Our Common Cause: Our Upland Commons

Holne Common

Assessment of habitat suitability for fritillary butterflies (2021- 2023)

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Contents

1.

Introduction

	2.	High Brown/Pearl-bordered Fritillary habitat assessment	Page 3
	2.1	Methodology	Page 3
	2.2	Results	Page 4
	2.3	Changes between 2021 and 2023	Page 4
	2.4	Butterfly monitoring results from 2021 to 2023	Page 5
	2.5	Discussion of results	Page 6
	3. M	anagement recommendations	Page 7
Αı	open	dices	
Ap	pendi	x 1 Map 1 Location of Great Combe and Venford Reservoir site	Page 9
Аp	pendi	K 2 Map 2 Subsites and transect lines used in habitat assessment, Great Combe	Page 10
		Map 3 Transect lines used in habitat assessment, Venford Reservoir site	Page 11
Аp	pendi	3 Sample vegetation data collection sheet	Page 12
Αp	pendi	x 4 Vegetation data collected in 2021	Page 13
Аp	pendi	x 5 Vegetation data collected in 2023	Page 14
Аp	pendi	6 Assessment of changes in vegetation data 2021-2023	Page 15
Аp	pendi	x 7 Butterfly data collected in 2021, 2022, 2023	Page 15

Page 3

1. Introduction

The 'Our Common Cause: Our Upland Commons' project aims to conserve and enhance the heritage of Commons and Commoning in the uplands. As part of this Dartmoor-focussed project, restoration work has been carried out over three years (2021-2023) on Holne Common to improve the quality and extent of breeding habitat for rare and declining fritillary butterflies.

Practical management has been delivered at two sites to benefit two of the UK's most threatened and rapidly declining butterflies, the High Brown Fritillary *Fabriciana adippe* and Pearl-bordered Fritillary *Boloria euphrosyne*. Other fritillary butterflies, the Small Pearl-bordered Fritillary *Boloria selene*, Dark Green Fritillary *Speyeria aglaja* and Silver-washed Fritillary *Argynnis paphia* are also found on these sites.

The two sites are located in Great Combe and to the north of Venford Reservoir, both part of Holne Common (see map, Appendix 1). An assessment of the condition of the breeding habitat at the two sites was carried out in each of the three years of the project. This report presents the results of the assessments and highlights changes in condition over the three year period. It includes results of butterfly surveys carried out for the two target species, and details of management works undertaken. Recommendations are provided for further management to improve breeding habitat condition.

2. High Brown/Pearl-bordered Fritillary baseline habitat assessment

2.1 Methodology

The survey methodology used was developed for the High Brown Fritillary and Pearl-bordered Fritillary sites on Dartmoor and Exmoor (Clarke and Warren, 1997) and Butterfly Conservation's monitoring protocols (Brereton *et al.*, 2005).

The method involves walking an area during April to late May (when bracken is dormant), and visually assessing the suitability of the habitat and dividing the site into sub-sites based on breeding habitat suitability. The sub-division takes into account density of violet plants, aspect and bracken density, and sites are allocated to one of the following categories:

- 1) Suitable. Violet plants growing amongst bracken seen on average every 2 5 paces.
- 2) Scattered. Violet plants growing amongst bracken seen on average every 6 -20 paces.
- 3) Occasional. Violet plants growing amongst bracken seen on average every 21-50 paces
- 4) No habitat. Sub-sites have no, or almost no, suitable violet plants (data sheets were completed if the area has future potential as breeding habitat, assuming appropriate management is undertaken).

Sub-sites were numbered and the boundaries marked on field maps. In each sub-site several 100m transect lines were set out across the area (the number of transects in each sub-site depended on the size of the sub-site). Appendix 2, Map 2 shows the location of sub-sites at Great Combe and the single site to the north of Venford Reservoir (Map 3). The following data were collected for each 100m transect line (see sample data collection sheet, Appendix 3):

- Slope
- Aspect
- Metres of bracken dominated habitat along the transect line
- Number of animal paths (temporary and permanent) crossing the transect A one metre square quadrat was laid at 20m intervals along the line. The following data were

A one metre square quadrat was laid at 20m intervals along the line. The following data were collected in each quadrat:

• GPS location reference

- Number and percentage ground cover of violet plants
- Percentage ground cover of litter (bracken, leaf etc), grass, bare ground, bramble, bluebell and scrub (note that the total percentage cover does not add up to 100% where bracken covers the whole of the quadrat, and bramble or grass are also present growing up through the bracken)
- Vegetation/Bracken litter depth at quadrat centre point (drop disc measurement in cms)
- Any feeding damage to violet leaves was noted.

2.2 Results

Vegetation data were collected in 2021, 2022 and 2023 between 15th and 26th April each year. Maps show the locations of sites (Appendix 1), subsites and transect lines (Appendix 2). It should be noted that, although GPS references were taken, the accuracy is not sufficient to allow precisely the same 1m quadrats to be revisited each year. A survey sheet was used to collect data (Appendix 3), and the results from 2021 and 2023 are presented in tables in Appendices 4 and 5 respectively. A comparison between the years to show the changes over time following the management interventions is presented in the table in Appendix 6.

In Great Combe an area of 8 hectares has been identified as having potential for fritillary butterflies, and here four subsites were identified and 12 transect lines were assessed and mapped (Appendix 4) each with 6 quadrat points. A total of 72 sample quadrat points were recorded across the 8 hectares on which management has been targeted. In 2023, 45% of the sample points contained violets (compared with 36% in 2021) with an average of 8 (4.5 in 2021) plants per 1m quadrat. The average grass cover across all quadrats was 27% (31% in 2021). Presence of bracken litter was recorded across all but one quadrats in 2023 (all but two in 2021), with an average cover of 71% (68% in 2021) and an average depth of 21cm (19cm in 2021).

North of Venford Reservoir, an area of 2 hectares has been identified as having potential for fritillary butterflies. The site is smaller and the habitat quality fairly consistent across the slope, and therefore not divided into sub-sites. 3 transect lines were established and mapped (Appendix 2, Map 3) with a total of 18 quadrat points recorded across just under 2 hectares of the Common on which management has been targeted. 28% (44% in 2021) of sample points contained violets, with an average of just under 3 plants per 1m quadrat (2.5 in 2021). The average grass cover across all quadrats was 7% (26% in 2021). Presence of bracken litter was recorded across all quadrats in both years, with an average cover of 81% in 2023 (71% in 2021) and an average depth of 21cm (13.5cm in 2021).

2.3 Changes between 2021 and 2023

In Great Combe, the following changes have taken place from 2021 to 2023:

- Violet presence (% of sample points containing violets) has increased by 9%.
- Violet abundance (average number of violets in quadrat) has increased by 3.5 plants per quadrat.
- Grass cover has decreased by 4%.
- Bracken cover has increased by 3%.
- Bracken litter layer depth has increased by 2cm.
- In both 2021 and 2023 subsite 1 was classified as having 'Scattered habitat'.
- In both 2021 and 2023 subsite 2 was classified as having 'Occasional habitat'.
- In both 2021 and 2023 subsite 2 was classified as having 'Occasional habitat'.
- In 2021 subsite 4 was classified as having 'Occasional habitat' and in 2023 it was classified as having 'Scattered habitat' (a slight improvement in suitability).

In the area north of Venford Reservoir, the following changes have taken place from 2021 to 2023:

- Violet presence (% of sample points containing violets) has fallen by 16%.
- Violet abundance (average number of violets in quadrat) has remained the same.
- Grass cover has decreased by 19%.
- Bracken cover has increased by 10%.
- Bracken litter layer depth has increased by 7.5cm.
- In both 2021 and 2023 it was classified as having 'Scattered habitat'.

2.4 Butterfly monitoring results for the Holne Common sites from 2021 to 2023

Butterfly surveys were carried out during the peak flight period for Pearl-bordered Fritillary (late April-mid May) and High Brown Fritillary (mid June-early July) to record the number of each species seen during a measured time period. Timed counts involve walking a zigzag route throughout a site and counting the number of butterflies seen over a measured time period. The number seen per person/per hour can be compared between years, and annual trends can be created.

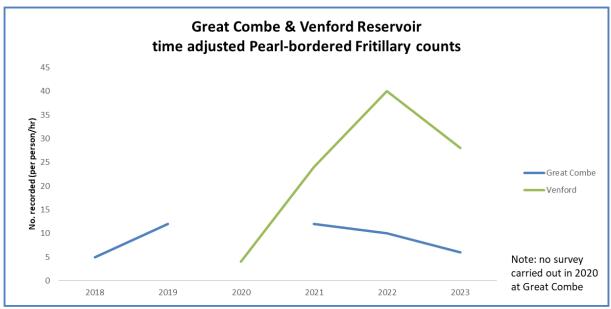


Figure 1. Time adjusted counts for the Pearl-bordered Fritillary 2018-2023

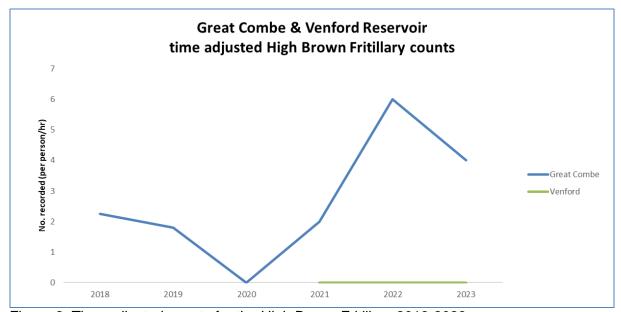


Figure 2. Time adjusted counts for the High Brown Fritillary 2018-2023

The graphs above present the results of timed counts for Pearl-bordered Fritillary (Figure 1) and High Brown Fritillary (Figure 2) at Great Combe and the area to the north of Venford Reservoir. The data on the graph has been adjusted for the time spent searching to ensure that the results from each year are comparable and that search effort is accounted for. (See Appendix 7 for the raw data.) The graphs present data from a period of 6 years for Great Combe, only four years from Venford, which is a relatively short time period, so any conclusions drawn should bear this in mind.

It should also be noted that the spring weather in 2023 during the flight period of the Pearl-bordered Fritillary was very cool and damp. The butterfly emerged around 2 to 3 weeks later than usual, and suffered from cool and breezy conditions during its flight period, hence numbers may have been affected.

The main points to draw from the graphs are:

- The Pearl-bordered Fritillary population is stable and faring reasonably well at the Venford Reservoir site.
- Great Combe Pearl-bordered Fritillary population is small but appears stable.
- Great Combe High Brown Fritillary population is small but appears stable.
- It should be noted that, although no High Brown Fritillary were recorded at the Venford Reservoir site during the survey in 2022, one individual was recorded during a subsequent site visit in July 2022, indicating that they are using the site, although not necessarily breeding there.

2.5 Discussion of results

Any changes in the quality of breeding habitat will inevitably take time to show; three years is a relatively short time period over which to assess change. Nevertheless, an improvement in one of the four subsites at Great Combe was recorded, with habitat quality improving from 'occasional' to 'scattered' breeding habitat. Violet presence and abundance increased slightly at Great Combe, although much of the lower half of the east facing slope remains dominated by dense bracken litter. Efforts to encourage stock grazing into the area to trample bracken do not appear to have been successful, but manual management to create tracks through areas of tall, dense bracken in the summertime have been beneficial and a 9% increase in violet frequency was recorded. Higher up the east facing slope, the bracken thins out considerably and the habitat is very grassy. The middle section remains the most suitable breeding habitat, with frequent violets amongst an appropriate depth of bracken litter.

The trial burn carried out in early spring 2022 on the south facing slope (sub-site 2) did not result in the hoped-for flush of violets or the creation of suitable breeding habitat in that area.

At the Venford site, the overall classification of 'scattered habitat' remained unchanged over the assessment period, however the presence and abundance of violets declined slightly, and bracken litter depth increased. Scrub control was carried out, with the removal of some of the young, invading alder buckthorn trees and gorse scrub, which has helped to maintain open conditions and prevent the breeding area becoming too shady. More young seedlings are starting to encroach, however, and will require control.

3.0 Management recommendations

Further management is recommended at both sites to improve habitat suitability.

Great Combe

Sub-site 1 (see Appendix 2, Map 2) This area is very grassy and bracken growth is sparse, but there are patchy areas where violets and bracken grow in suitable conditions, and could support

fritillary breeding. No bracken management is required here, and management with light grazing with cattle or ponies should maintain suitability.

Sub-site 2 The top of this sub-site has some suitable habitat with violets frequent amongst appropriate depth of bracken litter. Lower down the slope, violets are absent and bracken litter is very deep. The trial burn did not produce a flush of violets, and resulted only in the acceleration of bracken growth the following season. It is likely that this area will remain unsuitable due to lack of violets, so further bracken management in this area would not be worthwhile.

Sub-site 3 Some suitable habitat on this slope, although some areas are too grassy. No manual bracken management is required here, and management with light grazing with cattle or ponies should maintain suitability.

Sub-site 4 This area has greatest potential for fritillaries due to the abundant violets growing beneath the bracken, however bracken density is too high and requires further, and on-going, management to create tracks through the bracken in the summer (June) and to break up and disturb the dead bracken litter layer (in late winter). This could be carried out by targeted grazing by cattle or ponies at these times of the year, but invariably the stock avoid the dense bracken areas and graze around the sides, so additional manual management will likely be required to bruise or cut a network of tracks by hand throughout the very dense areas of bracken.

Grazing should continue as previously recommended. The sites should be grazed during the summer (May to August), specifically targeted to the lower half of the east facing slope, (Subsite 4, see Appendix 2, Map 2). Mineral licks could draw stock into these areas, which have been ignored by grazing cattle/ponies in the past. The aim is to create a network of tracks throughout the tall bracken area.

A further round of grazing is recommended in the winter during January/February (derogation may be required), to break up the dense bracken litter layer and create small areas of open ground where violets can germinate.

Manual bracken management should continue as previously recommended in areas where grazing has not created the necessary tracks throughout the bracken stand. Bracken areas should be bashed or bruised (June to August) to create a network of narrow tracks (around 1m wide) across the site. Aim to expose patches of violet plants where possible, as violets exposed to the sun will be sought out by egg-laying females. An inspection of the site should be carried out beforehand, to ensure no nesting birds are present, and the bruising/bashing work should be carried out only with hand tools.

In January/February, dense bracken thatch should be disturbed, again creating a network of tracks. Broken down material should be raked aside; some disturbance of the soil surface is desirable, to open up the area for potential colonisation of violets.





▲ Paths should be made through tall stands of dense bracken to break up the canopy, let light in, and enable butterflies to get down to the violets beneath. Ideally this will be achieved by stock grazing, but can be created manually.

Venford

Bramble and scrub have both increased significantly over the three year period of this study, in both frequency (number of quadrats with bramble and/or scrub) and coverage (area of quadrats with bramble or scrub. During the project period, the scrub control focussed on removal of larger alder buckthorn trees, however there are now many young alder buckthorn saplings across the site which have germinated from the abundant seed drift, or regrowth from cut stems. This requires continued management to remove up to a third of these young trees annually.

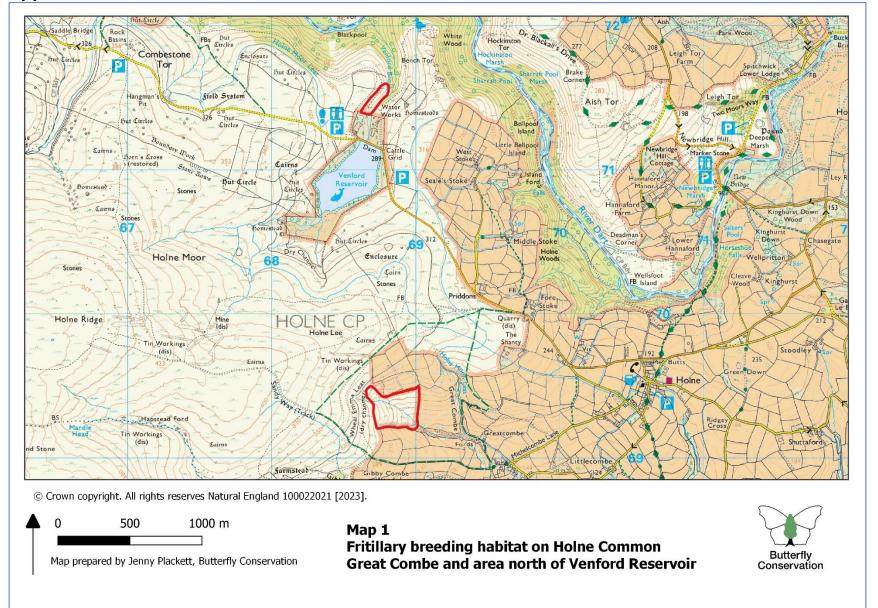
Scrub control – to remove encroaching Alder Buckthorn, gorse and other young scrub Reduce the extent of Alder Buckthorn, bramble, Silver Birch and gorse scrub to leave approximately 5-10% cover. Remove scrub right down to the woodland edge, leaving a wavy, scalloped edge to the wooded area alongside the river. Aim to increase the extent of open bracken/violet habitat. Focus on removing Alder Buckthorn, ideally pulling young saplings (no regrowth to deal with) by hand or using sapling pullers. If they are too large for pulling, cut at ground level, as close to the ground as possible (to minimise trip hazards and damage to grazing stock). If possible, the stumps should be painted with an appropriate herbicide to reduce regrowth and the cut vegetation should be removed and stacked in the woodland edge at the bottom of the slope. Small clumps of scrub growing in grassy areas can be left; focus on removing scrub from areas where bracken and violets are present.

Graze with cattle or ponies lightly in summer to create some tracks throughout the bracken, and during the late winter to break up areas of dense bracken litter (as described above).

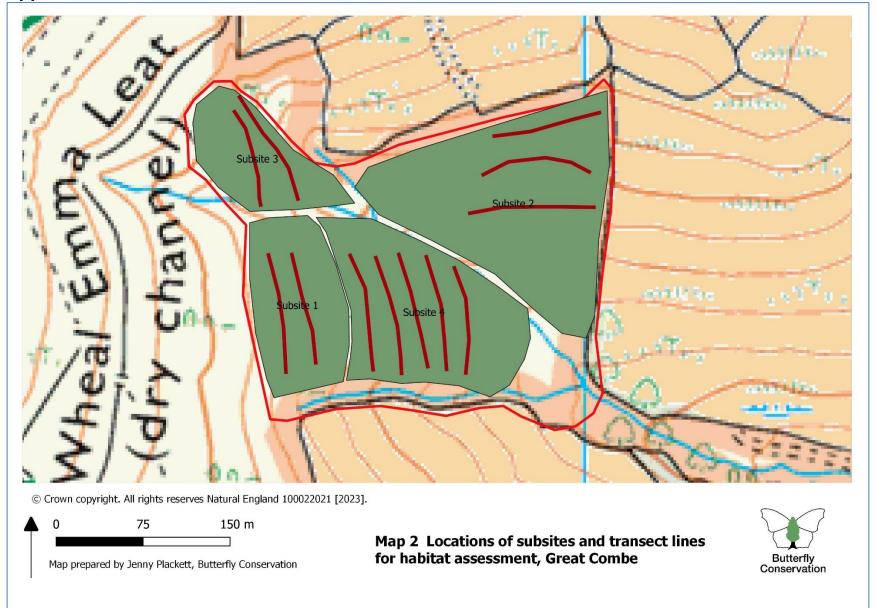
Summary of annual management required to maintain suitable habitat for the fritillary butterflies:

Action	Where	When
Summer grazing with cattle to break up the dense bracken stand and create a network of tracks	Great Combe (all areas, and especially target Sub-site 4); Venford Reservoir site	June-July
Summer bracken management – if cattle grazing cannot be targeted in areas of dense bracken to create a network of tracks, do this manually with scythes	Great Combe; Venford Reservoir site	June-July
Winter grazing with cattle to break down deep bracken litter layer	Great Combe; Venford Reservoir site	Feb
Winter bracken management – if cattle grazing cannot be targeted in areas of dense bracken to break down deep bracken litter layer, do this manually with strimmers or rakes (some disturbance of the soil surface is desirable to support violet germination)	Great Combe; Venford Reservoir site	Feb
Scrub control – Alder Buckthorn, bramble, Silver Birch, gorse see details above	Venford Reservoir site	Sept -March
Monitoring Pearl-bordered Fritillary butterflies	Great Combe; Venford Reservoir site	April-May
Monitoring High Brown Fritillary butterflies	Great Combe; Venford Reservoir site	June-July

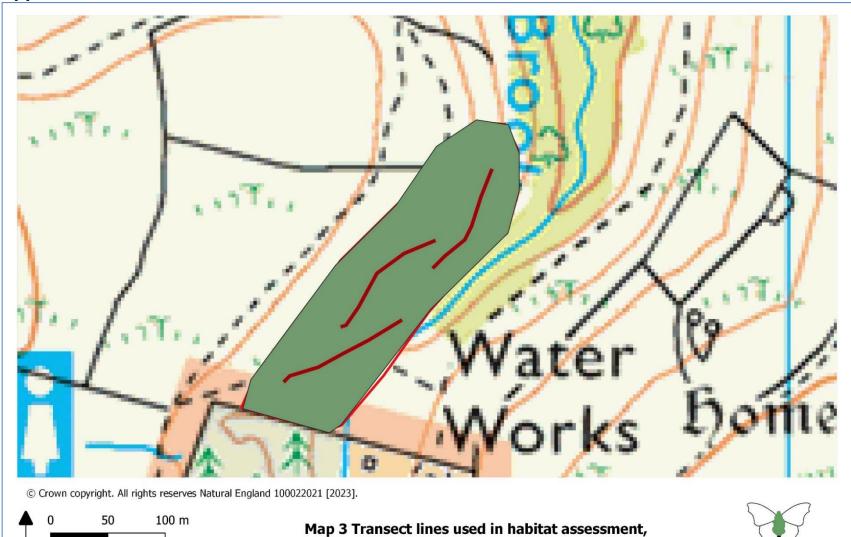
Appendix 1 Map 1 Location of Great Combe and Venford

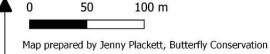


Appendix 2 Map 2 Subsites and transect lines used in habitat assessment, Great Combe



Appendix 2 continued. Map 3 Transect lines used in habitat assessment, area north of Venford Reservoir





Venford Reservoir site



Appendix 3 Sample vegetation data collection sheet

Site:		Grid	d reter	ence:			Date	:	Sı	ırveyor:
Subsite no.:	Habitat	gener	al (slo	pe, as	pect,	vegetation	on)			
Grazing										
Species & num	oer		Dung	presen	t (Y/N) & specie	s	Grazing	pressure	
S-sheep, C-cattle	e, D-dairy	, Dr- de	er, R-ra	abbit, P	-pony,	H-horse				
i uitability Juitable habitat Jark detailed area	as on ma		ered h	L	ability			nabitat [No	o habitat
Management	:									
DAFOR Dominance scale	Violet		Brac	ken		Grass		Bare	ground	Common plants
Butterflies se	en		•			Photo (& Gri	d ref)		
Transect:		Slope		/-li-le		Aspect	:		Metres	of bracken:
Paths: no. sm	all paths			ep /sligh . tempo		paths (>3	0cm)		Dermanen cm) (Surfac	•
Quadrats: (% o	over, bra	acken &	grass to	o neare	st 5%,	others to	1%)		N	
		1	2	3	4	5	6		Notes:	et density along
Violet										- plants seen ever
Bracken										s / 6-20 paces/ 21-
Grass/moss									paces?	·
Bare ground										
Bramble										
Scrub										
- /00		T .								
Drop disc: (30d	cm size)	1	2	3	4	5	6			
(cm) Feeding damag	۵.									
	D plants									
) plants									
	None									
Larvae seen										
0 10::	<u> </u>				14/5					
Q Grid re	T				WP					
1										
2										
3 4										
5										
5					1					

Appendix 4 Vegetation data collected in 2021

Seed Context		Sub-	Tran-	Quad-			% Violet	% Bracken	% Grass/m % Ba				Veg height/ Litter depth	Distance between	Distance with		
State Control 1																	
Grant Combet	Great Combe			2	SX68746927	16	3	3 20	80		0 ()	8				violets, some with feeding
Control																	1
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Great Centrel 1								_									
Figor		_													30	1	
Count Counties 1		_															
Cant Control			_					100	0				38				
Grant Contract Total Systems Total S			_														-
Sept Compt 2 1 2 2 2 2 2 2 2 2															50	3	Bracken dominated south-facing
Grant Controls Fig. 1 A SAMERSHAM A SAMERSHAM O CANA CONTROL A SAMERSHAM O CANA CONTROL		2	2 1	2	SX68996945	1	1	40	60				8				slope; honeysuckle frequent
Good Cornels																	across the slope; violets seen
Grant Contract 2																	
Grant Control 2 2 2 2 2 5/5/00090942																	
Great Contract 2															70	3	Bracken dominated, dense litter
Grate Commiss 2 2 2 6 500000000000000000000000000000000																	layer, violets very rare
Grant Cornel 2 2 2 1 S. SKERIBRINGS																	1
Greet Combe 2 3 1 (2006)0960858	Great Combe	2	2 2	2 5	SX68936942		(100	0	0	2 ()	6				
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Great Combe																	-
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Creat Combe 4 5 5 SX68916928 0 0 100 0 2 10 18																-	20 paces.
Creat Combe 4 5 6 SX68916928 0 0 100 2 2 2 0 5																	1
Venford						0	C	100		2							<u> </u>
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Venford															85	4	
Venford	Venford	1	1 1	3	SX68777152	4	1	10	80	10	0 ()	6				paths, with young alder
Venford 1 1 6 SX68747149 0 0 100 2 0 0 0 20 Venford 1 2 1 SX68737150 0 0 35 25 2 0 0 SE 16 20 95 Violets seen every 6-20 pace Venford 1 2 2 5x68727150 2 1 35 70 2 0 0 42 42 42 42 42 42 42 42 42 43 43 44<																-	buckthorn starting to invade, and
Venford 1 2 1 SX68737150 0 0 35 25 2 0 0 SE 16 20 95 Violets seen every 6-20 pac Venford 1 2 2 SX68727150 2 1 35 70 2 0 0 42 42 42 42 42 42 42 42 42 43 43 41 49 40 0 0 0 0 42 42 42 42 42 42 42 43 43 43 44																	mature gorse.
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Venford 1 2 6 SX68687143 1 1 100 2 0 2 0 10 0 10 0 10 0 0 5 0 SE 22 20 95 6 Violets seen all along the Venford 1 3 2 SX68667142 0 0 0 5 0 0 12 transect, 6-20 paces' feeding Venford 1 3 3 0 0 100 0 2 0 26 damage noted in 2 quadrats Venford 1 3 4 10 2 100 0 2 0 8 0 Venford 1 3 5 8 2 95 2 2 2 2 2 6 0 Venford 1 3 6 SX68727145 4 1 90 5 0 2 5 10 10																	-
Venford 1 3 1 SX68667142 0 0 100 0 5 0 SE 22 20 95 6 Violets seen all along the Venford Venford 1 3 2 SX68677142 0 0 95 0 5 0 0 12 transect, 6-20 paces' feeding transect, 6-20 paces' feeding damage noted in 2 quadrats Venford 1 3 4 10 2 100 0 0 2 0 8 0 0 0 0 2 0 8 0 0 0 0 2 0 8 0 0 0 0 0 2 0 8 0		_															1
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Venford 1 3 4 10 2 100 0 0 2 0 8 Venford 1 3 5 8 2 95 2 2 2 2 6 Venford 1 3 6 SX68727145 4 1 90 5 0 2 5 10			_														transect, 6-20 paces' feeding
Venford 1 3 5 8 2 95 2 2 2 2 6 Venford 1 3 6 SX68727145 4 1 90 5 0 2 5 10																	uamage noted in 2 quadrats
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1	1 3	5		8	2	95	2	2	2 2	2	6]
45 12 1285 466 71 17 8 0 242	Venford	1	1 3	6	SX68727145												

Appendix 5 Vegetation data collected in 2023

		T		T data oone	Violet-	1	%	%						Distance	Distance		
	Sub-	Tran-	Quad-		no. of	Violet			% Bare	%	%		Veg height/ Litter depth	between	with		
Site	site	sect	rat	Grid ref	plants	cover				Bramble		Aspect	(cm)	quadrats	bracken		Comments 2023
Great Combe	1			SX68736925	22			50	0			ESE		20 paces			Violets always in
Great Combe Great Combe	1			SX68746927 SX68726927	15 15			70 40	0				16 9				view. Good habitat, but exposed to
Great Combe	1			SX68736930	23			80	0				8				winds
Great Combe	1			SX68746931	20			50	0				41			2	Williad
Great Combe	1	1 1		SX68726932	1	1		30	0	0	0		37			2	
Great Combe	1			SX68766925	25			0				ESE		20 paces	60	1	Violets always in
Great Combe	1			SX68766927	8			5					29				view. Pony dung
Great Combe Great Combe	1			SX68766928 SX68756930	20 15			10 30	0				14 28				noted/evidence of grazing.
Great Combe	1			SX68746932	30			10	0				26			1	grazing.
Great Combe	1			SX68746933	4			60	0		_		30			0	
Great Combe	2			SX69016946	7			5	0			S		20 paces	98	5	Bluebell 15%,
Great Combe	2			SX68996945	0			5					18				Honeysuckle 15%,
Great Combe	2			SX68986946	0			2	0				35				Foxglove 2%, Shee
Great Combe	2			SX68966945	0			25 10	0		·		8				sorrel, Woodsage
Great Combe Great Combe	2			SX68946945 SX68926945	0			0					31 25			0	ł
Great Combe	2			SX69006941	34			0				s		20 paces	100		
Great Combe	2			SX68996942	0			0			0	1	53			0	
Great Combe	2			SX68976943	0			20	1				3			2	
Great Combe	2			SX68956942	0			0					27			0	
Great Combe	2			SX68936942	0			5				1	22			0	
Great Combe Great Combe	2			SX68916941 SX69006938	0			5 0					17	20 paces	98	1	Burn carried out las
Great Combe	2			SX68986938	0			0					14	Lo paces	90	-	winter; ground still
Great Combe	2			SX68966938	0			0					16				burnt beneath litter.
Great Combe	2	2 3		SX68946938	0			0	50				16				Honeysuckle,
Great Combe	2		5	SX68926938	0			2					4			1	nettles, bluebells,
Great Combe	2			SX68906937	0			0			_		24				sheep sorrel coming
Great Combe	3			SX68706947	0			95	0			SE		20 paces	50		Sheep poo, lots of
Great Combe Great Combe	3			SX68716945 SX68726944	25 0			70 60	0 5		_		5 10				tracks, bracken/grass
Great Combe	3			SX68726944 SX68736943	0			30	0		_		10				mosaic, violets
Great Combe	3			SX68746941	0			10	0				21				frequent (maybe too
Great Combe	3			SX68746940	0			0			0		28				grassy at top,
Great Combe	3			SX68706946	0			50	0			SE		20 paces	70	3	
Great Combe	3			SX68716944	40			45	0				34			2	
Great Combe	3			SX68706943	45			10	0			+	16			1	
Great Combe Great Combe	3			SX68706941 SX68716941	0			0 5	0				34 20			0	
Great Combe	3			SX68716940	0			50	0				16			3	
Great Combe	2			SX68816924	21			90	0			ESE		20 paces	95		Bracken dense, little
Great Combe		1 1	2	SX68816926	2			90	0	0	0		46			0	o evidence of stock movements
Great Combe	4			SX68806928	6			80	0				44			0	
Great Combe				SX68806930	30			15	0				7			0	
Great Combe	4		_	SX68806932	0			0	0				27			0	
Great Combe Great Combe	2			SX68796933 SX68846924	50 15			70 30	0		_	ESE	15	20 paces	70		Fewer tracks
Great Combe				SX68846926	2			100	0				2	20 paces	1 70	1	I CWCI HACKS
Great Combe				SX68846928	30			30	0		_		14			2	
Great Combe				SX68836929	1			10	0	0	0		26			1	
Great Combe	4	1 2	2 5	SX68826930	0	0	95	5	0	0	0)	10			0	
Great Combe		1 2		SX68816932	0								24			1	
Great Combe	2			SX68876925	3			95 90	0			ESE	3	20 paces	70		Dense bracken arched over areas
Great Combe Great Combe				SX68866925 SX68856927	21			15	0				18				with frequent violets
Great Combe				SX68856928	7			70	0				26				but quite grassy
Great Combe				SX68856930	4			80	0				3				beneath.
Great Combe		1 3	6	SX68846931	20	3		80	0	0	0		50			0	
Great Combe				SX68886924	1			20	0			ESE		20 paces	100		Some tracks made
Great Combe		1 4		SX68866926	5			10	0				24				with quad.
Great Combe	2			SX68876928	0			0					26			0	
Great Combe Great Combe	2			SX68876930 SX68876931	0			0					13 27			0	
Great Combe				SX68866933	0			0			_		27			1	
Great Combe		1 5	1	SX68856933	0	0	100	0	0	2	0	ESE	47	20 paces	100	<u> </u>	Violets rare; dense
Great Combe		1 5	2	SX68876931	0	0		5			0		27			0	bracken, sterile
Great Combe	4			SX68896931	0			0			_		32		ļ		beneath
Great Combe	4			SX68916928	0			0					12			0	
Great Combe	2			SX68916928 SX68916928	0			0					25 5		1	1 0	
Great Combe		-	0	OA00310320	567			1934	86		_					"	
					307	1/3	5143	1004	00	36	"		1300				
Venford	1			SX68797156	13	5	90	5	5	0	0	SE	13	20 paces	80	5	Many young stems
Venford	1		2	SX68777151	0	0	5	95	0				6				of alder buckthorn -
Venford	1			SX68777152	0			0					41				will require further
Venford	1			SX68757151	0			0					7		1		management next
Venford Venford	1			SX68757150 SX68747149	0			10 0	0				6 12		-	-	year
ventora Venford	1			SX68747149 SX68737150	0			0				SE		20 paces		5	
Venford	1			SX68737150 SX68727150	0			0					34	Lu paces	1	5	5
Venford	1			SX68717149	0			0					28				
Venford	1	1 2	2 4	SX68707146	0	0	99	0	0	0			30				
Venford	1	1 2	. 5	SX68697146	0		90	4	0				5				
Venford	1			SX68687143	8			5					30				
Venford	1			SX68667142	3			5				SE		20 paces		3	Violets seen all
Venford	1			SX68677142	21			0					10		-	-	along the transect.
Venford Venford	1	_			0			0					30		 	-	Bugle also present.
Venford Venford	1				0			0					50				
	-			SX68727145	0			0					45				-
Venford																	

Appendix 6 Assessment of changes in vegetation data between 2021 and 2023

Great Combe	Hectarage	of area ur	nder mana	gement: 8ha
No. of sample points: 72				
Year	2021	2022	2023	
% of sample points containing violets (violet presence)	36	38	45	
Av. No. violets in quadrat (violet abundance)	4.5	5	8	*Note: Incoming the discourse and and
Av. % Grass cover across all quadrats	31	24	27	*Note - burning had been carried out in winter 2022 and removed bracken
Av. % Bracken cover across all quadrats	68	68	71	litter depth, explaining sudden drop in
Av. Depth of Bracken litter (cm)	19	14*	21	average litter depth that year
		_	•	
Venford	Hectarage	e of area ur	nder mana	gement: 2 ha
No. of sample points: 18				
Year	2021	2022	2023	
% of sample points containing violets (violet presence)	44	39	28	
Av. No. violets in quadrat (violet abundance)	2.5	<1	2.7	
Av. Grass cover across all quadrats	26	28	7	
Av. Bracken cover across all quadrats	71	65	81	
Av. Depth of Bracken litter	13.5	14.5	21	

Appendix 7 Butterfly data

Survey results for fritillary butterflies 2021, 2022, 2023

Raw counts (not adjusted for time spent searching). Where more than one count was undertaken, only the highest count is shown.

Note that the early spring weather in 2023 during the flight period of the Small and Pearl-bordered Fritillary was very cool and damp. Emergence was 2 to 3 weeks later than usual, the weather was cool and breezy during the flight period, hence numbers may have been affected.

Species		Site	Grid reference	2021	2022	2023
Boloria Euphrosyne	Pearl-bordered Fritillary	Great Combe	SX688693	3	5	2
Boloria Selene	Small Pearl-bordered Fritillary	Great Combe	SX689694	4	12	8
Fabriciana adippe	High Brown Fritillary	Great Combe	SX689694	1	2	2
Boloria Euphrosyne	Pearl-bordered Fritillary	Venford Reservoir site	SX686714	6	10	7
Boloria Selene	Small Pearl-bordered Fritillary	Venford Reservoir site	SX686714	1	1	0
Fabriciana adippe	High Brown Fritillary	Venford Reservoir site	SX686714	0	0	0

Who we are

Butterfly Conservation is the UK charity dedicated to saving butterflies and moths.

Why butterflies and moths matter

Butterflies and moths are important parts of the ecosystem. They are beautiful and inspirational and people enjoy seeing them in their gardens and the countryside. They are sensitive to change and their fortunes help us assess the health of our environment. Two-thirds of butterfly and moth species are in decline. This is a warning that cannot be ignored.

What we do

Butterfly Conservation maintains and enhances landscapes for butterflies and moths. We provide advice to landowners and managers on how to conserve and restore habitats. We gather extensive butterfly and moth data and conduct research to provide the scientific evidence that underpins our work. We have an established record of reversing declines. We run programmes for more than 100 threatened species and are involved in conserving hundreds of sites and reserves. We rely on donations, memberships and grants to fund our work.

With your support we can help butterflies and moths thrive. www.butterfly-conservation.org

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