

Common Moor, East Putford



Culm grassland restoration Management Plan

2019 - 2029

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

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1.0 Site Information

Ownership: No recorded owner. Adopted by East and West Putford Parish Council, under Section 9 of the 2006 Commons Registration Act

Designation:: Site of Special Scientific Interest
Scheduled Monuments

Holding:

Countryside Stewardship Agreement Number:

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NIA ID: **Common Moor, S8**

Site Location: **SS373178 (Centroid)**

2.0 Introduction

This management plan lays out the implementation of management operations on Common Moor, a large area of Culm grassland habitat, through a ten year Countryside Stewardship agreement with Natural England commencing on 1 January 2019. The plan covers removal of scrub and bracken through clearance and controlled swaling (burning) and the subsequent management of the site through swaling to restore it to species rich grassland and return it to favourable SSSI condition.

The plan can be reviewed and amended at any time by Natural England, if monitoring or other management issues shows it to be necessary, with agreement from the Parish Councillors who have stewardship of the site. Similarly, the Parish Council can ask for it to be reviewed.

The management plan should be viewed and agreed with all stakeholders, including the Parish Council, Commoners and DWT.

Common Moor is located within the Nature Improvement Area and is a priority habitat for the Culm Grassland Natural Flood Management Project.

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

The aims of the Culm Grassland Natural Flood Management Project include increasing the protection, creation and use of Culm grassland within the Culm Grassland NCA for flood protection and biodiversity benefits. The project also aims to investigate how Culm grassland can manage flood risk, and then model how this works within the landscape at catchment level.

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

The Culm Grassland Natural Flood Management Project is led by DWT and supported and funded by the Environment Agency (EA), Devon County Council (DCC) and the European Union through the Interreg 2 Seas project.

The Common Moor management plan concerns the restoration of 55.06 ha of species rich mire and neutral grassland communities through scrub clearance and swaling. Management on RLR field parcels SS37173475 and SS37184104 is covered within this plan.

3.0 Site description

Common Moor is a SSSI in its entirety and at the time of writing the condition was assessed as unfavourable declining. It is a species rich, representative example of Culm grassland habitats, in particular the wet heath community. The site is one of the largest remaining areas of the Culm grassland habitats within the Culm Grassland National Character area. It supports diverse botanical communities and associated fauna. The lack of management over many years has led to increased *Molinia caerulea* dominance, shading less competitive plants. Increased scrub encroachment has led to habitat reduction. There is also a lack of heather in all growth stages across the site. English Nature's citation, when the Moor was designated a SSSI in 1988 includes

'The major part of the Common Moor consists of wet grassy heath'. This demonstrates further how the Moor has declined since then.

Common Moor is situated on Carboniferous shale deposits which are overlain with Pelo-Stagnoley soils, in this instance as part of the Denchworth soil series. Better drained areas along the central ridge have gleyed brown earths, while the wettest areas support *Sphagnum*-derived peats.

The site is separated into two by a road into a large unit of 44 ha and a smaller unit of 11 ha. The larger unit has a central West-East ridge and had gentle downwards slopes descending either side of this ridge. The area to the north is a large, flat plain. The smaller unit slopes down to a flat plain from its southern end. Drainage across the site is very poor with many areas remaining waterlogged throughout the year.

Historically, the site has Bronze Age interest. Both parcels have Bronze Age bowl barrows, which are part of a wider barrow cemetery. These are listed as Scheduled Monuments. Historic England is the public body that looks after England's historic environment.

In recent years, Common Moor has received little to no management. There are several properties around the moor with grazing rights, but these have not been exercised for many years. Common Moor has been burnt on occasion but these have been accidental burns and unmanaged, arguably causing more damage than benefit.

Map 1 provides an insight into Common Moor's strategic importance as a culm grassland habitat within the local landscape. It occupies an important central location, linking many large and small culm grassland habitats.

3.1 Flora

The wet grassy heath floral community covers the majority of the site. It is dominated by purple-moor grass (*Molinia caerulea*), ling heather (*Calluna vulgaris*), western gorse (*Ulex galii*) and cross-leaved heath (*Erica tetralix*). Western gorse forms large stands across the site and in areas has completely shaded out the rest of the sward. Other species associated with Common Moor when initially surveyed for the SSSI citation in 1988 include bell heather (*Erica cinerea*), heath-spotted orchid (*Dactylorhiza maculate*), lesser-butterfly orchid (*Platanthera bifolia*), saw-wort (*Serratula tinctoria*), meadow thistle (*Cirsium dissectum*), Devil's-bit scabious (*Succisa pratensis*), petty whin (*Genista anglica*) and tormentil (*Potentilla erecta*). This habitat in places becomes drier and features frequent bristle bent (*Agrostis curtisii*).

Areas to the edges of each parcel support wet rushy heath. These are dominated by purple moor grass with abundant soft rush (*Juncus effusus*) and sharp-flowered rush (*J. acutiflorus*). Other species associated with this community on Common Moor include common valerian (*Valeriana officinalis*), wild angelica (*Angelica sylvestris*), lesser skullcap (*Scutellaria minor*), tufted hair-grass (*Deschampsia cespitosa*) and compact rush (*J. conglomeratus*).

In the wettest areas of the site, more bog species have been recorded. When Common Moor was established as a SSSI in 1988, a series of open bog pools existed towards the north east of the site – these now have either been scrubbed over or have become dominated by bog-moss (*Sphagnum* spp.) species. Other species associated with these pools at the time of citation included bogbean (*Menyanthes trifoliata*), round-leaved sundew (*Drosera rotundifolia*), common cotton-grass (*Eriophorum angustifolium*) and bog asphodel (*Narthecium ossifragum*).

Scrub in the waterlogged areas of the site consists mainly of willow (*Salix* spp). The scrub communities in the drier areas of the site are more diverse, mostly consisting of willow (*Salix* spp), silver birch (*Betula pendula*), European gorse (*Ulex europea*) and bramble (*Rubus fruticosus*). Along the field boundaries other scrub species are present, in particular hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*). Towards the western and southern boundaries of the main parcel, the scrub turns to established woodland. A lichen with a distribution to the west of the UK, *Usnea articulata*, is often found on scrub and established tree species.

In the southern-most corner of parcel 4104, bracken (*Pteridium aquilinum*) has become established, in particular across the location of a Bronze Age bowl barrow.

3.2 Fauna

Bird species of note include overwintering snipe (*Gallinago gallinago*), yellowhammer (*Emberiza citrinella*) and skylark (*Alauda arvensis*). Reptile species include common European adder (*Vipera berus*) and common lizard (*Zootoca vivipara*). The invertebrate community includes the locally distributed marsh fritillary (*Euphydryas aurinea*) and marbled white (*Melanargia galathea*) butterflies. Both have been recorded since the site was cited as a SSSI, but the most recent sightings of marsh fritillary date from 2013. The original SSSI citation from 1988 lists that a nationally rare cranefly, *Limnophila abdominalis* and a nationally scarce longhorn beetle, *Strangalia quadrifasciata* were recorded. Red deer (*Cervus elaphus*) are frequently seen on Common Moor.

4.0 Project Rationale

In order to restore the culm grassland at Common Moor, management needs to be reinstated across the site. This will include scrub clearance, bracken management and rotational swaling.

Restoration of this site will create a larger, better connected and ecologically resilient mosaic of habitats. This work will directly benefit the plant communities along with the marsh fritillary meta-population and other wildlife. Map 1 indicates the location of Common Moor within the landscape and its vital strategic position in maintaining ecological links across the landscape.

4.1 Scrub

Scrub can be invasive of open habitats, such as culm grassland. In the absence of grazing pressure, the rate of invasion can be particularly high, leading to rapid successional change. If left unmanaged, this can significantly affect the conservation of a site. However, if a mosaic of scrub and open habitats is maintained, the overall biodiversity of a site will be increased.

Willow dominated scrub can be particularly damaging to fen and mire habitats; the nutrient rich leaf litter can accumulate and will change the nutrient levels within the soil, encouraging the growth of unwanted vegetation. Soils also become drier in scrub areas, through increased evapo-transpiration. This can damage the existing habitat, leading to increased scrub encroachment. Management is then needed in order to control the scrub expansion.

In established wet scrub, management has to focus on maintaining a mosaic of habitats, while preventing succession into woodland and further scrub encroachment onto priority open habitats.

However, it is important to recognise that wet scrub habitats are of significant ecological value and so management should reflect the desire to balance scrub with other priority wetland habitats.

Appropriate management techniques should be chosen to take into account the vulnerability of wetland habitats, in particular to soil disturbance and chemicals.

4.2. Swaling

Controlled, rotational burning, known as swaling in south west England, on Culm grassland sites has a long and beneficial history to maintain these open areas, often in association with extensive grazing. It is undertaken to create areas of grassland with a more open sward structure, as it burns off the thatch produced by *Molinia caerulea* over time. This mosaic of densely, unburnt areas and open areas presents a collection of niches, which are then favoured by plant, invertebrate, reptile and small mammal species, several of those present at Common Moor are of important ecological interest.

Purple moor-grass is encouraged by burning. Purple moor-grass is entirely deciduous and the remaining dense thatch is capable of smothering other plant species' growth. Culm grassland burns well during the winter months, usually January-March and the thatch from purple moor-grass is the main combustible material present; swaling removes this thatch layer and creates bare ground, which is ideal for the germination of plant seedlings.

Swaling is also a very useful tool to control the spread of scrub across the site, in particular western gorse (*Ulex gali*), as this species can form dense stands which smother the majority of other species. Small, scattered scrub such as willow and thorn species will also be adequately controlled through swaling. Fresh growth of *Molinia* is particularly palatable to grazing animals, including deer. Any incidental grazing of this nature will help to maintain an open sward and keep scrub re-growth to a minimum.

Swaling of Culm grassland can create suitable conditions where a variety of species are able to thrive. However, burning can be highly destructive to a site if it is carried out incorrectly, so care must be taken to control the operation, which should aim for as 'cool' a burn as possible.

4.3 Bracken

Bracken is a highly successful plant, as it is a vigorous and aggressive competitor. It is normally found on damp to dry, acidic soils. Young rhizomes cannot cope well with waterlogging and the plant often stops on the edge of marshy ground. In the UK, bracken is considered an invasive species on lowland grassland and heathland and upland moorland. It is also capable of thriving in shady woodlands and hedgerows, from which it can colonise neighbouring open areas. In western England, along with other areas of the UK, it dominates large areas of land.

Atypically of the other native fern species, bracken is a very successful coloniser, due to its ability to survive in a variety of climatic and soil conditions.

Because of this property, and the dense nature of bracken stands, it can out shade and out-compete many other species, which may be considered to be of higher conservation value. A dense litter of dead bracken material builds up under the stands, which can also affect the growth of other plant species.

The rhizomes are capable of causing major impacts on archaeological features, as they can damage underground archaeological deposits and obscure the site, which can lead to inadvertent damage from other operations, due to decreased visibility.

However, it does have other benefits; in western England it is associated with fritillary species, in particular the small pearl-bordered fritillary butterfly. Some bird species, such as nightjar and whinchat use it as preferred breeding habitat.

5.0 Project Description

Common Moor will be managed sympathetically across the ten years of this agreement to return it to Favourable SSSI condition. By delivering the management described below, the biodiversity of the flora and fauna will increase across the site.

5.1. Scrub Clearance plans and methods

Notes:

1. Other than work carried out at no cost to the Parish Council, there will be no capital works during Year 1 of the agreement, in order to allow funds to accrue.



2. It is agreed that the Parish Council will not be out of pocket through work within the Countryside Stewardship agreement. Should it appear that costs of proposed works may exceed the grants paid through the agreement, the amount of work expected will be reduced accordingly.
3. Scrub control in Year 2 will be funded at 80% of agreed cost as part of the capital works programme within the agreement. The remaining 20% will be funded from the annual management payments.
4. Scrub control funded within the agreement has to be paid for before a claim can be submitted. Therefore it is important to ensure that there are sufficient accrued funds before work is undertaken. It is expected that the work in Year 2 will be split. The first part should be completed and then claimed for as early as possible. This will enable funds to be generated to pay for the 2nd phase.
5. Other scrub control (Year 3 onwards) will be funded through the annual management payments. It is not possible at present to include capital works in the agreement in Years 3 onwards.

Several areas of scrub at Common Moor will be cleared in Year 2 of the Countryside Stewardship agreement, as part of the agreed capital works option. Refer to tables 1 and 2 for a summary of the scrub clearance across each field parcel throughout the 10 year agreement. Refer to Map 2a and 2b for locations of the scrub to be cleared throughout the agreement length.

Areas of scrub will be retained in order to create a mosaic of habitats. No management is included in Year 1 of the agreement, as noted above. There is no scrub clearance scheduled for Year 10 of the agreement. However, up to 0.5ha can be cleared in this year, either in new areas or in blocks where clearance has occurred previously.

Parcel Number	Scrub Block ID	Area (ha)	Clearance year
3475	W1	1.03	2020
	W2	0.62	2022
	W3	0.29	2023
	W4	0.66	2028
	W5	0.12	2027
	W6	0.57	2024
	W7	0.21	2023
4104	E1	0.65	2026
	E2	0.36	2025
	E3	0.36	2027
	E4	0.62	2020
	E5	0.41	2021
	E6	0.15	2020
Total scrub to clear		6.05	

Table 1. Scrub clearance by Parcel.

Scrub clearance by year (ha)	
2019	0
2020	1.80
2021	0.41
2022	0.62
2023	0.5
2024	0.57
2025	0.36
2026	0.65
2027	0.48
2028	0.66
2029	0

Table 2: Total scrub clearance by year

The blocks to be cleared of scrub have been designated in order to create connectivity between open habitats. In particular in Parcel 4104, the scrub has encroached to create three discrete open habitat areas. Removal of the scrub in these blocks will gradually link these areas together, allowing desirable species to further re-colonise these areas.

Clearance of particular blocks of scrub has also been designed to extend the area covered by the open habitats. This applies in particular to parcel 3475, where the majority of scrub on the site is around the edges. Some of this scrub encroachment in the north of the parcel has led to loss of bog habitats in particular. Removal of this scrub will lead to this area becoming wetter over time.

Block W7 has been placed to create a flyway between a currently existing population of marsh fritillary and Common Moor. This butterfly does not travel large distances and often woodland and scrub can act as effective barriers against movement. At the time of writing it is not known whether a population of marsh fritillary still exists on Common Moor. Creating a flyway will allow the existing population to migrate onto the Moor and hopefully become re-established. However, the landowner to the south will need to be consulted and agree to the clearance of this block. Some scrub clearance on their land may be needed in order to create an effective flyway.

5.1.1 Scrub Cutting

Scrub cutting work on Common Moor will include the removal of scattered and dense scrub across the site.

Common Moor is a wet site during the period when scrub clearance can take place. There is also limited access. Due to these conditions, all clearance will be carried out by hand by an appropriately qualified contractor. Saplings, regrowth from stumps and suckers will be removed using hand tools (spade, mattock, billhook or handsaw) or a clearing saw. Bushes and stands of larger trees will be removed using a chainsaw. All stands must be cut to ground level, as grubbing out or stump grinding are not an option on this site.

Work in Year 2 will be in two phases. One phase will commence in September with an aim to finish by the end of the same month. The second phase will begin in December and finish by the end of the same month. Work in years 3-10 can occur between the months of September-March. These timings avoid the bird nesting season.

Up to 10% of scrub within a block should be left uncut in order to maintain a mosaic of habitats and to provide a refuge for any disturbed species.

The scrub bordering the road may need to be managed during this agreement, in order to prevent it impeding the highway. Use of a tractor mounted hedge trimmer for this job is appropriate. This work should be carried out in consultation with the responsible highways authority.

5.1.2 Removal of cut scrub material

Some larger diameter logs may be left in situ, to act as lying deadwood. These piles should be sited on drier ground, to prevent leaching of nutrient into boggy areas and causing them to become more eutrophic. However, the majority of the material must be removed from site or burnt in situ.

As vehicle access to the site is greatly limited, and will be further limited during the winter months when scrub clearance can take place, removal from site should not be considered; therefore burning to remove waste must occur.

All arisings should be burnt in a safe and controlled manner, to prevent accidental fires within the purple moor-grass thatch, which could rapidly become out of control. Sacrificial burn sites should be agreed with NE in order to avoid areas which are species-rich or areas where burn residue can increase the nutrient content of standing water. Appropriate fire sites can often be located in the areas cleared of scrub, reducing manual handling of heavy cut material. Burning on corrugated tin sheets and removal of ash should also be considered, to prevent damage to the ground and reduce nutrient enrichment.

Smoke from burning brash can constitute a public nuisance or hazard, particularly where it impacts on private residences or roads. Fires should only be lit when the wind direction will take any smoke away from residences or roads and when conditions will help reduce the amount of smoke. Operators should aim to produce a hot fire, as this produces less smoke, both in volume and density.

When burning arisings from scrub clearance, a waste exemption must be obtained from the Environment Agency before work commences. The exemption required is 'D7: Burning waste in the open'. The exemption can be applied for online at:

<https://www.gov.uk/guidance/register-your-waste-exemptions-environmental-permits>

5.1.3 Stump treatment

Treating the cut stumps with herbicide, such as glyphosate, will kill the stand and prevent regrowth, therefore controlling encroachment of scrub into priority open habitats.

Stumps need to be treated immediately following cutting. Freshly cut stumps of woody plants can be treated using an appropriate herbicide with application by a paint brush or hand-held sprayer. If painted, the herbicide should be applied at the rate indicated by the product label.

Treated stumps must be marked with a dye to prevent re-application and to ensure 100% coverage. Risk of damage to non-target species should be minimal if this method is followed correctly.

Re-growth can be treated during the spring and summer using a knapsack sprayer. However, great care must be taken during this operation, as indiscriminate spraying will damage the grassland sward.

5.1.4 Environmental Considerations

5.1.4.1 *Storing and handling materials*

Storage of fuel over 200L must comply with Control of Pollution (Oil Storage) (England) regulations. However, even if less fuel is being stored, these regulations should be considered. Fuel and oil containers taken onto site must be handled with care in order to prevent spillage. Containers should not be left on site, whether empty or not. Storage of pesticides must comply with the Plant Protection Products regulations. No more than necessary needed for the operations should be stored, in a marked, locked, container, banded to 110% of the volume of pesticide stored within the container.

Spillages of oils or pesticides should not be diluted or hosed down, but contained and cleaned up immediately using absorbent material such as sand, fuller's earth or specialist materials in spill kits. Spill kits must be easily available in all designated storage areas.

5.1.4.2 *Emissions to watercourses and standing water*

Watercourses, ditches and open standing water should not in any way become contaminated with oils or pesticides. Where there is a risk, a buffer zone of at least 10m must be left. Fuelling and sprayer tank operations must occur in designated areas away from any watercourses. Where small spills occur near watercourses, they must be cleaned up as described above. Larger spills must be contained before they can enter the watercourse and reported to the Environmental Regulator.

5.1.4.3 *Herbicide use.*

Herbicide use should be minimised as much as possible, in order to prevent damage to non-target species. Measures that can be put in place to achieve this include:

- Spraying should not occur in unsuitable weather conditions. These include wet or windy conditions. Wind speed on a spraying day should not exceed Beaufort scale force 2 (7-11km/h). Very warm days should also be avoided to reduce the risk of volatilisation of the herbicide.
- When knapsack spraying regrowth, fine sprays must be avoided – nozzles that provide a medium-coarse droplet are ideal.
- Spot treating regrowth is preferable to any other form of spraying. An appropriate guard on the sprayer lance will allow more effective targeting and also reduce spray drift.
- Spray nozzles should be kept as close as possible to the target to help reduce drift, but minimum spray distances must also be taken into account.
- All unused pesticides and empty containers must be disposed of safely – for more information refer to the Code of Practice for Plant Protection Products:
<http://www.hse.gov.uk/pesticides/topics/using-pesticides/codes-of-practice/code-of-practice-for-using-plant-protection-products.htm>
- Anyone applying pesticides in a professional context on land not owned by them must hold an appropriate certificate of competence (NPTC PA1 and PA6aw or equivalent). Under the Plant Protection Products regulations, old grandfather rights no longer apply, and pesticides cannot be applied by any unqualified personnel, even when a qualified operator is supervising.

5.2 Swaling Management plan and methods

Note: The creation and management of the firebreaks will be carried out in Year 1 by DWT, at no cost to the Parish Council. Thereafter, these costs will be funded from the agreement's annual management payments.

Swaling is potentially dangerous by nature and therefore this operation should only be carried out by experienced personnel, following evaluation of the site for risks.

Timing of swaling is important and very weather dependent. Swaling outside of the period 1st November-31st March is illegal, as it will cause considerable damage to wildlife. Some reptiles, including adders (present in good numbers at Common Moor) can emerge before the end of March. Some bird species can also nest early. Because of the potential to damage these species, swaling operations should be carried out between mid-February and mid-March. Swaling requires a period of dry weather prior to the operation, so the vegetation has time to dry, but the soil conditions remain moist.

The day for swaling should be chosen with care. A light breeze will allow a fast burn with limited heat. It is essential to ensure that there are sufficient personnel present on the day of the swaling operation to control the burn. Firebreaks should be established in appropriate locations (Section 5.2.1).

Burning on this site, as it is the main form of management for Common Moor, has to be undertaken with extreme caution to prevent causing environmental damage. The Department for Environment, Farming and Rural Affairs (DEFRA) has issued heather and grass burning regulations and these must be read and followed by any personnel involved in the swaling operations. They can be found at: <https://www.uplandsmanagement.co.uk/best-practice-guides>

5.2.1 Firebreak Establishment and Maintenance

Firebreaks are an essential part of controlling swaling across the site. The existing firebreaks (as of 2017) and new firebreaks divide up the overall swaling blocks into smaller areas, allowing the burns to be smaller and more controlled.

Firebreaks across the site should be a minimum of 4 metres in width; this is roughly equivalent to twice the width of the DWT owned tractor mounted flail. The north-eastern edge of parcel 4104 is adjacent to a Forestry Commission plantation. This break should be 6 to 8 metres in width. Currently, there is a stand of gorse, roughly 2 to 4m in width, along much of the length of this firebreak. As such, the firebreak should follow the line of this stand and remove it completely. This will control the gorse and prevent it being a fire-risk to the forestry plantation. This firebreak is marked on Map 4 as firebreak 'B'.

The Forestry Commission also have a Right of Access across parcel 4104 to access the eastern end of the plantation. This access should be kept open to allow the FC access for wildlife management. The firebreak marked 'C' on Map 4 follows the route of this Right of Access and as such will satisfy the FC's requirements.

A power line runs across the very northern end of parcel 4104. In order to protect this, a firebreak will need to be cut along its route. Ideally, this firebreak will extend at least 6m from the route of the line, especially to the south. The power line is very close to the northern boundary of Common Moor and there is mature scrub along the boundary so any firebreak cut here north of the power line should take this into account and the width shortened appropriately. This firebreak is marked on Map 4 as 'A'.

There are several methods which will be used to establish and maintain firebreaks across Common Moor.

Where appropriate, a tractor mounted flail mower should be used. Tractor mounted flails are capable of cutting gorse material and breaking it down into small pieces, which will allow the material to rot down faster. However, to prevent damage to the soil, tractors should only be used where the ground conditions allow.

An ATV pulled flail will be less capable than a tractor mounted flail, as they are generally lighter and have much lower horsepower available. This combination of equipment will be more suited for wetter areas of Common Moor, due to the lighter weight. However, damage to the soil must be avoided in wet areas.

In areas where the site is too wet for any machinery, experienced, trained operators with brushcutters can be used to cut breaks through these habitats. However, this can be very slow and it may be easier to re-route the firebreak to less-wet areas without compromising their effectiveness. The optimum route of a firebreak may be established over time and therefore may differ slightly from Map 4.

All firebreaks should be cut twice per year, once in late summer and then once between January and the swaling date if possible. If the breaks are cut very close to the swaling date, the cut material can be flammable. If this situation occurs, firebreaks must be burnt in, as described below. Cutting all firebreaks twice every year will help reduce the effect of accidental fires, will provide routes for the public to walk on and will maintain areas of shorter sward to benefit wildlife.

If viewed necessary by the swaling supervisor on the day, firebreaks can be 'burnt in' where appropriate. These are established downwind by three or more operators, before the main swale is lit. One operator ignites material along the route of the firebreak. The other operators can then control where the fire burns, by using fire-beaters to extinguish the fire along the downwind edge, while allowing the fire to 'back burn' against the wind on the up-wind edge. The back burning front should be extinguished in the same manner once the required fire break width is reached.

If viewed necessary by the contractor, extra firebreaks can be added to further divide up the swaling blocks. This will also allow increased control of the swaling operation, which can be very useful if weather conditions change on the day.

5.2.2 Rotational Swaling plan

Please refer to Table 3 and Map 3 for details of the swaling blocks and Map 4 for firebreak routes.

Parcel Number	Block Code	Swaling area (Ha)	Burn Year				
			1 / 6	2 / 7	3 / 8	4 / 9	5 / 10
3475	West 1	6.1			X		
	West 2	8.4				X	
	West 3	7.2	X				
	West 4	5.8			X		
	West 5	5.9		X			
4104	East 1	4.8		X			X
	East 2	5.4	X			X	
Total (Ha)		43.6	13.2	12.6	5.8	10.7	11.5

Table 3. Common Moor Blocks and Agreement Year for swaling.

Note: The areas noted above are total areas, inclusive of some in-block scrub stands, so the total area swaled will be smaller.

This pattern of blocks, in particular West 4 and West 5, contain frequent stands of ling heather and cross-leaved heath, with occasional stands of bell heather. Swaling on the frequency given in this management plan may be too frequent to encourage strong growth of these species. As such, the growth of heather within these two blocks should be monitored and the swaling frequency lengthened if deemed necessary.

The two blocks in parcel 4104 will be burnt more frequently, every three years. The shape of parcel 4104 means scrub encroachment can quickly have a greater effect on reducing connectivity, so a more frequent swale will help control scrub saplings more effectively. In order to avoid damage to the Forestry Commission site, swaling can only be carried out in the block East 1 if the weather conditions allow. In particular, the wind direction needs to be so the fire-front burns away from the forestry block, but also so the smoke is carried away from the road. Ideally, this will be a North-Easterly wind. If conditions are not right, this block should not be swaled and left, the program for 4104 put back by one year. The more frequent rotation of swaling for these blocks allows for years when burning may not be possible.

As the swaling blocks on parcel 3475 are much more open, a less frequent burn will still be effective at controlling scrub encroachment.

This rotational burning plan should be considered as flexible, as the areas which can be safely burnt each year will depend upon weather conditions. However, no area should be burnt in consecutive years and all areas should be burnt at least once in a five year period.

5.2.3 Swaling health and safety precautions

Swaling carries inherent risk, but with appropriate precautions the risks to the operators, environment and the public can be minimised. The following points should be taken into account when carrying out the swaling operations.

- Only burn between sunrise and sunset.
- Provide advance notice to neighbours and commoners of intended burn periods.
- On the day of the swale, the local fire service control centre should be informed before the operations are carried out and again once operations have ceased and the fires extinguished.
- Operations should be carried out in light wind conditions, when the vegetation is dry enough to burn.
- Burns should be carried out with the wind, as this allows for a cooler, faster burn with less damage to the soil and non-target vegetation.
- Public access to the site should be prevented.
- An experienced person should be nominated as the burn supervisor; all work should be directed by them. They should hold responsibility for contact with the local fire service.
- All personnel should be trained in swaling techniques and equipped with fire beaters. For a site of this size, a minimum number of five people is required.
- A water bowser equipped with a pressure hose or lance can be used to control edges, particularly when burning in fire breaks.

- Only burn a block when the wind direction allows the fire to reach either a firebreak or a large area of scrub or woodland, where it will die out. Avoid wind directions where the smoke is blown towards residences or public roads.
- Re-visit the site before nightfall, to check for hotspots.
- Burn in good conditions to reduce the amount of smoke produced.
- Water for damping down purposes should be obtained from a hydrant or mains supply, rather than ponds, in order to protect the aquatic wildlife.
- Avoid burning areas where erosion could occur.

5.3 Bracken Control

Bracken, if left uncontrolled, can dominate swards, smothering other species. The rhizomes are also capable of damaging below ground archaeological features. However, it can be an important part of the ecological make-up of a site, as several butterfly species are associated with bracken.

At Common Moor, there is very little bracken present. A small stand currently exists on an archaeological feature; the tumulus at the southern end of parcel 4104 (see Map 5). The control of this, together with control of scrub on both barrows will be detailed in a management plan to be provided by Historic England.

5.3.1 Control Methods

Chemical control of bracken is the most effective method of controlling spread and preventing re-growth. Currently, the only pesticide licenced for use on bracken is glyphosate, as a broad spectrum herbicide. However, glyphosate would also damage other plant species that may still exist under the bracken cover, so spraying is not an appropriate method for applying this pesticide at Common Moor. Weed-wiping, using a quad towed weed-wiper can be a highly effective and targeted method of delivering glyphosate to the bracken fronds. Briefly, glyphosate solution is applied to brushes within the equipment. The equipment is set to a height where the brushes will only contact the bracken fronds and not any non-target vegetation. These brushes then transfer the solution directly onto the fronds.

While currently banned from general use asulam, a fern specific herbicide was derogated for use during summer 2017 and these summer derogations are likely to continue being issued by DEFRA for the foreseeable future. As this herbicide is specific only to fern species, it can be sprayed directly onto the bracken fronds and damage to other species is avoided.

It is appreciated that herbicide use may not be appropriate for use at Common Moor, due to the sensitive nature of the site.

Mechanical methods of bracken control include cutting and bruising.

Cutting bracken repeatedly – at least 2 times per year - through the growing season combined with removal of the arisings will weaken the rhizome. As the area of Bracken at Common Moor is on and next to a Scheduled Ancient Monument, machinery such as tractor mounted or ATV towed flails cannot be used in order to avoid compaction damage to the monument. However, the total area of bracken is small enough that it can be cut using a brushcutter and removed using hand tools.

It is worth noting that even repeated cutting will not kill bracken, but it will limit its spread and reduce its vigour.

Bruising of bracken fronds causes the sap to continually leach out of the wounds, which will weaken the rhizome. There are now several ATV towed attachments that can be used to bruise bracken. These usually consist of a heavy roller with attached ribs, which crush the stems multiple

times. However, these are unsuitable for use on the Scheduled Ancient Monument. Bruising can be done manually using a lightweight stick, such as a bamboo cane. This tool is then struck repeatedly onto the bracken fronds with enough force to damage the stem.

Again, bruising will not kill bracken but it is a good technique for controlling the spread of the rhizome and will reduce its vigour.

The best control method to use will be decided between Natural England and the contractor.

6.0 General Good Practice – All Management

6.1 Buffer-zones

5 m buffer-zones (i.e. no fuelling or machinery maintenance within these zones) should be located from the edge of any watercourses or ditches.

Within the buffer-zones (identified during site visits prior to operations), refuelling must not take place. If other maintenance is required which may result in the spilling of fluids or lubricants, this must take place outside of the restoration compartments, in a location agreed by the landowner and agent.

6.2 Wildlife

If any works are to be carried out during the bird nesting season then thorough checks must be made within the compartments for ground nesting birds throughout the operations period. If nesting is confirmed or suspected, works must cease until the end of the nesting period and fledging of the young to avoid disturbance. Checks by the agent will be made for scheduled nesting bird species prior to works commencing. It is the responsibility of those working on site to ensure regular checks are made throughout the works period.

Checks must be made for scheduled mammal species which may be disturbed. If such species are encountered within the compartments Natural England must be informed and relevant licenses / consent obtained.

The relevant species which may be encountered in the Culm land character area are considered in more detail below:

- Dormouse – No known records of this species exist for Common Moor the wet grassland and scrub at this site is not prime habitat for this species, and the existing hedgerows, together with small isolated patches of woodland, will *at best* offer sub-optimal habitat for Dormouse. It is felt that the works will actually enhance the site for Dormouse; providing both increased food supply (i.e., a large range of insects), and improved connective features (i.e., consistent taller sward which will assist Dormouse to traverse the sites –between established Culm areas, and will reduce the risk of isolating populations in the wider countryside).
- Badger – A search of the site by DWT staff did not locate any obvious setts, latrine pits, or signs of feeding activity. But Badger is known to be active across the wider Culm area. It is felt that the proposed Culm Grassland restoration and proposed management will increase the potential food resource for badgers in the future. Contractors will, however, need to be vigilant during operations, and if a sett is discovered as works are occurring, a 30 m exclusion zone will need to be established and further advice (and potentially a licence) should be sought from Natural England. The critical Badger breeding period of

January and February should also be avoided to minimise disturbance from operations, (though the wet nature of the sites will probably rule this period out for most operations)

6.3 Access

Access to the site is from the A388 at Stibb Cross. From Stibb Cross follow the road signposted to Woolsery. This road runs directly through Common Moor and is approximately 6km from the Stibb Cross turning. Access onto the site for vehicles is very limited and dependent on ground conditions. There is no access for 4x4 vehicles. Tractors should only access the site when ground conditions are suitable. ATVs can access the site in wetter conditions, but care should be taken to avoid damage to the soil.

6.4 Historic environment

A HEFER has been applied for, as of May 2017. Scrub control on the Scheduled Monuments has the potential to cause damage to these archaeological structures and so must be managed carefully to prevent this.

6.5 Health and safety

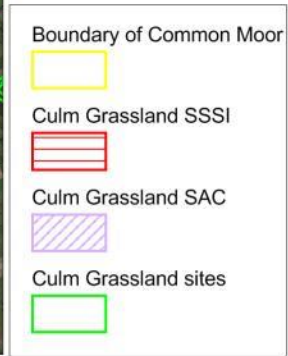
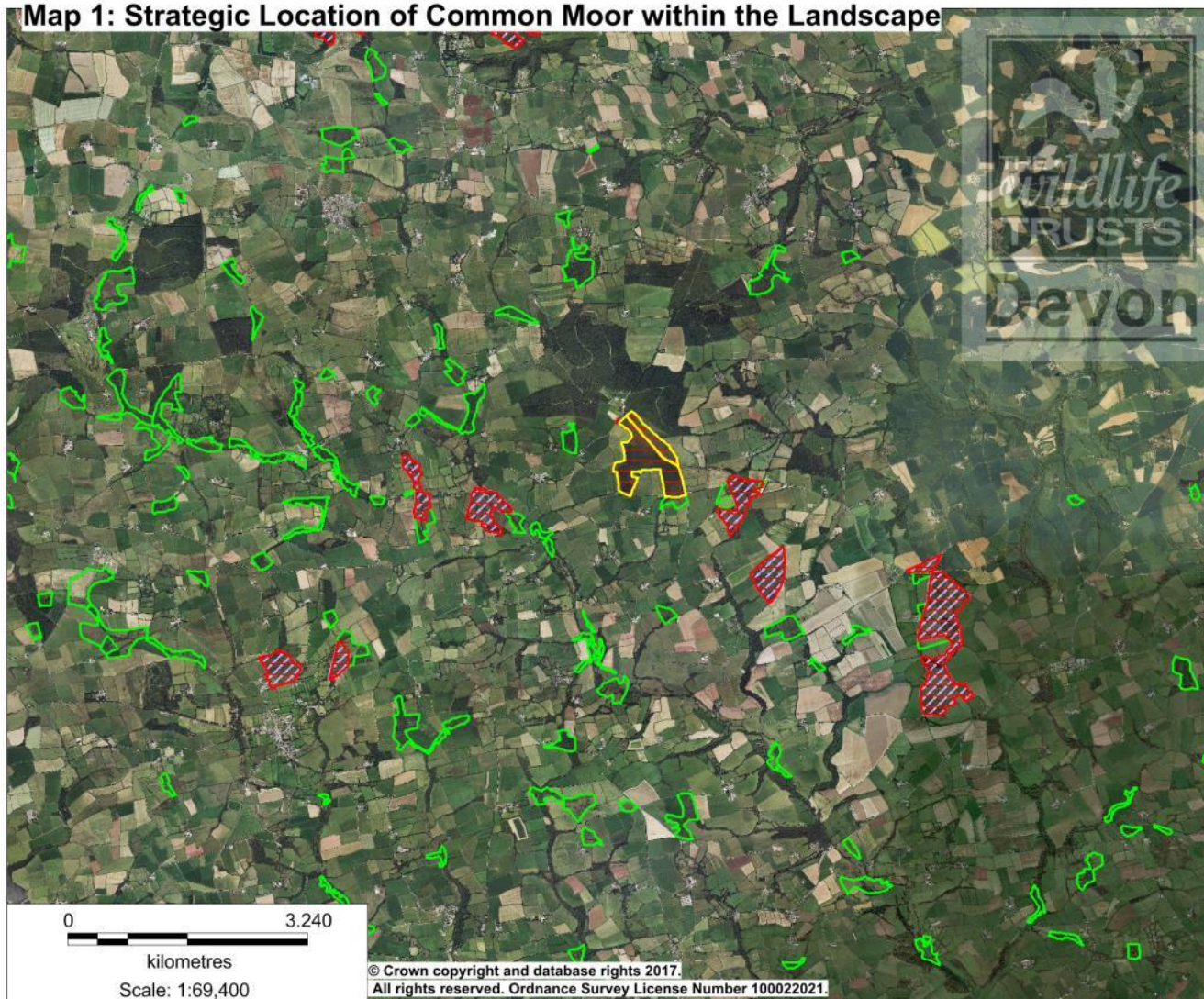
Contactors or any person working on the site shall ensure that its employees, agents and sub-contractors will comply with health and safety legislation and approved Codes of Practice. Example risk assessments are included in appendix 2.

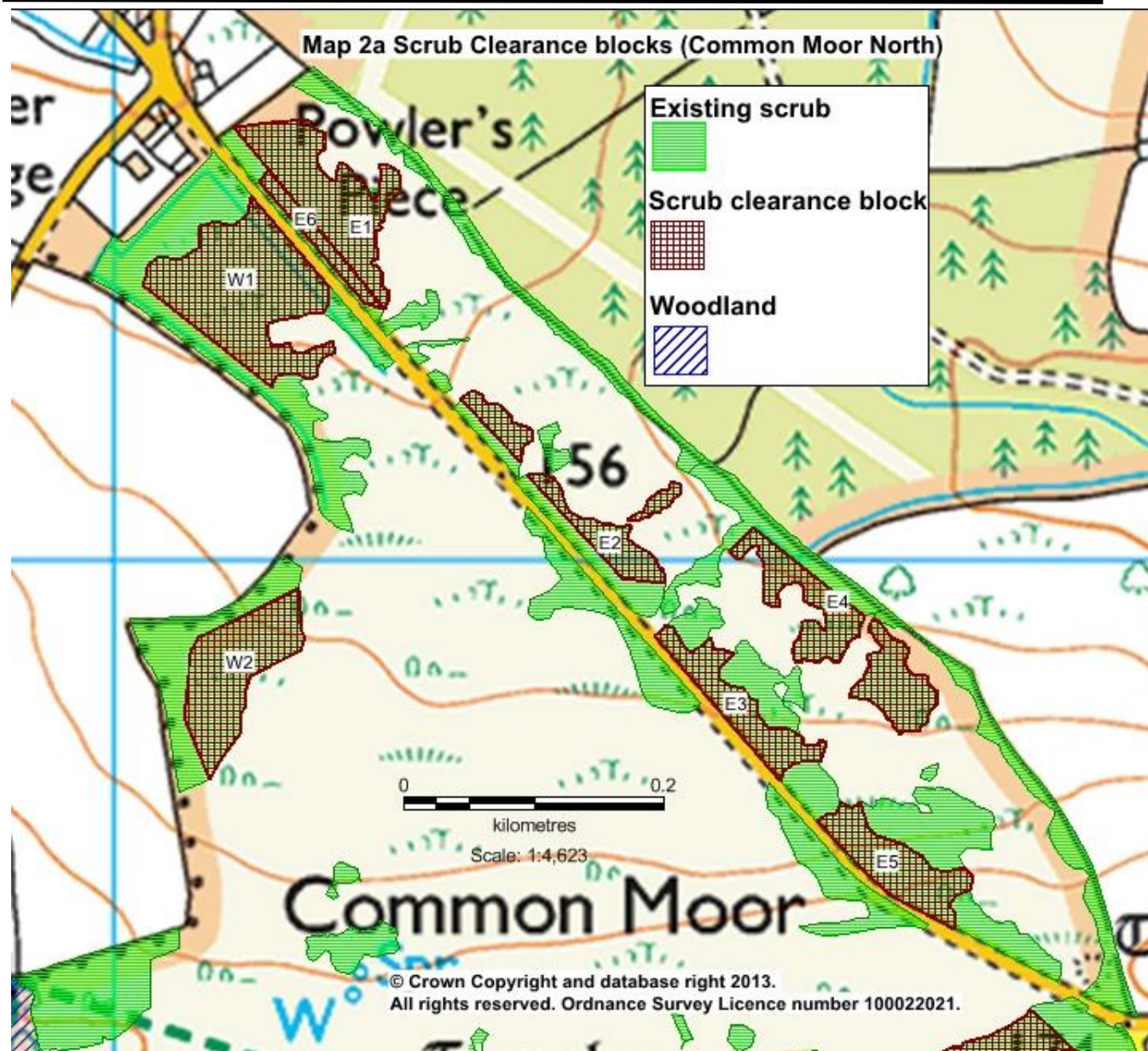
6.6 Site Monitoring

The effects of the management should be monitored throughout the length of the agreement by Natural England and Putford Parish Council, to a schedule agreed by these parties. Monitoring should feed back into the management and the management plan updated if changes are needed.



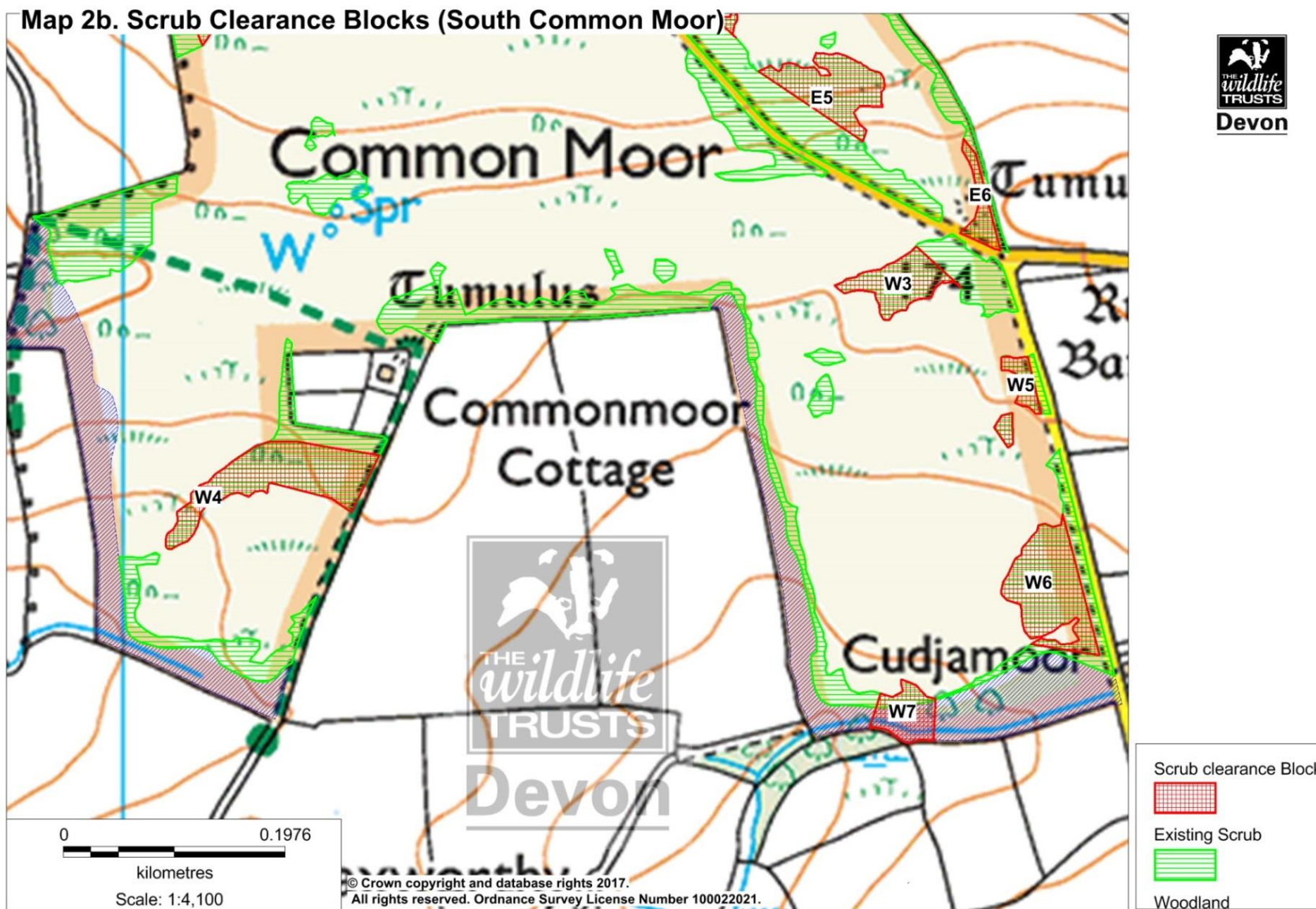
Map 1: Strategic Location of Common Moor within the Landscape



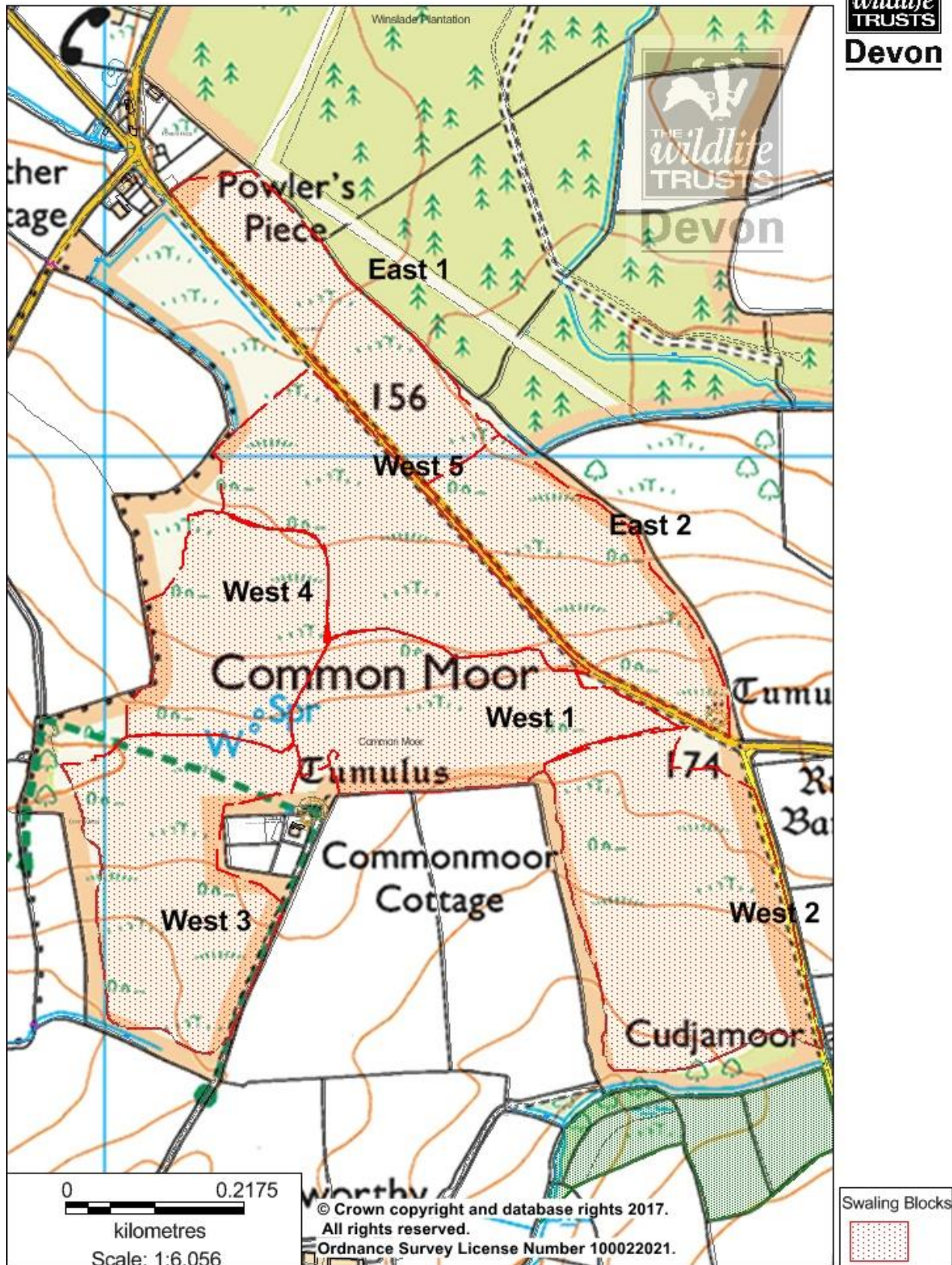




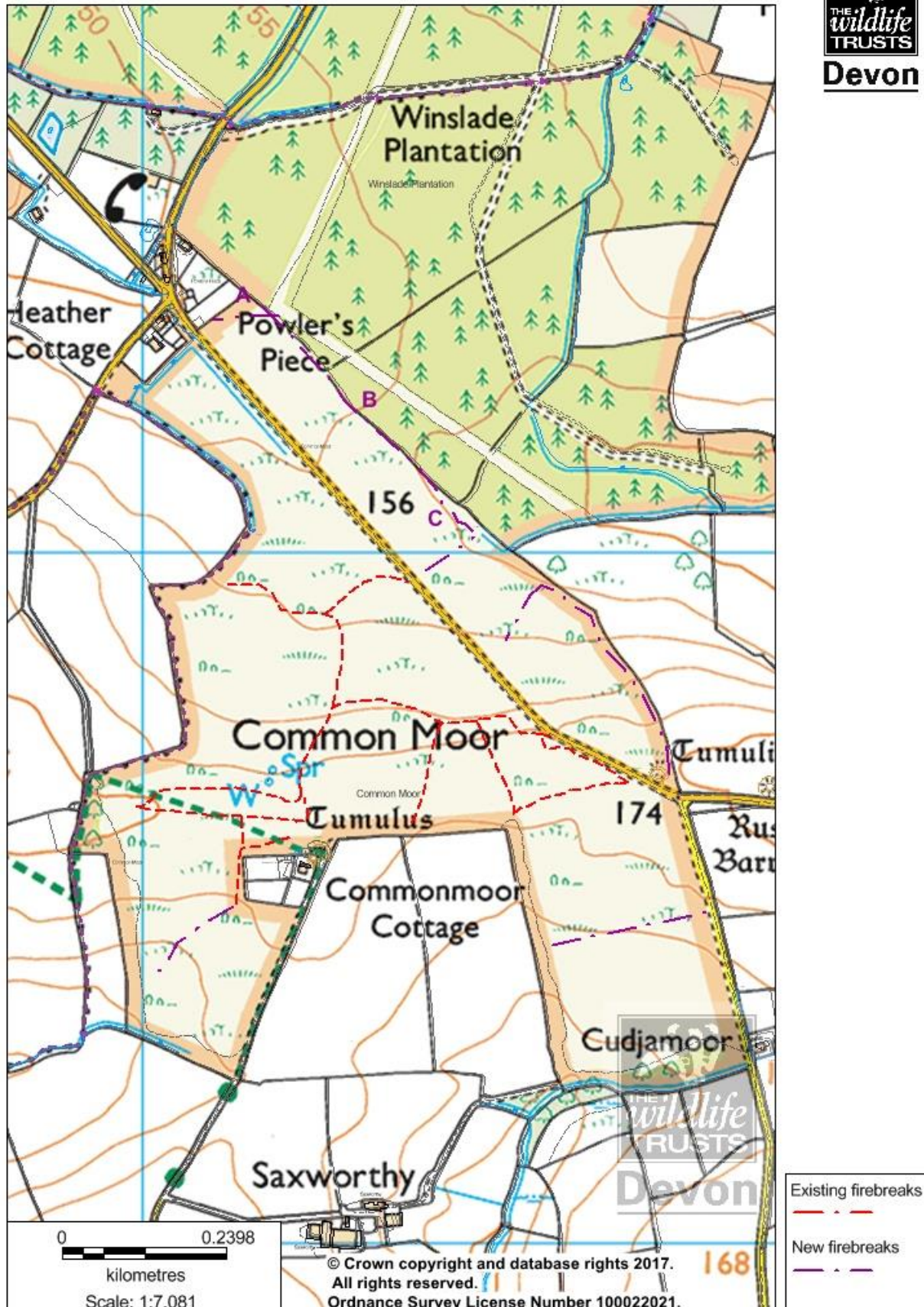
Note: Areas E5 & E6 on this map (2b) are superseded. E5 is now closer to the road, E6 is now roadside near Powler's Piece. See Map 2a (revised 31/8/17).



Map 3. Common Moor swaling blocks



Map 4 Common Moor Firebreak Routes



Map 5. Bracken Location on Bronze Age Barrow

