



The Graze the Moor Project
April 2014 – March 2019

Final Project Report

February 2020



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FOREWORD

Sarah Bryan

Chief Executive, Exmoor National Park Authority

Graze the Moor was an unusual, possibly unique, example of a landowner questioning accepted practice on moorland management and working with others to explore different ways of working. It learnt from historic land management, trialled new methods, was not afraid to be bold, was open and honest about successes and failures.

Five years on, as a community of farmers, conservationists, ecologists, vets and academics, we know a lot more about options for moorland. We have realised how complicated it is - there is no set of rules or prescriptions, and we have realised how much more there is to learn. The project was triggered by a realisation that heather moorland, a landscape of huge value to the national park's beauty and biodiversity, was in steep decline. (Initial work on Molland led to a wider project across the National Park to map moorland loss). Through Graze the Moor, farmers and scientists trialled different methods and techniques to restore heather moorland and understand the costs, benefits and challenges of moorland grazing. Five years on we are clearer about the complexity of moorland grazing, but we have probably only scratched the surface in terms of understanding these unique habitats and how they respond to changing climate, environmental pollutants, farming practice, swaling¹ and grazing.

The project has highlighted the difficulties in managing moorland to a prescription or prescribed outcome and shown the value of local knowledge and flexibility. The value of practical trials – such as Molinia control, winter grazing and the benefits of snacker feeding (see para 13.3) was a feature of Graze the Moor. The economic study was of particular value as it started to show that "low input, low output" sustainable farming might be a more viable option in our Protected Landscapes, particularly as we move towards support mechanisms, which reward the delivery of public goods. Of particular interest to the National Park Authority was the way that the project involved and valued a wide group of people with a variety of skills – local vets, economists, ecologists and farmers. It was particularly effective at sharing results and ideas to a wider community of Exmoor through seminars and discussion. Graze the Moor raised some real concerns which we were aware of, but lacking detail and data, in particular the worryingly high numbers of ticks on the moor. Through ecological desk based research and soil survey it also made us question the role of atmospheric pollutants such as nitrogen in the changing moorland vegetation - an area worthy of further study.

Through group discussion and community engagement, it became clear that people value the moorland for a variety of reasons - its wildness, beauty, the opportunity to see Exmoor ponies, birdlife, but perhaps importantly for this project, people felt the moor was more inviting, more



¹ Swaling is the local term for the controlled burning of moorland. It is a traditional form of management, which aims to encourage the regeneration of vegetation; on Exmoor it takes place between 1st October and 31st March.

See the [Project Report Folder](#) for supporting reports and information

open, better managed. For many observers seeing animals on the moor enhanced the experience, animated the landscape, gave it purpose, meaning and connected with historic, deeply rooted farming practice.

Key lesson learned from the NPA's perspective;

- The need for long term commitment to landscape management - short term projects and plans are unlikely to deliver meaningful results
- The benefits of a wide range of skills on the project team
- The importance of good relationships and trust in the project team - taking time at the outset
- The need for a passionate and committed landowner / manager to drive things forward
- The importance of robust science and monitoring
- The need for Government Agencies and advisers to be bolder, to take risks
- Key areas for future research could usefully include ongoing trials to restore heather and control *Molinia*, detailed soil science and nutrient impacts on vegetation types, public perceptions of moorland vegetation and management, tick control as well as longer term economic modelling.

Finally, I think there is now a significant piece of work to do, through the final report and other channels, to disseminate lessons learned.

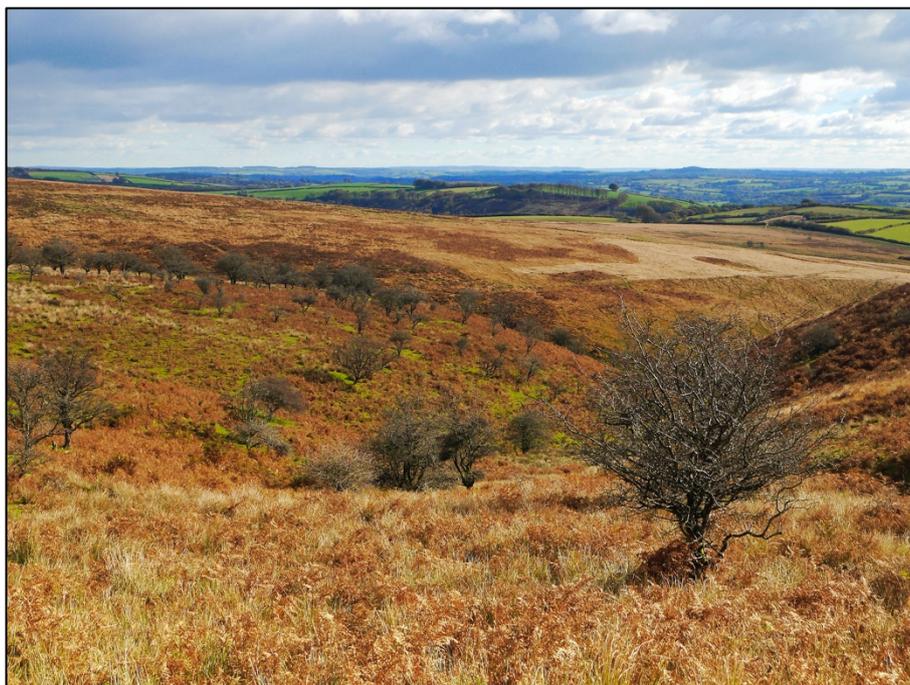


Figure 1 – Poulthouse Combe, Molland Moor

INTRODUCTION

Christina Williams, Molland Estate



Molland Moor covers 681ha (1680 acres) on the southern ridge of Exmoor National Park; it is a Site of Special Scientific Interest (SSSI), designated as open heathland; a Special Area of Conservation and a Principal Archaeological Landscape. Not a sheep devastated habitat but one of mires, blanket bogs, stands of gorse and hawthorn coppices, moorland streams and open hills surrounded by traditional Devon hedge banks. The moor is home to red deer, Exmoor ponies, breeding snipe, golden plover, mountain bumble bees, cotton grass, heathland orchids, clouds of whinchats, prospecting male hen harriers, cuckoos, and bog asphodel, but it is most loved by everyone for its wild open moorland and heather slopes. For me it is simply where my heart is, and I will look after this special place for as long as I can.

It is a good grazing moor with a benign, if wet, climate, abundant water, shelter and fodder. It is not a common, but the moor was a vital part of the farming system of the Estate's tenants, who grazed it with permission. However, we have seen a catastrophic decline in heather cover over the last thirty years. We do not want a monoculture of heather, but it is for the heather moorland that Molland was designated an SSSI. Heather is important; 75% of the world's heather is in the UK, and it is really important for pollinators.

The main culprits in the decline of heather are: heather beetle; invasive species, especially *Molinia*; possibly wetter weather and nitrogen deposition, but another factor has been the change in management occasioned by the Environmentally Sensitive Area prescriptions, when they were introduced in the early 1990s. This is not a criticism of Natural England. The agri-environmental schemes were as new to the authorities as they were to the farmers; they did bring a new source of money into the hills and the capital works grants were excellent. However, the stocking rates and the burning prescriptions were based on the research carried out in the north of England, and they were disastrous when applied to the warm, wet, south-west uplands, where there is no grouse interest. The rest of the country was talking about over-grazing, but here I was restricted to only putting cattle onto the moor from 15th May to 15th July. In the past, Molland tenants had put out leered², hardy, disease-resistant sheep and cattle, but these had been sold, as they could not be accommodated off the moor for ten months of the year. In the new regime, where was I to find cattle to graze on the moor for two months only, and would they be disease free?

So, the initial impetus for the Graze the Moor project, was to establish the ideal number of cattle and sheep to be on the moor, or 'up over' as they say in Devon, and for what period of the year.

Then it became apparent that farmers were now seeing the moor as a burden, rather than an essential part of their farming enterprise. The moor was literally becoming disconnected from the people living around it who had the knowledge, skills and experience to look after it.

The concerns boiled down to the farmers seeing the moor as uneconomic because of disease, rank unpalatable vegetation and the time needed for animal husbandry.

Eight years later, I can say it has been a rollercoaster ride. At times, I have felt that we have hundreds of hectares of good young heather, and at other times, I see nothing but *Molinia*, heather beetle devastation and well-intentioned misunderstanding.

² 'Leered' is a local term for 'hefted' – stock are adapted to a particular area and tend not to wander away from it, even when not fenced.

See the [Project Report Folder](#) for supporting reports and information

It has not been rocket science and it will not be applicable everywhere but we have learnt that:

- Increasing our stock levels but keeping them moving does not damage the valuable vegetation.
- We can regenerate heather by burning on as large a scale as possible and removing any litter, then allowing the stock to come in and graze the young *Molinia*.
- We can control the *Molinia* and reduce the stands of bracken and gorse.
- Despite a large and worrying tick problem, a low input, low output system using hardy cattle is not a bad system.

I think that you have to micromanage your site to take account of the different responses to the same management between: wet ground and dry ground, a north and a south facing slope, an old enclosure and an area never ploughed, and an area of peat and one of mineral soil. National policy makers must understand this. Molland Moor is hugely different to Anstey Common next door, more different again to Porlock Hill and very, very different to the North of England.

I would advocate trying something new on a small area first, so that you can adapt the approach in the light of any unexpected responses. Once the best approach has been found, then you should be bolder than you can possibly imagine, as success will not be achieved by tinkering at the edges.

It has been an excellent and trusting partnership and we all have learnt a lot from each other.

I would like to thank Simon Thorp of the Heather Trust, Sarah Bryan, Rob Wilson-North and Heather Harley of Exmoor National Park Authority, Dave Boyce the ecologist, Allan Butler of the Royal Agricultural University, Janet Dwyer of the Countryside & Community Research Institute at the University of Gloucester and of course Natural England for both allowing me a derogation but also for lending Mike Pearce to the project; he has allowed us flexibility and given us the official perspective. I would also like to thank Roy Brown and Simon Daligan who were introduced at the end of the project to quantify the tick problem.

Without Steve and Richard Langdon of Luckworthy Farm in Molland, their Galloway cattle and Welsh sheep, their unfailing good cheer in the face of rain, TB, official visits and my endless questions and worries, we would not have had a project.

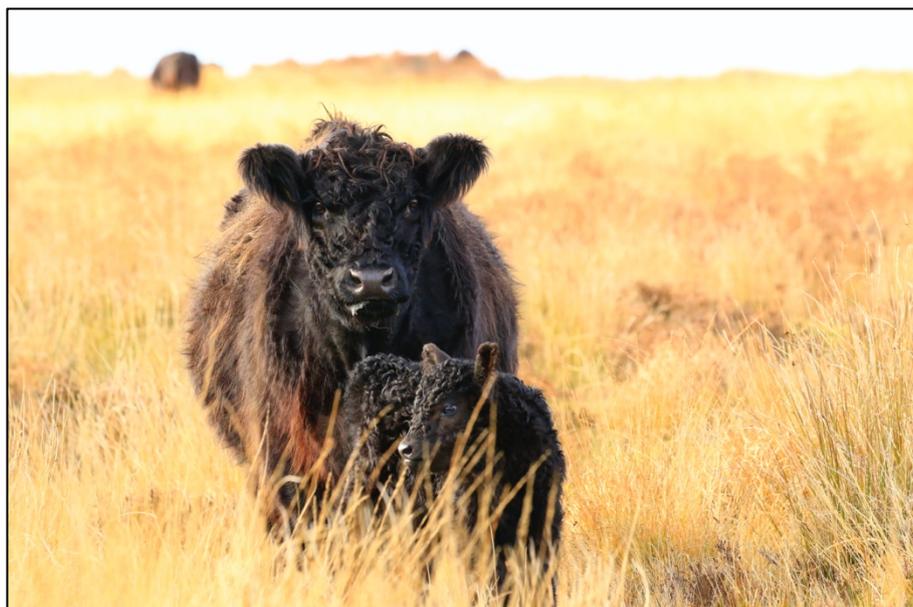


Figure 2 - Cattle looking good in January 2020 after a winter on the moor

EXECUTIVE SUMMARY

- 1 Molland Moor, on the south side of Exmoor, has benefited from innovative management and the collection of vegetation survey data for many years.
- 2 The Graze the Moor project was initiated by the Molland Estate.
- 3 The proposed project was supported by Exmoor National Park Authority financially, through the Partnership Fund, and also as a project partner.
- 4 A range of other project partners provided expertise and proved the value of collaborative working.
- 5 The value of the grant provided by Exmoor NPA was more than matched by the in-kind funding provided by the project partners.
- 6 Funding from additional sources was attracted during the course of the project, which allowed important extra work to be undertaken, notably the sheep tick survey.
- 7 Vegetation Monitoring has shown that there is still some localised overgrazing that appears to be linked to the swaling programme on the moor, but there may be benefits from increasing targeted grazing on unmanaged areas of Purple moor-grass *Molinia caerulea* (referred to as *Molinia* in this report).
- 8 As part of the project, swaling has been carried out on a large scale and the grazing by all types of stock on the burnt areas has been shown to control the regrowth of *Molinia*.
- 9 A *Molinia* trial demonstrated that the spray-burn-reseed technique is the most effective way to control this invasive grass.
- 10 Stock Health monitoring by the local vet proved that the stock turned out onto the moor throughout the year were maintained in the best possible condition.
- 11 The Sheep Tick Survey identified that there is a very large tick population on the moor and these ticks are carrying a range of diseases that affect humans, livestock and wildlife.
- 12 A range of meetings and discussions were held to engage with local and regional stakeholders.
- 13 The Economic Comparison demonstrated that grazing traditional livestock breeds on the moor need not disadvantage the farm business financially.
- 14 An independent Project Evaluation confirmed the credibility of the methods and the results obtained by the project.
- 15 The Graze the Moor project has established Molland Moor as a platform for further development and testing of moorland management techniques in south-west England.

PROJECT OVERVIEW

1 Introduction

- 1.1 Graze the Moor was based on Molland Moor (681ha) on the southern edge of Exmoor National Park. It was a 5-year project that ran from April 2014 until March 2019, and it followed a 2-year case study that took place 2012-14. More background to the development of the Project is provided in Appendix 1.
- 1.2 The south-west moors are important, but it is often assumed that moorland management guidelines developed in the North of England can be applied here. This collaborative project was established in response to a need, identified by the Molland Estate and the graziers of the Moor, for a better understanding of the impact of grazing on moorland in south-west England.
- 1.3 Heather is essential for pollinators and it is culturally iconic. It is important nationally, as 75% of the world's heather is in the UK, but heather is also a good indicative species for the health of moorland.
- 1.4 The condition and coverage of heather on the Moor has been in decline for many years, and particularly in the last two decades. An objective of the project was to prevent further decline. During the project, management work has taken place to control three invasive species that are a threat to heather cover: Bracken *Pteridium aquilinum*, Purple moor-grass *Molinia caerulea* (referred to as *Molinia* in this report) and European gorse *Ulex europaeus*.
- 1.5 The Moor is one of Exmoor's Principal Archaeological Landscapes and it is designated as a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC); the Moor was entered into a Higher-Level Stewardship (HLS) agreement in 2009.



**Statement by Mrs Rachel Thomas, CBE DL
Chairman of The Exmoor Society**

*Through the re-introduction of traditional moorland management, including: swaling, stocking rates and winter grazing, the landscape beauty of Molland Moor, with its stunning views, is being restored. First, the visual impact of a wide-open space, giving the perception of wildness and tranquility, has been improved through restricting the expansion of gorse, bracken, brambles, rowan and thorn trees. Second, the diversity of moorland vegetation has increased through arresting the expansion of *Molinia* and encouraging the regrowth of heather. This has led to a retention of moorland species, insects and birds, such as the skylark, adding further aesthetic qualities to the landscape.*

2 Project partners

The Molland Estate (ownership and management of the moor)
Exmoor National Park Authority (project funding, ranger input)
Natural England (designated site issues, ecological monitoring)
The Heather Trust (project management)
Dave Boyce (ecological monitoring, Molinia control trial)
Steve & Richard Langdon, Luckworthy Farm (grazing management)
Countryside & Community Research Institute, University of Gloucester (economic analysis and external evaluation)
Royal Agricultural University, Cirencester (economic analysis and external evaluation)
R&D Applied Biology (sheep tick survey)



Figure 3: Members of the project team. From L to R - Allan Butler (RAU), Christina Williams (Molland), Simon Thorp (Heather Trust), Janet Dwyer (CCRI), Julie Tucker (Farm Secretary), Dave Barrow (Moorkeeper), Steve and Richard Langdon (Luckworthy Farm)

3 Report Structure

- 3.1 This report provides an overview of the different elements of the project and acts as an umbrella for the separate reports that have been produced during the project.
- 3.2 Additional reports and information are available to view and download from the [Project Report folder](#). The sub-folders are listed using the paragraph numbers from this report as a reference.

4 Funding

- 4.1 Appendix 2 provides full details of the costs and sources of funding. All the available funding was used during the project.

See the [Project Report Folder](#) for supporting reports and information

- 4.2 The Exmoor National Park Authority's Partnership Fund provided the main funding support (£48,521), and additional funding from ENPA came from the Heart of Exmoor Project (£8,242). In addition, all partners contributed in-kind support for the project (original budget £63,950).
- 4.3 Local grant making bodies supported specific parts of the project. The Malcolm McEwan Trust provided the funding for the aerial photo analysis (£1,150), and the Badgworthy Trust funded the sheep tick survey (£2,000).
- 4.4 Additional in-kind and funding from partners increased the value of the work carried out by £17,400 during the course of the project. This additional funding allowed extra work to take place to add value to the work, most notably the sheep tick survey.
- 4.5 It should be noted that as a result of running this project, winter grazing took place on Molland Moor, and the Molland Estate was unable to claim the winter stock exclusion grant. This was valued at £33,500 during the 5 years of the project. The grant could also not be claimed during the 2-year case study, or during the 12-month extension of the project to March 2020.

PROJECT ELEMENTS

VEGETATION MANAGEMENT

5 Molland Moor Vegetation Survey

- 5.1 Dave Boyce (Ecologist) was commissioned by the Molland Estate to assess the current condition of the moorland vegetation, and especially the heathland, on Molland Moor.

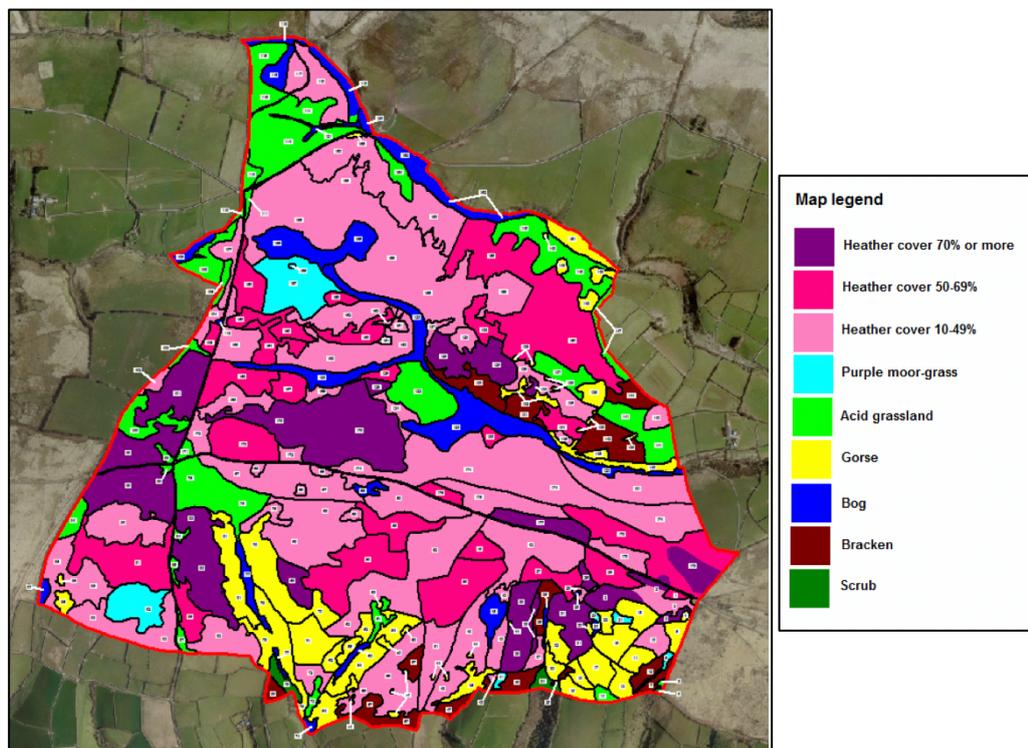


Figure 4 - Vegetation Survey 2013

See the [Project Report Folder](#) for supporting reports and information

- 5.2 The results of the 2013 survey were then compared with those of the Exmoor Heathland Survey carried out by Natural England (NE) in 2000, and also the very detailed vegetation survey of the site undertaken by the Estate, in 1991.
- 5.3 This work was not paid for through the Graze the Moor project, but as it was inspired by the project, the report is included in the Project Report folder as ‘The Molland Moor Vegetation Survey 2013’.
- 5.4 Conclusions:
- 5.4.1 The heather cover on Molland Moor has declined very markedly over the last two decades. This is important for cultural reasons, but the reduction in heather cover also reduces the amount of winter forage for stock.
- 5.4.2 This decline is continuing, with the remaining heather stock being heavily skewed towards the oldest age-classes, much of which is either senescent or has been killed by recent heather beetle outbreaks.
- 5.4.3 Without management, these areas will continue to degenerate towards species-poor, Purple moor-grass vegetation.

6 Aerial Photograph Analysis

- 6.1 This work identified trends in habitat change from 1947 to the present day. The Devon Biodiversity Records Centre used Aerial Photograph Interpretation, and digitised historic and up to date botanical, survey data.
- 6.1 Layered PDF files and GIS files were created to show the changes in the vegetation coverage of different habitats through time.
- 6.2 The Aerial Photograph Analysis report is available in the Project Report folder.

Heather cover categories	Area 2013 (ha)	Area 1991 (ha)
≥70% heather cover	86.9	247.2
50-69% heather cover	115.3	170.7
10-49% heather cover	259.4	40.5
Totals	461.6	458.4

Table 1 - Heather Cover Comparison

- 6.3 Conclusion - between 1947 and 2013, there has been:
- 6.3.1 A significant decline in heath cover (56.2%), (see Figure 3)
- 6.3.2 A large increase in Purple moor-grass (409%), (see Figure 4) and
- 6.3.3 A large increase in acid grassland
- 62% between 1947 and 2010; and
 - 43% increase between 1991 and 2013.

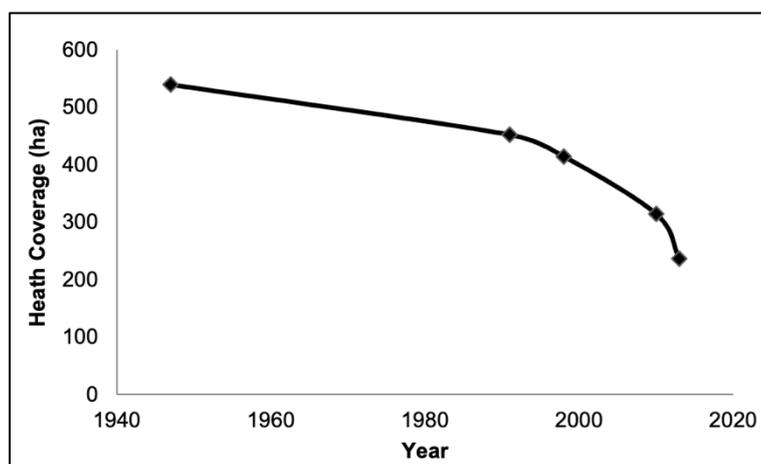


Figure 5 - Decline of Heather Cover

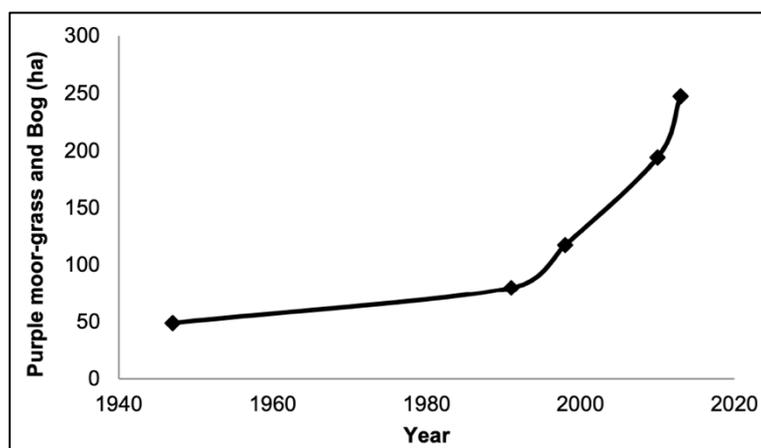


Figure 6 - Increase in Grass & Bog Cover

7 Vegetation Monitoring – Natural England

- 7.1 Natural England has carried out a vegetation survey of the moor every year since the start of the case study in 2012.
- 7.2 A key issue to establish through the vegetation monitoring was whether the change in the management regime, in particular the change in grazing, from the start of the project was having a positive or negative effect on the conservation interest of the moor. This will also feed into how the condition of the moor has changed against the Favourable Condition Table assessment criteria. This assessment criteria is Natural England's tool in establishing by unit the condition of a Site of Special Scientific Interest (SSSI). The assessment criteria are available on the Designated Sites website³.

³ <http://bit.ly/2TqgvY6>

7.3 Molland Moor is part of the South Exmoor SSSI which has an area of 3,024 ha and the Exmoor Heaths Special Area of Conservation (SAC), an area of 10,699 ha. When last assessed, 96% of the SSSI was in a ‘favourable recovering’ condition. Two units of the SSSI are on Molland Moor and the favourable condition assessment in February 2020 is shown below. The latest assessment is also available on a Designated Sites webpage⁴.

Unit	Unit name	Condition	Condition Threat Risk	Habitat	Area (ha)	Last Assessed
17	Molland Moor; north of road Moorhouse Ridge etc	Unfavourable - Recovering	Medium	Dwarf Shrub Heath - Upland	398.9	09/11/2017
18	Molland Moor: south of road White Moor	Unfavourable - Recovering	Medium	Dwarf Shrub Heath - Upland	291.5	28/01/2010

Comments

Unit 17: *Unfavourable condition due to insufficient indicator species and bryophytes. There is a lack of pioneer heather within the dry heath. However, it is in recovering condition due to appropriate management through a Higher-Level Stewardship scheme.*

Unit 18: *Unfavourable condition due to insufficient indicator species and bryophytes. There is a lack of pioneer heather within the dry heath. However, it is in recovering condition due to appropriate management through a Higher-Level Stewardship scheme.*

7.4 28 random points were chosen to assess where dwarf species, particularly heather, has been present. Attributes recorded include: presence of dwarf shrub species, heather height, condition of the heather, grazing pressure, flowering and whether the point had been burnt recently.

7.5 The NE Vegetation Monitoring reports are available in the Project Report folder.

7.6 Further analysis of the data contained in the annual survey reports is planned, as this may reveal more detailed information about the management taking place in different parts of the moor. This could allow for adjustments to be made to enhance the vegetation in areas adjacent to the survey points and prevent local negative impacts.

7.7 In an effort to establish the impact of grazing by the Red Deer during the winter, two fenced enclosures were constructed, using posts and sheep netting – one in September 2016 and one in January 2017 (see Figure 6).

7.7.1 The enclosures are only 10m square and therefore it was unlikely that deer will jump in.

⁴ <http://bit.ly/2I29w1Y>

See the [Project Report Folder](#) for supporting reports and information

- 7.7.2 By comparing grazing impact between the two enclosures, it may be possible to establish the extra grazing pressure from the deer. This work is ongoing and no conclusion has yet been reached.
- 7.7.3 The enclosures remain in place to provide a comparison of the overall grazing impact between ungrazed vegetation inside the enclosures and the grazed vegetation outside.
- 7.8 Conclusions (based on the draft 2019 report):
 - 7.8.1 Overgrazing of heather during the winter months is beginning to show through and to be a concern. 12 of the 28 points were showing signs of overgrazing (42.9%).
 - 7.8.2 There was a drop in grazing pressure at 6 stops, compared with the 2018 survey.



Figure 7 - Heather in flower

8 Vegetation Monitoring – Gateways

- 8.1 Initially, it was intended to allow the cattle on the moor access to the in-bye ground, each night. As this was likely to lead to poaching at the gateways leading to and from the moor, monitoring of the gateway areas was planned to establish the level of damage this practice caused.
- 8.2 A baseline survey was carried out in 2013, but this work was not continued.
- 8.3 Early in the project, it was recognised that the movement of stock was not necessary. It was agreed that the stock would remain on the moor in the winter months, but if the weather was very harsh, they could be moved onto in-bye land. During the project this was not required and stock were only moved off the moor for management purposes.

9 Molinia Control Study

- 9.1 Following the decision not to proceed with the gateway monitoring, the opportunity was taken to carry out a study to assess three different control options for *Molinia*.
- 9.2 Four trial plots were established in two areas – south-east of White Post, and in the south-west corner of the moor, at Splatts. The control methods were: cutting, burning and spray-burn-reseed with heather. The fourth plot was a control plot that did not receive any treatment.
- 9.3 The treatments were carried out after completion of a baseline vegetation survey, in order to assess the effectiveness of the different techniques in controlling *Molinia* and restoring a mixed vegetation cover.
- 9.4 On 23rd March 2016, a wildfire occurred on Cussacombe Moor, which adjoins the south-west corner of Molland Moor. The fire spread onto Molland Moor and burnt through the four trial plots at Splatts. However, useful information could still be obtained from these trial plots.
- 9.5 The Molinia Control Study report is available in the Project Report Folder.

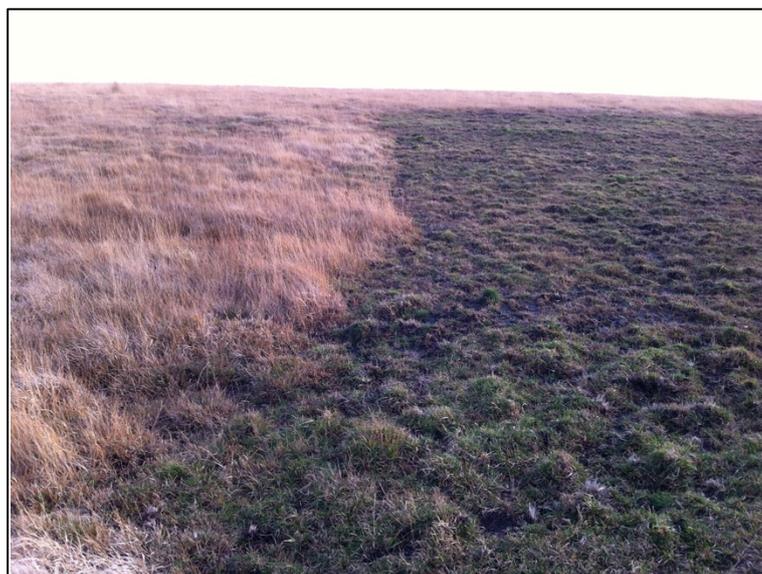


Figure 8 - One of the burnt Molinia trial plots

- 9.6 Conclusions:
 - 9.6.1 The spraying treatment is the most effective method to reduce the abundance of *Molinia*.
 - 9.6.2 If cutting is used, the litter layer should also be removed.
 - 9.6.3 The small plot size focussed grazing pressure from stock attracted by the new growth of vegetation. This suppressed re-growth of the *Molinia*, but it also suppressed heather regeneration. Future treatments should be carried out on a larger scale.

See the [Project Report Folder](#) for supporting reports and information

- 9.6.1 Where *Molinia* litter blows off, or is removed, burning and cutting can also enhance the competitive balance between *Molinia* and heathers, provided the stocking is not too heavy.
- 9.6.1 The Report ended with some recommendations for management, survey and monitoring works over the next five years. These recommendations were made against the background assumption that it seems likely that most of the remaining stands of heather-dominated vegetation at Molland will soon be lost without concerted and targeted management that aims to favour heather at the expense of *Molinia*.

PROJECT MANAGEMENT

10 Management of the Project

- 10.1 The Heather Trust had been involved on Molland Moor since 2002 and had helped with the management of the two-year Case Study.
- 10.2 The Trust and the Molland Estate developed an application for the Graze the Moor project to the Exmoor National Park Authority's Partnership Fund, which was successful. The Heather Trust provided a project management service to coordinate the work of the project, set up meetings, manage the project's finances and promote the work to a national audience.
- 10.3 Project Reports were prepared to summarise the progress of the work and are available in the Project Report Folder.

11 Moorkeeper

- 11.1 The concept of the Moorkeeper was to provide a presence on the moor, someone to carry out or coordinate management work and a point of contact for anyone wishing to report any issues.
- 11.2 Dave Barrow, a tenant farmer on the Molland Estate, with a large amount of experience of upland livestock management, fulfilled this role.
- 11.3 Monthly reports were provided that recorded the stock numbers on the moor and other activity and incidents. An example of a monthly report, from August 2017, is in the Project Report Folder.
- 11.4 Notices were placed at key points on the moor providing the Moorkeeper's contact phone number. This phone number was used by members of the public to report concerns about anything they saw on the moor, but frequently, reports were connected with livestock. Dave Barrow responded to some reports, others he passed on to Luckworthy Farm.
- 11.5 Conclusion:
 - 11.5.1 The concept was successful, as it provided an indication about ownership of the moor, and provided another person to help with its management.

- 11.5.2 However, as most of the reports from members of the public were about livestock, and these are all owned by Luckworthy Farm, at the end of project, it was decided not to continue the separate Moorkeeper role. This role has been merged with the input to the management of the moor provided by Luckworthy Farm.

GRAZING

12 Grazing Management

- 12.1 Historically, Molland Moor was managed with winter stocking; animals were grazed the moor during the daylight hours and taken off the moor overnight to be fed and housed or placed on adjoining in-bye land.
- 12.2 To establish the management history of the moor from the 1950s, a meeting was held with ‘senior farmers’ and this is reported on as part of the report from the Project Evaluation report (section 2.1). It was clear that the moor was more heavily stocked in the past, with up to 3,000 sheep being turned out in July and August.
- 12.3 Before the start of the project, cattle were not allowed to graze the moor between 1st November and 15th April. Sheep were allowed to graze during the winter but only at a stocking rate of 1 ewe/ha. The longstanding herd of Exmoor ponies and Red deer grazed the moor all year.
- 12.4 The recovering vegetation on the areas of the moor included in the swaling programme have been shown to provide good feeding value and these areas attract grazing livestock. As a result, the spread of the swaling programme across the moor has served to spread the grazing pressure and avoid some local overgrazing problems.
- 12.5 The project has encouraged the re-introduction of traditional, hill livestock onto the moor to reverse the increasing reliance on what are perceived to be more commercial breeds of sheep and cattle on Exmoor that require winter housing and higher levels of input. Such animals are not equipped to thrive on moorland and therefore the shift to these breeds has reduced the grazing management of the moor.
- 12.6 The project allowed winter grazing by cattle on the moor on a trial basis, with a view to establishing a sustainable grazing regime for the future based on solid evidence, without compromising the conservation interest of the moor. Overwintering on the moor has the additional benefit of avoiding the need for buildings to house stock over the winter.
- 12.7 Under Higher Level Stewardship two stocking calendars were agreed with Natural England. The one to be applied depended on the number of ponies present – 60 or 30.
- 12.7.1 At the start of the project, the number of ponies had been high, but the number of ponies reduced from November 2014 and the 30-pony grazing regime was applied for the remainder of the project.

See the [Project Report Folder](#) for supporting reports and information

12.7.2 The stocking calendars are in the Project Report Folder.

12.8 At the start of the project Luckworthy Farm established new enterprises to stock the moor with up to 100 cattle and 700 sheep in summer.

12.8.1 In winter, the maximum numbers reduced to 60 and 200, respectively.

12.8.2 The cattle were predominantly Black Galloway and the sheep, Welsh Mountain.

12.9 Conclusions:

12.9.1 Grazing of the moor has been successful. The traditional cattle and sheep have thrived in the conditions.

12.9.2 The output from the livestock enterprises has not been as high as from other systems but the inputs have reduced. See the report from the Economic Comparison (section 22)

12.9.3 More effort is involved associated with inspecting the stock on the moor in all weathers than in a barn, and to provide supplementary feed (see section 13). The associated costs need to be reflected in the financial analysis.

12.9.4 The time taken to establish a new herd of cattle should not be underestimated. Indications at the end of the project are that the production of the livestock enterprises is equivalent to ‘Less Favoured Area Sheep and Beef’ farms – see section 22 (Economic Comparison) for more information. However, the systems are not yet fully developed.



Figure 9 - Tree providing shelter at Ridgeway Cross



Figure 10 - Steve and Richard Langdon

The Farmers' Perspective: Steve and Richard Langdon

When we first agreed to take on the tenancy, it was for us an opportunity to expand Richard's farming, with extra land and the opportunity to expand on our already increasing number of hill cattle, in the business. It offered an exciting opportunity to develop our farming life in Exmoor.

The Galloway cattle have adapted well to the conditions of Molland Moor, and we feel we have improved the habitat up there. It does work having the cattle on the moor, and the public like seeing them, which brings along the interest on Exmoor: it has encouraged different wildlife species back to the moor. The main concerns are high levels of disease with ticks, etc., but we have bred immunities in the cows to adapt to the different parasites through them being up there all year round, and with calves being born out on the moor. We tried different breeds of sheep, even going back to traditional Exmoor horn, but in our opinion (not having our own flock bred to the area and so buying them in), we found them too soft, and not able to cope with the conditions. Welsh mountain sheep survive better here - this comes back to breeding immunity into the flock, and leering them to different areas of Molland moor. As a smaller sheep they can be hard to contain, but we have found from a financial aspect that this breed is the best option for Luckworthy Farm and Molland Moor. Ideally, we would like to see stock numbers increase on the moor all year round, to keep them as low maintenance and low cost as possible. The verdict is still out on the viability of it all: more generally, people appear to be going away from hill farming on Exmoor.

We have found it really helpful working in conjunction with our landlord with this project, and various different agencies, for everyone's benefit. This approach could work on other Exmoor sites: the only way to promote interest is to raise the incentives for everyone involved to gain from it. We hope the government sees this as a real need – to promote the notion that moorland grazing is an asset and not a liability to hill farming, and so continuing to manage this special landscape. Moves to provide adequate funding and support for this kind of approach would really help in maintaining the future of farming on Exmoor.

13 Movement of Stock

13.1 When the decision was made to allow the cattle to stay on the moor full-time, it was agreed that supplementary feeding on different parts of the moor to draw the stock to areas where their grazing impact would be beneficial. The extra feed would also help to maintain the condition of the cattle during the winter.

13.2 Discussion took place with Natural England to establish areas where additional grazing pressure would be beneficial to the vegetation. These areas were then targeted for supplementary feeding.

13.3 A ‘Snacker Feeder’ was used to spread concentrates on different parts of the moor each day.

13.4 A priority was to encourage grazing of the *Molinia* dominated areas of the moor, particularly on the southern side.



Figure 11: Example of a Snacker Feeder

13.5 Conclusions:

13.5.1 The use of supplementary feeding encouraged the stock to roam across the moor and spread the grazing pressure.

13.5.2 The use of supplementary feeding was an effective way of maintaining the condition of the cattle through the winter months without the need to move them off the moor.

13.5.3 If the requirement to gather the stock daily had been maintained, it was likely that the stock would not have moved far from the gateways. Although time consuming, feeding was quicker than gathering and turning the stock out each day.

14 Stock Health

14.1 The health of the livestock at Luckworthy Farm was monitored by Sophia Elworthy of Torch Vets in South Molton.

14.2 Herd Health Plans and reviews of the health requirements of the beef and sheep enterprises were carried out regularly. Examples of the information provided to the farm are included in the Project Report folder:

14.2.1 An example of a Herd Health Plan, dated 13th October 2014.

14.2.2 Health Plan calendars for the sheep and beef enterprises.

14.3 The cattle tested positive for Bovine TB in the final year of the project and this prevented any sales of stock for 12 months.

See the [Project Report Folder](#) for supporting reports and information

- 14.4 Some losses occurred due to road traffic accidents on the unfenced roads that cross the moor. Other significant cause of losses were: Redwater Fever⁵, and a high liver fluke burden.



Figure 12 - Cattle on the moor in winter

15 Grazing Records

- 15.1 Stock numbers on the moor were recorded each month, and the monthly figures were collated annually. Natural England used the stocking figures in the report from the annual vegetation survey in the assessment of the impact of grazing on the vegetation.
- 15.2 The stocking figures were presented as Livestock Units (LSU) on a spreadsheet and in chart form. Charts showed the total number of LSUs on the moor by different types of stock each month⁶, and a summary graph was provided that shows how the number of LSUs on the moor each month changed during the project period.
- 15.3 The maximum summer grazing level was 0.31 LSU/ha (in 2014), and the average summer grazing level was about 0.26 LSU/ha. In winter, there was one peak month when the grazing level reached 0.27 LSU/ha (January 2013), but otherwise the average winter grazing level was about 0.15 LSU/ha.
- 15.4 In the grazing section of the Project Report folder, the charts are presented in PDF and the Excel spreadsheet contains the charts and the worksheet includes the individual records.

⁵ This blood-borne protozoal disease is also referred to as babesiosis. The disease uses ticks as its vector, but the protozoa *Babesia* causes the disease. The most common one in UK cattle is *Babesia divergens*.

⁶ LSU used in calculation: Red deer 0.25, Pony 0.80, Cows 0.75, Ewes 0.10

16 Exmoor Ponies

- 16.1 As a result of issues with the registration of the Molland herd, and the market price for horse meat dropping, the number of Exmoor ponies in the herd had increased significantly.
- 16.2 A decision was made to reduce the size of the herd, and by March 2015, the size of the herd had been reduced to a sustainable level of about 30 breeding mares.



Figure 13 - Exmoor Ponies on Molland Moor

OTHER ACTIVITY

17 Moorland Management

17.1 Swaling

- 17.1.1 Swaling is an important tool for managing the heather and other vegetation. If not managed, the vegetation can become rank and the lack of light and moisture at ground level prevents growth of new heather plants and other species. By reducing the availability of fuel, swaling also reduces the potential for damage by a wildfire.
- 17.1.2 Rank vegetation is unattractive to grazing animals as the feed value is low and access can be difficult. The result is that grazing becomes focussed onto small areas and the overgrazed area increases.
- 17.1.3 Swaling encourages the regeneration of the vegetation, increasing the forage available and serves to spread the grazing pressure.
- 17.1.4 Through the project, it has been possible to reach agreement with Natural England about burning some larger fires as a way to achieve more management of heather than would otherwise have been possible. This type of collaborative approach has been possible as a result of the trust that has developed between the project partners.
- 17.1.5 The technical support provided by the Exmoor NPA Rangers is very gratefully acknowledged.



Figure 14 - Back-burning (hot fire) on Molinia

17.2 Gorse

17.2.1 Different gorse management techniques were used.

17.2.2 After cutting, gorse regenerates from the stumps. To achieve effective control, it was necessary to treat the stumps of gorse with glyphosate; this controlled about 40% of the stumps but was time consuming.



Figure 15 - Gorse after cutting

17.2.3 Cutting with a heavy-duty flail was most successful but some regrowth still took place. Repeat treatments were essential.

17.2.4 There was little evidence that cattle ate the gorse in winter, but it is thought that this is because there was plenty of fodder.

17.2.5 The cutting that took place during the project reduced the gorse cover to an optimum level, and this includes leaving some mature stands to

See the [Project Report Folder](#) for supporting reports and information

maintain biodiversity. Maintenance of the areas that have been cut will be required to manage the regrowth.

17.3 Bracken

- 17.3.1 Spraying with Asulox has been the most effective technique to control bracken.
- 17.3.2 Some bracken bruising took place in August in some years. This technique works but the treatment must be repeated for at least four years to achieve an acceptable level of control (~90%).



Figure 16 - Horse-drawn bracken bruising

- 17.3.3 Cutting the bracken twice each year combined with trampling by stock (cattle, sheep, deer and ponies) has been effective. However, cutting is not possible on the steep slopes of the coombes.

17.4 Heather Beetle

- 17.4.1 Much of the heather on the moor has been badly affected by heather beetle in the last 10 years.
- 17.4.2 It appears that younger heather is capable of recovering quickly from an attack by heather beetle, whereas an attack is more likely to be fatal on older stands of heather (see figures 16 and 17)
- 17.4.3 It is likely that the impact of heather beetle has been a major driver behind the transition from heather to *Molinia* dominated vegetation in many parts of the moor (also see para 5.4.2).



Figure 17 - Old heather killed by heather beetle



Figure 18 - Young heather recovering after heather beetle attack

18 Sheep Tick Survey

- 18.1 Some of the stock losses on the Moor, have been attributed to tick-borne diseases (see para 14.4).
- 18.2 In response to increasing concerns about the number of sheep ticks being seen on the livestock on the moor, a sheep tick survey was commissioned in late 2018.
- 18.3 The survey revealed that the tick population on the moor is very high and the analysis of the ticks identified that a wide range of tick-borne diseases is present; these have the potential to have significant impact on livestock, humans and wildlife.
- 18.3.1 The average number of ticks (of all life stages) on a 30m² plot in the 12 locations tested is 2.7. A high impact value is generally set at 0.5 ticks per 30m².
- 18.3.2 Engorged ticks were collected from 10 cattle, in February 2019, after the end of the project, and all tested positive for tick-borne fever *Anaplasma phagocytophilum*. In humans and animals, this disease can compromise the immune system.
- 18.4 The report from the Sheep Tick Survey is available in the Project Report Folder.
- 18.5 Conclusions:
- 18.5.1 The combination of large numbers of questing ticks, and the variety and distribution of potential TBD pathogens is of great concern. This level of activity poses a high level of risk to human and animal health, and welfare.
- 18.5.1 It has been recommended that further work should be carried out to include a review of potential interventions, and development of an implementation plan.

See the [Project Report Folder](#) for supporting reports and information



Figure 19 - Richard Langdon & Christina Williams with cattle on the moor

19 Meetings, Events and Visits

19.1 28 meetings, events and visits took place during the project and a summary of these is included in the Project Report Folder.

19.1.1 The summary covers Steering Group meetings, visits by prominent people, and events organised as part of the project.

19.2 The largest event, called *Grazing for the Future*, took place over two days, 24th-25th September, and was organised in conjunction with Clinton Devon Estates (CDE). This event included a comparison of the management of Molland Moor, with CDE's management of the East Devon Pebblebed Heaths.



Figure 20 - Grazing for the Future - 'team photo'

- 19.3 At the end of the first day, a panel discussion took place in the village hall at Molland, that was facilitated by Naomi Oakley of Natural England. The discussion was summarised into five principles, which are set out below:
- 19.3.1 People need to have an active interest and a sense of ownership in the land to manage it effectively.
 - 19.3.2 We all, land managers, NGOs and government, need to be bold in our ideas and practices, embracing risk and challenges.
 - 19.3.3 We need to allow small-scale dynamic change to engender wider, landscape-scale change to happen in time (small-scale burns, heavy stocking, tree planting, tree removal etc.).
 - 19.3.4 Long term commitments are required to allow businesses to restructure to support change in the wider rural economy. This will support third party land management activities such as: contractors, hedge layers, foresters, flying shepherds etc. Long term commitments will also help to keep many people working in the rural economy that will provide more connection between people and the land.
 - 19.3.5 Farmers and foresters have a long-term connection, respect and knowledge of the land; this must be considered and engaged in any future decision making. Place based solutions are key.

20 Soil Survey

- 20.1 At the end of the project discussion took place about other factors that should be considered to develop the work of the project further.
- 20.2 It was agreed that knowledge of the condition of the soil could be a significant factor in determining the most effective management of the vegetation.
- 20.3 There are concerns about the level of Nitrogen deposition and the impact that this might be having on the vegetation on the moor.
- 20.3.1 High levels of Nitrogen deposition have also been linked to the population blooms of Heather Beetle but conclusive evidence of this has never been obtained.
- 20.4 A series of 10 soil samples were taken from different locations across the moor and sent away for analysis.
- 20.5 The Analysis Results are in the Project Report Folder.
- 20.6 Conclusions:
- 20.6.1 The pH was very low on all the samples, with an average of 4.0, against a guideline level of 6.0.
 - 20.6.2 It was reported that at this level, fungi thrive, bacterial activity declines and nutrient cycling drops.

- 20.6.3 In the past, not enough consideration has been given to the condition and nutrient status of the soils on the moor. This should form part of a future work programme on the moor.

PROJECT EVALUATION & ECONOMIC COMPARISON

21 Project Evaluation

- 21.1 The evaluation of the project was carried out by Professor Janet Dwyer, the Director of the Countryside & Community Research Institute at the University of Gloucestershire.
- 21.2 The Evaluation Report was drafted as a standalone report, and as a result, there is some overlap with the information contained in this report. The Project Evaluation Report includes the Economic Comparison (see Section 22) and is available in the Project Report Folder.
- 21.3 The conclusions about moorland management are that:
- 21.3.1 Winter grazing on Molland Moor, in combination with swaling, has brought some benefits for heather regeneration and *Molinia* suppression, but it is too early to assess the full potential of impacts if grazing is sustained for longer, or at higher stocking rates.
 - 21.3.2 The more varied conditions achieved through the different practices tested and applied at Molland may be enhancing other environmental features such as bird populations, and a more accessible sward for recreational users.
 - 21.3.3 It would be extremely valuable for further learning about optimal moorland management in Exmoor, for the regimes being developed at Molland to be continued and for their monitoring to continue, beyond 2019.
- 21.4 The key conclusions from the evaluation process are:
- 21.4.1 The Project has demonstrated clear and positive results from: a carefully planned and integrated programme of farm/estate and habitat management, teamwork among a core team of dedicated partners and a strong focus on outreach and communication, to explore and promote better understanding of the needs and opportunities for sustainable and resilient moorland enhancement, in Exmoor.
 - 21.4.2 The project plan, management activities and emerging results presented here show clearly that this is a long-term exercise. Ideally, it should be continued for a further five years, as a minimum, to learn more lessons and to resolve some of the uncertainties around best economic and ecological practice for moorland-focused farm and biodiversity management.

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- 21.4.3 The longstanding practice of good data collection on this moor, and the management flexibility available, arising from a co-ordinated and positive landlord-tenant relationship, and the ability to control all grazing by stock on the moor, means it is an ideal test-bed for this kind of applied research.
- 21.4.4 There are some indications that the various management actions / experiments could benefit from being a bit bolder and spatially significant than they have been, to date. This would probably make the identification of transferable lessons easier, also.
- 21.4.5 The economic case for winter grazing of stock is not strong at present, but early financial results are positive, and there is evidence to suggest that its value could be increased if stocking levels were further, but carefully, increased to make better use of moorland vegetation value. Performance could also be boosted significantly, if additional value could be obtained for the products of the management system (e.g. high nature value, rare breed meat sales; farm visits for schools or other educational groups).
- 21.4.6 Ensuring good stock health and welfare on moorland where the vegetation condition has clearly deteriorated in recent decades is a particular concern, particularly where this is combined with a significant growth in the numbers of ticks at the site, due to unknown causes. Focusing some management effort upon testing options for more effective reduction of the tick burden on moorland could be valuable, not only for Molland but also for other Exmoor moors where all-year-round grazing is now being considered.
- 21.4.7 A particularly valuable and valued aspect of the project has been its ability to demonstrate the positive aspects of local partnership between active managers of sites (landlords and tenant), government agencies and a range of relevant stakeholders, to determine strategies for enhanced benefits and increased sustainability.
- 21.4.8 The project findings to date suggest already that there could be opportunities to extend the management across neighbouring moors, with positive impacts both economically and ecologically.
- 21.4.9 Under a future policy regime, an approach which increases the opportunity for local Land Management, with flexibility and the power to experiment, to attract sustained public funding would be beneficial. This would enable the current approach here, including the partnership, to continue for the benefit of all concerned with moorland management on Exmoor and across the southwest.

22 Economic Comparison

- 22.1 The economic comparison compared the financial results of farms that make full use of the moor using hill stock, with those that operate a more conventional system, without moorland grazing.
- 22.2 Using data provided by Luckworthy Farm, gross margins and other basic performance indicators were calculated for both the cattle and sheep moorland enterprises, and the combined results were compared with comparable farms in the Farm Business Survey, which are identified as ‘Less Favoured Area Sheep and Beef’ farms.
- 22.3 Data were collected for two years, after the new stock enterprises, which were established at the start project, had started to settle down. However, in the second year of data collection, the farm was under bovine TB (bTB) restrictions for 12 months, which reduces the comparability of the financial data.

(£ per head)	Gross Margin for in-bye sheep	Gross Margin for hill sheep	Gross Margin for hill suckler cows
Molland data	13 (average to low)	0 (low)	330 (average to high)
FBS data	21	21	221

Table 2 - Gross margins per head over the 2 years, Molland compared to FBS data

- 22.4 The report from the Economic Comparison is available in the Project Report Folder, as part of the Project Evaluation Report.
- 22.5 Conclusions:
- 22.5.1 The moorland-based enterprises at Luckworthy are performing at a similar standard to the average ‘LFA sheep and beef’ farm in the south-west uplands.
- 22.5.2 Analysis of the economic performance suggests that using the moor does not disadvantage the farm business economically, if suitable hardy stock are kept. Outputs are lower, but costs are also lower.
- 22.5.3 The moorland cattle enterprise performed better than the sheep enterprise, but it is clear that all the enterprises on the farm are important to the overall success of the farming enterprise as a whole.
- 22.5.4 These conclusions are based on 2 years of data only, and in one of those years the cattle were under bTB restrictions. The collection of data and its analysis will continue with a view to establishing the accuracy of these early results.

FURTHER WORK

23 Project Extension

- 23.1 With the support of the existing project partners, a successful application for extension funding was submitted to Exmoor National Park Authority. Funding was approved for a 12-month extension that runs to 31st March 2019.
- 23.2 The extended project could provide support for the Exmoor Ambition, and Molland Moor could become a site for tests and trials / pilot schemes as part of the development of Defra's Environmental Land Management Scheme.
- 23.3 It was suggested that Molland would be a good location for such work, as it is an established project and there is a proven ability to disseminate information.
- 23.4 It is considered very valuable to continue the development of the long-term dataset that exists at Molland, to allow management decision making to be based on evidence.
- 23.5 The support from Exmoor NPA for the 12-month extension has been gratefully received, as it will allow the momentum developed by the project to be maintained; it is hoped that a way to continue support beyond the period of the extension can be found.



Figure 21: Ridgway Cross from the south

PROJECT CONCLUSIONS

24 Conclusions - General

- 24.1 The importance of the support received from partners cannot be overstated.
- 24.2 Collaborative working has allowed:
 - 24.2.1 Trust and understanding to develop between the partners.
 - 24.2.2 Consensus to be achieved easily about the best approach to adopt for the management of the moor.
 - 24.2.3 For a flexible approach that has allowed new initiatives to be considered and adopted during the course of the project.
 - 24.2.4 The project to deliver a wide range of outcomes.
 - 24.2.5 This project to help develop Molland Moor as a local centre of excellence, able to demonstrate the benefits that empowering local people can provide.
- 24.3 With linkage to the Exmoor Ambition, the project is ideally placed to demonstrate how plans for agri-environment support can be supported by local people in the post-Brexit era.

25 Conclusions – Project

- 25.1 The long-term impact on the habitat from the removal of the restriction on winter grazing by cattle offers some benefits but this should be monitored further.
- 25.2 Locally determined grazing numbers are better for moorland than regimes designed and imposed nationally.
- 25.3 The ability to graze the moor during the winter allows farmers more management flexibility.
- 25.4 Economic analysis has shown the financial impacts of using hardy native breeds of cattle compared to continental breeds.
- 25.5 Over 100 moorland farmers and owners came to demonstration days and saw the project in action.
- 25.6 Having a Moorkeeper as an identified point of contact proved to be a useful additional feature.
- 25.7 It is clear that the dominance of *Molinia* is a major threat to the habitat diversity on the Moor.
- 25.8 The trial of different control methods for *Molinia* demonstrated the value of the spray-burn-reseed treatment.
- 25.9 Burning and cutting are also valuable management tools for controlling *Molinia*, provided these remove the litter layer.

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- 25.10 The Sheep Tick threat on the moor has been quantified. Tick-borne diseases pose a severe risk to humans, livestock and wildlife.
- 25.11 Heather regeneration is occurring in areas covering 75ha of the moor. The success of this work has been largely down to the ability to swale larger plots than had been previous practice. The Estate has developed the ability to manage the swaling programme effectively and achieve high standards.
- 25.12 Heather beetle *Lochmaea suturalis* attacks on ling heather *Calluna vulgaris* appear to have increased in frequency over the last decade and in combination with other stress factors are contributing significantly to heather loss.
- 25.13 Breeding bird populations have started to recover. In the RSPB's recent moorland bird survey, Molland Moor showed the greatest improvement on Exmoor.
- 25.14 Large flocks of Golden Plover have been seen on the larger plots managed as part of the *Molinia* trial taking place during the extension to the project.
- 25.15 To obtain full benefit from the *Molinia* control work, monitoring of the plots should continue for at least another five years.

Simon Thorp
Project Manager

28th February 2020

Project Reports

These reports are available in the Project Report Folder on Dropbox. These will be transferred onto the Exmoor NPA's website, and the links in this report will be updated. Please contact the [Molland Estate](#) if there are any difficulties accessing the information.

Authors names are in brackets, and the numbering reflects the paragraph numbering of the topic in this report.

- 5 Molland Moor Vegetation Survey 2013 (Dave Boyce)
6 Aerial Photograph Analysis (Devon Biodiversity Records Centre)
7 Vegetation Monitoring Reports – 2012-2018 (Mike Pearce, Natural England)
9 *Molinia* Control Study (Dave Boyce)
10 Project Progress Reports (Project Manager)
11 Moorkeeper (Dave Barrow)
12 Grazing Management (Project Manager, Moorkeeper, Luckworthy Farm)
14 Stock Health (Sophia Elworthy)
15 Grazing Records (Project Manager)
18 Sheep Tick Survey (Roy Brown, R&D Applied Biology)
19 Summary of Meetings, Events & Visits (Project Manager)
20 Project Evaluation and Economic Comparison (Janet Dwyer, Allan Butler)
22 Soil Analysis (Project Manager)

APPENDIX 1 - PROJECT BACKGROUND

- 16 For many years, the Molland Estate was concerned about the difficulty of managing the moor to a high standard. Grazing remains the main management input to the Moor and there was an obligation under a management plan agreed with Natural England to graze cattle on the moor during the summer.
- 17 It became increasingly difficult to find graziers with good quality hill stock for a range of reasons and these included:
- 17.1 The restrictions on income potential resulting from the high labour costs associated with extensive grazing and a perceived lack of adequate public support for hill farming as support was no longer paid on a headage basis;
 - 17.2 The drop in feed value of the grazing following the spread of gorse, Purple moor-grass *Molinia caerulea* and bracken; and
 - 17.3 The threat to animal health from tick borne diseases and bovine tuberculosis.
- 18 The overall impact of these difficulties was that farmers moved away from hill stock and the moor suffered from a lack of management. The vegetation became rank, coarse grasses invaded, and invasive species, such as bracken, gorse and scrub woodland, expanded onto the moor. The result of these changes was that the vegetation has lower food value and this in turn made it less attractive to graziers.
- 19 Much of the guidance that is available from Natural England for moorland and upland areas has been developed from evidence gathered in the north of England⁷. This was discussed with the Chairman of Natural England, Poul Christensen, during a visit to Exmoor in October 2011, and this work developed from that discussion.
- 20 The Graze the Moor project has gathered information that allows management decisions to be made based on local evidence. The Graze the Moor project has provided an opportunity to collect evidence from Exmoor that can be used to develop guidance that is both relevant to the management of Molland Moor, and the other moors in the south-west.
- 21 The shortcomings of the existing management regime, and the negative impact on vegetation composition, were highlighted by the report from the Molland Moor Vegetation Survey 2013 that was commissioned from David Boyce by the Molland Estate. This report is available in the Project Report Folder. Also see section 5 of this report.
- 22 Molland Moor has a long history of testing novel management techniques and it has a detailed vegetation monitoring record that spans 20 years. This dataset has allowed the impact of changes implemented through the project to be fully assessed.

⁷ MARTIN, D., FRASER, M.D., PAKEMAN, R.J. & MOFFAT, A.M. 2013. Natural England Review of Upland Evidence 2012 - Impact of moorland grazing and stocking rates. Natural England Evidence Review, [Number 006](#)

APPENDIX 2 - FINANCIAL SUMMARY

Partner	Activity	Cost	In-kind funding	Partnership Fund
David Boyce, Ecologist	Gateway Vegetation monitoring / Molinia Control Project	10,181	4,141	6,040
Natural England	SSSI Management Plan, vegetation monitoring	2,250	2,250	-
Elms Estate Office / Royal Agricultural University	Farm business study (Economic comparison)	13,195	5,681	7,514
Malcolm McEwan Trust	Aerial Photograph Analysis	3,183	1,150	2,033
Molland Estate	Moorkeeper	23,585	-	23,585
Heather Trust	Project Coordinator	26,978	13,489	13,489
Molland Estate	Loss of winter exclusion grant	33,500	33,500	-
Molland Estate	Allowance for input over 5 years	2,500	2,500	-
Luckworthy Farm	Soil Analysis	388		388
R & D Applied Biology	Sheep Tick Survey – contribution to costs	13,600	11,600	2,000
Exmoor National Park Authority	Mapping support	500	500	-
Molland Estate	Demonstration days	1,250	-	1,250
Countryside & Community Research Institute	Project Evaluation	8,915	5,300	3,615
Sub-totals		140,024	80,110	59,914
less Match Funding				11,393
Totals		140,024	80,110	48,521
Budget Totals		122,622	63,950	48,521
Difference		17,402	16,160	-