England has seen an increase in its budget in the current spending review, which has allowed us to increase our staff resource across England to work with farmers on SSSIs.

There is a strong perception locally that NE has significantly reduced its capacity to support Dartmoor farmers with their agri-environment schemes. It is important to note that NE's role, especially in direct delivery of schemes, has changed over recent years with scheme management now the responsibility of the RPA. Natural England's staff resource working on Dartmoor and the commons has changed over time but direct comparisons between periods are difficult including for the following factors:

- the evolving agri-environment schemes, and in in particular the transition from the Dartmoor ESAs to Higher Level Environmental Stewardship schemes
- the shift from the high resource demands in initially negotiating HLS agreements to the ongoing advice and support offered to agreement holders as their agreements progress
- the changing role of Natural England with respect to Environmental Stewardship schemes, with the administration of schemes passing to the RPA in 2018
- changing Defra priorities reflected in Natural England funding to support agri-environment advice and SSSI monitoring work.
- A growing emphasis on our work with the NPA and other bodies on the need to achieve nature recovery on Dartmoor, including after the Glover review

While the staff resources have changed, this in part reflects a shift towards more emphasis on agreement holders taking greater ownership for delivering on their agreement outcomes and to proactively seek Natural England's involvement where they have concerns or are seeking further advice. This change in approach was also supported by agreements in engaging in the Dartmoor Farming Futures trial.

This is a change in the level and type of service previously experienced by agreement holders. For example, we no longer advise on administrative aspects of agreements or get involved in helping resolve internal matters amongst agreement holders. Administration of the schemes is now the RPA's role. Our SSSI monitoring programme was impacted by deep cuts to our Grant in aid budget over recent years. These cuts have been partially reversed over the last 2 years and we now have a fuller programme to not only monitor condition but work with landowners to improve condition in line with new statutory targets for SSSIs

In addition despite the change in role on AES, Natural England has maintained the provision of technical advice to support agreement holders in delivering on their agreement outcomes, through regular contact and agreement site checks. Resourcing of advice to agreement holders on Dartmoor is comparable to other parts of the country which have large complex agreements.

Dartmoor also has particular challenges that create resource demands, including a history of non-compliance, so some agreements have not been successful and in some cases, commons associations struggle to achieve internal consensus. These difficulties create extra demands on Natural England staff and take time to resolve.

Successful agri-environment agreements are reliant on long standing professional relationships. It is true to say that there has been a breakdown in trust with some farmers on Dartmoor and our staff have also experienced some challenging behaviours from farmers. Th has had the impact of constraining frank and open conversations. The reputation of the area within the sector has led to difficulties in recruiting and maintaining experienced staff. Confrontational behaviours between commoners and other farmers on Dartmoor does seem to stifle progress, as farmers try to adapt to a shifting context some more innovative and progressive voices are not confident to make themselves heard.

Question 15
Q15. What has changed over time (time series data): habitat quality, extent, bird, butterfly and other wildlife species. Also plants

Response

The general trend is a decline in habitat quality and reduction in species abundance.

Data about trends in biodiversity indicators across the UK are available here UK Biodiversity Indicators | JNCC - Adviser to Government on Nature Conservation.

The State of Nature Report 2023 states that the abundance indicator for 682 terrestrial and freshwater species, for which England specific data are available, shows a decline in average abundance of 32% between 1970 and 2021. Over the last 10 years the decline was 7%. There is no evidence to show that the overall trend in species present on Dartmoor differs from the national trend. (England - State of Nature).

Distribution maps for many of the species found on Dartmoor are available through the National Biodiversity Network Atlas at NBN Atlas - UK's largest collection of biodiversity information.

Data on change in species distribution and abundance is most readily available for birds and we summarise patterns of change for a selection of key species in our response to the Review Panel's question about wild bird populations (Q18). There is evidence about the change in SSSI condition (Q3) and about changes in stock numbers and stocking practice (Q25).

Evidence of the most recent change in butterfly populations can be found in the Dartmoor and Exmoor Fritillary Monitoring Results for 2022 (Evidence folder DR012).

Question 17 and 39
Q17. Do NE consider the SSSI condition criteria and target habitats appropriate for the SSSI's given impacts of non-local or longer-term drivers of change? Climate change, N dep etc. Q39. To what extent may some of the changes on the SSSIs relate to climate change/nitrogen deposition and historical changes on the Moor (e.g., drainage)

Response

Q17. Do NE consider the SSSI condition criteria and target habitats appropriate for the SSSI's given impacts of non-local or longer-term drivers of change? Climate change, N dep etc.

Natural England consider the condition criteria and target habitats are appropriate for SSSIs and that land management is having a bigger impact on SSSI features than external drivers of change.

SSSI condition criteria are set out in the Joint Nature Conservation Committee's Common Standards Monitoring methodology. Common Standards Monitoring was developed to provide an agreed approach to the assessment of condition on statutory sites designated through UK legislation and international agreements. The decision to implement the monitoring programme for designated nature conservation sites, was made in 1999. JNCC and the country nature conservation bodies commenced a programme to develop such guidance across the range of species, habitat and earth science features, which occur on UK protected sites (JNCC, 2023).

The Common Standards Methodology involves assessing the target habitat feature, against a set of measurable attributes, such as extent, floristic composition, vegetation structure, and physical characteristics. Favourable condition is defined by setting broad targets for each attribute of the interest feature. Targets are intended to reflect geographical variation and local distinctiveness, and these are set locally by Natural England through a Monitoring Statement (also known as a Favourable Condition Table).

Natural England considers that this approach will allow adaptation of attributes and targets to take account of external and long-term drivers of change. While we acknowledge that there are external drivers of change, it is likely that the notified habitats at Dartmoor, will remain viable for the foreseeable future. There is a possibility of change in relative extent and characteristics of the vegetation, because of climate change and or other external factors. Although it is difficult to separate these effects from the influences of management, we consider that management influences are currently more important drivers of habitat condition. Moreover, management interventions are the most important and reliable mechanisms for building resilience to environmental change, and of these possible interventions, grazing is the one over which there is most opportunity for adjustment.

Natural England considers that building ecological resilience to the impacts of climate change is an important response (Natural England and RSPB 2019). Building resilience includes reducing the adverse impacts of climate change and enabling species, habitats and other environmental features to persist in the face of climate change. The scope for this extends to

reducing non-climatic sources of pressure, such as habitat fragmentation and restoring the hydrology of wetlands, for example by reversing the effects of drainage.

There is some focus, in particular, on the dominance of Molinia and suggestions that this is exacerbated by climate change and deposition of pollutants. The relative effects of management factors, for example the interaction between burning and grazing, including past regimes and external factors, is not sufficiently understood. Molinia dominance contributes to poor SSSI condition in some areas and Natural England recognises that this may be a difficult issue to address.

Positive management at the site level is critical, not just in having a direct bearing on SSSI condition, but importantly in mitigating potential impacts from external factors. Positive management of SSSI features builds resilience to changing external influences, while inappropriate management, can lead not only to the direct loss of features, but also increase the vulnerability of features to the externally driven pressures.

Q39. To what extent may some of the changes on the SSSIs relate to climate change/nitrogen deposition and historical changes on the Moor (e.g., drainage)

There are limited data on the impacts of climate change and nitrogen deposition but these external drivers are likely to have less impact on SSSI condition than land management factors.

.

Dartmoor is a cultural landscape managed by people for thousands of years, so it is inevitable that the habitats, including those for which the SSSI are notified, are influenced by both past and current management. It is well understood that the habitats on Dartmoor are semi-natural, i.e., they have ecological assemblages that have been substantially modified in their composition, balance or function by human activities.

The Mires on the Moors Project (2020) noted that, with regards to the peatlands on Dartmoor:

"The uplands of Dartmoor have also been shaped by human hand since the last ice-age. The uses have been varied and included domestic and commercial peat cutting, tin and china clay extraction, granite quarrying, drainage for agricultural improvement, grazing with and without burning to improve pasture, forestry, military activity and more recently recreation. These uses have each left their mark on the landscape so that today 29 km2 (2900 ha) of the peat on Dartmoor is significantly and directly ecohydrologically degraded or damaged."

There are limited data on the impact of climate change on condition, or changes in habitat, or wildlife features on Dartmoor. However, one study was identified that predicted changes in *Sphagnum* cover between 2020 and 2050 based on projections of climate change and atmospheric deposition of nitrogen and sulphur (Smart, et al 2011) The study reported that predicted changes in cover were all small, but also uncertain and that pollution exacerbates the predicted impact of climate change. Notably, Dartmoor was one of the peatlands expected to be most affected by climate change in combination with atmospheric pollution, alongside the Brecon Beacons and the western Lake District.

Consequently, although nitrogen deposition and climate change may be contributing factors, we do not consider them to be major drivers of the changes that have occurred.

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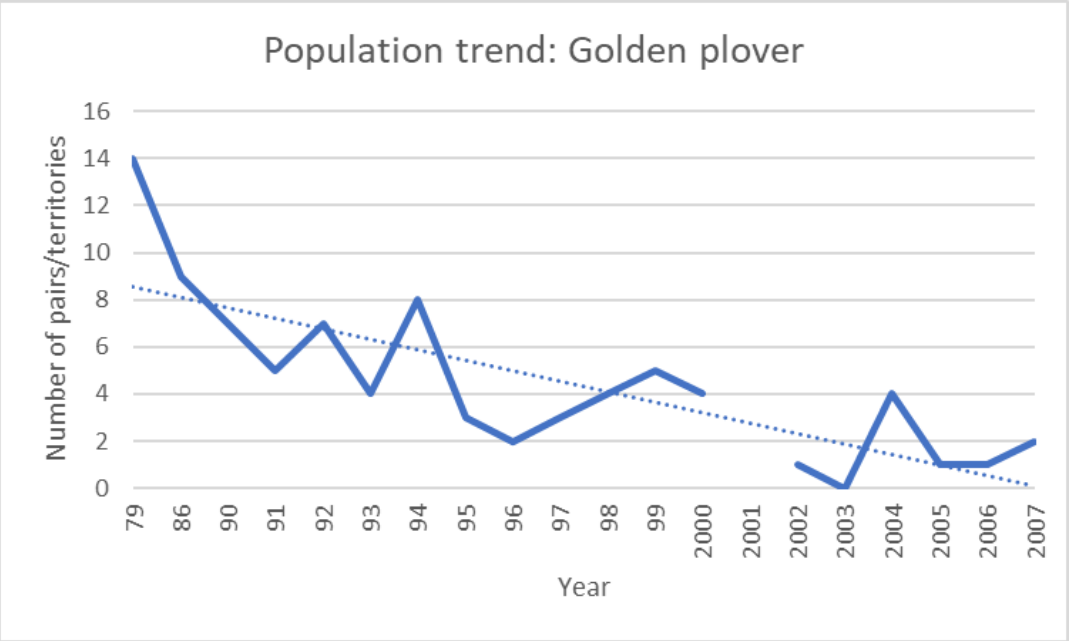
Question 18
Q18. What are the wild bird population trends on Dartmoor (breeding species of target upland habitats)?

Response

The general trend for bird species abundance reflects national trends of decline but there is some evidence of increase in response to peatland restoration.

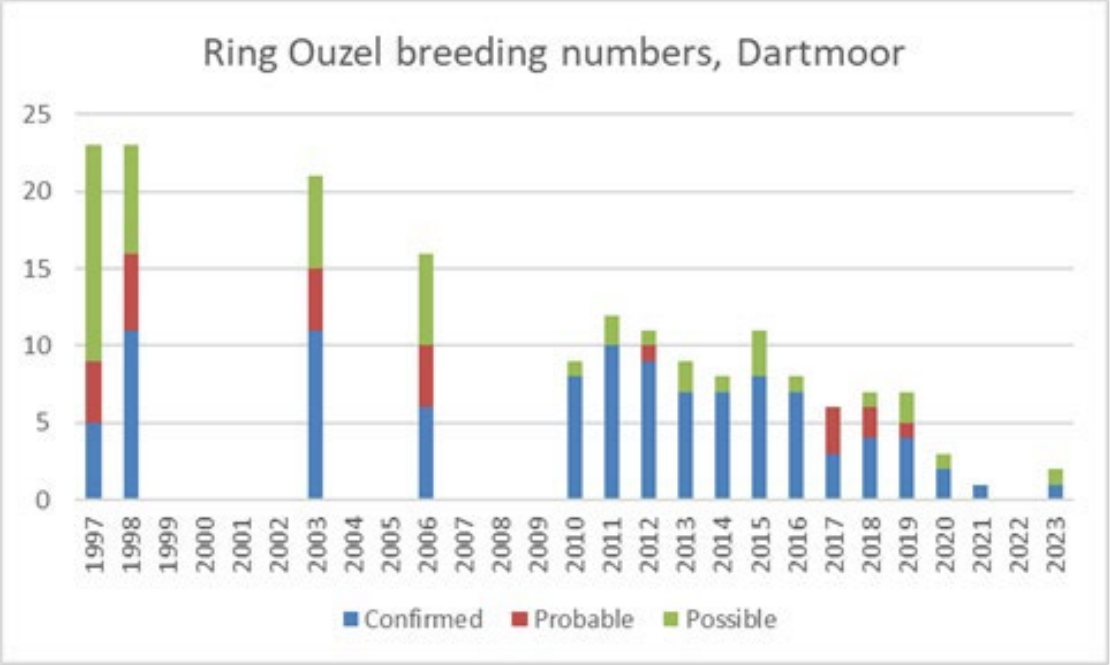
Golden Plover



Notes:

1. Chart produced from data in Birds of Dartmoor, Birds of Dartmoor 2 (in prep) and Operation Wader reporting.
2. No survey coverage in 2001 because of Foot and Mouth.
3. Data reflects combined proven, probable and possible breeding. The last proven breeding attempt was In 2005 and whilst pairs were present in 2006/07, there was no suspected breeding.
4. Since 2005 the Operation wader project and subsequent intensive surveys of the north moor for dunlin and other birds on the blanket bog, have found no evidence of breeding and breeding season sightings are rare. Considered extinct as a breeding bird.
5. Breeding distribution was restricted to blanket bog habitats on the North Dartmoor SSSI.

Ring ouzel



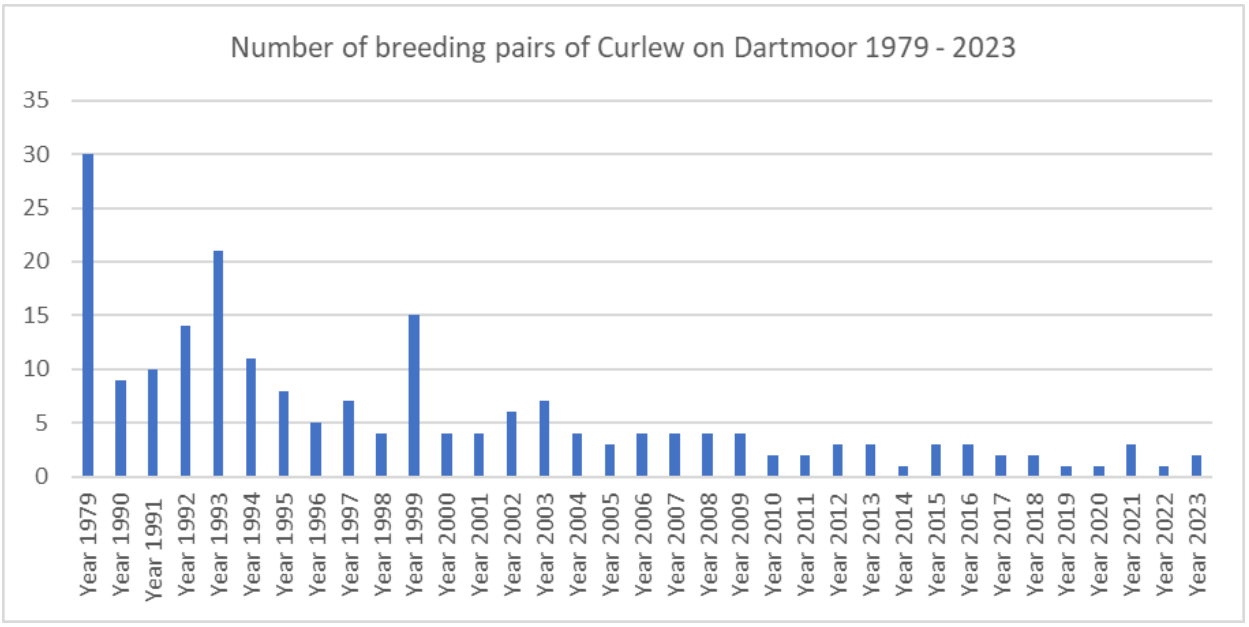
 The chart has been produced by the RSPB drawing upon annual survey data from 2010 to date and prior to that occasional, one-off surveys conducted in their known breeding strongholds.

Notes

1. The RSPB chart shows the number of confirmed, probable and possible breeding pairs on Dartmoor between 1997 and 2023 and illustrates their steady decline.
2. A 1979 survey by Mudge *et al,* located 29 confirmed, probable and possible territories (a survey that was not Ring ouzel specific, so fewer were confirmed as breeding and most were characterised as probable).
3. Survey data for each year was not collected on exactly the same basis, with lower survey input prior to 2010, hence the larger proportion of 'possible' pairs.
4. Annual surveys have only been undertaken since 2010, with intensive survey effort between 2010 and 2015, which sought to determine nest productivity and collect additional data (on habitat, predation, recreational disturbance, chick body condition and other variables) in order to determine possible drivers of decline.
5. Since 2017, survey has been lighter touch, only attempting to locate pairs and prove breeding and fledging, but all known sites are visited at least twice a year and key strongholds more frequently.
6. It is possible that a small number of territories were missed in 2010 and 2011, as survey funding rules restricted the area of search to the north-west quarter of the moor (their core breeding area), with three new breeding locations discovered from 2012 and then used intermittently by Ring ouzel for nesting.
7. Data sources: Annual Dartmoor Ring Ouzel Reports from 2010 – 2023, Dartmoor Birds, Dartmoor Birds 2 (in prep), Dartmoor Training Area Breeding Birds survey 2006.
8. The core breeding areas lie within north and north-west Dartmoor, with little breeding activity recorded south of the B3357 Moretonhampstead to Tavistock Road. The former stronghold

between the Warren House Inn and Headland Warren Farm (thought to support c.6 pairs previously), rarely supports breeding with the last successful nesting attempt in 2012.

Curlew

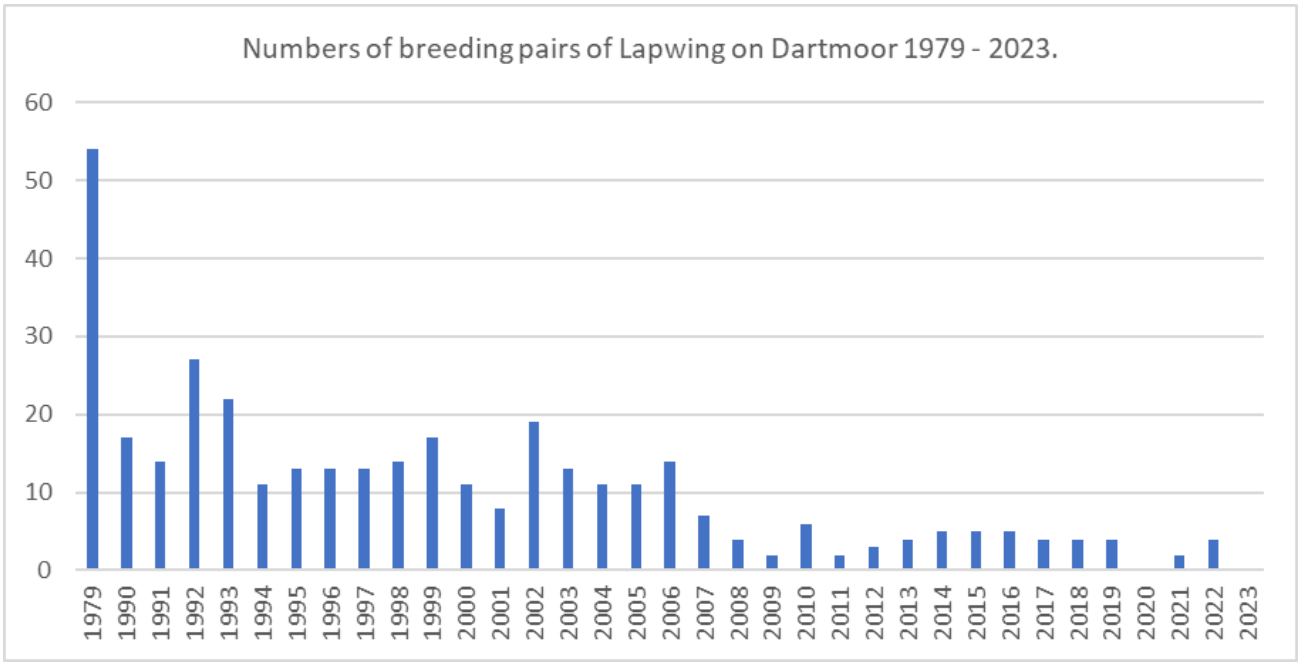


Number of pairs of breeding Curlew on Dartmoor 1979 -2023 showing the general decline in numbers breeding from the late 1970s. Chart courtesy of Jon Avon (Operation Wader, Dartmoor Curlew Recovery Project).

Notes

1. It should be noted that the data for each year has been generated from different sources and surveys. Since 2005 there has been annual survey under the Operation Wader project and subsequent Curlew Recovery Project, so a more comprehensive, accurate dataset has been generated than in some years.
2. In the latter years the chart shows only known breeding pairs and excludes non-breeding territories (i.e. those where only males were present on territory during the breeding season). In some years there has been up to 5 territories, but often only 1 or 2 pairs.
3. Prior to 1979 breeding Curlew had a wider distribution on Dartmoor, still rarely breeding on the high moorland, but were declining in their central Dartmoor stronghold even by the 1940s. Between 1952 and 1962 there were only about 20 to 25 pairs remaining in the Postbridge area, plus other territories in additional locations. The harsh winter of 1963 reduced the central Dartmoor population further.
4. The 1979 total of 30 is a minimum estimate, generated with reference to the 1979 RSPB survey (Mudge *et* al) who located 23 pairs combined with the tetrad data generated by the 1977 – 1985 Devon Bird Atlas (Sitters 1988).
5. The decline should be considered in a Devon context; between the 1977-1985 Devon Bird Atlas and that of 2007 – 2013, Curlew declined by an estimated 85% across Devon as a whole.

Lapwing

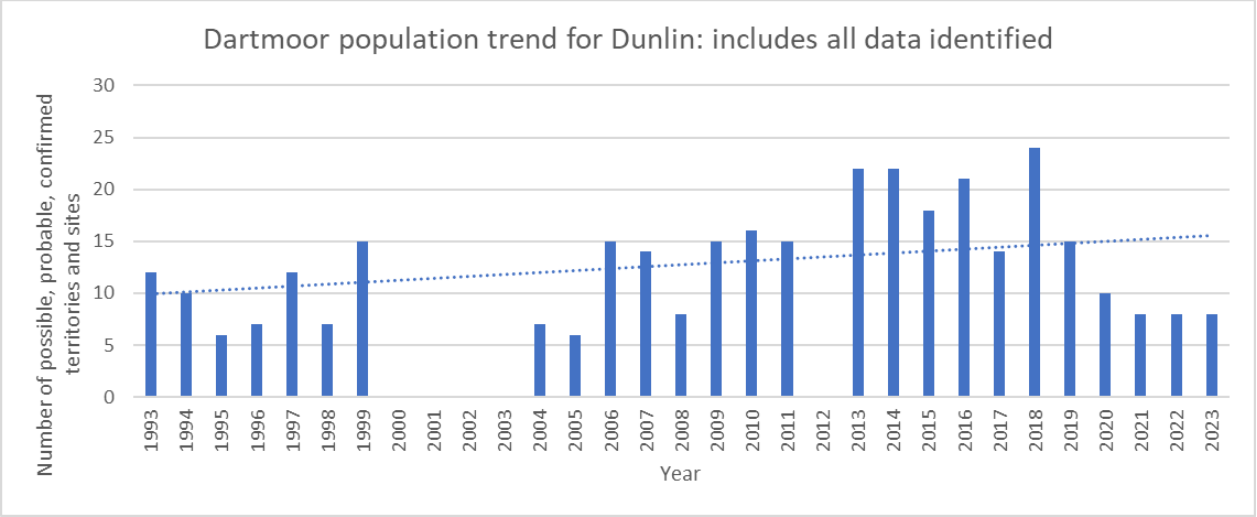


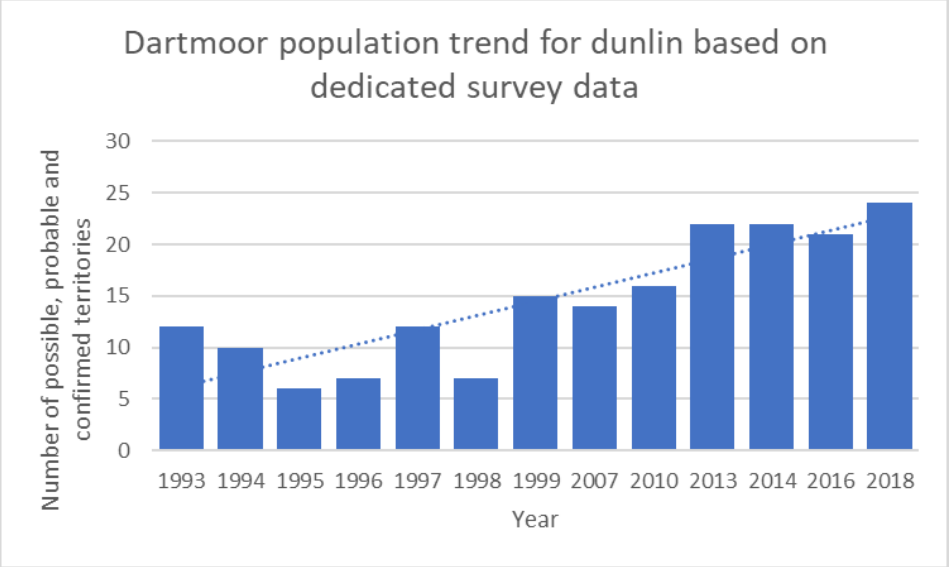
Decline in Lapwing 1979 – 2023. Chart courtesy of Jon Avon (Operation Wader, Dartmoor Curlew Recovery Project).

Notes

1. Information on breeding Lapwing on Dartmoor is scarce prior to the mid-fifties. Surveys from the Postbridge area indicated a population of between 15–25 pairs between 1956 and 1962. None bred after the harsh winter of 1963, but there were 5–10 pairs in 1967.
2. The 1979 RSPB survey (Mudge *et al*) recorded 54 pairs across the whole moor.
3. By 2000 many traditional breeding sites had been lost and by 2008, whilst a few birds were seen elsewhere, breeding was restricted to one site only on the southern end of Dartmoor, which the chart shows saw no breeding activity in 2020 or 2023.
4. Sustained annual surveys have been carried out under Operation Wader and the Curlew Recovery Project from 2005.

Dunlin





Notes

1. Due to the difficulties in merging data that has been collected using differing survey methodologies, two charts have been provided. The first shows all annual data, some of which is based on records of breeding pairs, some of it simply records number of dunlin presence on a site basis (so possible breeding only). There are a few gaps, including the Foot and Mouth outbreak of 2001 and since 2018 much of the data has been collected by one individual using two trailcams and more limited ground truthing. A full survey is overdue.
2. The second chart only shows years where more comprehensive surveys were undertaken, which includes years where a large sample of traditional breeding sites were surveyed, complemented by trailcam and other survey approaches.

3. Prior to 1993, annual records are patchier and generally not based on comprehensive survey coverage. In 1969, 10 trilling males were heard and a nest located, a RSPB survey of blanket bog habitat on the north moor found 12 territories and 14 were located in 1987. All confirmed breeding has come from the north moor, although two pairs were found on the south in May 1981.
4. Blank years with no count indicated (other than 2001) do not equate to no Dunlin recorded, rather an absence of meaningful data.

Whinchat

The limited availability of Dartmoor-wide or species-specific data, means it has not been possible to provide a chart to illustrate a population trend for this species. Instead, reference can be made to the results of surveys with more limited or defined geographical focus.

The results of the East Dartmoor Moorland Breeding Bird Survey (Moor Than Meets the Eye 2016) were compared with those of the 1979 breeding bird survey (Mudge et al), which concluded that whilst whinchat still occur in high density in their Dartmoor stronghold (Headland Warren area), they are more sparsely distributed elsewhere and that there may have been some losses in site occupancy. To view the following link, see pages 14 and 15, which show the mapped survey results for whinchat. East Dartmoor moorland breeding bird survey 2016

The Dartmoor Training Area survey conducted by the RSPB in 2006 produced a total of 61 whinchat territories across the whole of the North Dartmoor, Ringmoor and Cramber Training Areas which included a selection of km2 that lay adjacent to the Northern Training Area. See page 38 in the following link to see this table: Breeding Bird Survey of the Dartmoor Training Area 2006. The 2006 survey results were compared with earlier surveys (1979, 1986, 1992 and 1997). The data analysed was that generated from a sample of km2 that were surveyed in all years. This indicated an increase in whinchat between 1979 and 1986 and between 1986 and 1992 but declines between 1992 and 1997 and 1997 and 2006. The more recent 2018 DARTA survey also indicated a decline (report by RSPB to Defence Estates not available here), but it was acknowledged that the weather both in the preceding winter (The 'Beast from the East') and the unusually hot spring weather may have affected survey outcomes.

Dartmoor-wide analysis has recently been conducted by the RSPB (funded by The Foundation for Common Land), comparing breeding data on whinchat from a sample of locations where whinchat were recorded in 1979, with repeat surveys of these sample locations between 2015 and 2022. This analysis has also indicated a decline in the Dartmoor population that mirrors the national trend. Results will be available soon in a peer reviewed research paper.

Grasshopper warbler

The limited availability of Dartmoor-wide or species-specific data, means it has not been possible to provide a chart to illustrate a population trend for this species. Instead, reference can be made to the results of surveys with more limited or defined geographical focus.

The East Dartmoor Moorland Breeding Bird Survey 2016 showed a strong increase in grasshopper warbler between 1979 and 2016 where an estimated 4 territories were recorded in 1979 and 54 in 2016. All the 1979 territories were clustered around Two Bridges in 1979, but the population had expanded through the central newtakes towards Fernworthy by 2016. See pages 20 and 21 of the above report.

The Dartmoor Training Area survey in 2006 located 41 grasshopper warbler territories across the Northern, Cramber and Ringmoor Training Areas and the sample of km2 surveyed outside the northern Training Areas. This represented a significant increase since the 1979 survey. No grasshopper warbler were recorded in 1979 and whilst these are not an easy species to survey for, it is considered that such a large increase is unlikely to be just due to less survey effort in 1979.

Snipe

The Snipe population on Dartmoor appears to be relatively stable. Snipe are a very difficult species to survey being cryptic in colouration, mostly active in the early morning or at dusk and uninclined to show themselves unless flushed. Therefore, they are often poorly represented in broader breeding bird surveys; incidental records rarely provide an indication of breeding status. There have been few full surveys of Dartmoor's snipe population so annual trends are impossible to produce.

However, targeted survey of sites with suitable habitat was conducted in 2008/09 and a survey repeated ten years later in 2018/19. Survey coverage was the same (other than a few small sites which supported very small numbers of snipe not being surveyed again in 2018/19). In 2008/09 the estimated population of snipe was 180 to 200 territories and in 2018/19, 160 – 180 pairs, indicating stability of population size. The 160-180 pairs were considered a conservative estimate, acknowledging potential year differences (e.g., suitability of weather for survey) and the fact that the 2008/09 survey was conducted largely by experts, whilst the 2018/19 survey utilised volunteers. Supporting the assessment of population stability, data collected on breeding snipe, as part of the Operation Wader project between 2009 and 2019, recorded fairly consistent levels of snipe activity across the years.

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Question 19
Q19. Is there a collation of ecological evidence?

Response

Natural England has compiled a collation of wide-ranging information sources about Dartmoor which incorporates results of formal searches and lists of references provided by Natural England staff. It can be found in the Evidence folder (DR019).

This list does not contain internal Natural England surveys, assessments of vegetation condition and impacts of grazing or Condition Assessments of East, North and South Dartmoor SSSIs.

A separate list of historic evidence sources relating to the natural history of Dartmoor can be found in the Evidence folder (DR011).

Question 20
Q20. What is the condition of soils on Dartmoor? Is this associated with changes to the vegetation and what needs to be done to soil function appropriate to the target habitats?

Response

Natural England holds only limited recent data on the types, extent and condition of soils on Dartmoor.

A small number of records with soil data from around Princetown were collected as part of the England Ecosystem Survey, a long-term National Scale monitoring programme. Historic soil maps are available but provide no useful information about soil condition. Detailed measurements of soil health are not collected as part of routine common standards monitoring and a direct assessment of soil condition (outside of the presence or absence of bare soil) has not contributed to previous or current recommended stocking regimes. For information on current peat condition see our responses to the Review Panel's questions about peat (Q40, Q41 and Q42).

Question 21
Q21. What vegetation communities occur across the whole of Dartmoor now, and how does this compare with previous decades? Has the extent of *Molinia*, bracken, gorse, heathland that still has a heather component, been mapped?

Response

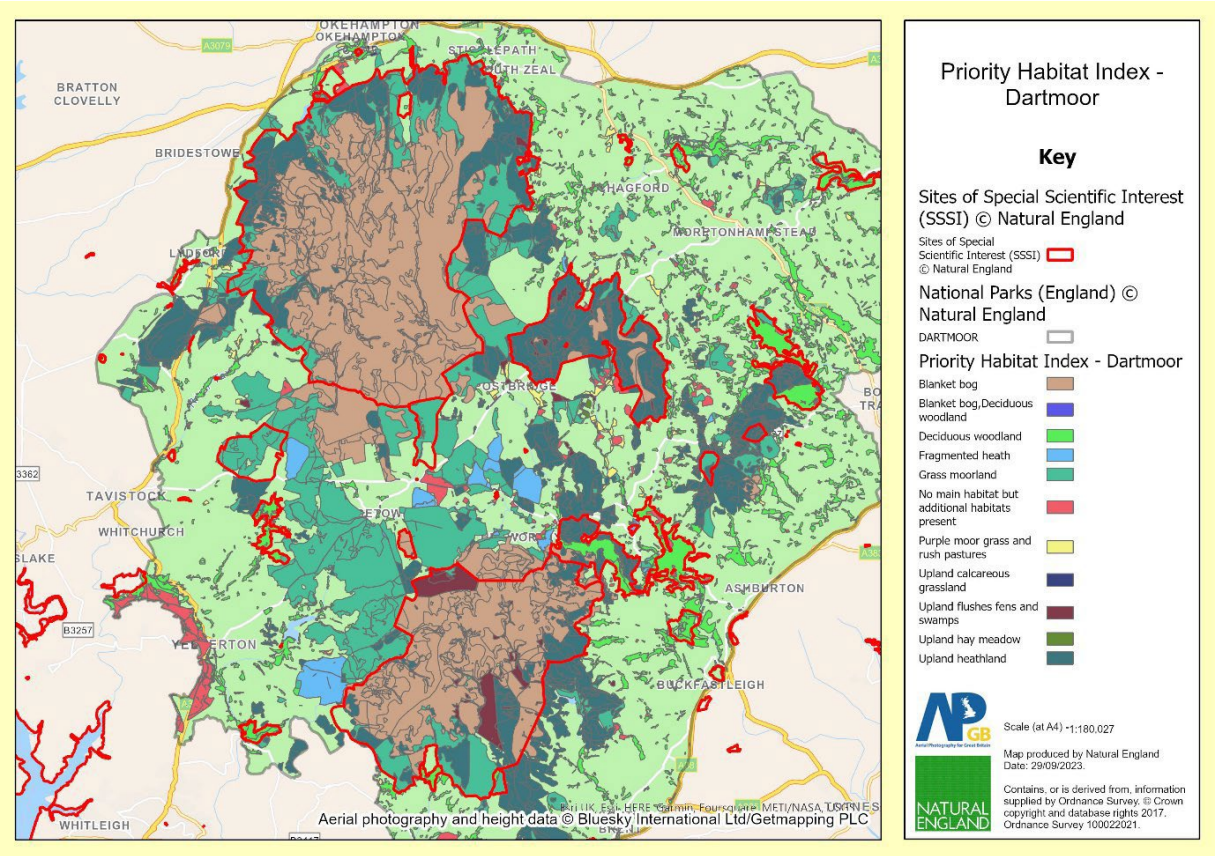
Q21. What vegetation communities occur across the whole of Dartmoor now, and how does this compare with previous decades?

A number of priority habitats occur across Dartmoor. Evidence indicates the grass and heath communities have decreased over time.

The extent of Priority Habitat Inventory habitats across the Dartmoor SSSI and Dartmoor National Park (source Natural England Priority Habitat Inventory, accessed 29th September 2023).

Priority habitat Type	**SSSI extent: North, South and East (ha)**	**Dartmoor NPA extent (ha)**	**SSSI feature**
Blanket bog	13951.7	16045.8	Blanket bog
Deciduous woodland	21.6	6567.1	Upland Oakwood
Fragmented heath	0.7	929.1	Subalpine dwarf-shrub heath, wet heath
Grass moorland	2579.1	11075.0	Acid grassland (upland)
Upland flushes fens and swamps	681.7	777.6	Valley bog (upland), Short sedge acidic fen (upland) Soakaway and sump (upland), Transition mire, ladder fen and quaking bog (upland)
Upland heathland	5256.0	11874.8	Subalpine dwarf-shrub heath, wet heath
No main habitat but additional habitats present	5.6	1287.8	

The distribution of habitats across Dartmoor is show in the map:



Dartmoor forms a poorly dissected high plateau, surrounded by steeper sided, more isolated hills towards the edge of the underlying granite boss. All the soils are acid or very acid podzols, gleys or blanket peats, with brown earth soils confined in the surrounding woodlands. The vegetation on Dartmoor shows some of the features of submontane vegetation of other sites in western Britain where there is an oceanic climate.

The highest parts of Dartmoor are dominated by *Trichophorum germanicum-Eripohorum vaginatum* blanket mire (M17), within which there are examples of bog pool vegetation and mire types (NVC *Sphagnum auriculatum* bog pool (M1) and *Carex rostrata-Sphagnum recurvum* mire (M4)), grading on steeper slopes into *Trichophorum germanicum-Erica tetralix* wet heath (M15) and Molinia dominated vegetation (*Molinia caerulea-Potentilla erecta* mire (M25b).

The Molinia stands are found especially on the better drained slopes on gley soils. The stream courses often have *Narthecium ossifragum-Sphagnum papillosum* valley mires (M21) at their heads and these extend downhill into the lower slopes, within mosaics of dry and damp heathlands.

The valley mires include local complexes of soligenous mire, especially *Carex echinata - Sphagnum recurvum/auriculatum* mire (M6), and *Erica tetralix-Sphagnum compactum* wet heaths (M16). Some of these features are distinctive to Dartmoor. For example, the predominant blanket bog vegetation found here is characteristic of western sites in Britain and contrasts with that found across most of the English uplands, while the valley mires found on

Dartmoor are better developed here than anywhere else in the English uplands. The abundance of Molinia is also typical of western sites.

On drier rocky upper slopes the peatland communities are replaced by *Calluna vulgaris-Vaccinium myrtillus* heaths (H12) and locally by *Vaccinium myrtillus-Deschampsia flexuosa* heath (H18). Below roughly 350 metres, these heathlands pass into oceanic lowland heathland communities, which are restricted to southwest England and outstanding in their extent and diversity on Dartmoor. The *Ulex gallii-Agrostis curtisii* heaths (H4) and the *Agrostis curtisii* heath (U3) include a range of sub communities corresponding to local changes in soil conditions, drainage and management.

It is unlikely that there has been significant gross change in the extent of bog or other wetland habitats, but the relative extent of heath and grass communities is likely to have declined in recent decades (indicated by ESA monitoring, case studies and more recent Natural England monitoring) and likely in response to changes in grazing pressure. Natural England is investigating funding options to use remote sensing data to evaluate the change in extent of Molinia and heather.

Has the extent of Molinia, bracken, gorse, heathland that still has a heather component, been mapped?

Habitats with *Molinia*, gorse or bracken contribute to the landscape and biodiversity of Dartmoor. Some of this vegetation could be restored to heath or bog.

There were an estimated 4,900 ha of bracken shown on ESA land cover maps. Gorse as part of scrub habitat was estimated at 750 ha, though western gorse will be included in heath and is an internationally scarce habitat type. The extent of gorse is relatively small and probably relatively stable. The ESA land cover map also included fragmented heath mapped at the start of the ESA in 1994. The extent of fragmented heath then was 6,900 ha, compared with 13,800 ha of dwarf shrub heath (which probably included heath vegetation of bog habitat). Up to date estimates of extent of these habitats are not available.

In most habitat mapping, vegetation is allocated to one of a number of vegetation types, though in some studies mosaics are identified. Vegetation classed as heath, may include areas with mixtures of heather with *Molinia*, gorse or bracken. Equally areas mapped as *Molinia*, gorse or bracken may contain some heather. These mixed habitats are likely to be dynamic, so the contribution that heather makes to the vegetation may vary on short timescales.

A proportion of the habitat made up predominantly of *Molinia*, gorse or bracken could be restored to heather dominated heathland, but some, perhaps most, in the case of gorse scrub and bracken, of the habitat dominated by these species is likely to be stable. Some of the *Molinia* dominated areas may restore to more diverse bog habitat if natural hydrology is re- established.

Question 22
Q22. Vegetation change - Evidence for past condition and change in heather/Molinia cover over time.

Response

There is clear evidence of a reduction in the extent of heather. There is likely to have been an increase in the extent of *Molinia* but the evidence is less certain.

Evidence from past monitoring of habitat condition is being compiled separately as part of this review process. Measurements from long term monitoring of Dartmoor have shown consistent declines in heather cover and condition (Smallshire and others 1997; ADAS 1998; Kirkham and others, 2005; Poulton 2010). Moorland surveys, prior to the onset of these monitoring programmes, identified that overgrazing was already a significant problem on the Moor, leading to heather decline. One survey in 1989/1990 estimated that 31% of common land was heath, within the heath 32% of heather was classed as healthy, 32% damaged and 36% effectively absent, with overgrazing attributed as the cause of this poor condition (Wolton and others 1994).

Estimates of changes in Molinia cover over time are less consistent, past studies have not focussed on monitoring change in Molinia cover in the same way as they have dwarf shrub cover. Wolton and others (1994) estimated that Molinia cover was only 1% of the moor in 1989/1990 and some local commentators have suggested that this has since increased 20 times (Colston, 2017), although no survey data is provided in support of this estimate. In contrast an evidence review paper for the Dartmoor National Park Management Plan Review (Devon Biodiversity Records centre, 2019) refers to reports that Molinia cover in 1970 was 35% on common land and higher in new-takes. This estimate has little empirical evidence to support it, however the review paper states that it is 'supported by anecdotal records going back more than 200 years, that document Molinia as a prominent feature of mire vegetation communities.' A summer purple moor-grass grazing supplement was introduced early under the Dartmoor ESA in 1999 to reduce widespread dominance of Molinia at that time.

The local area team at Natural England have applied for Agri Environment evidence funding from DEFRA to undertake earth observation monitoring of Dartmoor, to try and model change in Molinia and heather cover over time since the mid-1990s.

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Question 23
What are the BAP priority species for Dartmoor and where are they located?

Response

List derived from the Devon Biodiversity Action Plan (Section G) with species recorded as presented on Dartmoor. There are no data on status or distribution on the species within Dartmoor.

Beetle *Carabus intricatus* blue ground beetle
Bird *Alauda arvensis* skylark
Bird *Carduelis cannabina* linnet
Bird *Emberiza cirlus* cirl bunting
Bird *Emberiza schoeniclus* reed bunting
Bird *Lullula arborea* woodlark
Bird *Muscicapa striata* spotted flycatcher
Bird *Pyrrhula pyrrhula* bullfinch
Bird *Turdus philomelos* song thrush
Butterfly *Argynnis adippe* high brown fritillary
Butterfly *Boloria euphrosyne* pearl-bordered fritillary
Butterfly *Eurodryas aurinia* marsh fritillary
Butterfly *Maculinea arion* large blue
Clubmoss *Lycopediella inundata* marsh clubmoss
Crustacean *Niphargellus glenniei* a freshwater shrimp
Damselfly *Coenagrion mercuriale* southern damselfly
Fern *Trichomanes speciosum* killarney fern
Fly *Eristalis cryptarum* a hover fly
Lichen *Bryoria smithii* a lichen
Lichen *Graphina pauciloculata* a lichen
Lichen *Schismatomma graphidioides* a lichen
Mammal *Arvicola terrestris* water vole
Mammal *Lepus europaeus* brown hare
Mammal *Lutra lutra* European otter
Mammal *Muscardinus avellanarius* dormouse
Mammal *Pipistrellus pipistellus* pipistrelle bat
Mammal *Rhinolophus ferrumequinum* greater horseshoe bat
Mammal *Rhinolophus hipposideros* lesser horseshoe bat
Moth *Hemaris tityus* Narrow-bordered beehawkmoth
Moth *Hydrelia sylvaka* waved carpet moth
Moth *Jodia croceago* orange upperwing
Moth *Schrankia taenialis* White-line snout
Vascular plant *Dianthus armeria* Deptford pink
Vascular plant *Pilularia globulifera* pillwort
Vascular plant *Spiranthes romanzoffiana* Irish lady's tresses

Question 25, 26 and 30

Q25. What numbers of livestock are there? How have these changed, why and when?

Q26. To what extent / how these rates (and rate changes) relate to whether the sites are now classified as green, amber or red. Do these problem issues relate more to sheep, cattle or pony grazing?

Q30. Is it possible to attain ideal stocking rates (with the appropriate stock grazing the sites at the appropriate times) within the SSSIs given the unfenced common boundaries, presence of SSSI/non SSSI, HLS agreement and non-agreement land, different landowners and stock managers? What are the barriers to achieving the ideal? (time or cost resources, skills, knowledge?)

Response

Livestock numbers are only one part of the grazing regime. Livestock numbers, type, breed, grazing period (in particular the need for very different regimes in winter and summer) and stock management through shepherding and supplementary feeding are all important.

Q25. What numbers of livestock are there? How have these changed, why and when?

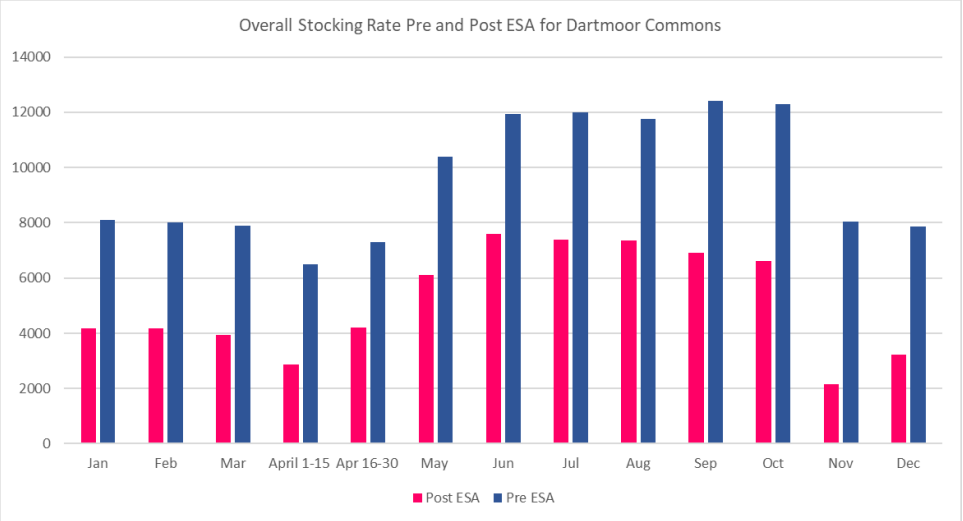
Livestock numbers

The numbers of livestock grazing rights registered (Commons Registration Act 1965) and numbers estimated to be grazing c. 1986 (see Evidence Folder DR014) are shown in the Table below. These total approximately 33,000 cattle, 145,000 sheep and 5,000 ponies registered. In 1986 The Dartmoor Commons Council (DCC) tried to convert this into actual numbers of 10,000 cattle, 51,000 sheep and 2,200 pones, about a third of the rights registered actually grazed, to avoid problems from over registration of rights and otherwise unsustainable numbers.

Quarter	Commoners (grazing)	Commoners (not grazing)	Total entitled			Total grazed		
			Cattle	Sheep	Ponies	Cattle	Sheep	Ponies
North	126	240	8326	39263	1301	2631	5861	279
South	94	108	9685	42021	768	2324	12345	404
East	173	150	7492	35443	1179	3758	25547	725
West	91	65	7651	28330	2204	1688	7435	855
TOTAL	484	563	33154	145057	5452	10401	51188	2263

Pony numbers have decreased from 2,500 in 1994 to between 1,000 and 1,500 currently. The Dartmoor Pony groups believe there are only 1,000 Hill ponies, but there is an acknowledgment that there are also many vast numbers of unmarked ponies grazing the commons. Natural England records show that there are 1079 ponies on HLS stocking calendars in on HLS agreements.

ESA agreements and grazing numbers



The graph above shows the historical changes in stocking levels (livestock units) pre-Dartmoor Environmentally Sensitive Area (ESA) scheme in 1994 and post scheme in 2006 (see Evidence Folder DR013). The level expressed in Livestock units was 12,000Lu in the Summer and 8,000Lu in the Winter prior to the ESA and post scheme the levels were reduced to 7,000Lu in the Summer and approximately 4,000Lu in the winter.

Since 2006, under the ESA, the stocking levels have reduced further to approx. 5,000Lu in the summer and 2,500Lu units in the winter. It is difficult to determine the exact numbers as the proportion of land in agri-environment schemes has reduced from 30,000ha under scheme in 2006 to 22,000a in 2022. Data are not available for land no longer in agreement and the summary figures include some extrapolation.

The data show that livestock numbers reduced during the ESA period between 1994 and 2006 with further reductions since. The ESA scheme (and subsequent agri-environment schemes) are voluntary so any stock adjustments made to join the scheme were business decisions made by the farmers themselves. Changes to subsidy arrangements, notably the switch from headage payments to the Basic Payment Scheme (2006), will also have had an impact and resulted in reductions in numbers. Other farmers' business decisions will have had an effect as farmers adjusted to market opportunities. Agri-environment scheme requirements have been only one of a number of factors influencing stock numbers.

Stocking levels permitted under the Dartmoor ESA scheme published for Tier 1E moorland and Tier 2B moorland were published in 1994 (see Evidence Folder DR015 and DR016). In 1996, due to lack of progress on uptake to the ESA and pressure from DCC to adjust stocking levels to reflect a longer growing season in the southwest, the summer levels on some of the more grass dominated commons were increased to 0.36Lu per ha.

Other drivers of change in grazing patterns

The numbers of livestock and the seasonal pattern of grazing have been affected by the breakdown of the link between home farms and commons. Through the levanacy and couchancy approach, prior to the 1965 Commons Registration Act, stock numbers on farms should have been matched to carrying capacity on the moor. It is understood that the rate was 4 ewes or 1 cow per 4 acres then depastured on the moor. As farms amalgamated, the ratio of rights became unbalanced and the 1985 Commons Registration Act Part 2 was never enacted to resolve the carrying capacity issue.

Farmers with environmental stewardship schemes on their home farms must meet the option prescriptions for those and these reduce their capacity to remove stock from the moor at certain times of the year. There are few situations where agreements on inbye land are well coordinated and complement agreement management on the open moorland. In addition, there is a tendency for farms to put stock on the commons and save their inbye land for winter forage. The practice of livestock being moved to lowland areas for the winter has declined.

Impact of grazing patterns on vegetation

A Farming and Rural Conservation Agency (FRCA) report made to assess if there was overgrazing (Evidence Folder DR017) gives a snapshot of livestock numbers on 4 commons and describes some of the annual grazing patterns evident at the time.

Livestock figures submitted by commoners for the four commons were compared to theoretical values for carrying capacity as shown in the Table below.

Okehampton Common was regarded as seriously overgrazed. Recent changes to fencing on Blackdown Common had led to recent changes in utilisation, while at South Brent there had been overgrazing of the southern edge of the Common. Gidleigh Common was noted to have been regarded as well managed with a lower grazing rate in summer allowing a surplus of herbage to be carried through to the winter.

The report concluded that the theoretical carrying capacity figures were realistic and highlight serious overgrazing on some commons. It was noted that serious damage arising from poaching and rutting over winter had been resolved but that there had not been a positive response in the vegetation condition. The Report points to under utilisation of spring growth, and that the moor could carry more cattle in spring, but that the moors are used for winter grazing in ways that is resulting in a change in vegetation. Natural England have observed that both these practices have continued and consider that this has exacerbated the *Molinia* dominance on the high moor and overgrazing of dwarf shrub communities on the moorland fringes.

Common	Summer Lu (average)	Winter Lu average)	Theoretical Lu summer	Theoretical Lu winter
Okehampton	1328	1208	558	348
Blackdown/Mary Tavy	341	309	273	177
Gidleigh	281	309	416	263
South Brent	789	648	414	279

A FRCA report in 1999 gave a condition report of a selection of Dartmoor Commons and is available in the Evidence Folder (DR18), as are copies of the Dartmoor ESA stocking level prescriptions for Tier 1E Moorland and Tier 2B Moorland (DR015 and DR016).

Q26. To what extent / how these rates (and rate changes) relate to whether the sites are now classified as green, amber or red. Do these problem issues relate more to sheep, cattle or pony grazing?

Grazing rates do have a bearing on SSSI condition, but type of stock, breed, grazing period and stock management through shepherding and supplementary feeding are all important. Other factors that influence the distribution of stock may also be relevant, for example the interaction between burning and grazing.

Typical HLS grazing calendars allow for ranges of numbers of cattle, sheep and ponies intended to provide commoners some flexibility in how they manage stock to meet scheme objectives. We

often find that cattle numbers are maintained at the low end of these ranges with winter sheep at the high end, though decisions on stock numbers within the agreed maxima and minima appear to be driven by agricultural considerations rather than the requirement to deliver agreement outcomes.

Where HLS stocking calendars include a range with maxima and minima numbers of livestock, the expectation is that agreement holders will graze at least the minimum number but not exceed the maximum. A number of factors affect the actual grazing rate. For example, prior to 2006 levels were generally close to the maxima because subsidy payments were applied on a headage basis. Following 2006 and the switch to the Basic Payment Schemes payments were made on an area basis and on some commons, numbers were reduced to the minima levels. These were business choices. An example is the Forest of Dartmoor agreement (11,000ha) which for the last 10 years has reported summer grazing levels at 70 to 80% of levels allowed within the agreement (from records collated by the agreement administrator). This combination of reduced cattle numbers and grazing cattle late in the summer has contributed to local undergrazing and an increase in *Molinia*.

Molinia is deciduous and offers forage for grazing livestock only in the summer. The lack of sufficient summer grazing when *Molinia* is palatable creates a dense thatch as the *Molinia* dies back in late summer/autumn. If *Molinia* is not utilised in the summer its biomass accumulates. Molinia dominance may be compounded by the effects of peatland drying and nitrogen deposition. During the autumn, winter and early spring, *Molinia* provides little or no forage for sheep so any sheep on the commons in winter are forced to graze in other habitats. Hence there is a pattern of under grazing by cattle in some areas and overgrazing by sheep in others.

There is some observational evidence that farming systems have changed.

Where farmers have spring calving herds, cattle are not available to graze on the moor in the key grazing period in June and July. Instead, cattle are kept on in-bye land for bulling in spring and are then turned out later when the palatability of the *Molinia* is lower.

There is evidence of recent change in sheep management towards crossing the hardy hill flocks to improve productivity or removing the hardy sheep in winter to in-bye land to improve the lambing percentage. Other grazing commoners have also removed their Scotch Black Faced ewes after the clearance dates in November and not returned them to the Commons until April. They have reported an increased lambing percentage to 1.5 lambs per ewe and better-quality animals. Prior to this they were only achieving 0.8 lambs per ewe and the ewes were in borderline poor condition in welfare terms. Commoners operating these systems appear to be able to successfully maintain traditional lears.

Q30. Is it possible to attain ideal stocking rates (with the appropriate stock grazing the sites at the appropriate times) within the SSSIs given the unfenced common boundaries, presence of SSSI/non SSSI, HLS agreement and non-agreement land, different landowners and stock managers? What are the barriers to achieving the ideal? (time or cost resources, skills, knowledge?)

It is possible to advise on appropriate grazing regimes taking account of the type of stock, their numbers grazing period. Those elements of the regime can be flexible to allow different permutations to meet local requirements and to take account of land managers' business considerations. There can also be flexibility if other elements such as shepherding are built into the regime.

On agreement land the grazing regimes would normally be directed to achieve favourable condition of important semi-natural habitats on the land. This approach is set out in the Indicators of Success for each agreement whether it is SSSI or non-SSSI land.

Where the adjoining commons are unfenced, the possibility that stock stray from one common to

another must be accounted for and on agreement land it is the agreement holder's responsibility to meet the prescriptions. To do this they must be able to manage any stray stock. It is acknowledged that unfenced boundaries present problems; however, the HLS agreement payments reflect the range of management demands on the agreement holders.

In HLS there is an agreement holder who, on signing the agreements, confirms that they have land management control so that the agreement prescriptions can be met. Unless there is agreement from all parties with rights to graze on the commons, it is unlikely that an agreement will be practical, because it will be impossible for a prospective agreement holder to confirm that they have land management control. There is a 'Administration of group managed agreements supplement' available in HLS, intended to fund the development of an 'internal agreement' that covers such matter as the governance of the agreement, responsibilities for delivering the agreement requirements and payment allocation.

On many commons governance arrangements such as a Commoners Association, which enable individual commoners to access agri-environment schemes, have been in place for a number of years. There are exceptions, and in these cases entering into an agreement is not always possible. On Dartmoor, commons expertise and experience of managing these complex agreements has developed among farmers and the land agent sector. While multi- party agreements do present particular challenges, Natural England has developed experience and expertise in working with these complex agreements.

Though agreements involving a number of parties will always be complex it is likely that support will continue to be available in future schemes and there is sector capacity to deal with them.

On common land RPA scheme requirements mean that HLS agreements cover the whole common and must not include any other land. It is therefore unlikely that there is a mixture of agreement/non-agreement land in the same management unit. For commons agreements it is normal that management lies in the control of both the landowner and commoners.

One possible solution is to manage several Commons together, for example, the East Quarter Commons with 5/6 commons all with habitat in similar condition is successfully managed as one block with allowances for straying between commons boundaries. This is possible as the stocking level on each common land unit is similar and several commoners hold rights and graze adjacent commons. This could be replicated on other blocks of moorland common but would need agreement and support from all the relevant Commons Associations and the Dartmoor Commoners Council

Question 27
Impacts of overwinter grazing on the status of SSSIs

Response

Evidence for impacts of overwinter grazing on the status of SSSIs

Under excessive grazing, stands of heather tend to decline. Grass vegetation has poor feed value in the winter months and livestock switch to browsing on heather.

Many of the current stocking regimes on Dartmoor involve the overwintering of sheep on the moor. Sheep are selective grazers; in winter the growth of their preferred grass species slows / stops. When grass is not growing, any remaining grass rapidly loses its nutritional value and selective grazers like sheep turn their attention to other plants, especially heather and bilberry.

The Natural England evidence review of moorland grazing and stocking rates (Martin and others, 2013) highlighted the particularly detrimental impacts of high sheep stocking densities in English uplands over the second half of the 20th century. The review highlights the potential negative impacts of winter sheep grazing, as the attractiveness of heather to grazing animals increases in winter compared to graminoids. There is evidence that utilisation of dwarf-shrubs by sheep is lower in summer and greater in autumn / winter.

The DEFRA funded research project "Determining Environmentally Sustainable and Economically Viable Grazing Systems for the Restoration and Maintenance of Heather Moorland in England and Wales" (ADAS, 2007) stated amongst its conclusions that

"Until recently agri-environment schemes have focused primarily on the reduction of livestock numbers, which has tended to halt the decline of dwarf shrubs such as heather… but has been less successful in reversing the process. This has been exacerbated by most grazing systems relying solely on sheep" and that

"Reduced sheep stocking levels especially in winter, tended to arrest defoliation of dry heath, wet heath and blanket bog."

One site on Exmoor, where all winter stock were removed under agri-environment schemes (AES) agreements has shown good recovery, including a highly significant decrease in heather grazing index and corresponding increase in heather cover (Darlaston and Glaves, 2004). A more recent review of AES in the uplands of Cumbria also highlighted the importance of taking sheep off the moor in winter to allow dwarf shrub recovery (Natural England, 2020.)

The need to deliver dwarf shrub recovery has been highlighted by monitoring on Dartmoor, which over the years has repeatedly identified heavy grazing of dwarf shrub communities (e.g. Wolton and others, 1994), with very reduced cover and over-grazed, stunted growth forms being common, (e.g. 'drumstick' [Figure 1] and carpet forms). The desired structural diversity of multi-aged heather stands is almost totally absent on parts of the moor. Over-wintering of sheep on the moor is likely to be a significant contributor to the low cover, reduced growth, and lack of structural diversity of Dartmoor dwarf shrub communities. Evidence of over-grazing includes established long-term monitoring programmes on Dartmoor. One such programme to provide an assessment of the condition of moorland vegetation was begun at the start of the Dartmoor Environmentally Sensitive Area (ESA) management scheme in 1994 (Smallshire and others 1997:) with resurveys in 1997 (ADAS 1998:), 2003 (Kirkham and others, 2005:)

and more recently of the Forest of Dartmoor part in 2010 (Poulton, 2010). The survey comprised two methods, one to assess detailed vegetation change in nested quadrats in permanent plots and a second utilising radiating transects from these quadrats to assess grazing pressure particularly on heather. The monitoring programme documents continued heavy grazing pressure.

Figure 1 Over-grazed heather growth form

In addition to the formal ESA monitoring, Natural England hold a substantial volume of other moorland monitoring data from in-house overgrazing surveys of most of the Dartmoor commons, some of which include resurveys on sites which entered ESA and other AES agreements. Two of these sites, Okehampton Common and Ugborough and Harford Common, were resurveyed in 2014 as part of a national project to resurvey a sample of moorland sites with relatively long data series (Natural England 2014). During the 2014 re- survey at Okehampton Common, there was considerable evidence of high levels of grazing on the site. The mean Grazing Index (GI; % of heather shoots grazed) was high (63%; increased from 43.3% in 2004) and 72% of samples did not meet the Common Standards Monitoring (CSM) GI target of less than 33%. At Ugborough and Harford the mean GI increased from 44.1% in 2004 to 77.9% in 2014. These levels are much higher than the 40 % threshold for heather growth proposed by Martin and others (2013).

A recent habitat condition resurvey in South Dartmoor SSSI (Evidence Folder DR020) noted the poor condition of habitats surveyed and how this condition has deteriorated over time. The report notes that the site is overgrazed.

Natural England also carry out moorland vegetation mapping and condition assessment surveys in-house and using contractors. Evidence from these sources informs Natural England's views on management of the Dartmoor commons and other moorland. This evidence, along with condition data from other sources is being compiled as part of an evidence review by Natural England and will be presented separately to this response.

Evidence that suggests overgrazing is contributing to the current poor condition of Dartmoor is further supported by the response of vegetation in grazing exclosure plots. During a visit to Okehampton Common on 14th March 2023, Claire Horrocks (Natural England Grazing Specialist) and Dave Glaves (Natural England Upland Specialist) were shown a former grazing exclosure plot. Photos of the site in 2021 show a good coverage of early growth stage (pioneer) heather (Figure 2). Since the 2021 photo the exclosure fence has been removed

and sheep allowed back on site. During our visit in 2023, we observed very limited heather cover, with heather that remained showing high incidence of browsing. Sheep were grazing on site at the time (Figure 3).

Figure 2. Comparison photo to Figure 3, inside exclosure with exclosure in place (17 August 2021)

Figure 3 Inside former location of Okehampton Commons exclosure once exclosure had been removed (14 March 2023)

We note that the practice on Dartmoor is to keep ponies out on the moor all-year round. Our proposed grazing regime accepts that this will remain the case, as farming systems do not

provide anywhere for the ponies to be brought in. We also recognise the valuable role the ponies play on Dartmoor, to the heritage but also in their role as grazers. There is some evidence that ponies can help in gorse and bracken control. In the case of bracken, they increase their consumption during the autumn when toxicity is lowest. Ponies are also thought to graze less selectively on heather than sheep over winter. Ponies have an important role to play in maintaining structural diversity on Dartmoor as part of a mixed grazing regime (Lake 2016; Fraser and others, 2019).

We note that past agricultural subsidies, including headage payments led to increases in stock numbers in the uplands. Although numbers have declined since the peak, livestock numbers are still greater than can be sustained by the in-bye land. Many Dartmoor farms still utilise a dual flock system, with better quality flocks being kept on the in-bye land. As such, we recognise the shift in farming practice that may be required by some to remove most of the winter stock from the moor. However, to deliver habitat improvement on Dartmoor, stocking reductions, particularly of over wintering sheep, will be required. Recent reports have analysed upland farm businesses, showing that for many, their current livestock enterprise (not accounting for subsidies) is loss making. The reports identify that reducing stock and concentrating on a smaller higher quality flock/herd that does not exceed the natural carrying capacity of the land, could provide a more economically and environmentally sustainable future for upland farms (Clark and Scanlon 2019; Royal Society of Wildlife trusts, 2023). Some of the learning from the analyses in these reports could inform future farming practice on Dartmoor and enable viable businesses to be maintained with the removal of winter stock from the moor.

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Question 28
Q28. Where is the evidence that reduced grazing has improved the status of SSSIs and what grazing regimes have been applied to those areas?

Response

Monitoring of the Dartmoor ESA and of agri-environment schemes in Cumbria contributed to the extensive evidence base about the grazing regimes that are consistent with nature recovery.

In a national assessment of the significance of the vegetation of the mountains and moorlands of England by Drewitt & Manley (1997), Dartmoor was considered outstanding: "The vegetation of Dartmoor is of particular interest in that it combines western oceanic communities with a more northern, upland component. This includes extensive areas of internationally important blanket mire (M17) and some of the best areas of wet heath (mainly M15) in England. These wet and predominantly western communities occur with dry heath including the upland H12 and the lowland H4. The extensive valley mires (M21) are also of significant interest."

Nevertheless, most Dartmoor moorland habitats have been modified by a range of past, and in some cases still current, impacts, as they have nationally. These impacts are described in the Biodiversity Action Plans (BAPs) for the UK (UK Biodiversity Steering Group 1995, UK Biodiversity Group 1999) and Dartmoor (English Nature & Dartmoor National Park Authority 1997, 2001, Dartmoor Biodiversity Steering Group 2001, Dartmoor Biodiversity Partnership 2013, 2017). They include some effects of grazing, burning, uncontrolled 'wildfires', atmospheric deposition (currently especially nitrogen), heather beetle, climate change, and past drainage, peat cutting, tin mining, soil compaction and other factors affecting hydrological function.

Heavy grazing in particular, has long been considered a key cause of heather loss from upland habitats nationally (e.g., Bardgett & Marsden 1992) and on Dartmoor (e.g., Wolton and others 1994, Drewitt & Manley 1997). To address this, overgrazing controls were introduced by government between 1992 and 1994, and most of the commons of Dartmoor were subject to overgrazing surveys and in some cases controls over the remainder of the 1990s. Dartmoor ESA was designated in 1994 with a key objective of halting heather loss under Tier 1 and maintaining and restoring vegetation composition and structure under Tier 2 though the majority of moorland was entered into Tier 1. This was supported by the establishment of a vegetation (Smallshire and others 1997, ADAS 1998, Kirkham and others 2005, Poulton 2010) and wider environmental monitoring programme (ADAS 1998). This showed that grazing pressure on heather generally increased, and its cover declined, especially between 1994 and 1997 when ESA uptake was relatively low on moorland and only one of the monitoring sites was considered to be in favourable condition (Kirkham and others 2005).

Sites or part-sites considered to be in good condition in the past or in favourable condition now, especially those with extensive dwarf shrub heath, tend to be less heavily grazed than Dartmoor moorland in general. For example, a Farming and Rural Conservation Agency (FRCA) review of sustainable grazing practices on the South West moors of England identified 20 sites considered to then be in good condition, seven of which were on Dartmoor[11] (three newtakes and four commons/part-commons) with the remainder on Exmoor (ten sites), West Penwith (two) and Bodmin Moor (one) (Smallshire and others 1996). The authors noted that "tentative conclusions suggest that ESA [maintenance] prescriptions are broadly similar to [stocking rates then on] the sites examined, although the results of monitoring must be awaited before the effects of applying these prescriptions on degraded sites can be assessed." The condition of Dartmoor moorland at the time and especially on these sites was likely considerably better than now, although there was already evidence of heather loss prior to this (e.g., Wolton and others 1994 who refer to

[1] The sites were: D1, Challacombe Down newtake; D2, Headland Warren; D3, Langridge newtake; D4, Gidleigh Common; D5, South Tawton Common; D6, Brimpts newtake; and south Roborough Common.

losses over the previous few decades resulting in half of the area then supporting heather cover showing signs of damage, nearly a third severely so). Thus, at the start of the ESA scheme, much of Dartmoor moorland was heavily grazed.

Currently, only a small minority of Dartmoor moorland SSSI site units (SU) are classed as in favourable condition (excluding other habitats, especially woodland, and geological sites), some of which are small units covering valley mires and other fen features. Site units in favourable condition in the three large moorland SSSIs comprise: 14 SUs in East Dartmoor including areas of heath and valley mires at Headland Warren, East Bovey Head, King Tor, Hamel Down Tor and small parts of Hamel Down and Chagford Common; two SUs in South Dartmoor, Fox Tor Mires and High House Waste, both valley mires; and none in North Dartmoor. In addition, a number of generally smaller, more isolated individual SSSIs have SUs in favourable condition: the Trendlebere Down part of Yarner Wood and Trendlebere Down (5 SUs), Blackslade Mire (all 3 SUs), Tor Royal Bog (1 of 2 SUs), and Whitchurch Down (1). These SUs tend to be less heavily grazed areas of heath and valley mires.

Although dwarf shrub cover has declined and is now very low on some commons, frequency tends to remain relatively high on the South-West moors indicating good heath restoration potential if stocking levels are reduced, especially in winter when sheep switch to browsing heather (ADAS, 1997, 1998). Perhaps the best example of this comes from an Exmoor case study at Winsford Allotment under the ESA Tier 2 moorland restoration option. Here, a year-round heavily sheep and winter cattle grazed (0.33 LU/ha summer and 0.68 LU/ha winter), short, grassy sward was restored to heath within ten years through light summer sheep grazing (0.10 LU/ha) and off-wintering (Darlaston & Glaves 2004, Figure 1 below).

Heath restoration potential is also demonstrated by grazing exclosures, a number of which have been installed on Dartmoor moorland over recent decades. These include a series erected by Dartmoor National Park Authority in the late 1980s, including on Longstone Hill and Lydford High Down, both of which showed good heath recovery over relatively short timescales (Figure 2 below). Another set of exclosures were installed at West Mill Tor on Okehampton Common as part of a project to monitor and support ring ouzels, photos taken on 17 August 2021 showed a good coverage of early growth stage heather within the exclosure plots. A visit to the same site on 14 March 2023, after the enclosures had been removed showed limited heather cover with remaining heather showing high incidence of browsing. (Figure 3 below).

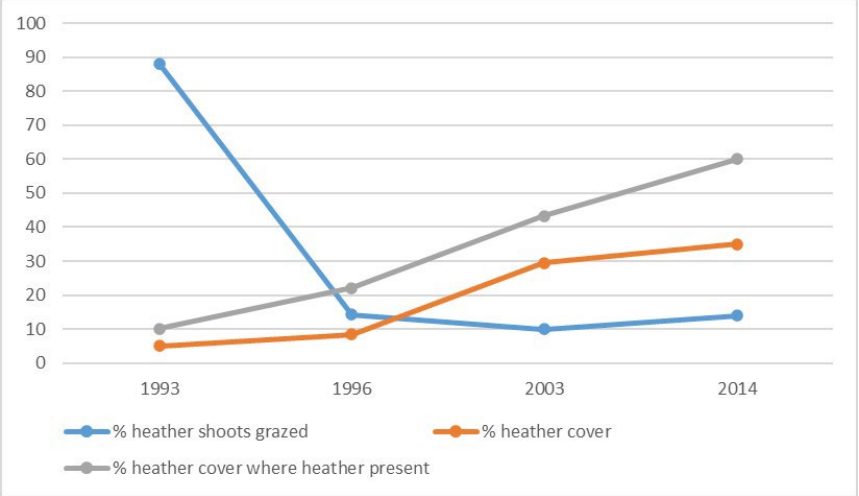

Figure 1. Change in percentage of heather shoots grazed and heather cover at Winsford Allotment plateau 1993–2014. (From preprint version of Alonso and others 2021).

(a) (b)

Figure 2. Grazing exclosure plots at (a) Longstone Hill (left) and (b) Lydford High Down (right) in 1993 after around five years ungrazed. (Photos scanned from slides © David Glaves.)

(a) (b)

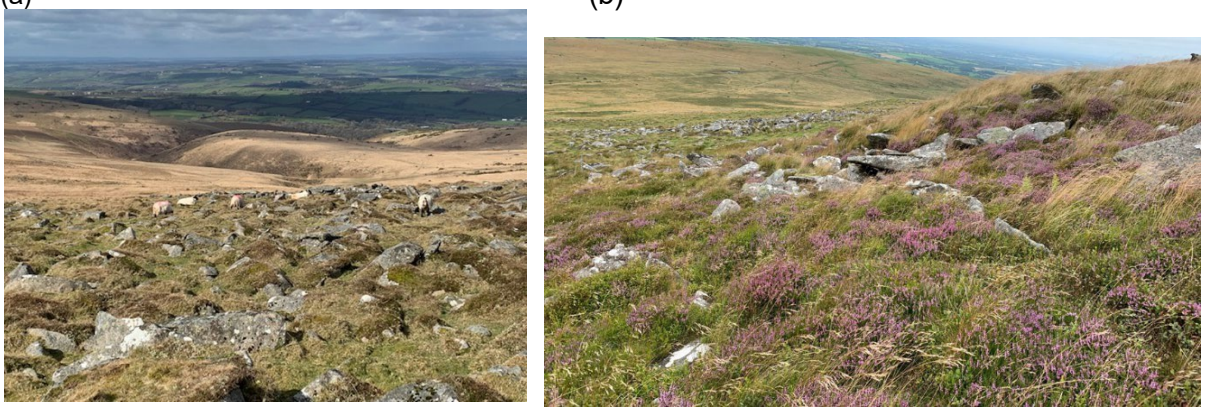

Figure 3. Grazing exclosure plots at West Mill Tor. Photo (a) taken 14 March 2023 after exclosure removal; photo (b) taken 17 August 2021 with exclosures still in place

Natural England's report *Grazing regimes for nature recovery: Experience from 25 years of agri-environment agreements in the Lake District's high fells* (NATURAL ENGLAND, 2020) explains the environmental effects of grazing on the Lake District's high fells and describes Natural England's involvement with agri-environment schemes in the Lake District over the last 25 years. It gives a summary of our data on the condition of sites under different grazing regimes and captures some of the experience of Natural England advisors. Several advisors have worked in Cumbria for 20 years or more and collectively, current advisors have over 150 years' experience of working in the Cumbrian uplands. Habitats have recovered best under low grazing pressure. Recovery of existing SSSI habitats has been universally good below a year-round average of 0.4 ewes/ha. Good recovery has sometimes been seen up to an annual average of about 0.5 ewes/ha. No sites stocked at or above an annual average of 0.6 ewes/ha have fully recovering habitats. Habitat response varies between sites and factors affecting this are discussed in this report (copy available in the supplied Evidence Folder).

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Question 29
Q29. What stocking rates does NE advise to recover the target habitats? Does NE advise on stocking type, rates and timings for SSSI's? Do these rates adjust for the SW location, effects of N deposition and warming climate with extended grazing seasons? Will proposed stocking levels address both over-grazing & under-grazing (*Molinia*) concerns?

Response

Q29. What stocking rates does NE advise to recover the target habitats?

The recommended stocking rates for Dartmoor have been based on the guidance for higher level stewardship (HLS) moorland options.

This guidance was first produced in 2006 and subject to a minor revision in 2008. The rates and guidance are based on extensive evidence (Nisbet and Glaves, 2010) including:

i) Monitoring the performance of classic Agri-environment schemes, at upland sites across the country (including Dartmoor and Exmoor)

ii) Data collected from mostly DEFRA-funded experimental grazing trials on research farms, especially at Pwllpeiran (West Wales) and Redesdale (Northern England), but also at other sites.

iii) Modelling of grazing impacts accounting for the productivity of key moorland species including *Calluna, Vaccinium myrtillus, Agrostis/Festuca, Nardus, Molinia* and *Eriophorum* across a range of environmental conditions, sustainable utilisation rates for these species and dietary requirements of livestock.

As detailed in the guidance, the recommended rates are applied according to the area of each broad upland habitat type and its current condition (assessed through monitoring visits), from which a decision is made as to whether to apply the maintenance or restoration rate. In addition to these 'core grazing rates,' we have recommended an additional '*Molinia*' rate be applied in some units on Dartmoor in proportion to the area of land dominated by Purple Moor Grass (*Molinia caerulea;* hereafter *Molinia*). It should be noted that a summer purple moor-grass grazing rate was first introduced in the Dartmoor *ESA* scheme following the mid-term review in 1999. Natural England has encouraged summer cattle grazing ever since; however, uptake has been relatively low. See later discussion on *Molinia*.

The use of the maintenance and especially the restoration stocking rates recommended in the HLS guidance was considered the most appropriate for Dartmoor. The rates and associated guidance are designed to give appropriate grazing regimes where current grazing management and condition are a long way from favourable. They provide stocking rates that, according to the best available evidence, can be expected to allow recovery if appropriately applied across sites with a range of climatic / other environmental conditions. Currently much of Dartmoor shows extensive evidence of substantial overgrazing, evidence of ongoing condition decline and has a low level of remaining heather cover. Reducing grazing levels on Dartmoor to the grazing rates detailed in the guidance as quickly as possible, gives the best chance of seeing much needed recovery in key habitats.

The best available evidence at the time was used to develop the recommended grazing rates for HLS options (Nisbet and Glaves, 2010). Since then, a subsequent review of evidence (Martin and others 2013) and ongoing monitoring of Agri-environment schemes (AES), including a report on impacts of upland AES from Cumbria (Natural England, 2020), together with ongoing declining condition, have indicated that similar restoration stocking rates to those within the HLS guidance are needed to deliver recovery at a range of sites. They support the use of such rates as a sensible guide for setting a grazing regime.

Does NE advise on stocking type, rates and timings for SSSIs?

It is widely acknowledged that stock type and timings of grazing can be as significant as grazing numbers in determining habitat outcomes. It is standard practice for Natural England advisors to develop stocking calendars that detail the timings, number and type of stock to be grazed on SSSIs. These calendars are developed based on consideration of habitat type, current condition, recent changes in condition, target condition, and broader site characteristics. For the proposed new stocking regimes on Dartmoor the stocking calendars include taking most stock off the moor over winter (see answer to question on overwintering stock), and ensuring sufficient cattle and ponies are on the moor in spring to graze the new *Molinia* growth (see answer below to point on *Molinia*).

Do these rates adjust for the SW location, effects of N deposition and warming climate with extended grazing seasons?

There are multiple factors that could influence habitat response to grazing on Dartmoor, some of which may make it more tolerant to higher grazing levels (e.g., climate) compared to some other upland sites. Although the South-west location does not necessarily mean heather growth rate will be faster compared to other upland areas; Milne and others (2003) measured biomass production of upland plant species in different regions of the UK and heather (*Calluna vulgaris)* biomass production was found to be lowest in the South-west of England, whilst bilberry *(Vaccinium myrtillus)* and grass biomass production was similar between regions. One factor that may make Dartmoor vegetation less tolerant to a given grazing level is the recent/current poor condition and declining dwarf shrub cover c.f. other upland areas; (Glaves, 2008). It is hard to predict how these factors will interact, and as such we cannot justify adjustments to the current proposed stocking rates, which are based on the rates in the guidance for HLS moorland options. Evidence to devise these stocking rates was collated from sites that varied in climate and other characteristics, including Dartmoor and other sites in the South-West. The HLS guidance rates offer the best evidence-based stocking rates to be applied at sites like Dartmoor, where current grazing regimes are so far off delivering recovery towards favourable condition.

In sites that are currently favourable or near favourable, recommended changes to stocking regimes would typically take into consideration detailed and accurate knowledge of current grazing calendars, current site condition and target condition. New grazing prescriptions would then be set based on necessary adjustments to current regimes to deliver a defined outcome. By taking this approach (rather than using fixed grazing rates defined by habitat) supported by monitoring, we can tweak existing stocking calendars to get a more tailored grazing regime, appropriate to the site, which accounts for the many factors that can influence how a habitat will respond to grazing, i.e. adaptive management. On Dartmoor it would be expected that over time, if the proposed rates were applied, then we would see a change towards favourable condition. Ongoing monitoring and discussions with farmers would then allow slight changes to stocking rates in the future to reflect how Dartmoor was responding and all the factors that influence this. However, currently large areas of Dartmoor are a long way from achieving favourable condition and showing ongoing decline in condition. There are also apparent discrepancies between permitted stocking rates (according to current scheme prescriptions) and stock observed on the moor. Together the poor condition and uncertainty over actual current stocking rates and timings, mean that the approach of making slight adjustments to existing stocking calendars to tailor grazing regimes to local conditions is not one that can be realistically applied more widely on Dartmoor at this time.

It should be noted that the Favourable Conditions Tables (now referred to as Monitoring Specifications) tailored for Dartmoor SSSIs, currently incorporate a number of revisions to targets, e.g. allowing for a higher percentage of dwarf shrub shoots browsed (50%) compared to the generic upland Common Standards Monitoring guidance (33%). Although based on current local and national evidence this figure may require review as 50% may be too high to allow recovery of heather cover on Dartmoor.

Will proposed stocking levels address both over-grazing & under-grazing (*Molinia*) concerns?

Stocking levels are only one element of grazing regimes which include the type and breed of stock, the grazing period and stock management. Appropriate management regimes need to account for all aspects of the grazing regime.

Whilst there is substantial evidence that much of Dartmoor is overgrazed, there are other areas that have become dominated by dense swards of poorly grazed *Molinia caerulea* (Purple Moor-grass), hereafter *Molinia*. *Molinia* dominance is likely to have multiple causes, including increased Nitrogen deposition and moorland drainage and other factors altering the hydrology in blanket bogs, which have been shown to favour *Molinia* over other species. Where *Molinia* has come to dominate in what is often now degraded blanket bog and wet heath, then the preferred option to reduce over-dominance of the grass should be blocking of drainage ditches to restore hydrology and support peatland restoration. The reasons for and potential methods to control *Molinia* dominance are discussed in the proceedings of a 3-day conference hosted by the National Trust and attended by Natural England in 2015 (National Trust, 2015).

There is some evidence that adjustments to the grazing regime on Dartmoor could help reduce *Molinia* dominance, enabling more diverse habitats to develop. *Molinia* is a deciduous grass that senesces in winter and through much of the year is a less preferred grass for grazing livestock. It is most likely to be grazed when new growth appears in spring and early summer, with cattle being more likely to graze it than sheep (Martin and others, 2013). There is also evidence from Dartmoor that ponies will readily graze *Molinia* when provided with a molasses lick (Lunt and others, 2021). It is likely that provision of the molasses alongside the *Molinia* helps compensate for a low soluble carbohydrate content of the grass (Fraser and others 2009, and Fraser M.D., personal communication). Key to controlling *Molinia* through grazing management is having the right stock on at the right time; there is some evidence that historic overstocking with sheep, particularly in winter, has increased dominance by less palatable grasses such as *Molinia* (Holden and others, 2007).

Due to the seasonal variation in *Molinia* palatability and greater chance of cattle / ponies grazing it than sheep, the proposed grazing regimes for Dartmoor include a '*Molinia* rate', in addition to the 'core grazing rates' (determined according to habitat type and condition and the grazing rates given in the moorland HLS guidance). This *Molinia* rate takes account of the proportion of each unit that is considered to be dominated by *Molinia* (from site checks). The livestock units prescribed in the *Molinia* rate must be provided by cattle (turned out in May) or ponies (year-round grazing). We note that current farm practice on Dartmoor has meant graziers have often struggled to get sufficient cattle out on the moor early enough in the season to graze the new *Molinia* growth. We would need to work with the graziers to understand how this issue could be addressed and how their business could be supported to provide more cattle in the spring. Ponies have great potential as a tool for reducing *Molinia* dominance, as they are present on the moor all year round so will be able to graze *Molinia* from the start of the growing season. To encourage stock to graze the *Molinia*, graziers may need to provide molasses licks, or cut paths through dense stands of *Molinia* to ease access to the centre of *Molinia* dominated areas. Other methods could include the use of 'No Fence' collars to keep stock on the *Molinia* areas.

There is a risk that the additional stock proposed in the *Molinia* rate may not graze the *Molinia* as desired and may instead target other vegetation at risk from overgrazing. As such we would expect to work closely with graziers to ensure stock were successfully encouraged onto the *Molinia*. In some cases it has been found that the stocking rates required to sufficiently reduce *Molinia* cover were so high as to prevent recovery of neighbouring heathland (Critchley and others, 2008; Stewart, 2002). Grazing to reduce dominance by *Molinia* should not be undertaken at the expense of heathland and other priority habitat. The *Molinia* rate should only continue to be applied if additional stock continues to graze the *Molinia* dominated areas. Whilst reduced dominance of *Molinia* could be beneficial, it does provide some habitat structure, and may allow sphagnum to establish over time (National Trust, 2015), therefore reducing *Molinia* dominance should not be given preference to restoration of wider habitat structure and dwarf shrub communities.

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Question 31
Q31. What are the environmental, social and economic consequences of requiring further livestock reductions?

Response

Environmental, social and economic consequences arise from any livestock grazing regime on Dartmoor.

Grazing regimes includes livestock numbers, but we stress that the situation is more complex and grazing regimes include also grazing period, type of livestock (species and breed) and the supplementary management that influences the distribution of livestock on the moor. The current situation should not therefore be characterised as simply a matter of stock reduction.

Grazing regimes that are sustainable offer the best combination of environmental, social and economic outcomes, taking account of Dartmoor itself and the surrounding area. Effects of grazing at different rates are addressed in responses to other questions. The economic and social costs of not managing upland areas, including Dartmoor, sustainably include impact on water supply, flood risk, loss of climate change mitigation potential, and impacts on health and wellbeing.

The government has introduced a policy to transition agriculture away from an industry that receives direct subsidies for farming, to an industry that can access public payments for public goods. This means that some farms, particularly those that have traditionally had a high proportion of their income come from subsidies, will need to adapt their business models to remain viable. The “do nothing different” approach is likely to have significant economic consequences for farmers who run more intensive systems that have low value outputs. These may translate into social consequences if business viability is threatened.

And in turn, there are opportunities for people who farm in more marginal areas to gain reward by moving to low cost / extensive systems that have high environmental outputs. Indeed, these farmers will be essential to the delivery of the outcomes that the government has prioritised, and the new incentive schemes and other private finance initiatives are being developed to reward land managers for doing this.

We believe that many farm businesses would benefit from accessing independent advice from farming business experts on how to adapt their business models and farming systems.

Natural England’s report *Grazing regimes for nature recovery: Experience from 25 years of agri-environment agreements in the Lake District’s high fells* details the some of the environmental effects of grazing rates.

Clark and Scanlon (2019) discuss the viability of farming under low input systems.

References

CLARK, C AND SCANLON, B (2019) Less is more: Improving profitability and the natural environment in hill and other marginal farming systems November 2019

NATURAL ENGLAND, 2020. *Grazing regimes for nature recovery: Experience from 25 years of agri-environment agreements in the Lake District's high fells*. Natural England Lake District Team, Kendal.

Question 32

Q32. What information has underpinned decisions around setting the proposed new grazing regimes? What is the likelihood/level of confidence that new stocking levels will deliver success? or will other management actions also be needed? How quickly might favourableness be obtained? Have potential risks or unintended consequences been assessed?

Response

Natural England applies evidence from site monitoring and understanding of local factors alongside recommended stocking rates for each habitat type to inform proposals for agreement grazing regimes.

Guidance about recommended stocking rates is discussed in our response to Q29.

Grazing regimes, including stocking rates are summarised in stocking calendars taking account of the range and extent of different habitats on the site, the condition of the habitats and the objectives of the proposed agreement.

During establishment of the Environmentally Sensitive Area on Dartmoor in 1996, the then Government adviser the Farming and Rural Conservation Agency (FRCA) agreed higher levels of stocking than advised in guidance. This approach took into account the views of graziers and commoners that because Dartmoor has a milder climate than other upland areas in England there is a longer growing season and therefore greater capacity to support grazing livestock. Natural England later agreed to these higher stocking rates in HLS agreements on the understanding that there would be monitoring and review, and if necessary, adjustment of grazing rates. Therefore, there the grazing rates set out in the current HLS agreement are not prescribed grazing rates that would remain constant over time. The grazing calendars set up in the agreements were always open to adjustment during the period of the agreement based on feedback from both formal Common Standards Monitoring and less formal 'site checks'.

Advisers also take account of the variation in grazing pressure that might arise with a given stocking rate due to factors such as palatability of different vegetation, animal ranging behaviour across unfenced commons and the degree to which animals are actively shepherded for example the need to move stock on and off the ranges during MOD firing days or the need to distribute grazing to avoid under grazing or overgrazing on parts of the agreement land. We take account not just the results of site checks or monitoring but also the experience of commoners in developing our appreciation of these factors on each common. We understand that grazing across moorland areas and adjoining unfenced commons is not uniform and stock tend to concentrate in certain areas This behaviour may interact with, for example, burning which may make some areas temporarily more palatable or conversely reduce the forage temporarily on parts of the moor.

A key issue is that Natural England consider the condition of vegetation and other factors rather than applying the stocking rates recommended for each habitat rigidly. Subsequently through the agreement, it is important to determine whether outcomes are being delivered not just by simply by taking account of the agreed stocking rates and importantly the actual e stocking rates reported by agreement holders or identified during site visits. In practice we observe high rates of browsing impact in heathlands which suggests winter grazing rates are too high. On the other hand, some returns from commoners indicate that summer grazing on some commons is at 70 – 80% of the available level and later turn out dates set out in the agreement stocking calendars. This may contribute to lack of progress in tackling *Molinia* dominance where higher cattle grazing in the early part of the summer is considered beneficial in reducing *Molinia* dominance. This demonstrates that the grazing regime as a whole contributes to the success or otherwise of the agreement; it is not simply a matter of relying on the blunt tool of a set stocking rate and Natural England must take account of seasonal patterns, type of stock and how the stock are managed, for example through shepherding. Furthermore, grazing is one of a number of management activities that needs to be considered. Both burning regimes and hydrological restoration have

an impact on vegetation and interact with grazing so need to be considered when stocking calendars are drawn up.

We recognise the need for flexible application of the recommended grazing rates that work with stocking calendars reflecting local conditions and other management interventions. Together these need to allow for an iterative approach to refine whole management regimes depending on how well agreement outcomes are being met.

We use Common Standards Monitoring surveys and annual site checks to determine the state of the moorland vegetation. The evidence collected on vegetation or other site feature condition reflects the impact of the current management regime and is reflected in our advice to agreement holders on any management changes including stocking adjustments aimed at improving habitat condition or the delivery of other agreement outcomes.

Question 33
Q33. What relevant case studies are there (for Dartmoor and comparable common land) and what have they demonstrated?

Response

Case studies demonstrate the effects of grazing and grazing management on habitats (1-25).

Areas of Dartmoor SSSI surveyed in habitat monitoring and grazing surveys include:

Okehampton Common (3, 6, 8, 9)
Ugborough and Harford Commons (2, 4, 20, 21)
Holne Moor (10)
Belstone Common (11)
Black Dunghill (12)
Chagford Common (13, 14)
Cut Hill (15)
Gidleigh Common (16) Mary
Tavy Common (17)
Peter Tavy Great Common (18)
Throwleigh Common (19)

The sites that have been monitored longest for grazing impacts were Okehampton Common (1999–2014) (3, 6, 8, 9) and Ugborough and Harford Commons (1998–2014) (2, 4, 20, 21). Summaries of the findings from these studies are presented below.

Okehampton Common

The latest follow-up on Okehampton Common was reported in 2017, using data from a 2014 survey (3). The study examined whether changes in stocking rates (Table 1) from before 2000 to 2012 had an impact on vegetation growth and cover.

Table 1: Stocking rates at Okehampton Common

Period	Average annual stocking rate (LU/ha)	Maximum monthly stocking rate (LU/ha)	Average summer stocking rate (LU/ha)	Average winter stocking rate (LU/ha)
Pre-2000	0.91	1.15 (September)	0.96	0.90

2000–2002 (ECC restrictions)	0.33	0.37 (16 April–30 October)	0.37	0.28
After 2002 (ESA agreement)	0.17	0.28 (16 April–30 October)	0.22	0.11
After 2004 (SWES agreement)	0.13	0.22 (June–July)	0.19	0.08
After 2012 (HLS agreement)	0.11	NR	0.16	0.07

Despite average stocking rates decreasing from 2004 to 2014 (Table 1), the heather grazing index[1] significantly increased over this time period from 43.4% in 2004 to 63.2% in 2014 ($F_{3,204}$=4.85; p<0.01) (Table 2). Accordingly, dwarf shrub cover significantly decreased between 2004 and 2014 (9.8% versus 4.2%; $F_{3,225}$=10.5; p<0.001). This was mainly accounted for by a decreased in the cover of heather from 8.5% in 2004 to 2.5% in 2014 ($F_{3,225}$=9.8; p<0.001). In contrast, bilberry cover increased from 0.2% in 2004 to 4.5% in 2014 ($F_{3,225}$=22.4; p<0.001). Heather height decreased between 2004 and 2014 (11.9cm versus 8.2cm; $F_{3,225}$=22.5; p<0.001), but there was no significant difference in the height of graminoids. It should be noted that the average annual stocking rate for Okehampton common of 0.11 LU / ha as agreed under the 2012 HLS agreement, is substantially higher than the recommended stocking obtained through strict application of the Natural England guidance on setting stocking prescription under HLS moorland options. Based on relative proportions of each main habitat the average annual stocking rates according to the guidance should be closer to 0.033 LU/ha to achieve habitat restoration.

The 2017 publication compared data from 2004 to 2014; however, there are data available from as far back as 1999, which are reported by Nisbet (2004). Nisbet (2004) demonstrated that there was a decrease in heather grazing index from 64% in 1999 to 43% in 2004; the difference between 2002 and 2004 was significant (61% versus 43%; p=0.05). There was also an increase in mean heather height from 9.2cm in 1999 to 11.9cm in 2004, which was again significant between 2002 and 2004 (8.0cm versus 11.9cm; p=0.05), but dwarf shrub cover, including heather cover, did not significantly increase during this period.

Overall, the authors concluded that changes to stocking densities required under the agri-environment schemes had not achieved a reduction in grazing intensity on heather or promoted heather growth on the common. Notably, the effect of the stock reductions specified by the Higher Level stewardship (HLS) scheme may not have had effect in the time since they were implemented, but nonetheless the authors noted that further reductions in stock reductions may be necessary. Given the relatively high stocking rates permitted in previous HLS schemes compared to the rates suggested through strict application of the HLS guidance for moorland options this lack of habitat recovery is perhaps unsurprising.

Table 2: Data on vegetation height and cover, and heather grazing index at Okehampton Common reported in the 2014 survey

Outcome	2004	2006	2008	2014	$F_{3,225}$
Dwarf shrub cover, %	9.8 (16.30)	8.2 (16.06)	3.8 (13.09)	4.2 (10.92)	10.5 (p<0.001)
Bilberry cover, %	0.2 (0.46)	0.2 (0.55)	0.5 (1.15)	4.5 (9.73)	22.4 (p<0.001)
Heather cover, %	8.5 (15.88)	7.3 (14.99)	1.6 (6.63)	2.5 (7.26)	9.8 (p<0.001)
Bilberry height, cm	NR	7.5 (4.98)	NR	8.8 (5.01)	22.5 (p<0.001)
Heather height, cm	11.9 (9.06)	11.1 (4.99)	6.4 (6.54)	8.2 (4.08)	22.5 (p<0.001)
Graminoid height, cm	8.0 (4.00)	7.7 (4.44)	6.8 (3.71)	6.0 (3.33)	2.2 (non significant)
Mean heather grazing index	43.3 (28.98)	47.3 (29.32)	64.0 (31.51)	63.2 (36.17)	4.85 (p<0.01)

Data are presented as mean (standard deviation).

Ugborough and Harford Moors

The latest follow-up on the Ugborough and Harford Moors was reported in 2017, using data from a 2014 survey (4). Like the 2017 Okehampton report, the Ugborough and Harford Moors study examined whether changes in stocking rates from before 1998 to 2010 (Table 3) had an impact on vegetation growth and cover.

Table 3: Stocking rates at Ugborough and Harford Moors

Period	Average summer stocking rate (LU/ha)	Average winter stocking rate (LU/ha)
Pre-1998	0.490	0.439
1999/2000 (ESA agreement)	0.258	0.143
2001 (ESA agreement	0.258	0.158

After 2010 (HLS agreement)	0.3	0.17

Since 2004 the grazing intensity on heather significantly increased, with a grazing index of 44.1% in 2004 and 77.9% in 2014 (F_{286}=7.17; p<0.01) (Table 4). This resulted in a non- significant decline in the cover of heather between 2004 and 2014 (1.4% versus 0.8%; F_{286}=0.7). Despite this, dwarf shrub cover had a net increase from 3.5% in 2004 to 11.4% in 2014 (F_{286}=5.0; p<0.01), which was caused by a significant increase in the cover of bilberry (0.6% versus 5.3%; F_{286}=9.6; p<0.001). Notably, while heather cover decreased, heather height increased from 11.6 cm in 2004 to 13.7 cm in 2014 (F_{286}=3.1; p<0.001), as did graminoid height (F_{286}=6.3; p<0.01). It should be noted that the average annual stocking rates for both summer and winter on Ugborough and Harford moors as agreed under the 2010 HLS agreement, are substantially higher than the recommended restoration grazing rates for any of the main moorland habitats according to the Natural England guidance on setting stocking prescription under HLS moorland options, e.g. blanket blog, upland dry heath, upland wet heath and fragmented heath have recommend aver annual stocking rates for restoration of 0.018, 0.051, 0.022 and 0.051 LU /ha respectively.

The 2002 survey of the Ugborough and Harford Moors showed that dwarf shrub condition declined between 1999 to 2002, despite a reduction in stocking levels in the same period (Table 3) (2). Heather grazing index reduced from between 1998 and 2002 but remained high at 61% in 2002 (down from 75% in 1998). Dwarf shrub cover decreased from 14.2% in 1998 to 4.6% in 2002 (6.1% at the points sampled in both 1998 and 2002). Similarly, heather cover decreased from 7.4% to 1.4% (2.0% at points sampled in 1998 and 2002) between 1998 and 2002.

The authors concluded that consecutive agri-environment scheme agreements had limited improvement on the condition of the vegetation, with grazing pressure remaining high after reductions in stocking rates. However, the authors noted that even under optimum grazing intensity, full recovery of the vegetation is only likely in the long term, due to the degraded condition of the heath and bog in part reflecting historically high stocking levels.

Table 4: Data on vegetation height and cover, and heather grazing index at the Ugborough and Harford Moors reported in the 2014 survey

Outcome	2004	2007	2014	$F_{2,86}$
Dwarf shrub cover, %	3.5 (10.15)	4.9 (15.67)	11.4 (22.51)	5.0 (p<0.01)
Bilberry cover, %	0.6 (1.75)	2.4 (9.26)	5.3 (11.61)	9.6 (p<0.001)
Heather cover, %	1.4 (6.16)	0.9 (4.91)	0.8 (2.67)	0.7 (non significant)
Heather height, cm	11.6 (6.21)	15.8 (8.20)	13.7 (7.42)	3.1 (p<0.05)

Graminoid height, cm	9.0 (4.04)	9.8 (6.01)	7.0 (6.09)	6.3 (p<0.01)
Mean heather grazing index	44.1 (25.34)	56.4 (29.62)	77.9 (29.24)	7.17 (p<0.01)

Data are presented as mean (standard deviation).

Winsford Allotment, Exmoor

While efforts to reduce grazing pressure and improve dwarf shrub cover on Dartmoor have had limited success, there are cases from other regions in South-West England where reducing stocking improved the condition of vegetation. One such case is the Winsford Allotment on Exmoor (22).

After the introduction of Environmentally Sensitive Area (ESA) agreements in 1993, summer stocking rates on the Winsford Allotment reduced considerably and winter stocking was eliminated completely (Table 5).

Table 5: Stocking rates at Winsford Allotment

Period	Average summer stocking rate (LU/ha)			Average winter stocking rate (LU/ha)		
	Cattle	Sheep	Total	Cattle	Sheep	Total
1992/1993	0.027	0.305	0.332	0.362	0.316	0.678
1995/1996	0.000	0.105	0.105	0.000	0.000	0.000
2002/2003	0.000	0.105	0.105	0.000	0.000	0.000
2010 (HLS agreement)	NR	NR	0.09–0.15	0.000	0.000	0.000

Mean heather grazing index reduced from 88.2% in 1993 to 14.2% in 1996 and 10.0% in 2003 (Table 6). This led heather cover to improve from 5.0% in 1993 to 8.4% in 1996 and 29.4% in 2003. Mean dwarf shrub height also improved between 1993 and 2003 (5.0cm–23.1cm). Over the same period of time, the vegetation type on the Winsford Allotment change from a grassland majority (rough acid grassland, 73%; bent-fescue grassland, 16%; heather/wet heath, 8%) to a wet heath majority (rough acid grassland, 18%; bent-fescue grassland, 21%; heather/wet heath, 50%).

The authors concluded that heath restoration was achieved under an Exmoor ESA Tier 2 agreement and that the Tier 2 moorland performance indicators had been met on the Winsford Allotment. However, they cautioned that even with good early regeneration, heath recovery at the site takes time (43% Heather cover after 10 years) and some agri-environment schemes at the time were over ambitious with their goals (e.g. 40–50% cover after 5 years).

A follow-up survey of the Winsford Allotment was carried out in 2014; however, the 2014 survey used a different sampling regimen to the earlier surveys, making a direct analysis of change difficult. That said, the study drew some general comparisons. The grazing index was 23.2% overall, 14.0% in heather heath, and 17.4% in fragmented heath, which was higher than the 2003 value of 10%. Heather cover was 35% in heather heath and fragmented heath in 2014, and mean dwarf shrub height was 24cm in fragmented heath 48cm in heather heath. Mean bracken cover was 27% in 2014, which compared with 7% in 2003. Notably, the mean proportion of land classed as bent-fescue grassland or rough acid grassland decreased from 2003 to 2014 (39% versus 14%).

The authors concluded that the initial improvement in the condition and extent of heather caused by initiation of the ESA agreements in 1993 had been maintained during the transition to HLS agreements in 2010, although there was not a notable increase in heather since 2003 and restoration to the full complement of dry heath indicator species across the site is likely to take much longer.

Table 6: Data on vegetation height and cover, and heather grazing index at the Winsford Allotment reported in the 2003 survey

Outcome	1993	1996	2003
Dwarf shrub cover, %	-	-	31.2
Dwarf shrub height, cm	5.0	8.0	23.1
Heather cover, %	5.0	8.4	29.4
Heather/wet heath, %	8	NR	50
Bent-fescue grassland	16	NR	21
Rough acid grassland	73	NR	18
Bracken	1	NR	7
Western heath	1	NR	2
Other (scrub	1	NR	2
Mean heather grazing index	88.2	14.2	10.0

Abbreviations: NR, not reported.

Dozmary Downs, Bodmin Moor

Dozmary Downs in Bodmin Moor also improved vegetation condition by reducing stocking rates between 2003 and 2011 (Table 7) (23).

Table 7: Stocking rates at Dozmary Downs

Period	Average summer stocking rate (LU/ha)	Average winter stocking rate (LU/ha)
2003	0.7 (16 April–July)	0.3 (December–15 April)*
2005	0.7 (16 April–31 August) and 0.5 (September–October)	0.3 (1 November–15 April)
2011 (HLS agreement)	0.32 (February–September)	0.00 (unless permitted by Natural England)

*Stocking rates unclear from August to November.

Heather grazing index reduced from 31.4% to 11.2% in 2014 (Table 8); the number of heavily grazed features also decreased (x^2=106.8; p<0.001). This was accompanied by a significant improvement in dwarf shrub cover between 2004 and 2014 (2.7% versus 7.5%; $F_{3,161}$=12.0; p<0.001), caused by an uplift in heather cover from 2.3% in 2004 to 5.8% in 2014 ($F_{3,161}$=12.3; p<0.001). Bilberry cover did not improve (0% in both surveys). Heather height increased from 9.0cm in 2004 to 10.3cm in 2014 ($F_{3,161}$=14.7; p<0.001), as did graminoid height ($F_{3,161}$=8.1; p<0.001).

The authors concluded that reductions in stocking levels had been successful in improving dwarf shrub height and cover, but noted that the dry heath is still predominantly fragmented, and much longer timescales will be needed to allow recovery of indicator species and heather heath vegetation type.

Notably, while summer stocking rates reduced from 2003 levels, the rate in 2011 was still relatively high and was comparable to summer rates at Ugborough and Harford Common, which saw a decline in dwarf shrub cover between 2004 and 2014. While this may be explained by site-specific variables, it is also possible that the success at Dozmary Downs was partially attributable to the exclusion of livestock between October and February, allowing vegetation recovery while growth rates are at their lowest.

Table 8: Data on vegetation height and cover, and heather grazing index at Dozmary Downs reported in the 2014 survey

Outcome	2004	2005	2006	2014	$F_{3,161}$
Dwarf shrub cover, %	2.7 (5.35)	2.8 (5.00)	2.4 (4.9)	7.5 (11.16)	12.0 (p<0.001)
Bilberry cover, %	0.0 (0.00)	0.0 (0.16)	0.0 (0.07)	0.0 (0.31)	1.7 (non significant)
Heather cover, %	2.3 (4.38)	1.3 (2.14)	2.1 (4.65)	5.8 (8.81)	12.3 (p<0.001)
Heather height, cm	9.0 (16.90)	8.0 (15.27)	5.0 (2.95)	10.3 (3.64)	14.7 (p<0.001)

Outcome	2004	2005	2006	2014	$F_{3,161}$
Graminoid height, cm	5.6 (2.20)	5.3 (1.79)	4.5 (1.81)	6.8 (2.75)	8.1 (p<0.001)
Number of heavily-grazed features, n/N	31/35 (1.88)	34/36 (1.37)	33/36 (1.66)	6/58 (2.32)	X^2=106.8 (p<0.001)
Mean heather grazing index, %	31.4 (32.58)	38.2 (24.44)	NR	11.2 (14.62)	17.77 (p<0.001)

Data are presented as mean (standard deviation).

Birbeck Commons, Lake District

The results of the Dozmary Downs surveys were echoed at Birbeck Common in the Lake District (24). Stocking rates were reduced at Birbeck Common in 2001 and again in 2010 relative to 1998 levels (Table 9).

Table 9: Stocking levels at Birbeck Commons

Period	Average annual stocking rate	Average summer stocking rate	Average winter stocking rate
1998	3.2 sheep/ha, 0.17 cattle/ha, 0.05 equines/ha	NR	NR
2001 (ESA agreement)*	NR	1.5 sheep/ha (0.225 LU/ha)	25% reduction compared with summer rates
2010 (HLS agreement)	NR	1.3 sheep/ha or 0.104 LU/ha	No sheep grazing from November to March

*12 of 15 commoners agreed to the 2001 ESA

The reduction in stocking rates resulted in a lower heather grazing index from 2004 to 2015 (48.1 versus 19.4; $F_{4,194}$=5.79; p<0.001), as well as fewer heavily grazed features (X^2=27.0; p<0.001) (Table 10). Heather cover significantly increased from 9.0% in 2004 to 13.7% in 2014 ($F_{4,194}$=5.8; p<0.001). Heather height also significantly increased between 2004 and 2015 (17.3cm versus 24.9cm; $F_{4,194}$=5.5; p<0.001), as did graminoid height ($F_{4,194}$=8.4; p<0.001). Dwarf shrub cover increased between 2004 and 2015, but not significantly (12.2% versus 16.8%; $F_{4,194}$=1.8).

Notably, all vegetation growth and cover metrics improved between 2009 and 2015, after the HLS agreements excluded winter grazing, with heather cover improving from 10.7% in 2009

to 13.7% in 2015 and heather height increasing from 19.1cm in 2009 to 24.9cm in 2015. However, it was unclear whether exclusion of winter grazing was the main factor driving growth from 2009 to 2015, as summer stocking rates also decreased as part of the HLS agreement.

The authors concluded that reduction in stocking levels under the ESA and subsequent HLS agreements, along with cessation of winter grazing under HLS, have been successful in reducing the grazing intensity on heather and other vegetation.

Table 10: Data on vegetation height and cover, and heather grazing index at Birbeck Commons reported in the 2015 survey

Outcome	2004	2005	2006	2009	2015	$F_{4,159}$
Dwarf shrub cover, %	12.2 (24.75)	12.0 (22.31)	15.7 (25.48)	16.0 (24.71)	16.8 (27.15)	1.8 (non significant)
Bilberry cover, %	0.6 (0.62)	0.6 (0.68)	0.9 (0.54)	0.1 (0.79)	0.9 (0.39)	0.4 (non significant)
Heather cover, %	9.0 (22.87)	6.0 (17.75)	10.7 (23.58)	10.7 (22.93)	13.7 (26.69)	5.8 (p<0.001)
Heather height, cm	17.3 (9.28)	14.1 (8.77)	15.0 (9.96)	19.1 (11.27)	24.9 (11.10)	5.5 (p<0.001)
Graminoid height, cm	11.0 (5.35)	12.3 (8.03)	8.3 (4.29)	11.9 (10.92)	14.2 (5.87)	8.4 (p<0.001)
Number of heavily-grazed features, n/N	20/24 (1.83)	NR	26/48 (3.45)	23/46 (3.39)	5/33 (2.06)	x^2=27.0 (p<0.001)
Mean heather grazing index	48.1 (34.68)	39.4 (27.02)	28.6 (35.53)	20.3 (27.19)	19.4 (13.94)	5.79 (p<0.001)

Data are presented as mean (standard deviation).

Climate change

There are limited data on the impact of climate change on condition or changes in habitat or wildlife features on Dartmoor. However, one study was identified that used generalised linear mixed models (GLMM) and generalised additive mixed models (GAMM) to predict changes in Sphagnum cover between 2020 and 2050 based on projections of climate change and atmospheric deposition of nitrogen and sulphur (28). Smart 2011 reported that predicted changes in cover were all small but also highly uncertain. The generalised additive mixed model predicted that climate change would negatively impact Sphagnum cover on Dartmoor by 2050 (figure 6 of publication). Further comparison with generalised linear mixed models indicated that pollution exacerbates the predicted impact due to climate change in Dartmoor. Notably, Dartmoor was one of the peatlands expected to be most affected by climate change in combination with atmospheric pollution, alongside the Brecon Beacons and the western Lake District.

Bracken

One randomised controlled trial was identified that examined the effectiveness of cutting and chemical control on the growth of bracken at six locations in the UK (26). Of the six locations examined, only Devon and the Lake District met the inclusion criteria for the review; data were not extracted for Mull, Scottish Borders, Clwyd, and Breckland.

The study examined the effectiveness of six interventions:

- Untreated (control)
- Cut once yearly, starting 1993
- Cut twice yearly, starting 1993
- Single application of asulam in 1993
- One cut and single application of asulam in 1993
- Single application of asulam in 1993 followed by cut in 1994

The data reported for Devon and the Lake District are summarised in Table 11 and Table 12. The key findings were as follows:

- Of the five active interventions, cutting once yearly was the least effective at reducing bracken growth, although frond biomass, density, and height and rhizome biomass were still lower after 3 years compared with the control.
- Cutting twice yearly was more effective than cutting once yearly or control, with the twice-yearly intervention resulting in lower frond biomass, density, and height and rhizome biomass after 3 years compared with cutting once yearly or control. In addition, cutting twice yearly reduced rhizome biomass more than cutting once yearly or single application of asulum in 1993.
- Single application of asulum in 1993 reduced frond growth compared with control; however, it had little to no effect on rhizome biomass. Asulum also reduced frond biomass and density more than cutting twice yearly, although the difference between the treatment was not substantial.
- Cutting once plus a single application of asulam in 1993 did not reduce frond growth compared with a single application of asulam in 1993, alone. Instead, frond biomass was higher in 1995 for plots that we cut once and then treated with asulum compared with plots that were only treated with asulum.
- Single application of asulam in 1993 followed by cut in 1994 also had similar effect on frond growth compared with a single application of asulam in 1993, alone.
- Overall, the most effective measures at reducing frond growth were cutting twice yearly, single application of asulum in 1993, and Asulam in 1993 followed by cut in 1994. The most effective measure at reducing rhizome biomass was cutting twice yearly.
- These trends were confirmed at the national level, and there was little difference between sites.

Two additional studies have confirmed the efficacy of asulam for reducing bracken growth on Dartmoor (26, 27).

Table 1: Outcomes of bracken control in 1994 and 1995 in Devon

Treatment	Frond biomass, g/m²		Frond density, n/m²		Frond height, cm		Rhizome biomass 1995, g/m²
	1994	1995	1994	1995	1994	1995	
Untreated	282.1 (5.61)	362.1 (5.83)	14.7 (3.93)	16.0 (4.09)	115.3 (4.75)	110.7 (4.71)	1,789.1 (7.48)
Cut once yearly	139.2 (4.66)	227.9 (5.40)	12.7 (3.63)	18.0 (4.35)	78.3 (4.34)	78.0 (4.37)	1,221.1 (7.10)
Cut twice yearly	82.3 (3.81)	46.8 (3.57)	12.0 (3.45)	10.0 (3.29)	58.5 (4.04)	37.7 (3.62)	1,192.5 (7.08)
Single application of asulam in 1993	8.8 (2.18)	35.2 (1.90)	0.9 (1.38)	2.7 (1.90)	76.2 (4.34)	72.2 (4.24)	1,589.2 (7.36)
One cut plus asulam in 1993	56.2 (4.03)	92.1 (4.34)	8.0 (2.87)	8.0 (2.96)	78.9 (4.38)	61.3 (4.12)	NR
Asulam in 1993 followed by cut in 1994	15.5 (2.80)	28.4 (1.73)	1.1 (1.43)	2.0 (1.73)	93.9 (4.52)	71.7 (4.27)	NR

Abbreviations: NR, not reported.

Table 2: Outcomes of bracken control in 1994 and 1995 in the Lake district

Treatment	Frond biomass, g/m²		Frond density, n/m²		Frond height, cm		Rhizome biomass 1995, g/m²
	1994	1995	1994	1995	1994	1995	
Untreated	282.6 (5.64)	408.7 (6.01)	28.7 (5.43)	36.0 (6.04)	72.3 (4.30)	70.8 (4.27)	1,409.9 (7.25)
Cut once yearly	218.4 (5.38)	190.3 (5.13)	32.0 (5.74)	30.0 (5.50)	57.4 (4.07)	42.6 (3.76)	1,286.4 (7.16)
Cut twice yearly	138.2 (4.81)	118.6 (4.74)	30.7 (5.60)	26.0 (5.09)	42.1 (3.75)	37.2 (3.64)	1,026.6 (6.92)
Single application of asulam in 1993	3.6 (1.53)	44.9 (3.59)	2.3 (1.82)	10.7 (3.36)	30.1 (3.44)	32.9 (3.51)	1,481.1 (7.28)
One cut plus asulam in 1993	42.5 (3.68)	141.6 (4.73)	7.3 (2.88)	23.3 (4.88)	47.4 (3.86)	40.1 (3.70)	NR
Asulam in 1993 followed by cut in 1994	4.1 (1.62)	22.3 (2.92)	2.3 (1.83)	8.7 (3.05)	29.1 (3.39)	27.0 (3.33)	NR

Abbreviations: NR, not reported.

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Cumbrian Commons

An unpublished report by Natural England 'Grazing Regimes for Nature Recovery' details the effects of grazing regimes implanted on over 40 commons in Cumbria. The summary of the report is included below and the full report see Evidence Review Folder DR008.

"Summary

Healthy habitats in the Lake District's high fells deliver a range of public benefits including biodiversity, filtration of water, moderation of water flows, helping to reduce landslips, carbon storage and capture, contributing to health and wellbeing and are part of the area's landscape, history and culture.

By the early 1990s, farm subsidy regimes had led to high levels of grazing over most of the Cumbrian fells and this had led to deterioration and loss of many upland habitats and a reduction in the public benefits they provided.

Natural England staff in Cumbria have many years of experience of working on upland agri- environment schemes and SSSIs– in some cases going back 25 years and adding up to over 150 'person-years' of work in the uplands. This report draws on this experience as well as data gathered as part of formal SSSI assessment.

Habitats have recovered best under low grazing pressure. Recovery of existing SSSI habitats has been universally good below a year-round average of 0.4 ewes/ha. Good recovery has sometimes been seen up to an annual average of about 0.5 ewes/ha. No sites stocked at or above an annual average of 0.6 ewes/ha have fully recovering habitats.

Habitat response varies between sites; factors affecting this are discussed in this report. To achieve different objectives, for example to restore scrub, woodland, tall herb vegetation or radically alter vegetation structure, it is necessary for sheep grazing to be at even lower levels (or excluded for a period of time). The responses of a range of habitats to altered grazing regimes is reviewed.

A variety of management regimes is welcome. Changes to grazing by hardy cattle (instead of just sheep) have been highly beneficial and light pony grazing may also have similar effects. Ecological restoration of sites with relatively good remnant vegetation is straightforward, just requiring appropriate stocking rates. Sites in poorer ecological condition may need more complex interventions. (eg reintroduction of missing species or disturbance to dominant species).

Successful agreements are often where farmers have adopted low input/low output systems. Reducing nutrient inputs has major ecological benefits. Reducing costs is key to achieving economic sustainability but the whole sector is still subject to severe economic threats. A summary of feedback received from farmers is included in this report."

Annex 1: Stocking Rates in HLS agreements on the Lake District High Fells SAC at March 2018

SSSI	Site	Agreement number	Sheep summer rate (max ewes/ha*)	Sheep (ewes/ha*) maximum annual average	Complete off-wintering of sheep Nov-Mar	Cows in addition to sheep	Notes	Current management in place since (approx)	Date of last Condition Assessment or visit*	Is it working? (Yes/no/ partially)	Summary of Condition Assessment
Armboth Fells			0	0	Yes	No	Stock excluded, some red deer pressure	2013	2017	Yes	Good recovery of dwarf shrubs in areas where these were still present
Shap Fells Pillar and Ennerdale			0	0	Yes	No	Stock excluded, significant red deer pressure	2013	2017	Yes	Mostly blanket bog, habitat condition good and improving.
Pillar and Ennerdale			0.32	0.01	Yes	Yes	25 cattle in summer, sheep may be phased out	2007		Yes	Blanket bog and scree favourable. Heathland and montane habitats recovering. Improving all round condition of habitats. Stock trespass issue has been addressed and situation is improving
Armboth Fells			0.4	0.2	Yes	Yes	10 cattle year round	2007	2010	Yes	Improving all-round condition of habitats. Historic stock trespass issue no longer an issue
Pillar and Ennerdale			0.62	0.34	Yes	No		2003?	2015	Yes	Good all-round condition of habitats
Skiddaw Group			0.67	0.35	Yes	No		2003?	2010	Yes	Good all-round condition of habitats
Armboth Fells			0.71	0.4	No	No		2007	2010	yes	Blanket Bog and scree favourable. Heathland and montane habitats recovering well.
Armboth Fells			0.05	0.05	No	No		2005?	2015	Yes	Brief visit only but all habitats appeared to be thriving
Armboth Fells			0.68	0.3	Yes	No		2008	2010	Yes	Good all-round condition of habitats
Skiddaw Group			0.67	0.31	Yes	No		2003	2010	Yes	Good all-round condition of habitats
Skiddaw Group			0.67	0.35	Yes	No		2004	2007	Yes	Good all-round condition of habitats
Helvellyn and Fairfield			0.67	0.35	Yes	No		1999	2007	Yes	Good all-round condition of habitats
None Shap Fells Pillar and Ennerdale			0.08	0.08	No	No		2005?	2015	Yes	Brief visit only but all habitats appeared to be thriving
Buttermere Fells			1.18	0.53	Yes	No		2004	2010	Yes	Dry heath recovering well though some localised heavy grazing. Stocking rates are less than the maximum stated in the agreement.
Honister Crags			0.81	0.44	Yes	No		2007	2010	Yes	Good all-round condition of habitats
Skiddaw Group			0.67	0.4	Yes	No		2007	2009	Yes	Recovering but structure poor and recovering from low baseline
			0.67	0.45	No	No	Significant red deer pressure	2004	2009	Yes	Mostly blanket bog. Current grazing impacts low and good recovery expected.
			0.67	0.4	Yes	Yes		2007	2009	Yes	Blanket bog and scree favourable. Heath and montane habitats showing slow recovery
			1.06	0.56	No	No		2006	2014	Yes	Some units have reached favourable, others still recovering. Stocking rates are less than the maximum stated in the agreement.
			0.56	0.45	No	No		2003?	2010	Yes	Most habitats in good condition although some concerns about grazing impacts on dwarf shrubs in some places and potential for expansion of tall herb
			0.8	0.49	Yes	No		2003	2010	Yes	Dry heath in good condition on steep slopes but less so on flatter ground

Helvellyn and Fairfield		0.6	0.48	No	Yes		2007	2010	Yes	Improving all-round co and montane habitsts
Helvellyn and Fairfield		0.96	0.42	No	No		2007	2010	Partially	Trespass from Grasm recovery but overall th
Buttermere Fells		1.25	0.68	No	No		2005	2014	Partially	A mixed picture due to complex topography le grazing. Some units re and some unchanged
Skiddaw Group		0.81	0.66	No	No		2004	2010	Partially	Much of dry heath is re fragmentary on steep
Helvellyn and Fairfield		1.2	0.57	No	Yes	20 cattle in summer	2007	2010	Partially	Trespass from Grasme recovery over past 5 y
Helvellyn and Fairfield		0.85	0.58	No	Yes	10 cattle in summer	2007	2010	Partially	Trespass from Grasme recovery over past 5 y
Scafell Pikes		0.64	0.42	No	No		2012	2010	Partially	Needs a more systema recovery but stock tres in upper end.
Skiddaw Group		1.35	0.74	No	No		2010	2018	Partially	Blanket bog and rocky mountain top vegetatio are poor due to grazin
Helvellyn and Fairfield		0.87	0.54	No	No		2007	2010	Partially	Recovery patchy and g further adjustment
Shap Fells		0.79	0.53	Yes	ponies	Unauthorised ponies	2010	2017	Partially	A mixed picture. All bla pony feeding) in good condition; many areas fragmented and suffer
none (adj Pillar)		1.38	0.59	No	No	This is under review	2009	2016	No	Poor condition of fell. H required outcomes
Wasdale Screes		1.67	1.16	No	No	This is under review	2009		No	NT visit suggests poor
Birk Fell		1.2	0.64	No	No	Heavy red deer pressure	2012	2017	No	Poor condition of all ha
no biological SSSI		1.47	0.85	No	No		2011	2015	No	Little overall change in bog sward height incre indicators showed no
Pillar and Ennerdale		0	0	Yes	Yes	No sheep, cattle in summer only	2013		Not assessed	Needs site visit
Scafell Pikes		1	0.43	No	Yes		2013		Not assessed	Information from NT vi

Armboth Fells		0.66	0.3	Yes	No		2013	2010	Not assessed	Not assessed since ne
Armboth Fells		0.8	0.34	Yes	No		2013	2010	Not assessed	Not assessed since ne
Skiddaw Group		1.26	0.61	No	Yes	Up to 50 cattle in summer	2013		Not assessed	Assessment being com
Buttermere Fells		1.18	0.51	No	No		2013	2014	Not assessed	At time of assessment new off-wintering regim
Skiddaw Group		1.07	0.54	No	Yes	Summer: 12 ponies and 15 cattle, winter: 17 ponies	2013	2010	Not assessed	Being assessed 2019/2
Scafell Pikes		0.84	0.49	No	No		2013	2010	Not assessed	No assessment since c
Scafell Pikes		1.2	0.62	No	Yes		2012		Not assessed	No NE visit. Informatio

Question 34
Q34. Examples of optimised grazing regimes (and what those regimes have been) that have improved the habitat status with quantitative evidence.

Response

A 2009 review of Agri-environment schemes (AES) in England (Natural England, 2009) found that, whilst many moorland AES agreements had been successful at halting habitat decline, there had been less success in improving habitat condition particularly of heath and bog. Agreements that had been most successful were generally associated with higher stock reductions, and usually involved off-wintering or stock removal. The review highlighted that the poorer the starting condition of a site the lower grazing pressure it can withstand. The review gives the example of Winsford Allotment on Exmoor in the South-West, as a site that showed improvement in habitat condition under AES, due to significant stock reductions and off wintering (under Tier 2; also described in Darlaston and Glaves, 2004). It has been acknowledged that lower grazing pressure on Exmoor has historically resulted in greater populations of target species (Boatman and others, 2008) when compared to Dartmoor.

A relatively old review of sustainable grazing practices on the South-West moors of England identified 20 sites considered to then be in good condition, seven of which were on Dartmoor (three newtakes and four commons/part-commons) with the remainder on Exmoor (ten sites), West Penwith (two) and Bodmin Moor (one) (Smallshire and others, 1997). The authors note that "tentative conclusions suggest that ESA prescriptions are broadly similar to [stocking rates on] the sites examined, although the results of monitoring must be awaited before the effects of applying these prescriptions on degraded sites can be assessed." The condition of Dartmoor moorland at the time was likely considerably better than now, although there was already evidence of heather loss prior to this (e.g., Wolton and others, 1994).

Habitat condition across much of Dartmoor continued to decline under Environmentally Sensitive Area schemes (mostly Tier 1), whilst some other upland areas showed some improvement in habitat condition and bird species abundance in response to reduced grazing pressure. A Natural England report on upland AES in Cumbria summarises the outcome of a range of agreements, many on commons, with some showing much greater success than others (Natural England, 2020). The report highlights examples of good habitat recovery, particularly where grazing pressures were lower under Higher Level Stewardship restoration options. Sites with less productive vegetation or in very degraded condition showed recovery when grazed at rates significantly below an annual average of 0.4 ewes/ha, while the authors note that "We know of no examples, whether SSSI or not, where a grazing level at or above an annual average of 0.6 ewes/ha has allowed good habitat recovery."

Natural England also carry out moorland vegetation mapping and condition assessment surveys in-house and using contractors. Some of these assessments have shown positive habitat responses to reduced grazing pressure at sites across the South-West Moors. This evidence, along with condition data from other sources is being compiled as part of a Natural England evidence review and will be presented to the inquiry separately to this response.

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Question 35 and 36
Q35. What swaling regimes have been granted on SSSIs under the HLS areas? Q36. What are the risks of swaling given current conditions of the vegetation? What measures can be put in place to address these?

Response

Q35. What swaling regimes have been granted on SSSIs under the HLS areas?

Swaling On Dartmoor commons swaling (burning) is the responsibility of the landowner and may be carried out by commoners only with the permission of the owner.

Typical agreement prescriptions state *'Follow a programme (agreed in writing with your Natural England adviser) of rotational heather, grass or gorse management'* which means that burning is approved separately from the main HLS agreement.

Most commons HLS agreements have active swaling plans in place produced by the commons association that aim to help deliver the scheme objectives through rotational management of vegetation. Where there is no swaling plan this is usually where burning is not an appropriate management option for the habitat or because of objectives for historic environment features. Proactive cutting of fire breaks or control lines forms part of these agreed swaling regimes, both to enable safe delivery of the burning proposed but also to help manage wildfire risk. Advice on scale and location of burns is provided through a process of consultation with Natural England ahead of plans being submitted to RPA for sign off.

Burning is regulated by the Heather and Grass etc Burning (England) Regulations 2007 (hereafter the '2007 Regulations') and the Heather and Grass etc Burning (England) Regulations 2021 (hereafter the '2021 Regulations').

The 2007 Regulations are administered by Natural England. There are a number of provisions, but the main ones relevant to Dartmoor are that the Regulations establish a 'burning season' (1st October – 15th April), limits the maximum size of fires to 10ha and require that fires are under control at all times.

The 2021 regulations require that any burning (with minor exceptions) of vegetation on peat more than 40cm deep in SAC and SPA is licenced by the Secretary of State.

Q36. What are the risks of swaling given current conditions of the vegetation? What measures can be put in place to address these?

Swaling may impact SSSI condition, and it may result in uncontrolled fire if not properly managed.

Swaling removes the surface vegetation and in heath areas may result in temporary dominance of bristle bent (*Agrostis curtisii*). If burning is too frequent and is combined with high stocking rates heather dominated vegetation may be replaced by grass. It is likely that in some areas swaling has contributed to the dominance of *Molinia*. Swaling also affects the

distribution of livestock which are attracted to recently burned areas so leaving other areas underutilised. Careful planning of controlled burning and coordination with grazing management can mitigate these risks (Glaves and Haycock, 2005).

The main risk of uncontrolled fire on Dartmoor arises in areas where there is dominant *Molinia* or, in heathland areas, where there is gorse. Fire risk is highest in late winter and early spring and if there are weather conditions that result in drying of the surface vegetation**.**

In the UK there is a very low risk of wildfire being caused by natural events (eg lightning) and almost all fires are caused by people. However, our understanding of the precise causes of fire is poor (Glaves et al, 2020; Jones, 2023). On Dartmoor the most likely causes of uncontrolled fire are poorly controlled management burning, third party arson and live firing on military training areas.

Natural England recognises that fire risk is a matter of serious concern for land managers.

Mitigation of the risk of uncontrolled fires can be addressed through planned burning regimes and wildfire risk can be addressed through careful management planning that addresses all the risks associated with uncontrolled vegetation fire. Management Plan templates are available e.g. at Wildfire Risk Management | uplandsmanagement. In some HLS agreements there is active encouragement to cut and maintain fire control lines (or fire breaks/access tracks) to help manage any fire risk. However, the evidence that such activity is effective in preventing or reducing the impact of wildfire is weak. A review of managed burning by NatureScot (Holland et 2022) concluded that:

- the evidence base relating to the role of muirburn in controlling fire intensity and fire severity was too limited to draw firm conclusions;
- There was a lack of evidence relating to muirburn controlling the extent of wildfire in moorland.
- There was a lack of research into the relationship between muirburn and wildfire on non-Calluna dominated habitats.

Habitat restoration, particularly of peatlands, may offer the opportunity to reduce risk and increase resilience to wildfire and other impacts, and potentially address over-dominance of more flammable species, though relatively limited existing evidence is available on this issue specifically in relation to wildfire (Glaves et al, 2020).

On Dartmoor shifting the balance of grazing in favour of spring and summer grazing by cattle over winter sheep grazing may have the benefit of reducing the over winter biomass in *Molinia* dominated areas and therefore contribute to the reduction of fire risk.

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Questions 37 and 38

Q37. What bracken control methods are granted on the SSSIs?
Q38. Who would be expected to control bracken? Why? and how would it be resourced?

Response

Q37. What bracken control methods are granted on the SSSIs?

Bracken control is carried out either by herbicide treatment or by mechanical methods such as repeated cutting or crushing (rolling). Cattle can also be used to crush bracken and expose the rhizomes to frost and cold weather. Dartmoor ponies have been shown to be particularly effective at controlling bracken through grazing, especially in autumn when toxicity is reduced (Lake, 2016). Both chemical or mechanical control may be consented on a SSSI.

Q38. Who would be expected to control bracken? Why? and how would it be resourced?

Bracken may be controlled by the landowner or by the commons association.

Bracken is controlled for a number of reasons. Commoners may wish to control bracken to improve grazing or to facilitate stock management. Bracken is regarded as detrimental to some historic environment features, may impede public access and is sometimes invasive of priority habitats, so control may be encouraged by Natural England when agreements are set up to meet environmental objectives.

Bracken control can be funded through HLS or CS capital payments which are usually for ‘one-off’ treatments, supported by a revenue option that funds on-going follow up.

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Question 40, 41, 42 and 43
Q40. What is the extent of the area of peatland that can be rewetted? Q41. How much peatland restoration has been done and is planned and budgeted for (what is the timeline)? Q42. How quickly will peatland rewetting result in better SSSI condition, over what extent and how long will this take? Q43 What are the costs and feasibility of restoring all restorable peatland on Dartmoor?

Response

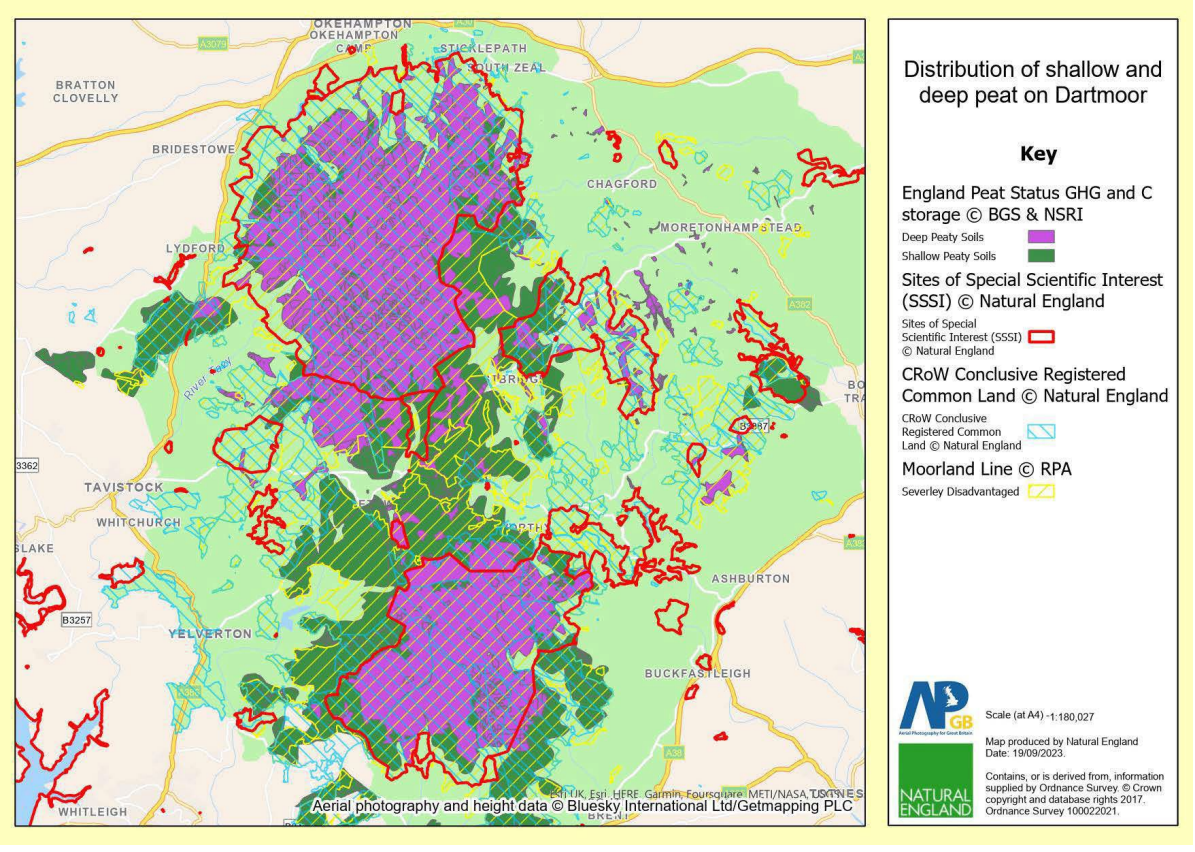
Q40. What is the extent of the area of peatland that can be rewetted?
Q41. How much peatland restoration has been done and is planned and budgeted for (what is the timeline)?

There are an estimated 15,933 ha of deep peat and 2284 ha shallow peaty soils within the SSSI on Dartmoor.

The table below shows this in comparison to the extent of peat across Dartmoor National Park.

Location	Soil Type	Area (ha)
Dartmoor National Park	Deep Peaty Soils	19182
	Shallow Peaty Soils	14261
SSSI (North, South and East Dartmoor)	Deep Peaty Soils	15933
	Shallow Peaty Soils	2284

This map shows the distribution of peat:



In principle all of these areas of peat could be rewetted but whether it will be practical to re- wet the whole extent of peat is uncertain. In the short to medium term, it is likely that restoration capacity will match the area that could practically and economically be restored.

A Natural England topic review (Shepherd et al 2013) found no evidence that any blanket peatlands are unrestorable, although costs of restoration effort may not be repaid rapidly by improvements in function, and the timescales for full recovery to approximate undamaged function may be long. No studies have reported complete restoration to a fully functioning, active, blanket bog, comparable in its characteristics to an intact bog, from any degraded initial condition. However, it is apparent that for some functions at least, restoration is moving bogs, which have been affected by drainage, afforestation, management to deliver non-bog vegetation or other factors, closer towards the biological, hydrological and geochemical condition of intact bogs.

Research by Exeter University (2020) indicates that 2,900 ha of the peat on Dartmoor is significantly and directly ecohydrologically degraded or damaged. They estimated the cost of restoration at between £306/ha to around £5000/ha.

A National Trust case study estimates there are 2,200 hectares of damaged peat on Duchy of Cornwall-owned land in Dartmoor. 410 hectares have already been restored or are currently being restored. The latest project on Dartmoor will see a further 809 hectares restored. The remaining balance will be the subject of future programmes as the Duchy aims to halt emissions from damaged peatland before 2030.

The South West Peatland Partnership is the main collaborative organisation focussing on peatland restoration in the South West. Partners include Dartmoor Commoners' Council, Dartmoor National Park Authority, Duchy of Cornwall, National Trust, South West Water and Forest of Dartmoor Commoners Association. In 2021 they successfully applied to the Nature for Climate Peatland Grant Scheme for a £13.3m project (£9.4m of grant money and £3.9m of private finance) to restore over 2,600 ha of peatland in the South West by March 2025. The latest figures (June 2023) indicate that 350 ha has been restored with work underway on a further 65 ha. South West Water's Upstream Thinking Programme, working with a multitude of stakeholders, has restored a total of 2,480 ha of peatland across Exmoor and Dartmoor since 2010.

Q42. How quickly will peatland rewetting result in better SSSI condition, over what extent and how long will this take?

The rate of improvement in peatland condition following restoration depends on a number of factors including the 'starting conditions'.

The aim of peatland restoration is to restore more natural hydrological function which will include raising the water table in the peat mass. This may be described as re-wetting,

On Dartmoor there is some evidence to quick response in some features to re-wetting, for example increases in breeding dunlin, and reduction in *Molinia* cover.

Studies in the Pennines of the progress of restoration of bare peat over 12 seasons (Pilkington et al 2016) showed that rates of improvement in vegetation cover were rapid but levelled off after 5 years while both cover and number of blanket bog indicator species continued to increase over the 12 years of the study but slowly. This study assessed the progress of restoration of highly degraded peatlands where the starting conditions were eroding bare peat. On Dartmoor the starting conditions are likely to be from less degraded habitat.

Hydrological restoration to reduce the dominance of Molinia to more mixed vegetation has been shown to take 5-7 years. The Applied Ecologist (appliedecologistsblog.com) (accessed 28/09/2023).

Q43. What are the costs and feasibility of restoring all restorable peatland on Dartmoor?

The costs of peatland restoration vary considerably depending on factors such as current state (eg whether re-vegetation or remediation of drainage is required) and accessibility.

In some areas costs may be high – for example the average cost in the South West Peatland Partnership scheme above exceeds £5000 per hectare. In contrast in some areas of peatland vegetation restoration might be achieved through changing vegetation management at a much lower cost.

References

Pilkington, M., Walker, J. and Maskill, R. (2016) Trajectories for impacts of re-vegetation activities on upland blanket bogs. Moors for the Future, Edale. 2016-Trajectories-for-impacts-of-revegetation-Summary-report.pdf (moorsforthefuture.org.uk)

Shepherd, M. J., Labadz, J., Caporn, S. J., Crowle, A., Goodison, R., Rebane, M. & Waters, R. 2013. Natural England review of upland evidence - Restoration of Degraded Blanket Bog. Natural England Evidence Review, Number 003. Restoration of degraded blanket bog - NEER003 (naturalengland.org.uk)

Question 44

Q44.What is the natural capital value of the peatland stored on Dartmoor?

Response

The capital value of peatlands includes their grazing value, potential to contribute to net zero, provision of water supply, flood mitigation potential and contribution to biodiversity and health and well-being.

The UK natural capital account for peatlands notes the following main points about peatlands:

- Supply over a quarter of the UK's drinking water, valued at £888 million in 2016.
- Climate regulation through carbon storage has a negative contribution to ecosystem services; only 22% peatlands are in a near natural or rewetted condition, consequently the Centre for Ecology and Hydrology (CEH) estimated peatlands emitting around 23,100 kt CO2e yr-1 greenhouse gas (GHG) in total.
- Estimated time spent for recreation on peatlands in 2016 is 180 million hours valued at £274 million.
- Publicly funded research on Peatlands estimated to be £882,796 in 2018.
- The net benefits, in terms of climate change emissions alone, of restoring 55% of peatlands to near natural condition are estimated to have a present value of approximately £45billion to £51 billion.

A natural capital atlas (using the Natural Capital Indicators to explore the distribution and condition of natural assets and the benefits they provide to society) has been compiled for Devon which shows the location and relative indicator value for the key ecosystem services provided by the peatland in Dartmoor.

On Dartmoor there is an estimated 8.4 Mt C (million tonnes carbon) in the deep peat area, 8.8 Mt C in the shallow peat/heath areas and 5.0 Mt C in the remainder of the Moor. This is 22 Mt C in total (or 81 million tonnes CO2 equivalent, or 9 years of Devon's per capita emissions). (Source: Cumulus Consultants Ltd Final Report for Dartmoor National Park Authority and Natural England Report No: CC-P-587 September 2013 Dartmoor Farming Futures Project Independent Project Evaluation Microsoft Word - Dartmoor Farming Futures Project Evaluation - Final Report _20 9 13_ _2_.docx).

Question 45

Q45. Is there a relationship between wetting and grazing and the condition of SSSI's?

Response

Restoration of hydrology is one possible means of reducing the dominance of *Molinia.*

Bog, wet heath and valley mires / fens would be expected to improve in condition in response to re-wetting and reduction in grazing, particularly in winter, when wet ground is vulnerable to poaching from even very light grazing. The Mires on the Moors Project (Brazier and others, 2020) looked at the implications for the grazing value of moorland sites if re-wetting were undertaken. It noted that '*Cattle spend little time in either degraded or restored mires, and so restoration should have a negligible effect on the area used for grazing such that restoration should have a minimal impact on the overall grazing value of a site*'.

Currently much (but not all) of the drained and degraded blanket bog and wet heath on Dartmoor is dominated by dense swards of *Molinia. Molinia* is a less preferred feed plant for most stock during most of the year (see response to question on *Molinia*). Control of *Molinia* through the blocking of drainage ditches and associated peatland restoration is the preferred option to reduce *Molinia* dominance where possible. If this re-wetting was undertaken, it is anticipated that the application of an enhanced *Molinia* stocking rate (as discussed in response to the question on *Molinia* control) would not be required and instead low stocking rates e.g., suitable for restoration of blanket bog communities i.e., 0.018 LU / ha /yr would be applied.

References

Brazier, R.E., Angus, M., Benaud, P., Gatis, N., Luscombe, D.J., Anderson, K., Ashe, J., Barrowclough, C., Carless, D., Freeman, G., Gillard, M., GrandClement, E., Hand, A., Malone, E., McAleer, A. and Smith, D. (2020) Mires on the Moors: Science and Evidence Report 2020, University of Exeter, Exeter, UK

Questions 46, 47, 48, 49 and 50

Q46 Who are the people and what are the skillsets needed to deliver healthy ecosystems across Dartmoor?
Q47 What structures and support need to be in place to enable success? What is the current situation and the strength, weaknesses and threats associated?
Q48 What financial support is needed?
Q49 Are all the parties involved able and willing to work collaboratively? What resources and support, etc do different parties require to achieve this?
Q50 Are the current structures and arrangements, including the CS agreement structure, fit for purpose. What alternatives are there?

Response

Q46. Who are the people and what are the skillsets needed to deliver healthy ecosystems across Dartmoor?

A thriving local community will underpin healthy ecosystems on Dartmoor.

We have considered how the skills available to farmers can be harnessed to deliver environmental outcomes and the support they will need to deliver to best effect. Ideally agreements will be farmer led so that there is a greater sense of ownership and we suggest measures that would incentivise more commoners to take an active role in management of commons and measures that would bring innovation on managing land for nature and climate as well as food production into management and decision making. More of the farming and other communities of interest should be enfranchised to take part in and benefit from management of the commons.

Agri-environment agreements are more successful when the agreement holders take an active role in developing the agreement and are fully engaged in the delivery of the agreed outcomes. The key to achieving farmer engagement is trusted support and facilitation particularly through the development of the agreement but also at key points through the agreement term. Facilitation is especially important where there are multiple parties to an agreement, including on commons.

Agreements on commons have the potential to provide wider benefits for the farming community where the agreement itself, supported by the associated funding, leads to collaboration and innovation.

One form of farmer engagement is self-assessment of agreement delivery towards agreed objectives and an element of payment by results. Self-assessment has the potential to improve engagement from agreement holders provided it is supported by ecological advice, not just on whether the agreement outcomes are being met but also advice on how management is impacting on the delivery of those outcomes.

The experience of Dartmoor Farming Futures (DFF) showed that the process of self- assessment of agreement benefit had its limitations. In particular, there was too little assessment by the agreement holders of how their management was impacting on delivery of scheme outcomes such as SSSI condition. Agreement holders appeared to take the view their current management had no impact on poor SSSI condition and consequently management decisions seemed to be more driven by agricultural objectives then scheme outcomes, especially in relation to SSSI condition. There is little evidence that DFF's farmer led approach resulted in better delivery of environmental outcomes. If an approach similar to DFF is to be effective there would need to be clarity on the breadth of outcomes to be achieved – ie the public goods for which payment might be made and independent facilitation to understand what this would look like on the ground. This could be contracted by the agreement holders themselves, built into an agri-environment scheme or delivered by a third-party supervising body.

Where there was self-monitoring of SSSI condition by agreement holders their assessments tended to support the conclusions of Natural England's assessments of condition. However, this did not result in adjustment of management or other interventions to improve the delivery of agreement outcomes, particularly nature recovery including SSSI condition.

Dartmoor Farming Futures was well-meant and well-conceived, but it needed checks and balances from both commoners and agencies to work successfully. We conclude that on SSSI sites and in a wider functioning Dartmoor, a DFF type approach could provide a viable model, but it will succeed only where there is clear and well understood prior agreement based on description and quantification of the desired outcomes and clear understanding of the relationship between management practices and changes in SSSI condition. We believe that this initial understanding needs to be reinforced over the term of the agreement through ongoing engagement with Natural England or other, independent expert bodies, including in the third sector. We have also repeatedly seen the value of long-term relationships between agreement holders and expert, trusted advisors.

To be successful a future DFF type approach will need to take account of the previous trial both building on positives and addressing less successful aspects including:

- improved buy-in from agreement holders, not just by a small number of more proactive commoners;
- better understanding of what the full range of outcomes (for example carbon sequestration) that agreements are trying to deliver;
- agreement that management decisions will be made based on delivering agreement outcomes not just farm buisness prorities;
- an active and engaged association chair;
- active self-assessment (or perhaps more helpfully the employment of professional expertise in undertaking assessments) and identifying management responses where needed;
- seeking a more pro-active role from commons associations across wider areas eg in the shepherding of stock to reduce stock straying;
- more regular F2F engagement between NE, RPA and agreement holders.

Q47. What structures and support need to be in place to enable success? What is the current situation and the strength, weaknesses and threats associated?

<u>There needs to be structural support to overcome barriers to change for commoners on Dartmoor.</u>

Active commoners may be those who graze livestock on the commons, engage in other management activity or do neither but continue to take an interest in management of the common. We are aware that there are many commoners who do not graze livestock in the commons or who have become disengaged from the commons associations. The interests of all commoners need to be considered lest there is a risk of disenfranchising some.
Barriers to active participation of all commoners may prevent more inclusive and broader based decision making. There needs to be space for a wide range of voices including those who do not currently take part in public debate: The dominance of the agenda by a minority is a barrier to change in itself. Improved facilitation and professional support to put commons associations on a more professional footing would improve governance and delivery of agreement commitments.

Change of management of Dartmoor commons is likely to require supporting change in farming systems and structures at the individual business level. This will include transitional payments, significant capital investment advice and

support for business restructuring and new skills. These support mechanisms may need to be sustained to embed business change. Public investment in business change would need to be complemented by facilitation so that farmers can be supported to integrate delivery of public goods with food production.

There are different business models available to farmers and there may be value in the farming bodies such as NFU and TFA developing case studies of business that have changed to demonstrate what is possible

Q48. What financial support is needed?

Natural England fully supports the need for agri-environment schemes that fairly incentivise and reward the right management to deliver SSSI condition. There are no other payments available to those who manage SSSIs on behalf of the nation.

We recognise that 'income foregone' based payments alone do not always work well, particularly where farming profitability is marginal. In these cases we support the use of payment premia and focused capital grant support for environmental measures. We note the importance of associated government support to farming, for example veterinary and technological, as well as rural development/business measures that support alternative income generation. Support for facilitation and collaboration, to encourage farmers to work together, is essential if maximum benefit is to be secured from these other investments. A suite of complementary support measures is required.

High value capital works

We are concerned that there are significant barriers to delivery of high value capital works and there is a need to find ways that land managers can be incentivised to take on hight capital works where there is high risk but little reward. In some situations expensive capital works are required and these present a challenge both in organisation and funding for the agreement holders. In short, complex works require a lot of preparation that must be undertaken before an agreement can begin and often has to be paid for by the agreement holder before monies can be reclaimed (a new system of defrayal allowing payment based on incurred expenditure introduced in 2023 has eased this issue). We know of situations where these capital works exceed £1m and in such situations are out of proportion with the revenue payments. This issue is particularly pertinent to commons where agreements are with a commons association, which do not have their own capital or business revenue and cannot meet the 'business viability test' required for high value capital works to be approved. The complexity and financial burden of these capital works is a disincentive to those considering an agri-environment agreement but may be a requirement that must be met if an agreement is to be recommended. For example, on an area of moorland with degraded peatland, high-cost capital works may be required to achieve agreement objectives, underpinning effective delivery of revenue options.

We also recognise that agreement holders may gain little or even nothing financially from the works that are funded other than from the revenue payment from the agreement option that the works support.

There are two issues that need to be addressed:

First, reducing the financial burden of high value capital works. This could be achieved by:

- Simplifying or removing the 'business viability test'
- Phasing payments so that some is paid 'upfront' to be followed by staged payments so that agreement holder's cash flow issues are mitigated
- Establishing a capital fund used to pay for capital works which is repaid when the works are completed. This might be described as a 'rolling loan facility'. This approach may not have been possible while agri-environment schemes were regulated by the EU but may be possible now.

Second, incentivising and rewarding engagement with capital works where there is no financial

benefit to the agreement holder by offering payment for time put into preparing plans. Though agreement holders can receive payment for costs incurred employing contractors to prepare works there is no payment for their own time. There could be a payment for 'applicants time' payable on a sliding scale and payable when an agreement is signed. For commons there is a supplement available for 'shared agreements' which is intended to meet costs associated with establishing and maintaining a 'commons association' and this payment could be adapted to also include an element that covers facilitation of capital works.

Q49. Are all the parties involved able and willing to work collaboratively? What resources and support, etc do different parties require to achieve this?

There needs to be support to encourage collaboration and innovation among commoners on Dartmoor.

We offer suggestions about how agreements on commons and in-bye land can better complement each other and how parties can be encouraged to work together to deliver SSSI favourable condition and support sustainable farming practices. This should reach beyond the immediate farming community and involve bodies who strategically influence local land use, especially the NPA, and others who own and manage land such as e NGOs and water companies.

Opportunities for collaboration between farmers to coordinate delivery across agreements would be welcome. It may offer a solution where common land and farmers' own land is in separate agreements and allow such agreements to complement each other rather than create barriers to delivery on one or the other because of competing requirements.

Many commoners have Mid-Tier agreements on their in-bye land and this restricts their capacity to move stock seasonally onto the inbye from the commons. Current rules require that agreements on commons include the whole common and only the common, so inbye land and common land is in separate agreements. This prevents a whole farm approach and potentially leads to agreement management on one part of the farm either conflicting with objectives on the common, or at least constraining capacity to fulfil objectives on the common. There are examples of effective co-ordination of agreements on inbye land complementing the open moorland so it is possible.

To improve co-ordination between in-bye and commons agreements there should be adjustment of agreement start dates and terms so that these related agreements run concurrently. The opportunity for commoners to collaborate and co-ordinate through agreements on their own land should be considered. Commons could be seen as the hub of 'farm clusters' with a facilitator to join up delivery on the common and home farms. In some cases commoners could be brought together to access the current Landscape Recovery offer. We are aware of some exciting and innovative initiatives of this sort on Dartmoor. The Landscape Recovery Scheme is specifically designed for farmers and land managers who want to take an ambitious large-scale, long-term approach to producing environmental and climate goods and services on their land. A project in East Dartmoor was awarded a development grant in the first round of this scheme in 2022. Natural England is aware of applications that have been made that include Dartmoor commons in a second round 2 that are currently being evaluated.

Policy makers, Natural England and the Review Panel could learn from the farmers involved. There is a tendency for farmers to reserve their inbye to save their inbye for winter forage.
Previous practice of moving stock to lower ground in winter has lapsed with farmers now preferring to keep their animals at home. There has been a breakdown of the link between home farms and commons known as 'levanacy and couchancy', the principle of a relationship between the carrying capacity of the home farm and rights on the common.

Q50. Are the current structures and arrangements, including the CS agreement structure, fit for purpose. What alternatives are there?

Defra is developing its agricultural transition plan The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024 (publishing.service.gov.uk) through which there will be a new support landscape.

There is a summary of the emerging support arrangements and explanation about how farmers can support the Environmental Improvement Plan here What the Environmental Improvement Plan means for you - Farming (blog.gov.uk)

Current extensions to HLS agreements will bridge any gap so that farmers will be able to remain in an agreement until an alternative is available. It is unclear at the moment how funding will work.

We have considered how stocking regimes appropriate to deliver favourable SSSI condition can be incentivised, taking account of numbers, stock type and grazing period? In this context we have considered whether this requires a bespoke scheme or payment rates on Dartmoor?

Our experience strongly suggests that it would be preferable to avoid paying for stock reductions but instead reward positive outcomes from stock management.

There are different approaches to making payments to farmers, each with advantages and disadvantages:

Differentiated Payments
This involves developing a more sophisticated set of payments which reward different levels of ambition. It is 'action' based so for example still sets out stocking rate limits etc, but instead of a single ''one size fits all" payment rate, a series of incremental rates are established with the highest rate for the most ambitious action (in this case total stock removal). This is the approach that Defra are taking forward in their ELM development.
Currently, a range of differentiated rates are being proposed covering stocking rates, stock exclusion periods and stock type (crudely a balance between sheep and cattle) these would effectively be combined for the overall payment and supported by a range of other options, supplements and capital items. Assuming the detail of the different tiers is pitched right then this could be effective and provide a clear lever in the SSSI consenting process. There is still a risk that a national framework does not provide sufficient differentiation to cope with regional/local differences and the action-based approach still puts the onus on Natural England to agree acceptable combinations for individual SSSIs. Neither does it guarantee improvements in condition as there remains a high requirement for effective implementation of the agreed measures. In theory this would negate the need for specific seasonal stock removal payments as this will be part of the core payment approach.

Results-based Payments (Payment by Results)
Here the payment is linked to delivery of results as defined by some form of descriptor of indicators. There are lots of potential design variations and these have been tested in Defra sponsored 'test and trials', including on Dartmoor. There are some widely held misconceptions about the approach for example that the payment is only triggered when a threshold level is met and about risk of failure and therefore no payment.

However, the normal model is a stepped indicator scale linked to stepped payments with an annual assessment and an annual payment based on achievement reached against the scale. The shape of the scale/payment curve can be adjusted depending on whether the aim is to stretch what are generally sites in good condition or to focus improvement on a bigger number of sites in poorer sites. Potentially, indicators/scores could be adjusted regionally within a national framework. We have advocated self-assessment (with a random proportion subject to independent checking) as this drives ownership and understanding and potentially the active engagement with advice input. Self–assessment also reduces cost. In Ireland a results-based scheme uses independent advisers carrying out annual assessment. In Switzerland there is 3-year cycle using government advisers for their results-based scheme.

A particular challenge in results-based payments is developing indicators that respond to management inputs and can be assessed consistently, especially if self-assessed. There are numerous existing examples to draw on as well as the experience from NE's pilot projects in Norfolk and the Yorkshire Dales which ran for 6 years. Degraded habitats which typically respond very slowly to management change (such as upland heath) represent a challenge because of the slow response and the need for supporting investments to help drive the management change before significant payment uplifts are secured.

In some situations, land managers are exposed to risk of failing to meet indicators because of external factors beyond their control. The potential for annual variability in payments may make business planning difficult.

Payment by results will be easier to manage and administer on land under single occupancy than on land with multiple parties involved. On commons there would need to be strong leadership and governance and confidence among all the commoners that outcomes will be delivered. The risk of failure and therefore no payment might be a barrier for individuals in engaging with such a scheme.

Hybrid

A hybrid approach which combines an action-based base payment and a results-based 'bonus' has the potential to bring the best of both approaches together and mitigate some of their weaknesses. It is though potentially more complex. A particular advantage of this approach is that a relatively simple results-based bonus (perhaps just a single level for the 'best' sites) can be applied rewarding those in the short-term while also demonstrating/developing the approach, then over time shifting the balance of the overall payment from actions to results as the results-based element is better developed and understood.

Natural England suggests that a hybrid approach is preferrable. In some situations, 'action' based payments are suitable and the greater complexity of payment by results can be avoided. Payment by results is likely to be more expensive to deliver and is best targeted rather than deployed everywhere. A hybrid approach would remove some of the uncertainty for agreement holders associated with payment by results.

Natural Capital

Another suggestion that may emerge is payments based on 'natural capital' values but Natural England considers that natural capital approaches are not sufficiently well developed at present to offer a solution to current issues and they risk unintended consequences. We caution against this as follows:

- The evidence base for the value of such payments and the way in which value varies across multiple services and according to site condition within or between sites is incomplete at best and not available for many of the natural capital benefits. It is also worth noting that most deep peat in poor condition is actually costing society, due to its impact on carbon emissions, water quality and other natural capital components, so strictly should result in a negative payment rate. Where there is a payment based on a positive result (eg amount of carbon sequestration) then it logically suggests that if the trend in the outcome is negative (carbon emissions in this example) then payments are negative. It is unlikely that this would work in practice since agreements are entered on a voluntary basis. Robust measurements of results/condition are a pre-cursor to this, irrespective of the cash value so in this respect it shares the same building blocks as a payment by results approach.
- The value of the benefits to society does not equate to a logic to pay this full value for their delivery. If we are seeking a change in land management/use then from a public perspective we should apply the lowest payment that secures the change and, logically, that will be a payment that just exceeds the highest yielding alternative land use (which is typically agriculture and represented by income foregone).
- Unforeseen consequences – such as radical change in the relative value of assets (and associated markets) could have quite profound implications. For example, if deep peat in

favourable condition suddenly generated a very significant stream of annual payments this would almost certainly drive rapid improvements in the condition of this asset (albeit at a significant public cost) but it would also be capitalised into land prices, probably trigger landlords to take deep peat back in hand to receive the payments and economically marginalise those farms unfortunate not to have significant areas of deep peat. We are already aware of concerns among the tenant farming sector of the potential for changes to support payments for land management affecting tenant/landlord relationships.

Natural England suggests that a hybrid approach is preferrable. In some situations, 'action' based payments are suitable and the greater complexity of payment by results can be avoided. Payment by results is likely to be more expensive to deliver and is best targeted rather than deployed everywhere. A hybrid approach would remove some of the uncertainty for agreement holders associated with payment by results. We do not favour a natural capital approach at present.

A bespoke scheme and payments?

The challenges faced by Dartmoor farmers and Natural England are not unique but are common to the uplands of England and therefore core solutions should come via a national scheme managed by Defra. A scheme with simple 'entry' level options and requirements and with a higher tier with delivery body support should provide sufficient flexibility to take account of local circumstances. We do not consider that a bespoke scheme for Dartmoor is viable. We note that there was a bespoke Dartmoor Environmentally Sensitive Area but at that time agri-environment schemes were targeted to discrete areas and to specific features. A bespoke scheme is less practical against a background of a national scheme. The FIPL scheme however enable the NPA to add additional Dartmoor specific actions to a national scheme, such as protection of the historic environment and could also consider specific local needs such as shepherding to manage stock across unfenced commons.

Agreement Length

A key issue for any support mechanism is that the length of agreements matches the timescales over which environmental change happens. Improvement in SSS condition takes time and there is a resulting requirement for agreements of at least 10 years. This is helpful to farmers, allowing them to follow a clear direction and have business certainty. There could be differing levels of commitment available to land managers and the 10-year Higher Tier Countryside Stewardship or 20+ years via Landscape Recovery provide an element of choice. Longer terms available in Landscape Recovery may be preferable where there a longer-term outcomes and we welcome the availability of these longer-term schemes.

Question 51
Q51. Archaeology? (Are any proposed management changes to improve SSSI favourableness in conflict with protecting archaeological sites)

Response

Natural England believes that sustainable grazing regimes are consistent with maintaining the historic environment.

The historic environment is an important and non-renewable resource. It allows us to understand the cultural landscape in which we live and work and gives a 'sense of place' and local distinctiveness to our landscapes. Upland sites can be rich with prehistoric features, including stone hut circles, trackways and remnants of ancient field systems. They are also abundant in industrial remains, such as peat cutting and lead mining. Over one fifth of all Scheduled Monuments are found in upland moorlands.

The Dartmoor Moorland Vision set out an approach to balance a range of interests including historic environment with biodiversity. We believe that both these interests can be achieved by managing grazing including active shepherding.

Maintenance of historic environment features is part of the Indicators of Success in HLS agreements, and some agreements feature additional capital and revenue payments to support management.

Agri-environment remains the primary source of funding for private owners to address Heritage at Risk along with mitigating the ongoing detrimental impacts of agriculture and post- Common Agricultural Policy industry restructuring upon our heritage, rural communities and landscape; Currently, in the national context, 42% of Scheduled Monuments are in agri- environment agreements, as are 87% of Registered Battlefields and 41% of Registered Parks and Gardens. A further 45,000 archaeological sites identified as important by local authorities are also being positively managed.

We understand that species such as bracken and scrub can both obscure historic features and, through root penetration, damage and disturb buried archaeologic remains and structures. Bracken control and scrub management can both be funded through agri-environment schemes and there are many examples of these activities in agreements on SSSI. Similarly, fluctuating water tables and water-table draw-down (which can negatively impact historic environment features) can be addressed through peatland restoration.

Natural England is committed to integrating the management and protection of our historic and natural environment in order to deliver more for nature and landscape, benefitting people, society and the economy. We believe that the historic and natural environments are so closely interrelated and interwoven that it is impossible to split them apart. Both are fundamental to making our landscapes resilient to the challenges they face. Creating the right habitat in the right place is the remedy to the vast majority of risk factors on archaeological sites and across historic landscapes. The synergies between nature and heritage are clear.