

Filey to Red Cliff, North Yorkshire

National Vegetation Classification Survey Report 2021

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Natural England Commissioned Report NECR564

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Foreword

An NVC survey of maritime cliff and slope vegetation habitats between Filey Brigg and Red Cliff on the east coast of Yorkshire was undertaken in 2021 to investigate the potential for their inclusion within a Site of Special Scientific Interest (SSSI). This report does not itself make a case for designation, rather it provides an objective record of the survey findings which will be used to support Natural England's independent assessment of special interest.

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Executive summary

Haycock and Jay Associates Ltd. was commissioned by Natural England to undertake a National Vegetation Classification (NVC) survey of habitats within a survey area extending from Leberston Cliff to Filey Sands.

The survey identified a complex interplay of factors which were found to be influencing grassland and maritime vegetation communities. These include soils and underlying geology, aspect, slope, amount of input from salt-spray, drainage and locally on hard-cliffs, enrichment by sea birds. The major influence is the dynamic nature of the soft cliffs with natural processes causing slipping and erosion at varying rates in different parts of the site. Soft cliff erosion was noted to be particularly active at Gristhorpe Sands where there are extensive areas of bare ground and rotational slippage to form wetlands (e.g. Target Note 7 and Target Note 20).

The degree of maritime influence was found to be limited, though apparent on some more exposed slopes, notably at Filey Brigg. Sub-maritime grassland was recorded along much of the coast; these are essentially lowland grasslands occurring on maritime cliff and consequently supporting an unusual assemblage of species including some species limited to coastal sites. Sub-maritime and para-maritime features, in particular dense scrub and woodland were also recorded. In these cases the influence of the sea is not immediately apparent, however, the sculpting of these features by constant strong winds from the sea is clear, and some climatic maritime influence is likely.

Hard cliff zones are eroding less rapidly, and consequently provide a more stable environment for vegetation communities to develop. Consequently there are large areas of unimproved calcareous grassland on steep slopes below hard cliffs at Gristhorpe. There has been one major hard cliff rock fall since the 2012 survey which has led to the covering of calcareous grassland by debris. This is now recolonising naturally and will no doubt form calcareous grassland in time if there is a period of low disturbance. Maritime cliff and ledge communities also occur, often associated with nesting seabirds, and in sheltered inlets strandline vegetation occurs.

East of the Wyke cliffs are very steep, and steep slopes of eroded material below these cliffs appear to be suffering a degree of eutrophication, possibly due to percolation of water from adjacent intensively managed arable fields. This has led to the development of grassland dominated by coarse grasses with a narrow band of maritime grassland by the sea. Where eroded slopes at the top of the hard cliff have stabilised, unimproved neutral grassland occurs.

Filey Brigg is a rocky peninsula supporting some of the most species-rich vegetation encountered during the current survey. Maritime grassland is abundant on the exposed northern side of Filey Brigg, along with sub-maritime unimproved neutral grassland. There is evidence that significant erosion of this feature has taken place since 2012 with the loss of maritime grassland on north-facing slopes. The sheltered southern slopes of Filey Brigg and stabilised slopes above Filey Sands support both calcareous and neutral species-rich

grassland. Whilst not the focus of this survey, it is considered likely that these sheltered south and south-east facing slopes could be important for a range of invertebrates.

Contents

Report details.....	3
Author(s)	3
Natural England Project Manager	3
Contractor	3
Keywords	3
Citation.....	3
Foreword.....	4
Executive summary	5
Introduction	8
Background.....	8
Methodology	10
National Vegetation Classification Survey.....	10
Constraints.....	11
National Vegetation Classification Survey Results	13
Introduction	13
Rational for Community Descriptions	13
Community Descriptions	14
Artificial Wetlands at Filey Brigg.....	59
Target Notes	60
Mosaic Data.....	61
Discussion	63
Comparison with previous vegetation survey.....	63
Comments on coastal erosion.....	64
References	65
Appendices	66

Introduction

Background

Haycock and Jay Associates Ltd. was commissioned by Natural England to undertake a National Vegetation Classification (NVC) survey of habitats within a survey area extending from Leberston Cliff to Filey Sands.

This report presents data collected during September 2021 and represents an update for survey carried out in this area by the author in August 2012 and June 2013.

For each community a description is recorded followed by a species list for that community, and quadrat data gathered during the survey where appropriate. The extent of each vegetation community is mapped on Figure 1 and tabulated below.

Where communities were encountered in intimate mosaic, these areas have been recorded on Figure 1 as ‘Mosaic’ along with a label indicating which communities are present. Each mosaic is also labelled with a letter of the alphabet. The percentage of each community in each labelled mosaic area is recorded in Section 3.26. Table 1 – NVC Communities present in the survey area;

NVC Community	Extent (ha)
CG2c <i>Festuca ovina</i> – <i>Helictotrichon pratense</i> grassland; <i>Holcus lanatus</i> – <i>Trifolium repens</i> sub-community	3.43
M10b <i>Carex dioica</i> – <i>Pinguicula vulgaris</i> mire; <i>Briza media</i> – <i>Primula farinosa</i> sub-community	0.22
M22 <i>Juncus subnodulosus</i> – <i>Cirsium palustre</i> fen-meadow <i>Briza media</i> – <i>Trifolium</i> spp sub community	0.57
M27b <i>Filipendula ulmaria</i> – <i>Angelica sylvestris</i> mire; <i>Urtica dioica</i> – <i>Vicia cracca</i> sub-community	0.33
MC8a <i>Festuca rubra</i> – <i>Armeria maritima</i> grassland; <i>Anthyllis vulneraria</i> sub-community	0.02
MC8f <i>Festuca rubra</i> – <i>Armeria maritima</i> grassland; Typical sub-community	6.99
MC9a <i>Festuca rubra</i> – <i>Holcus lanatus</i> maritime grassland; <i>Plantago maritima</i> sub-community	9.13
MC10b <i>Festuca rubra</i> – <i>Plantago</i> spp. maritime grassland <i>Carex panicea</i> sub-community	1.13
MG1a <i>Arrhenatherum elatius</i> grassland; <i>Festuca rubra</i> sub-community	15.39
MG5b <i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> grassland <i>Galium verum</i> sub community (species-poor)	3.51
MG5b <i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> grassland <i>Galium verum</i> sub community	9.99
MG6a <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> grassland; Typical sub community	9.65
MG7 <i>Lolium perenne</i> leys	1.91
MG10a <i>Holcus lanatus</i> – <i>Juncus effusus</i> rush-pasture Typical sub-community	0.10
MG11b <i>Festuca rubra</i> – <i>Agrostis stolonifera</i> – <i>Potentilla anserina</i> grassland, <i>Atriplex prostrata</i> sub-community	12.36

NVC Community	Extent (ha)
MG12a – <i>Festuca arundinacea</i> grassland <i>Lolium perenne</i> – <i>Holcus lanatus</i> sub-community	1.15
OV25 <i>Urtica dioica</i> – <i>Cirsium arvense</i> community	0.41
OV26 <i>Epilobium hirsutum</i> community	0.45
OV27 <i>Chamerion angustifolium</i> community	0.04
S4diii <i>Phragmites australis</i> reedbed <i>Atriplex prostrata</i> sub-community <i>Agrostis stolonifera</i> variant	0.09
S26 <i>Phragmites australis</i> – <i>Urtica dioica</i> tall-herb fen	>0.01
S12b <i>Typha latifolia</i> swamp <i>Mentha aquatica</i> sub-community	0.03
SD2 <i>Honkenya peploides</i> – <i>Cakile maritima</i> strandline community	0.23
W8 <i>Fraxinus excelsior</i> – <i>Acer campestre</i> – <i>Mercurialis perennis</i> woodland	0.76
W22c <i>Prunus spinosa</i> – <i>Rubus fruticosus</i> agg. scrub; <i>Dactylis glomerata</i> sub-community	0.12
W23 <i>Ulex europaeus</i> – <i>Rubus fruticosus</i> scrub	0.39
W24 <i>Rubus fruticosus</i> – <i>Holcus lanatus</i> underscrub	0.25
W25 <i>Pteridium aquilinum</i> – <i>Rubus fruticosus</i> underscrub	0.55

A spreadsheet is attached at appendix 2 summarising the area occupied by each vegetation community and its attributes.

Methodology

National Vegetation Classification Survey

The method used for this survey followed the approach for National Vegetation Classification (NVC) survey as described by Rodwell et al (1992) and Rodwell (2006). This allows the vegetation communities identified to be classified in accordance with the accounts published in British Plant Communities (Rodwell et al, 1991 et seq.).

In accordance with Rodwell (2006), survey was undertaken across the site to determine variation in vegetation and delimit homogenous stands. Where there was a readily observable boundary between homogenous stands this was mapped accordingly, however, where there was a diffuse boundary between vegetation types this was mapped at a mid-point in the transition from one vegetation type to another. Taking into account the width of a line representing a vegetation boundary on the map as it would appear on the ground, this was rarely necessary. Genuine mosaics of different NVC sub-communities were mapped as single polygons and a note taken of the percentage of each sub-community recorded in the polygon.

For each homogenous stand of vegetation identified, five or more vegetation samples were taken by laying out a 2 x 2m quadrat to record the abundance and frequency of all species of flora present. Where the sward was short and species densely packed, a 1m x 1m quadrat was used. The number of quadrats taken for each homogenous stand was dependent on the extent of the stand, and the variation within it. Small stands of homogenous vegetation had fewer quadrat samples than large stands where the flora was more variable. In addition the proportion of bare ground, vegetation height in centimetres and a photograph of each quadrat was recorded.

Within each quadrat/sample, all species of vascular plant and bryophytes (mosses and liverworts) were identified and, for each species, the percentage cover of the quadrat was estimated. In addition, a full species list for each community was made including species not featuring in the quadrats, and an indication of abundance throughout the community recorded using the DAFOR scale. Each species was classified as either Dominant, Abundant, Frequent, Occasional or Rare for the community.

The figure for percentage cover for each species in each quadrat was recorded as a Domin value.

Table 2 – Domin values for percentage cover for each species in each quadrat.

Cover (%)	Domin
91 -100	10
76-90	9
51-75	8
34-50	7
26-33	6

Cover (%)	Domin
11-25	5
4-10	4
<4 with many individuals	3
<4 with several individuals	2
<4 with few individuals	1

Following field survey and for the purposes of assigning a community in the NVC, the frequency of each species in each homogenous stand was calculated here:

I = 1-20% of quadrats

II = 21-40%

III = 41-60%

IV = 61-80%

V = 81-100%

Finally, the NVC community type was determined by comparing the results of the field survey, using both keys and the experience of the field surveyor, with the published accounts and floristic tables given in British Plant Communities (Rodwell et al., 1991 et seq.).

It is widely acknowledged that applying software to NVC datasets does not provide a more 'robust' assessment of results and placement of vegetation within the NVC. The various software applications available rely on data input and interpretation of the output, both of which are based on professional judgement (placement of quadrats and then interpretation of results). Experience of applying MAVIS and other software indicates that it is imperative that the practitioner knows what the sub-community is prior to using the software in order to interpret the results correctly. There appears little to be gained from running data through a software programme unless the purpose is simply to convince the reader with what is regarded as 'empirical evidence' (which it clearly is not). Consequently, it was not considered necessary to use computer software to assist in assigning NVC community in this study.

The community description provides a discussion of how the floristic features compare to the standard vegetation community descriptions and highlights the character of vegetation communities at this site.

Constraints

The NVC survey was undertaken in good weather conditions during the latter part of the optimal time of year. As such early flowering species and annuals were less apparent, and it was not possible to identify some plants to species level. In particular orchids have often been recorded simply as *Dactylorhiza* sp.

Some vegetation communities were not safely accessible due to their proximity to the edge of the cliff or occurrence on steep, unstable substrate. These communities could not be surveyed directly, but with use of binoculars it was possible to attribute them to a sub-community without quadrat survey.

National Vegetation Classification Survey

Results

Introduction

An NVC survey of habitats within the survey boundary from Lebberston Cliff to Filey Sands was undertaken on 22nd – 24th September 2021 by Principal Ecologist Gordon Haycock CEcol CEnv FCIEEM.

NVC communities are mapped on Figure 1, and a photograph of each quadrat is attached at Appendix 1.

Appendix 2 is an Excel spreadsheet summarising results and tabulating each NVC sub-community including NVC community, broad habitat, Priority Habitat (where relevant) and maritime status.

Appendix 3 is a Figure taken from our previous report, and an updated table showing NVC sub-communities present in each morphological section. Reporting on protection works was outside the scope of the current study.

Rational for Community Descriptions

The National Vegetation Classification (NVC) sets out to represent identifiable communities at various points in the phyto-sociological continuum. In the introduction to Maritime Cliff Communities (Rodwell 2000), it is stated that the east coast of England, and in particular soft cliffs, were not extensively sampled, and this vegetation is not comprehensively characterised at present. Indeed, sampling from the North Yorkshire coast barely appears to have taken place at all. Consequently, vegetation communities encountered do not always readily accord with those described in Rodwell.

In describing the vegetation, the terms Maritime, Sub-maritime and Para-maritime (as defined by Ratcliffe 1977) have been used. Maritime communities show strong and direct influence of sea with markedly saline soils. Sub-maritime vegetation shows less direct effect of sea; however, soils are still more saline than those inland. Para-maritime communities occur in the zone in which special climatic conditions of seacoast are influential, but soils are not saline and halophytes not present. All three types of vegetation should be regarded as elements of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts.

Vegetation communities encountered during the survey are described in terms of analogous communities appearing in the NVC published literature and their 'maritime status' stated. These are the headings and labels given to the community, but practitioners must remain aware that whilst those NVC codes have been assigned, the communities we are dealing with differ in significant ways from those described in Rodwell. This is particularly important when considering the mapped information.

Community descriptions are offered below for each sub-community encountered based on quadrat data collected.

Community Descriptions

CG2c *Festuca ovina* – *Helictotrichloa pratensis* grassland; *Holcus lanatus* – *Trifolium repens* sub-community

Table 3 – CG2c Community Attributes

Attribute	NVC Code – CG2
Broad habitat type	Calcareous Grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Lowland Calcareous Grassland
UKHabs code	g2a5
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Sub-maritime

Whilst neither sheep's fescue nor meadow oat-grass were recorded during the survey, other community constants are well represented including quaking grass, glaucous sedge, mouse-ear hawkweed, rough hawkbit, fairy flax, bird's-foot trefoil and ribwort plantain. Sheep's fescue is replaced throughout by red fescue.

The replacement of sheep's fescue by red fescue, and the relative abundance of Yorkshire fog accompanied by creeping bent and a range of calcicolous bryophytes indicate that this community is best described in terms of its affinity with CG2c *Holcus lanatus* – *Trifolium repens* sub-community. The abundance of false brome is also indicative of this sub-community.

Maritime species are represented by sea plantain, and the proximity and exposure to the sea indicate that this should be regarded as sub-maritime grassland with some affinity to grassland on magnesian limestone outcrops on the Durham Coast.

CG2c occurs in abundance on exposed, steep, free-draining slopes below north and east facing hard cliffs where the substrate is largely stable. These stands are considered to be of high nature conservation value as the sward is flower-rich with lady's bedstraw, kidney vetch, small scabious and devil's-bit scabious. Common twayblade was noted in the 2013 survey along with early purple orchid which is more reminiscent of northern upland calcareous grasslands. There is also sporadic abundance of bryophytes reflecting the northerly aspect of these cliffs.

CG2c is also represented in actively eroding areas (e.g. Mosaics E and P) where it occurs in intimate mosaic with other grassland types. Considerable areas of species-rich CG2c were recorded at Gristhorpe Cliff, and the community appears to be in a stable state with no imminent threats.

Since the survey in 2013 cliff erosion event has taken place at TN19 (Target Note 19) with a rock fall from the top of the cliff creating much bare ground and loose talus where previously CG2c had been recorded. Interestingly, amongst the creeping bent and colt's-

foot which is colonising the bare ground were species persisting from the previous grassland (for example black knapweed, rough hawkbit, common restharrow, ribwort plantain, cock's-foot, pepper-saxifrage, bird's-foot trefoil and false brome. Amongst the colonisers (from seed) were species from the cliff top such as teasel, spear thistle and bristly ox-tongue alongside sea-plantain, creeping cinquefoil, sea-mayweed and an abundance of small scabious. It would be fascinating to monitor this process of recolonisation.

Table 4 – Species recorded within this community are listed below:

Species	DAFOR
<i>Brachypodium sylvaticum</i>	A
<i>Festuca rubra</i>	A
<i>Ctenidium molluscum</i>	LA
<i>Eurhynchium striatum</i>	LA
<i>Lotus corniculatus</i>	LA
<i>Rhytidadelphus triquetrus</i>	LA
<i>Agrostis stolonifera</i>	F
<i>Carex flacca</i>	F
<i>Centaurea nigra</i>	F
<i>Daucus carota</i>	F
<i>Holcus lanatus</i>	F
<i>Kindbergia praelonga</i>	F
<i>Leontodon hispidus</i>	F
<i>Linum catharticum</i>	F
<i>Origanum vulgare</i>	F
<i>Plantago lanceolata</i>	F
<i>Plantago media</i>	F
<i>Prunella vulgaris</i>	F
<i>Trifolium pratense</i>	F
<i>Vicia hirsuta</i>	F
<i>Briza media</i>	LF
<i>Orchis mascula</i>	LF
<i>Equisetum arvense</i>	LF
<i>Plantago maritima</i>	LF
<i>Primula veris</i>	LF
<i>Centaureum erythraea</i>	LF
<i>Silaum silaus</i>	LF

Species	DAFOR
<i>Achillea millefolium</i>	O
<i>Calliergonella cuspidata</i>	O
<i>Campylium stellatum</i>	O
<i>Carlina vulgaris</i>	O
<i>Dactylis glomerata</i>	O
<i>Heracleum sphondylium</i>	O
<i>Neckera complanata</i>	O
<i>Pilosella officinarum</i>	O
<i>Potentilla reptans</i>	O
<i>Pulicaria dysenterica</i>	O
<i>Rubus fruticosus</i> agg.	O
<i>Scabiosa columbaria</i>	O
<i>Tortella tortuosa</i>	O
<i>Knautia arvensis</i>	O
<i>Ononis repens</i>	O
<i>Arrhenatherum elatius</i>	R
<i>Cerastium fontanum</i>	R
<i>Cirsium palustre</i>	R
<i>Dactylorhiza</i> sp	R
<i>Geranium sanguineum</i>	R
<i>Jacobaea erucifolius</i>	R
<i>Jacobaea vulgaris</i>	R
<i>Rhinanthus minor</i>	R
<i>Schedonorus arundinaceus</i>	R
<i>Sonchus asper</i>	R
<i>Tussilago farfara</i>	R
<i>Viola</i> sp	R
<i>Trifolium arvense</i>	R
<i>Cirsium arvense</i>	R

Table 5 – Quadrat data recorded in this community is detailed below, blank cells indicate species not recorded:

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
Quadrat location - OS Grid TA	0840 8407	0800 8413	1003 8297	1003 8287	0964 8325		
Sward height (cm)	24	20	25	25	15		
Bare ground (%)	2	2	0	10	10		
<i>Festuca rubra</i>	4	6	5	8	8	V	(4-8)
<i>Brachypodium sylvaticum</i>	7	4	5	8	5	V	(4-8)
<i>Agrostis stolonifera</i>	4	2	4	4	3	V	(2-4)
<i>Centaurea nigra</i>	2	3	3	2	2	V	(2-3)
<i>Plantago lanceolata</i>	2		3	2	3	IV	(2-3)
<i>Prunella vulgaris</i>		2	2	2	3	IV	(2-3)
<i>Carex flacca</i>	3	3			3	III	(3_)
<i>Plantago media</i>	2	3			4	III	(2-4)
<i>Holcus lanatus</i>		2	4	2		III	(2-4)
<i>Origanum vulgare</i>			4	4	2	III	(2-4)
<i>Leontodon hispidus</i>	3	2			3	III	(2-3)
<i>Linum catharticum</i>		3		2	3	III	(2-3)
<i>Kindbergia praelonga</i>	2		3	3		III	(2-3)
<i>Trifolium pratense</i>	2	2			2	III	(2_)
<i>Daucus carota</i>			2	1	2	III	(1-2)
<i>Vicia hirsuta</i>	1		1	2		III	(1-2)
<i>Ctenidium molluscum</i>		8			4	II	(4-8)
<i>Eurhynchium striatum</i>			7	4		II	(4-7)
<i>Plantago maritima</i>		3			3	II	(3_)
<i>Lotus corniculatus</i>		3			2	II	(2-3)
<i>Primula veris</i>		3	2			II	(2-3)
<i>Carlina vulgaris</i>	2				2	II	(2_)
<i>Heracleum sphondylium</i>	1		2			II	(1-2)
<i>Achillea millefolium</i>	1			2		II	(1-2)
<i>Pulicaris dysenterica</i>	1	2				II	(1-2)

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
<i>Rubus fruticosus</i> agg.	1			1		II	(1_)
<i>Equisetum arvense</i>	5					I	(5_)
<i>Briza media</i>		5				I	(5_)
<i>Schedonorus arundinaceus</i>			4			I	(4_)
<i>Rhynchospora triquetra</i>		4				I	(4_)
<i>Dactylis glomerata</i>					3	I	(3_)
<i>Calliergonella cuspidata</i>					3	I	(3_)
<i>Pilosella officinarum</i>					3	I	(3_)
<i>Scabiosa columbaria</i>					3	I	(3_)
<i>Campylidium stellatum</i>					3	I	(3_)
<i>Tortella tortuosa</i>					3	I	(3_)
<i>Neckera complanata</i>					3	I	(3_)
<i>Potentilla reptans</i>	3					I	(3_)
<i>Jacobaea vulgaris</i>			2			I	(2_)
<i>Cirsium palustre</i>			2			I	(2_)
<i>Rhinanthus minor</i>	2					I	(2_)
<i>Viola sp</i>	2					I	(2_)
<i>Cerastium fontanum</i>	2					I	(2_)
<i>Tussilago farfara</i>			1			I	(1_)
<i>Arrhenatherum elatius</i>				1		I	(1_)
<i>Dactylorhiza sp</i>		1				I	(1_)
<i>Geranium sanguineum</i>				1		I	(1_)
<i>Jacobaea erucifolia</i>		1				I	(1_)

M10 *Carex dioica* – *Pinguicula vulgaris* mire

Table 6 – M10 Community Attributes

Attribute	NVC code – M10
Broad habitat type	Fen, Marsh and swamp

UK BAP Habitat (UK Habitat Classification Working Group (2018))	Lowland Fen
UKHabs code	f2a7
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Para-maritime

There are a small number of base-rich springs and seepages throughout the soft cliff resource which give rise to M10 flushes characterised by small sedges, predominantly glaucous sedge with a smaller contribution from carnation sedge. Grass of Parnassus is a community constant and was much in evidence during the survey (a good example occurs at TN3).

Comparison with survey data from 2012/13 indicates that the community is dynamic in time and space and depends on constant erosion of the soft cliff to persist. Where the substrate stabilises for long periods more robust species such as rushes and hairy willowherb become established and outcompete the more diminutive sedges and bryophytes.

These springs and flushes are of high conservation value and would benefit from frequent monitoring. Bryophytes form a hepatic mat in a number of locations featuring endive peltia and fern-leaved hook-moss.

Often in inaccessible locations, only one quadrat was possible to characterise this community.

Table 7 – Quadrat data recorded in this community is detailed below:

Species	Q1	Frequency	Abundance
Quadrat location - OS Grid TA	0851 8375		
Sward height (cm)	7		
Bare ground (%)	30		
<i>Carex flacca</i>	4	V	(4_)
<i>Festuca rubra</i>	4	V	(4_)
<i>Cratoneuron filicinum</i>	4	V	(4_)
<i>Ceratodon purpureus</i>	4	V	(4_)
<i>Agrostis stolonifera</i>	3	V	(3_)
<i>Parnassia palustris</i>	3	V	(3_)
<i>Pellia endiviifolia</i>	3	V	(3_)
<i>Tussilago farfara</i>	3	V	(3_)

Species	Q1	Frequency	Abundance
<i>Aneura pinguis</i>	3	V	(3_)
<i>Juncus articulatus</i>	2	V	(2_)
<i>Brachythecium rivulare</i>	2	V	(2_)
<i>Cirsium palustre</i>	1	V	(1_)
<i>Holcus lanatus</i>	1	V	(1_)
<i>Pulicaria dysenterica</i>	1	V	(1_)
<i>Lotus corniculatus</i>	1	V	(1_)
<i>Trifolium pratense</i>	1	V	(1_)

M22b *Juncus subnodulosus* – *Cirsium palustre* fen-meadow *Briza media* – *Trifolium sp* sub-community

Table 8 – M22b Community Attributes

Attribute	NVC code – M22b
Broad habitat type	Fen, Marsh and swamp
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Lowland Fen
UKHabs code	f2a
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Para-maritime

Whilst clearly not fen meadow, the suite of species encountered in this community appear to have most affinity with M22, although generally dominated by hard rush rather than blunt-flowered rush. Community constants marsh thistle, Yorkshire fog and pointed spear-moss are present. The generally base rich substrate promotes the growth of grass-of-Parnassus and glaucous sedge. With hard rush and marsh arrow-grass preferential and the combination of associates listed, it is considered that the community has most affinity with M22b. A good example of this community occurs at TN2.

The community constants in this para-maritime community include creeping bent, colt's-foot and common fleabane, typical soft cliff pioneers and this community should perhaps be considered as a sere in the succession from bare ground following land slip on soft cliff. The comparison with M22b is tenuous, but in the absence of NVC description and data for para-maritime communities of the Yorkshire coast, this has been chosen as the 'best fit'.

Calcicolous and wetland bryophytes are well represented where the sward is more open with top notchwort and endive pellia in evidence.

M22b forms typically on poorly drained, clay soils. On soft cliff slopes hard and compact rush occur as dominants, in various places accompanied by Yorkshire fog and enlivened by ruderal species typical of the soft slopes, including common fleabane, colt's-foot and field horsetail.

This rather variable community is characteristic of soft cliffs on Yorkshire's east coast, and is worthy of conservation effort and further study.

The community is threatened by eutrophication of incoming water from arable land which promotes exuberant growth of great willowherb and / or common nettle and replacement of M22 by OV25 and OV26.

Table 9 – The following species were recorded in M22b;

Species	DAFOR
<i>Juncus inflexus</i>	D
<i>Pulicaria dysenterica</i>	F / LA
<i>Calliergonella cuspidata</i>	F / LA
<i>Carex flacca</i>	LA
<i>Pellia endiviifolia</i>	LA
<i>Juncus conglomeratus</i>	LA
<i>Agrostis stolonifera</i>	F
<i>Juncus articulatus</i>	F
<i>Equisetum arvense</i>	F
<i>Parnassia palustris</i>	F
<i>Cirsium palustre</i>	F
<i>Tussilago farfara</i>	F
<i>Festuca rubra</i>	LF
<i>Dactylorhiza sp</i>	LF
<i>Triglochin palustris</i>	LF
<i>Epilobium hirsutum</i>	O
<i>Rubus fruticosus agg</i>	O
<i>Plantago lanceolata</i>	O
<i>Mesoptychia turbinata</i>	O
<i>Lathyrus pratensis</i>	O
<i>Schedonorus arundinaceus</i>	O
<i>Juncus effusus</i>	O
<i>Cirsium arvense</i>	O
<i>Holcus lanatus</i>	O
<i>Filipendula ulmaria</i>	O

Species	DAFOR
<i>Kindbergia praelonga</i>	O
<i>Jacobaea vulgaris</i>	O
<i>Melilotus altissimus</i>	R
<i>Rumex acetosa</i>	R
<i>Epilobium parviflorum</i>	R
<i>Persicaria amphibia</i>	R
<i>Rumex obtusifolius</i>	R
<i>Jacobaea erucifolius</i>	R
<i>Galium aparine</i>	R
<i>Vicia hirsuta</i>	R
<i>Ranunculus repens</i>	R
<i>Typha latifolia</i>	R

Table 10 – The following quadrat data was recorded for M22b, blank cells indicate species not recorded;

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
Quadrat location - OS Grid TA	1210 8106	0839 8392	0851 8378	0844 8394	0888 8360		
Sward height (cm)	45	40	45	85	70		
Bare ground (%)	5	4	2	10	10		
<i>Juncus inflexus</i>	8	8	8	9	5	V	(5-9)
<i>Pulicaria dysenterica</i>	5	4	3	2	3	V	(2-5)
<i>Tussilago farfara</i>	2	2	3	2	2	V	(2-3)
<i>Agrostis stolonifera</i>	3	2	2	2		IV	(2-3)
<i>Juncus articulatus</i>		3	2	2	3	IV	(2-3)
<i>Calliergonella cuspidata</i>	4		7		4	III	(4-7)
<i>Festuca rubra</i>		2	3		4	III	(2-4)
<i>Equisetum arvense</i>	3		3	2		III	(2-3)
<i>Parnassia palustris</i>		2	3		3	III	(2-3)
<i>Cirsium palustre</i>		2	2		2	III	(2_)
<i>Epilobium hirsutum</i>	2			2	1	III	(1-2)
<i>Rubus fruticosus agg</i>	2	1			1	III	(1-2)
<i>Plantago lanceolata</i>		1	1	1		III	(1_)
<i>Carex flacca</i>		5	3			II	(3-5)
<i>Pellia endiviifolia</i>		4	3			II	(3-4)

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
<i>Mesoptychia turbinata</i>			3		3	II	(3_)
<i>Juncus conglomeratus</i>			2		6	II	(2-6)
<i>Lathyrus pratensis</i>		3			2	II	(2-3)
<i>Schedonorus arundinaceus</i>	4			1		II	(1-4)
<i>Juncus effusus</i>					4	I	(4_)
<i>Cirsium arvense</i>	3					I	(3_)
<i>Holcus lanatus</i>	3					I	(3_)
<i>Melilotus altissimus</i>	2					I	(2_)
<i>Rumex acetosa</i>		2				I	(2_)
<i>Dactylorhiza sp</i>		2				I	(2_)
<i>Filipendula ulmaria</i>			2			I	(2_)
<i>Epilobium parviflorum</i>			2			I	(2_)
<i>Persicaria amphibia</i>				2		I	(2_)
<i>Rumex obtusifolius</i>	1					I	(1_)
<i>Jacobaea erucifolius</i>	1					I	(1_)
<i>Galium aparine</i>	1					I	(1_)
<i>Vicia hirsuta</i>			1			I	(1_)

M27b *Filipendula ulmaria* – *Angelica sylvestris* mire; *Urtica dioica* – *vicia cracca* sub-community

Table 11 – M27b Community Attributes

Attribute	NVC Code – M27b
Broad habitat type	Fen, Marsh and Swamp
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Lowland Fen
UKHabs code	f2a
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Para-maritime

Dominated by meadowsweet, this community is characterised by a number of associates including great willowherb, false oat-grass, marsh thistle. This combination of species in damp areas dominated by meadowsweet is consistent with the NVC description for M27b *Filipendula ulmaria* – *Angelica sylvestris* mire; *Urtica dioica* – *Vicia cracca* sub-community.

M27 is characteristic of moist, circum-neutral soils occurring in ungrazed locations in lowland England. A certain amount of eutrophication is tolerated, and exuberant growth is typical where agricultural run-off occurs onto the cliff. Common nettle, goosegrass and curled dock are preferential in these stands.

M27 occurs on this coast where flushes are found on the more stable soft cliff in the north at Lebberston Cliff and Gristhorpe Cliff where extensive flushed areas occur. The community is also found at this location on the cliff top associated with drainage ditches and small seepage zones.

Table 12 – The following species were recorded in M27

Species	DAFOR
<i>Filipendula ulmaria</i>	D
<i>Calliergonella cuspidata</i>	A
<i>Arrhenatherum elatius</i>	F
<i>Cirsium palustre</i>	F
<i>Deschampsia cespitosa</i>	F
<i>Epilobium hirsutum</i>	F
<i>Festuca rubra</i>	F
<i>Tussilago farfara</i>	F
<i>Brachythecium rivulare</i>	LF
<i>Kindbergia praelonga</i>	LF
<i>Pulicaria dysenterica</i>	LF
<i>Rubus fruticosus</i>	LF
<i>Urtica dioica</i>	LF
<i>Cirsium arvense</i>	O/LF
<i>Brachythecium rutabulum</i>	O
<i>Galium aparine</i>	O
<i>Heracleum sphondylium</i>	O
<i>Juncus inflexus</i>	O
<i>Dryopteris filix-mas</i>	R

MC8f *Festuca rubra* – *Armeria maritima* grassland; *Anthyllis vulneraria* sub-community

Table 13 – MC8f Community Attributes

Attribute	NVC code – MC8f
Broad habitat type	Supralittoral Rock

UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime Cliff and Slope
UKHabs code	S2a5 and s2a6
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Maritime

A maritime cliff grassland community, MC8f is found on soft cliffs where slopes are partially stabilised and is a natural succession on free-draining substrates on soft cliff colonised by MG11. Consequently, creeping bent can form a significant part of the graminoid element. Dominated by red fescue, the sub-community preferential kidney vetch was recorded, often in abundance. Colt's-foot and creeping bent are not dominant in this community; however, the latter can appear to have significant coverage in late summer.

In common with the MC8 recorded by Milliken and Pendry (2002), no thrift was recorded during these surveys, suggesting that on further analysis this community may well be recognised as a distinct community of Yorkshire's east coast.

In the survey area this maritime grassland community supports a suite of calcicoles including hoary plantain, carline thistle, mouse-ear hawkweed and false brome as well as calcicolous bryophytes. It is likely that some stands of MC8f have been derived from CG2 grassland as turfs move down-slope into situations more exposed to salt spray, the incremental movement allowing gaps for kidney vetch and sea plantain to colonise.

This community can form quite a dense sward of red fescue with little bare ground over time and appears to stabilise even very steep soft slopes allowing the bryophyte flora to flourish. Where flushing is apparent, there is a transition community featuring MC8f constants mingling with grass-of-Parnassus and glaucous sedge.

The community often forms as a sere in succession following erosion of soft cliff, however, it was also encountered below hard north-facing cliffs forming large stands on steep slopes. In this case eroding turves from higher up the slope supporting either MG5 or CG2 are 'passing through' creating a mosaic of maritime and sub-maritime grassland.

On soft cliff between Filey Brigg and the town, species richness of the community is enhanced as calcareous grassland forms the precursor community and species common in calcareous grassland such as quaking grass, common centaury and carline thistle are present throughout.

Due to its often open character this community forms a niche for 'soft cliff species', i.e. those species capable of sustainably colonising bare ground as it forms on the soft cliff slope. Soft cliff species are not dependent on input from vegetation communities at the top of the cliff, and consequently are less under threat from simplification of vegetation communities adjacent to the cliff due to agricultural intensification.

Table 14 – The following species were recorded in MC8f

Species	DAFOR 2021
<i>Festuca rubra</i>	D
<i>Agrostis stolonifera</i>	A
<i>Anthyllis vulneraria</i>	A
<i>Leontodon hispidus</i>	A
<i>Plantago lanceolata</i>	A
<i>Trifolium pratense</i>	A
<i>Tussilago farfara</i>	A
<i>Briza media</i>	LA
<i>Calliergonella cuspidata</i>	LA
<i>Carex flacca</i>	F
<i>Centaurea nigra</i>	F
<i>Dactylis glomerata</i>	F
<i>Equisetum arvense</i>	F
<i>Holcus lanatus</i>	F
<i>Linum catharticum</i>	F
<i>Lotus corniculatus</i>	F
<i>Pulicaris dysenterica</i>	F
<i>Pseudoscleropodium purum</i>	LF
<i>Succisa pratensis</i>	LF
<i>Aneura pinguis</i>	O
<i>Campylium stellatum</i>	O
<i>Cirsium arvense</i>	O
<i>Ctenidium molluscum</i>	O
<i>Dactylorhiza sp</i>	O
<i>Daucus carota</i>	O
<i>Eurhynchium striatum</i>	O
<i>Heracleum sphondylium</i>	O
<i>Parnassia palustris</i>	O
<i>Pellia endiviifolia</i>	O
<i>Pilosella officinarum</i>	O
<i>Plantago maritima</i>	O
<i>Rhytidiadelphus squarrosus</i>	O
<i>Scabiosa columbaria</i>	O

Species	DAFOR 2021
<i>Achillea millefolium</i>	R
<i>Brachypodium sylvaticum</i>	R
<i>Carlina vulgaris</i>	R
<i>Centaureum erythraea</i>	R
<i>Dicranella heteromalla</i>	R
<i>Fissidens sp</i>	R
<i>Hypnum lacunosum</i>	R
<i>Jacobaea erucifolius</i>	R
<i>Jacobaea vulgaris</i>	R
<i>Lathyrus pratensis</i>	R
<i>Ononis spinosa</i>	R
<i>Plantago media</i>	R
<i>Prunella vulgaris</i>	R
<i>Rubus fruticosus agg.</i>	R
<i>Schedonorus arundinaceus</i>	R
<i>Trichostomum crispulum</i>	R
<i>Vicia hirsuta</i>	R
<i>Trifolium campestre</i>	R
<i>Ononis repens</i>	R

Table 15 – The following quadrat data was recorded for MC8f, blank cells indicate species not recorded

Species	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Frequency	Abundance
Quadrat location - OS Grid TA	0830 8418	0861 8368	0836 8415	0863 8373	0987 8315	1231 8146	0746 8403		
Sward height (cm)	10	15	18	15	10	15	12		
Bare ground (%)	15	10	5	15	15	10	15		
<i>Festuca rubra</i>	8	8	8	9	6	6	6	V	(6-9)
<i>Agrostis stolonifera</i>	3	4	5	3	2	7	6	V	(2-7)
<i>Anthyllis vulneraria</i>	5	5	3	3	6	3	2	V	(2-6)
<i>Leontodon hispidus</i>	4	4	2	3	4	4	4	V	(2-4)
<i>Trifolium pratense</i>	3	2	2	2	1	3	3	V	(1-3)
<i>Plantago lanceolata</i>	3	2	3		2	3	2	V	(2-3)
<i>Tussilago farfara</i>	3	3	2	5	3		1	V	(1-5)

Species	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Frequency	Abundance
<i>Linum catharticum</i>	3	2	3			3	3	IV	(2-3)
<i>Centaurea nigra</i>		1	3		2	1	1	IV	(1-3)
<i>Carex flacca</i>		2	3			3	4	III	(2-4)
<i>Dactylis glomerata</i>	2		2			3	2	III	(2-3)
<i>Equisetum arvense</i>		1	3			2	2	III	(1-3)
<i>Pulicaris dysenterica</i>	2	2	2					III	(2_)
<i>Lotus corniculatus</i>		1				2	3	III	(1-3)
<i>Holcus lanatus</i>	1	2	2					III	(1-2)
<i>Pseudoscleropodium purum</i>			3				3	II	(3_)
<i>Pellia endiviifolia</i>	3						2	II	(2-3)
<i>Eurhynchium striatum</i>			2				2	II	(2_)
<i>Aneura pinguis</i>	2	2						II	(2_)
<i>Daucus carota</i>					1	3		II	(1-3)
<i>Dactylorhiza sp</i>		2	1					II	(1-2)
<i>Plantago maritima</i>	2						1	II	(1-2)
<i>Parnassia palustris</i>	2		1					II	(1-2)
<i>Heracleum sphondylium</i>					1		1	II	(1_)
<i>Cirsium arvense</i>		1			1			II	(1_)
<i>Calliergonella cuspidata</i>							5	I	(5_)
<i>Briza media</i>						4		I	(4_)
<i>Campyium stellatum</i>							3	I	(3_)
<i>Ctenidium molluscum</i>							3	I	(3_)
<i>Pilosella officinarum</i>						3		I	(3_)
<i>Scabiosa columbaria</i>						3		I	(3_)
<i>Schedonorus arundinaceus</i>						3		I	(3_)
<i>Rhytidiadelphus squarrosus</i>		3						I	(3_)
<i>Jacobaea erucifolius</i>			2					I	(2_)

Species	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Frequency	Abundance
<i>Ononis spinosa</i>						2		I	(2_)
<i>Plantago media</i>							2	I	(2_)
<i>Fissidens sp</i>		2						I	(2_)
<i>Hypnum lacunosum</i>		2						I	(2_)
<i>Dicranella heteromalla</i>		2						I	(2_)
<i>Trichostomum crispulum</i>					2			I	(2_)
<i>Achillea millefolium</i>					1			I	(1_)
<i>Brachypodium sylvaticum</i>		1						I	(1_)
<i>Carlina vulgaris</i>			1					I	(1_)
<i>Jacobaea vulgaris</i>						1		I	(1_)
<i>Prunella vulgaris</i>			1					I	(1_)
<i>Rubus fruticosus</i> agg.			1					I	(1_)
<i>Vicia hirsuta</i>		1						I	(1_)
<i>Lathyrus pratensis</i>		1						I	(1_)
<i>Centaureum erythraea</i>			1					I	(1_)

MC9a *Festuca rubra* – *Holcus lanatus* maritime grassland; *Plantago maritima* sub-community

Table 16 – MC9a Community Attributes

Attribute	NVC Code – MC9a
Broad habitat type	Supralittoral Rock
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime Cliff and Slope
UKHabs code	s2a5 and s2a6
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Maritime

A maritime cliff grassland community of more sheltered locations, MC9 is found on soft cliffs generally on deeper soils and shallower slopes than MC8. Red fescue and Yorkshire fog are sometimes co-dominant with forbs such as black knapweed, hogweed and ribwort plantain reflecting the deeper, more water retentive soils.

Sea plantain is locally frequent in more maritime stands, and these expressions have clear affinity with MC9a. However, a number of expressions are species poor or have a preponderance of ruderal species due to ongoing erosion activity. In these cases it has not been possible to assign a sub-community with any certainty, however, for the purposes of this study these stands are grouped with MC9a sub-community.

Occasionally elements indicating base enrichment were recorded, with hoary plantain and rough hawkbit preferential in some stands of MC9a. Where incremental erosion is active, ruderal species (common fleabane and field horsetail) take hold in the gaps between turfs, and can mask this community at a distance.

This maritime grassland community is distributed on the soft cliffs throughout the study area, often forming small stands on spurs exposed to maritime influence. At Gristhorpe Cliff the soft cliffs have stabilised in the north allowing MC9 to mature, and a number of species are present here which do not occur in MC9 elsewhere.

MC9a reaches its greatest extent on Filey Brigg where unimproved MC9a grassland persists (e.g. at TN15), though eutrophication is evident (TN14). The sward is rank and being invaded by creeping thistle and prickly sowthistle. Despite this, sea plantain remains occasional throughout although the sward tends to be species-poor. Limited areas of pruinose red fescue occur. On more exposed areas of Filey Brigg, MC9a in good condition occurs.

Where hard cliffs occur, north of Filey Brigg, MC9a forms a narrow band along the seashore and at the base of the cliff. Larger stands form sporadically where slopes are stabilised and there is a lack of eutrophication from adjacent farmland. Unfortunately these more extensive areas are rare, and the more usual case is a wide band of MG1 and OV25 between the cliff base and MC9a forming a narrow band along the shore. In this case MC9a tends to be species poor, with ribwort plantain preferential, however, there is some influence from cliff ledge communities above with sea beet and common scurvy grass appearing.

There is evidence that this maritime community has increased in coverage since survey in 2012 reflecting a move towards adequate buffering from intensive arable land on the cliff top. As the nutrient load decreases red fescue increases in abundance, and the maritime character of the grassland is returning to what were previously mesotrophic swards. As there is a large area of this 'maritime reversion' grassland quadrat data was recorded and is presented below as 'MC9a maritime reversion', however, this should perhaps best be regarded as a para-maritime grassland at present.

Table 17 – The following species were recorded in MC9a

Species	DAFOR 2021
<i>Festuca rubra</i>	D
<i>Holcus lanatus</i>	A
<i>Dactylis glomerata</i>	F

Species	DAFOR 2021
<i>Tussilago farfara</i>	F
<i>Cirsium arvense</i>	F
<i>Plantago lanceolata</i>	F
<i>Lathyrus pratensis</i>	F
<i>Plantago maritima</i>	LF
<i>Achillea millefolium</i>	O
<i>Carex flacca</i>	O
<i>Centaurea nigra</i>	O
<i>Arrhenatherum elatius</i>	O
<i>Rumex acetosa</i>	O
<i>Prunella vulgaris</i>	O
<i>Heracleum sphondylium</i>	O
<i>Beta vulgaris</i>	O
<i>Succisa pratensis</i>	O
<i>Lotus corniculatus</i>	O
<i>Agrostis stolonifera</i>	R
<i>Cerastium fontanum</i>	R
<i>Leontodon hispidus</i>	R
<i>Cochlearia officinalis agg</i>	R
<i>Filipendula ulmaria</i>	R
<i>Trifolium medium</i>	R
<i>Hypochaeris radicata</i>	R
<i>Sonchus arvensis</i>	R
<i>Sonchus asper</i>	R
<i>Plantago media</i>	R
<i>Galium verum</i>	R
<i>Viola sp</i>	R
<i>Brachypodium sylvaticum</i>	R
<i>Dactylorhiza sp</i>	R
<i>Potentilla erecta</i>	R
<i>Daucus carota</i>	R

Species	DAFOR 2021
<i>Helminthotheca echioides</i>	R

Table 18 – The following quadrat data was collected for MC9a, blank cells indicate species not recorded;

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
Quadrat location - OS Grid TA	1296 8159	1239 8181	1187 8210	0819 8414	0882 8364		
Sward height (cm)	18	22	20	25	20		
Bare ground (%)	0	0	0	0	2		
<i>Festuca rubra</i>	10	9	10	9	9	V	(9-10)
<i>Dactylis glomerata</i>	2	1	2	1	2	V	(1-2)
<i>Holcus lanatus</i>	4	5	3	4		IV	(3-5)
<i>Tussilago farfara</i>	3	1	2		3	IV	(1-3)
<i>Cirsium arvense</i>	4	2		2		III	(2-4)
<i>Plantago lanceolata</i>	2		3		2	III	(2-3)
<i>Lathyrus pratensis</i>			1	4	1	III	(1-4)
<i>Achillea millefolium</i>			2	3		II	(2-3)
<i>Carex flacca</i>			2		3	II	(2-3)
<i>Centaurea nigra</i>			2		2	II	(2_)
<i>Arrhenatherum elatius</i>			2	2		II	(2_)
<i>Rumex acetosa</i>	1			3		II	(1-3)
<i>Prunella vulgaris</i>			2		1	II	(1-2)
<i>Heracleum sphondylium</i>	1				1	II	(1_)
<i>Beta vulgaris</i>		4				I	(4_)
<i>Plantago maritima</i>					3	I	(3_)
<i>Succisa pratensis</i>					3	I	(3_)
<i>Agrostis stolonifera</i>	2					I	(2_)

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
<i>Cerastium fontanum</i>	2					1	(2_)
<i>Leontodon hispidus</i>					2	1	(2_)
<i>Cochlearia officinalis agg</i>	2					1	(2_)
<i>Filipendula ulmaria</i>					2	1	(2_)
<i>Trifolium medium</i>					2	1	(2_)
<i>Hypochaeris radicata</i>	1					1	(1_)
<i>Sonchus arvensis</i>				1		1	(1_)
<i>Sonchus asper</i>	1					1	(1_)
<i>Plantago media</i>			1			1	(1_)
<i>Galium verum</i>			1			1	(1_)
<i>Viola sp</i>			1			1	(1_)
<i>Brachypodium sylvaticum</i>					1	1	(1_)
<i>Dactylorhiza sp</i>					1	1	(1_)
<i>Potentilla erecta</i>					1	1	(1_)

Table 19 – The following species were recorded in ‘MC9a maritime reversion

Species	DAFOR
<i>Festuca rubra</i>	D
<i>Arrhenatherum elatius</i>	F
<i>Centaurea nigra</i>	F
<i>Cirsium arvense</i>	F
<i>Heracleum sphondylium</i>	F
<i>Holcus lanatus</i>	A
<i>Lathyrus pratensis</i>	F
<i>Plantago lanceolata</i>	F
<i>Achillea millefolium</i>	F
<i>Dactylis glomerata</i>	F
<i>Trifolium pratense</i>	O

<i>Agrimonia eupatoria</i>	O
<i>Rumex acetosa</i>	O
<i>Dactylorhiza sp</i>	O
<i>Lolium perenne</i>	R
<i>Elymus repens</i>	R
<i>Galium verum</i>	R
<i>Taraxacum officinale</i>	R
<i>Cerastium fontanum</i>	R
<i>Ranunculus repens</i>	R
<i>Vicia hirsuta</i>	R

Table 20 – Quadrat data for ‘MC9a maritime reversion, blank cells indicate none recorded

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
Quadrat location - OS Grid TA	1200 8195	1191 8201	1165 8216	1143 8226	1123 8230		
Sward height (cm)	30	25	25	30	25		
Bare ground	0	0	0	0	0		
<i>Festuca rubra</i>	8	9	6	9	8	V	(6-9)
<i>Arrhenatherum elatius</i>	3	3	5	4	3	V	(3-5)
<i>Centaurea nigra</i>	4	1	4	4	1	V	(1-4)
<i>Cirsium arvense</i>	1	2	1	3	1	V	(1-3)
<i>Heracleum sphondylium</i>	1	2	2	2	2	V	(1-2)
<i>Holcus lanatus</i>	6	5	5		7	IV	(5-7)
<i>Lathyrus pratensis</i>		2	3	2	2	IV	(2-3)
<i>Plantago lanceolata</i>	4	3	2		1	IV	(1-4)
<i>Achillea millefolium</i>	1	2	2	2		IV	(1-2)
<i>Dactylis glomerata</i>	3		2	2		III	(2-3)
<i>Trifolium pratense</i>		3				I	(3_)
<i>Rumex acetosa</i>			2			I	(2_)
<i>Lolium perenne</i>		2				I	(2_)
<i>Elymus repens</i>					2	I	(2_)
<i>Galium verum</i>				1		I	(1_)
<i>Taraxacum officinale</i>	1					I	(1_)
<i>Cerastium fontanum</i>					1	I	(1_)
<i>Ranunculus repens</i>					1	I	(1_)

<i>Vicia hirsuta</i>					1	I	(1_)
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MC10b *Festuca rubra* – *Plantago* spp. maritime grassland *Carex panicea* sub-community

Table 21 – MC10b Community Attributes

Attribute	NVC code – MC10b
Broad habitat type	Supralittoral Rock
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime Cliff and Slope
UKHabs code	S2a5 and s2a6
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Maritime

More usually a community associated with exposed west coast of Britain, a phytosociological grouping having most affinity with MC10b has found a locus on the exposed cliff tops of Filey Brigg. This cliff-top maritime community is characterised by a closed, tight sward dominated by red fescue (with significant amounts of pruinose sub-species). Interleaved with red fescue is an abundance of sea plantain and stag's horn plantain with stolons of creeping bent sporadically through the sward.

Locally small sedge species including glaucous sedge are frequent, suggesting most affinity with the *Carex panicea* sub-community. Species indicating occurrence on base-rich substrates such as common centaury and rough hawkbit occur sporadically throughout.

In the absence of grazing, short turf is maintained on Filey Brigg through trampling and extreme maritime exposure of situations supporting this vegetation. This extreme exposure is reflected in the abundance of bare ground and significant erosion of this community since 2012.

Table 22 – The following species were recorded in MC10b;

Species	DAFOR
<i>Festuca rubra</i>	F
<i>Plantago maritima</i>	F
<i>Plantago coronopus</i>	F
<i>Agrostis stolonifera</i>	F
<i>Leontodon hispidus</i>	F
<i>Trichostomum brachydontium</i>	O
<i>Sonchus asper</i>	O

<i>Carex flacca</i>	R
<i>Centaureum erythraea</i>	R

Table 23 – The following quadrat data was recorded for MC10b, blank cells indicate species not recorded

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
Quadrat location - OS Grid TA	1305 8150	1298 8161	1283 8161	1279 8165	1237 8185		
Sward height (cm)	3	3	4	2	4		
Bare ground (%)	90	85	80	90	80		
<i>Festuca rubra</i>	4	4	5	4	5	V	(4-5)
<i>Plantago maritima</i>	3	4	3	2	5	V	(2-5)
<i>Plantago coronopus</i>	3	3	3	3	2	V	(2-3)
<i>Agrostis stolonifera</i>		3	3	1	3	IV	(1-3)
<i>Leontodon hispidus</i>		2	2		2	III	(2_)
<i>Trichostomum brachydontium</i>			3		3	II	(3_)
<i>Sonchus asper</i>				1	1	II	(1_)
<i>Carex flacca</i>		2				I	(2_)
<i>Centaureum erythraea</i>		2				I	(2_)

MG1a Arrhenatherum-elatius grassland; Festuca rubra sub-community

Table 24 – MG1a Community Attributes

Attribute	NVC code – MG1a
Broad habitat type	Neutral Grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	g3c5
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Sometimes – depends on location.
Status	Para-maritime

This community is dominated by coarse grasses including false oat-grass and cock's foot, however, red fescue is locally prominent. There is much evidence of eutrophication throughout, probably as a result of fertiliser drift from adjacent farmland (or via nutrient rich run-off), however, further study to identify sources of eutrophication is necessary if inputs are to be managed. The community is characterised by locally abundant common nettle

and creeping thistle. This combination of species is consistent with the description for MG1b in Rodwell 1992.

Stands of MG1 on the coast tend to be unmanaged, with neither grazing nor cutting, and a tussocky sward usually develops. Where habitation occurs nearby MG1 grassland on the cliff is often subject to tipping of garden waste and invasive non-native species such as Montbretia can become established (e.g. TN1).

The community develops throughout the site on the fertile, moisture retentive clay soils, predominantly on the cliff top where maritime influence is minimal. MG1b also occurs sporadically in sheltered locations where spray deposition is limited on soft cliff slope.

Scattered scrub often accompanies MG1b and can be viewed as seral succession to continuous scrub and ultimately woodland. Close to habitation Japanese rose was noted in this grassland community (TN16), and ferns are prominent in the expression below Leberston Cliff (TN5).

In fields abutting Red Cliff Point a broad strip of unmanaged grassland has been created at the cliff top which is now dominated by MG1. Similar broad strips of unmanaged grassland were recorded along the coast to Filey Brigg. Where these are established and unmanaged with low fertiliser input and no cutting, the process of reversion to MC9a can be detected in some areas (see above).

Table 25 – Species recorded in this community are listed below

Species	DAFOR
<i>Arrhenatherum elatius</i>	D
<i>Cirsium arvense</i>	F
<i>Dactylis glomerata</i>	F
<i>Heracleum sphondylium</i>	F
<i>Urtica dioica</i>	F
<i>Agrostis stolonifera</i>	LF
<i>Calystegia sepium</i>	LF
<i>Centaurea nigra</i>	LF
<i>Cirsium arvense</i>	LF
<i>Festuca rubra</i>	LF
<i>Agrimonia eupatoria</i>	O
<i>Anthriscus sylvestris</i>	O
<i>Holcus lanatus</i>	O
<i>Jacobaea vulgaris</i>	O
<i>Lathyrus pratensis</i>	O

Species	DAFOR
<i>Plantago lanceolata</i>	O
<i>Rubus fruticosus</i> agg	O
<i>Sonchus arvensis</i>	O
<i>Tussilago farfara</i>	O
<i>Vicia hirsuta</i>	O
<i>Achillea millefolium</i>	R
<i>Cerastium fontanum</i>	R
<i>Dryopteris filix-mas</i>	R
<i>Galium aparine</i>	R
<i>Rumex acetosa</i>	R
<i>Rumex obtusifolius</i>	R
<i>Schedonorus arundinaceus</i>	R
<i>Silene dioica</i>	R
<i>Plantago major</i>	R
<i>Dryopteris dilatata</i>	R
<i>Asplenium scolopendrium</i>	R

Table 26 – Quadrat data recorded in this community is detailed below, blank cells indicate none recorded

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
Quadrat location - OS Grid TA	0770 8398	0814 8408	0808 8415	0840 8381	0866 8364		
Sward height (cm)	55	50	60	90	80		
Bare ground (%)	0	0	0	5	0		
<i>Arrhenatherum elatius</i>	10	10	10	10	9	V	(9-10)
<i>Dactylis glomerata</i>	1	4	1		2	IV	(1-4)
<i>Urtica dioica</i>	2	3	2			III	(2-3)
<i>Cirsium arvensis</i>	2	2			2	III	(2_)
<i>Heracleum sphondylium</i>		2	1		2	III	(1-2)

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
<i>Festuca rubra</i>				4	5	II	(4-5)
<i>Agrostis stolonifera</i>		2		4		II	(2-4)
<i>Holcus lanatus</i>	2			2		II	(2_)
<i>Rubus fruticosus agg</i>			1		3	II	(1-3)
<i>Jacobaea vulgaris</i>				1	1	II	(1_)
<i>Centaurea nigra</i>					3	I	(3_)
<i>Plantago lanceolata</i>				2		I	(2_)
<i>Lathyrus pratensis</i>				2		I	(2_)
<i>Vicia hirsuta</i>					2	I	(2_)
<i>Sonchus arvensis</i>					2	I	(2_)
<i>Tussilago farfara</i>					2	I	(2_)
<i>Cerastium fontanum</i>		1				I	(1_)
<i>Dryopteris filix-mas</i>			1			I	(1_)

MG5b *Cynosurus cristatus* – *Centaurea nigra* grassland *Galium verum* sub community

Table 27 – MG5b Community Attributes

Attribute	NVC code – MG5b
Broad habitat type	Supralittoral rock
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime cliff and slope
UKHabs code	s2a
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Para-maritime / Sub-maritime

Community constants for MG5 are well represented with black knapweed, red fescue, cock's-foot, red clover and ribwort plantain. Crested dog's-tail and Yorkshire fog are also present locally. Whilst dominated by red fescue, false oat-grass is also locally frequent, although usually represented by poorly grown individuals.

Forbs are represented by the appearance of lady's bedstraw, ribwort plantain, black knapweed, rough hawkbit and hoary plantain indicating influence of base-rich sub-soils. This character is further exemplified with the appearance of glaucous sedge and common twayblade (recorded in 2013 at TA0811284130 and TA0797584088). These preferential species suggest strong affinity with MG5b *Galium verum* sub-community.

Ruderal species common on soft cliffs at this site include field horse-tail and colt's-foot. These are prominent where disturbance due to erosion is marked, and these opportunities for colonisation may well form a focus for invasive non-native species in the future.

As is typical for species-rich MG5b on the soft cliff resource, its persistence is dependent on maintenance of species-rich MG5 grassland at the top of the eroding slope in the medium to long term. Management of cliff top grasslands to reduce dominance of coarse grasses and promote species-rich sward are recommended. This includes creation of wide buffer strips (to reduce eutrophication) and grazing.

There is evidence of re-seeding of arable land with wildflower seed which may be part of efforts to conserve this community, however, the species mix found at Target Notes 10 and 11 indicate a generic wildflower mix featuring species rarely encountered locally (e.g. hedge bedstraw, ox-eye daisy, teasel) along with more appropriate species (e.g. wild carrot, greater knapweed, lady's bedstraw and selfheal). In both TN10 and TN11 there is evidence that fertility levels remain high, and it may simply be a matter of time before a more stable grassland community representative of the area establishes.

Whilst land management at TN10 and TN11 is promoting a diverse grassland buffer to the maritime cliff and slope habitat, the treatment of arable margins in other parts of the study area is less conducive with narrow buffer strips of regularly mown, species-poor neutral grassland (e.g. TN8, TN9, TN12).

Other areas of species-poor MG5 grassland include neutral grassland recorded at TN21 where the sward comprises crested dog's-tail, common bent, red fescue, Yorkshire fog, red clover, black knapweed, autumn hawkbit and *Dactylorhiza* orchids. Similarly species-poor neutral grassland best described in terms of MG5 occurs at TN22.

MG5b is distributed throughout the site on both the cliff top (in limited areas) and developing on the soft cliff as sub-maritime grassland, in particular where soils have stabilised for some time and are well-drained. A degree of exposure to salt spray appears to be tolerated,. Where active erosion is occurring, MG5b occurs in mosaic with MG11 (e.g. Mosaics B, F, I and M).

Due to extensive eutrophication and the narrow ecotone created by hard cliff habitat, MG5b is sparsely distributed along Gristhorpe Cliff to The Wyke, however, where it occurs

it is often species-rich. Stabilised soft clay slopes in north-west part of Gristhorpe Cliff do support reasonably large patches of MG5b, with pruinose red fescue in evidence and drifts of big shaggy moss.

From The Wyke to Filey Brigg the community occurs in small pockets on the relatively stable slopes above the hard cliff.

Filey Brigg supports a large area of MG5b grassland on the sheltered, south facing aspect of the peninsula; spiny restharrow and wild carrot are prominent in this community which has the character of genuine unimproved grassland.

Species-rich MG5b swards occur in mosaic with MC8f and MG11 on the stabilised slopes above Filey Sands, although there appears to be a decreased importance of plantains with very little (if any) buck's-horn and sea plantain, and less ribwort plantain. It is likely that maritime influence is low on these slopes.

Table 28 – The following species were recorded in MG5b grassland

Species	DAFOR
<i>Festuca rubra</i>	D
<i>Centaurea nigra</i>	A
<i>Dactylis glomerata</i>	F / LA
<i>Plantago lanceolata</i>	F / LA
<i>Daucus carota</i>	F
<i>Trifolium pratense</i>	F
<i>Jacobaea vulgaris</i>	F
<i>Cirsium arvense</i>	F
<i>Carex flacca</i>	F
<i>Arrhenatherum elatius</i>	LF
<i>Holcus lanatus</i>	LF
<i>Schedonorus arundinaceus</i>	LF
<i>Agrostis capillaris</i>	LF
<i>Linum catharticum</i>	LF
<i>Pseudoscleropodium purum</i>	O
<i>Rhynchospora triquetrus</i>	O
<i>Equisetum arvense</i>	O
<i>Lathyrus pratensis</i>	O
<i>Heracleum sphondylium</i>	O
<i>Tussilago farfara</i>	O
<i>Prunella vulgaris</i>	O

Species	DAFOR
<i>Jacobaea erucifolius</i>	O
<i>Ononis spinosa</i>	O
<i>Cynosurus cristatus</i>	O
<i>Galium verum</i>	O
<i>Kindbergia praelonga</i>	O
<i>Rhinanthus minor</i>	O
<i>Leontodon hispidus</i>	O
<i>Potentilla reptans</i>	O
<i>Hypnum lacunosum</i>	O
<i>Scorzoneroides autumnalis</i>	O
<i>Vicia hirsuta</i>	O
<i>Cerastium fontanum</i>	O
<i>Plantago media</i>	O
<i>Taraxacum officinale agg</i>	O
<i>Ranunculus acris</i>	O
<i>Pulicaris dysenterica</i>	O
<i>Centaureum erythraea</i>	O
<i>Achillea millefolium</i>	R
<i>Rumex acetosa</i>	R
<i>Lotus corniculatus</i>	R
<i>Carlina vulgaris</i>	R
<i>Primula vulgaris</i>	R

Table 29 –The following species were recorded in MG5b grassland quadrats, blank cells indicate species not recorded

Species	Q1	Q2	Q3	Q4	Q5	Q6	Freq	Abundance
Quadrat location - OS Grid TA	1280 8156	1301 8152	1171 8216	0995 8286	0993 8297	0973 8316		
Sward height (cm)	25	20	25	25	25	23		
Bare ground (%)	4	2	2	0	4	2		
<i>Festuca rubra</i>	8	8	8	8	8	8	V	(8_)
<i>Centaurea nigra</i>	3	3	3	4	4	4	V	(3-4)
<i>Dactylis glomerata</i>	5	4	4	2	2	4	V	(2-5)
<i>Plantago lanceolata</i>	4	3	2	4	4	3	V	(2-4)

<i>Arrhenatherum elatius</i>	2	3	4			2	IV	(2-4)
<i>Carex flacca</i>	3	2	2		1		IV	(1-3)
<i>Daucus carota</i>	3	3			3		III	(3_)
<i>Holcus lanatus</i>			2	5		4	III	(2-5)
<i>Schedonorus arundinaceus</i>	2	4			2		III	(2-4)
<i>Trifolium pratense</i>				3	2	2	III	(2-3)
<i>Jacobaea vulgaris</i>		2		1		1	III	(1-2)
<i>Cirsium arvense</i>	1	1	1				III	(1_)
<i>Pseudoscleropodium purum</i>			3			4	II	(3-4)
<i>Agrostis capillaris</i>				4	2		II	(2-4)
<i>Rhytidiadelphus triquetrus</i>			2			3	II	(2-3)
<i>Equisetum arvense</i>					2	2	II	(2_)
<i>Lathyrus pratensis</i>			1			2	II	(1-2)
<i>Heracleum sphondylium</i>			2			1	II	(1-2)
<i>Tussilago farfara</i>			1		2		II	(1-2)
<i>Prunella vulgaris</i>					1	2	II	(1-2)
<i>Jacobaea erucifolius</i>	1	1					II	(1_)
<i>Ononis spinosa</i>		4					I	(4_)
<i>Cynosurus cristatus</i>					3		I	(3_)
<i>Galium verum</i>			3				I	(3_)
<i>Kindbergia praelonga</i>			3				I	(3_)
<i>Rhinanthus minor</i>					3		I	(3_)
<i>Leontodon hispidus</i>						3	I	(3_)
<i>Potentilla reptans</i>						3	I	(3_)
<i>Hypnum lacunosum</i>						3	I	(3_)
<i>Scorzoneroides autumnalis</i>				2			I	(2_)
<i>Vicia hirsuta</i>						2	I	(2_)
<i>Cerastium fontanum</i>	2						I	(2_)
<i>Plantago media</i>			2				I	(2_)
<i>Taraxacum officinale agg</i>				2			I	(2_)
<i>Ranunculus acris</i>				2			I	(2_)

<i>Pulicaris dysenterica</i>					2		I	(2_)
<i>Achillea millefolium</i>			1				I	(1_)
<i>Rumex acetosa</i>			1				I	(1_)
<i>Lotus corniculatus</i>						1	I	(1_)

MG11b *Festuca rubra* – *Agrostis stolonifera* – *Potentilla anserina* grassland, *Atriplex prostrata* sub-community

Table 30 – MG11b Community Attributes

Attribute	Status – MG11b
Broad habitat type	Neutral Grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	g3c6
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Maritime / Para-maritime / Sub-maritime

The community present on eroding cliffs of this survey area has affinities with MG11 as described in Rodwell (1992), however, whilst the floristics are similar, the habitat is quite different. MG11 generally forms on areas of poorly vegetated mud, inundated occasionally by brackish water. Here the community is forming on bare mud, and the maritime influence is variable dependent on exposure to salt spray rather than direct inundation.

Although invariably present, red fescue is less abundant in MG11 on this site than the description in Rodwell suggests, which is likely due to the derivation of the community reflecting the instability of the substrate. The community present is considered to have most affinity with MG11b *Atriplex prostrata* sub-community, however, maritime species are rarely prominent.

MG11 is widespread throughout the site where soft cliffs occur, particularly where active erosion is taking place exposing large areas of bare soil and subsoil. At a distance, areas supporting this community can look like bare ground. On closer inspection a thinly distributed grassland community is apparent, with creeping bent straggling across the surface colonising bare ground. This grass is frequently joined by colt's-foot which can be abundant in some stands, both species colonising vegetatively.

Table 31 – the following species were recorded in MG11b

Species	DAFOR
<i>Agrostis stolonifera</i>	F

Species	DAFOR
<i>Tussilago farfara</i>	F
<i>Holcus lanatus</i>	F
<i>Plantago lanceolata</i>	F
<i>Festuca rubra</i>	F
<i>Trifolium pratense</i>	F
<i>Pulicaria dysenterica</i>	O
<i>Sonchus asper</i>	O
<i>Prunella vulgaris</i>	O
<i>Leontodon hispidus</i>	O
<i>Jacobaea erucifolius</i>	O
<i>Trifolium campestre</i>	R
<i>Trichostomum crispulum</i>	R
<i>Anthyllis vulneraria</i>	R
<i>Lotus corniculatus</i>	R
<i>Hypochaeris radicata</i>	R
<i>Schedonorus arundinaceus</i>	R
<i>Equisetum arvense</i>	R
<i>Carlina vulgaris</i>	R
<i>Cirsium palustre</i>	R
<i>Juncus conglomeratus</i>	R
<i>Ranunculus repens</i>	R
<i>Helminthotheca echioides</i>	R
<i>Tripleurospermum maritimum</i>	R

Table 32 – The following quadrat data was recorded for MG11b, blank cells indicate species not recorded

Species	Q1	Q2	Q3	Q4	Q5	Frequency	Abundance
Quadrat location - OS Grid TA	0842 8384	0839 8392	0862 8368	0846 8391	0808 8409		
Sward height (cm)	8	10	8	4	8		
Bare ground (%)	25	80	80	90	30		
<i>Agrostis stolonifera</i>	7	4	6	4	5	V	(4-7)
<i>Tussilago farfara</i>	5	4	2	4	5	V	(2-5)
<i>Holcus lanatus</i>	3	1	1	1		IV	(1-3)
<i>Plantago lanceolata</i>	2	1		1	1	IV	(1-2)
<i>Festuca rubra</i>		2	1		2	III	(1-2)
<i>Trifolium pratense</i>	1	2	1			III	(1-2)
<i>Pulicaria dysenterica</i>	2	2				II	(2_)
<i>Sonchus asper</i>		1		1		II	(1_)
<i>Prunella vulgaris</i>	1			1		II	(1_)
<i>Leontodon hispidus</i>		1			1	II	(1_)
<i>Jacobaea erucifolius</i>	2					I	(2_)
<i>Trifolium campestre</i>	2					I	(2_)
<i>Trichostomum crispulum</i>			2			I	(2_)
<i>Anthyllis vulneraria</i>					2	I	(2_)
<i>Lotus corniculatus</i>				1		I	(1_)
<i>Hypochaeris radicata</i>	1					I	(1_)
<i>Schedonorus arundinaceus</i>		1				I	(1_)

<i>Equisetum arvense</i>		1					(1_)
<i>Carlina vulgaris</i>			1				(1_)
<i>Cirsium palustre</i>			1				(1_)

MG12a – *Festuca arundinacea* grassland *Lolium perenne* – *Holcus lanatus* sub-community

Table 33 – MG12a Community Attributes

Attribute	Status – MG12a
Broad habitat type	Neutral Grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	g3c8
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Para-maritime

This para-maritime grassland community develops on moist but free-draining soils on coastal soft cliffs, and is characteristic of the Yorkshire coast. The community is dominated by tussocks of tall fescue, a community constant for MG12, with false oat-grass and Yorkshire fog. Forbs are represented by ribwort plantain, black knapweed, meadow vetchling and wild carrot. This combination of associates is consistent with MG12a *Lolium perenne* – *Holcus lanatus* sub-community.

The long list of species occurring at low frequency indicate the complex nature of the development of this community. On stabilised soft cliff, tall fescue can become prominent in a wide range of soil moisture conditions, typically where erosion cracks appear in dry grassland tall fescue colonises the cracks which represent pockets of moist, bare ground and the tussocks become dominant over time. Alternatively, tall fescue colonises flushed areas of thinly vegetated soft cliff after erosion events. Consequently, MG12 may feature dry grassland species and species of early succession flushes.

The situation is further complicated by the onset of incremental erosion in once MG12b is established which opens up cracks where conditions suitable for further colonising species (including INNS) and species of humid sheltered spots including small liverworts. Overall this grassland can represent a species-rich element of the soft cliff flora, notably on cliffs above the Filey Sands.

Table 34 – The following species were recorded in MG12b;

Species	DAFOR
<i>Schedonorus arundinaceus</i>	D
<i>Festuca rubra</i>	F / LA

Species	DAFOR
<i>Plantago lanceolata</i>	F
<i>Centaurea nigra</i>	F
<i>Lathyrus pratensis</i>	F
<i>Daucus carota</i>	F
<i>Agrostis stolonifera</i>	LF
<i>Dactylis glomerata</i>	LF
<i>Holcus lanatus</i>	LF
<i>Tussilago farfara</i>	LF
<i>Brachypodium sylvaticum</i>	LF
<i>Pulicaria dysenterica</i>	LF
<i>Lotus corniculatus</i>	O
<i>Heracleum sphondylium</i>	O
<i>Dactylorhiza sp</i>	O
<i>Jacobaea erucifolius</i>	O
<i>Calliergonella cuspidata</i>	O
<i>Equisetum fluviatile</i>	O
<i>Carex flacca</i>	O
<i>Ceratodon purpureus</i>	O
<i>Jacobaea vulgaris</i>	O
<i>Equisetum arvense</i>	O
<i>Lotus pedunculatus</i>	O
<i>Trifolium pratense</i>	O
<i>Leontodon hispidus</i>	R
<i>Melilotus altissimus</i>	R
<i>Rhinanthus minor</i>	R
<i>Anthyllis vulneraria</i>	R
<i>Ononis repens</i>	R
<i>Cirsium arvense</i>	R
<i>Achillea millefolium</i>	R
<i>Cirsium vulgare</i>	R
<i>Prunella vulgaris</i>	R
<i>Crataegus monogyna (seedling)</i>	R
<i>Odontites vernus</i>	R
<i>Trifolium campestre</i>	R

Species	DAFOR
<i>Rubus obtusifolius</i>	R

Table 35 – The following quadrat data was collected for MG12b, blank cells indicate species not recorded

Species	Q1	Q2	Q3	Q4	Frequency	Abundance
Quadrat location - OS Grid TA	1209 8105	0993 8296	0841 9400	1002 8288		
Sward height (cm)	80	40	45	50		
Bare ground (%)	0	0	5	5		
<i>Schedonorus arundinaceus</i>	9	9	8	8	V	(8-9)
<i>Plantago lanceolata</i>	2	2	2	3	V	(2-3)
<i>Centaurea nigra</i>	1	2	1	2	V	(1-2)
<i>Festuca rubra</i>	4		3	5	IV	(3-5)
<i>Lathyrus pratensis</i>	1	3	2		IV	(1-3)
<i>Daucus carota</i>	2	1		1	IV	(1-2)
<i>Agrostis stolonifera</i>	3		3		III	(3_)
<i>Dactylis glomerata</i>	2			4	III	(2-4)
<i>Holcus lanatus</i>	2	4			III	(2-4)
<i>Tussilago farfara</i>			2	4	III	(2-4)
<i>Brachypodium sylvaticum</i>		2	3		III	(2-3)
<i>Pulicaria dysenterica</i>	4		1		III	(1-4)
<i>Lotus corniculatus</i>		1		3	III	(1-3)
<i>Heracleum sphondylium</i>		2		1	III	(1-2)
<i>Dactylorhiza sp</i>	1	2			III	(1-2)
<i>Jacobaea erucifolius</i>	1		1		III	(1_)

<i>Calliergonella cuspidata</i>	3				II	(3_)
<i>Equisetum fluviatile</i>	3				II	(3_)
<i>Carex flacca</i>			3		II	(3_)
<i>Ceratodon purpureus</i>			3		II	(3_)
<i>Jacobaea vulgaris</i>				2	II	(2_)
<i>Leontodon hispidus</i>			2		II	(2_)
<i>Melilotus altissimus</i>	2				II	(2_)
<i>Equisetum arvense</i>		2			II	(2_)
<i>Rhinanthus minor</i>		2			II	(2_)
<i>Anthyllis vulneraria</i>			2		II	(2_)
<i>Ononis repens</i>				2	II	(2_)
<i>Cirsium arvense</i>				2	II	(2_)
<i>Achillea millefolium</i>	1				II	(1_)
<i>Cirsium vulgare</i>				1	II	(1_)
<i>Prunella vulgaris</i>	1				II	(1_)
<i>Crataegus monogyna (seedling)</i>			1		II	(1_)
<i>Odontites vernus</i>				1	II	(1_)
<i>Trifolium campestre</i>				1	II	(1_)

S4diii *Phragmites australis* reedbed *Atriplex prostrata* sub-community *Agrostis stolonifera* variant

Table 36 – S4Diii Community Attributes

Attribute	Status – S4diii
Broad habitat type	Fen Marsh and Swamp
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Lowland Fen

UKHabs code	f2a
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Sub-maritime

Dominated by common reed, S4 swamp occurs in limited stands in flushed areas on soft cliff and steeper flushed zones on Filey Brigg. A degree of stability is necessary to allow common reed to develop a sward, however, this plant is at home in brackish water, and once established persists until eroded away by the sea.

As is typical in these situations, common reed is short and forms an open sward. A ground layer dominated by creeping bent is present, with occasional halophytes. The presence of these associates indicate most affinity with S4diii *Atriplex prostrata* sub-community *Agrostis stolonifera* variant.

Only one accessible expression of this community was encountered and hence limited species data was collected.

Table 37 – The following quadrat data was collected for S4diii

Species	Q1	Frequency	Abundance
Quadrat location - OS Grid TA	1240 8181		
Sward height (cm)	120		
Bare ground (%)	0		
<i>Phragmites australis</i>	9	V	(9_)
<i>Festuca rubra</i>	5	V	(5_)
<i>Sonchus arvensis</i>	4	V	(4_)
<i>Agrostis stolonifera</i>	3	V	(3_)
<i>Tussilago farfara</i>	3	V	(3_)
<i>Heracleum sphondylium</i>	2	V	(2_)
<i>Sonchus asper</i>	1	V	(1_)
<i>Plantago maritima</i>	1	V	(1_)

SD2 Honkenya peploides – Cakile maritima strandline community

Table 38 – SD2 Community Attributes

Attribute	NVC code – SD2
Broad habitat type	Supralittoral sediment
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Coastal vegetated shingle
UKHabs code	s3b

Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Supporting habitat
Status	Maritime

The strand-line community, SD2 is represented by species poor associations in the few places where a strandline exists in front of cliffs, characterised by spear-leaved orache *Atriplex prostrata* (e.g. TN6).

S12b *Typha latifolia* swamp *Mentha aquatica* sub-community

Table 39 – S12B Community Attributes

Attribute	Status – S12b
Broad habitat type	Fen Marsh and Swamp
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Lowland Fen
UKHabs code	f2a
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Sub-maritime

Where major slumps have taken place on soft cliff, water often accumulates behind ridges created by rotational slippage (e.g. TN7). These perched wetlands are then rapidly colonised by wetland species with high dispersal capabilities (wind borne seed).

Common reedmace can become dominant, however, stands of this community were very limited being recorded in small amount on Gristhorpe Cliff and soft cliff above Filey Sands (TN4).

Table 40 – Species data for this community was collected as follows, blank cells indicate species not recorded,

Species	DAFOR	DAFOR
Grid ref TA	1215 8118	0972 8319
<i>Typha latifolia</i>	D	D
<i>Epilobium hirsutum</i>	F	
<i>Pulicaria dysenterica</i>	O	
<i>Tussilago farfara</i>	O	
<i>Agrostis stolonifera</i>		F
<i>Juncus effusus</i>		F
<i>Equisetum arvense</i>		F

OV25 *Urtica dioica* – *Cirsium arvense* community, OV26 *Epilobium hirsutum* community and OV27 *Chamerion angustifolium* community

Table 41 – OV25 Community Attributes

Attribute	NVC code – OV25b
Broad habitat type	Modified grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	G4, Secondary code: 16
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Supporting habitat
Status	Para-maritime

Table 42 – OV26 Community Attributes

Attribute	NVC code - OV26
Broad habitat type	Fen, Marsh and Swamp
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	F2, Secondary code: 17
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Para-maritime

Table 43 – OV27 Community Attributes

Attribute	NVC code – OV27
Broad habitat type	Modified grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	G4, Secondary code: 16
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Supporting habitat
Status	Para-maritime

Dominated by great willowherb, OV26 forms where moist but well-aerated soils occur in the soft cliff matrix and on watercourses. Stands on the soft cliff and flushes on the top of the hard cliffs are usually on a slight slope and in areas that accumulate freshwater run-off. The community often abuts M22 mire or S12 reedpace swamp. Hard rush and common nettle may accompany great willowherb, but few other associates are common.

Common nettle is usually overwhelmingly dominant in OV25 which has a restricted distribution in the study area occurring only in fertile, well-drained soils. OV25 was recorded on the cliff top where eutrophication has occurred due to fertiliser drift, and very occasionally on the soft cliff where eutrophication was apparent. Tipping of garden waste has promoted development of OV25 near habitation where it occurs in mosaic with OV26 and scrub on Gristhorpe Cliff. One large stand was recorded on Lebberston Cliff where it appears eutrophication has occurred possibly due to land drains exposed on the cliff slope

Rose-bay willowherb characterises OV27, but is relatively scarce in the study area usually associated with tipping of garden refuse or other disturbance causing eutrophication.

Table 44 – The following species were recorded in OV26;

Species	DAFOR
<i>Epilobium hirsutum</i>	D
<i>Equisetum arvense</i>	F / LA
<i>Juncus inflexus</i>	A
<i>Urtica dioica</i>	F
<i>Dactylis glomerata</i>	F
<i>Pulicaria dysenterica</i>	F
<i>Cirsium palustre</i>	F
<i>Cirsium arvense</i>	F
<i>Rubus fruticosus agg</i>	O
<i>Galium palustre</i>	R

W8 *Fraxinus excelsior* – *Acer campestre* – *Mercurialis perennis* woodland

Table 45 – W8 Community Attributes

Attribute	NVC code – W8
Broad habitat type	Other woodland - broadleaved
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	w1g7
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	No
Status	Para-maritime

The slipway down to the beach at Filey Sands is flanked by woodland best described in terms of W8. The groundflora features wood avens *Geum urbanum* and red campion *Silene dioica* and the canopy is dominated by sycamore *Acer pseudoplatanus*.

This woodland is not considered to be of intrinsically high nature conservation value, but as woodland is a scarce resource on this coast it has value for fauna associated with deciduous woodland.

W22c *Prunus spinosa* – *Rubus fruticosus* agg. scrub; *Dactylis glomerata* sub-community

Table 46 – W22c Community Attributes

Attribute	NVC code – W22c
Broad habitat type	Supralittoral rock
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime cliff and slope
UKHabs code	s2a5
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Sub-maritime

Scrub is not a large element of the vegetation on the coast between Leberston Cliff and Filey Sands, however, there is a limited stand of wind-clipped blackthorn *Prunus spinosa* south of Cunstone Nab. Due to the suckering nature of blackthorn the patch is dense and expanding and forms a significant feature. In addition, a limited expression occurs at the base of Gristhorpe Cliff where the slope has been stabilised for some time.

W23 *Ulex europaeus* – *Rubus fruticosus* scrub

Table 47 – W23 Community Attributes

Attribute	NVC code – W23
Broad habitat type	Supralittoral rock
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime cliff and slope
UKHabs code	s2a5
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Sub-maritime

European gorse *Ulex europaeus* is prominent on the soft cliffs above Gristhorpe Sands where it forms dense stands in parts of the cliff which have been stabilised for some time. These stands are invariably broken up by erosion events on the soft cliff leading to scattered gorse amidst a complex of wetland and early succession soft cliff communities. W23 is also present inland on steep slopes adjacent to the caravan site; this more stable community occurs on thin, relatively acid soils.

W24 *Rubus fruticosus* – *Holcus lanatus* underscrub

Table 48 – W24 Community Attributes

Attribute	NVC code – W24
Broad habitat type	Supralittoral rock
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime cliff and slope
UKHabs code	s2a5
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Sub-maritime

Bramble is not a prominent feature of this part of the coast with occasional stands occurring within rank grasslands. A bramble dominated patch occurs on soft cliff above Filey Sands which has become a locus for sycamore *Acer pseudoplatanus* and the invasive non-native species Japanese rose *Rosa rugosa*.

There are occasional bramble thickets on the soft cliff at Gristhorpe Sands, but overall this community is not a prominent feature perhaps reflecting the generally thin, well drained soils of the cliff top.

W25 *Pteridium aquilinum* – *Rubus fruticosus* underscrub

Table 49 – W25 Community Attributes

Attribute	NVC code – W25
Broad habitat type	Supralittoral rock
UK BAP Habitat (UK Habitat Classification Working Group (2018))	Maritime cliff and slope
UKHabs code	s2a5
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	Yes
Status	Sub-maritime

An area of bracken *Pteridium aquilinum* was recorded at the base of Gristhorpe Cliff on stabilised soil. Whilst relatively close to the shore, the topography offers some protection from maritime influence.

W25 occupies much of the low ground below High Red Cliff forming a substantial area on deep, well drained soils. Blackthorn is also present here, and it is likely that the area will become continuous scrub over time.

Improved Grassland - MG6a *Lolium perenne*-*Cynosurus cristatus* grassland; Typical sub community

Table 50 – MG6a Community Attributes

Attribute	Status – MG6a
Broad habitat type	Neutral Grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	g3c6
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	No
Maritime Status	None

This is a species-poor grassland dominated by perennial rye-grass *Lolium perenne*, with the abundance of white clover *Trifolium repens*, and occurrence of ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, creeping buttercup *Ranunculus repens* and daisy *Bellis perennis* at low cover, indicating that this grassland is best described as the Typical MG6 sub-community. Timothy *Phleum pratense* is prominent in some expressions.

This grassland is maintained by agricultural management including application of fertiliser and use of herbicide. Where this management has been relaxed (for example at TN17) the species composition of the grassland changes as perennial rye-grass loses vigour

allowing other grasses to dominate and native forbs to establish. The evolution of the grassland is dependent on local seed source and edaphic factors. The latter, including maritime influence, is masked by the intensive management undertaken to maintain MG6 grassland. At TN17 relaxation of management with light grazing has led to an increase in red fescue in the eastern part of the field and Yorkshire fog elsewhere and the appearance of a variety of common forbs.

Amenity grassland at Filey Sands was also considered to be within the locus of MG6a.

Improved grassland - MG7 *Lolium perenne* leys

Table 51 – MG7 Community Attributes

Attribute	Status – MG7
Broad habitat type	Modified Grassland
UK BAP Habitat (UK Habitat Classification Working Group (2018))	No
UKHabs code	g4
Element of H1230 Vegetated Sea cliffs of the Atlantic and Baltic Coasts	No
Maritime Status	None

This grassland was recorded on intensively managed agricultural situations where fields have been recently ploughed and re-seeded with perennial rye-grass. Few other species are present in these stands which are regularly cut for silage throughout the growing season.

Artificial Wetlands at Filey Brigg

Located at TN13 is an artificial wetland dominated by emergent vegetation leaving little open water. In 2012 New Zealand pygmy weed was recorded covering 5% of the area. In 2021 this species is now overwhelmingly dominant accounting for 90% of emergent vegetation. Creeping bent and silverweed are present along with reed canary-grass, common spike-rush, yellow iris and jointed rush. White water lily is also present.

An adjacent waterbody (TN18) also appears to be artificial with an abundance of Nuttall's pondweed *Elodea nuttallii* and with white water lily present. Open water is fringed by common spike-rush,. This waterbody receives run-off from nearby farmland and appears eutrophic, however, no New Zealand pygmyweed was recorded despite the close proximity of this species in the adjacent waterbody.

Table 52 – The following species were recorded in wetland at TN13

Species	Common name	DAFOR
<i>Crassula helmsii</i>	New Zealand pygmyweed	D
<i>Agrostis stolonifera</i>	Creeping bent	LF

Species	Common name	DAFOR
<i>Phalaris arundinacea</i>	Reed canary-grass	LF
<i>Glyceria notata</i>	Plicate sweet-grass	O
<i>Iris pseudacorus</i>	Flag iris	O
<i>Eleocharis palustris</i>	Common spike-rush	O
<i>Potentilla anserina</i>	Silverweed	O
<i>Juncus articulatus</i>	Jointed rush	O
<i>Nymphaea alba</i>	White water lily	O
<i>Persicaria amphibia</i>	Amphibious bistort	O
<i>Elytrigia repens</i>	Common couch	R

Target Notes

Table 53 – Target Notes (TN) are tabulated below

TN	Grid ref	Note
1	TA09078345	Garden waste tipped from caravan site. Montbretia established on cliff.
2	TA08448394	Good example of M22 with marsh arrow-grass.
3	TA12098108	M10 flush with grass-of-Parnassus
4	TA12158118	S12 wetland
5	TA08088415	Ferns preferential in MG1 grassland with broad buckler fern and hart's-tongue fern.
6	TA09428341	SD2 strandline community with <i>Atriplex prostrata</i>
7	TA08438385	New pool formed by soft cliff slumping. No vegetation as yet.
8	TA10518257	Narrow margin between arable field and cliff top. Regularly mown species-poor neutral grassland.
9	TA10168264	Narrow margin between arable field and cliff top. Regularly mown species-poor neutral grassland.
10	TA09968262	Arable conversion to grassland. Currently MG6 but appears to be diversifying slowly.
11	TA09888278	Arable conversion to grassland. Currently species-rich MG6, has all the hallmarks of a wildflower seed mix.
12	TA11098234	Arable margin comprises regularly mown species poor neutral grassland.
13	TA12448167	Scrape overwhelmed with <i>Crassula helmsii</i> . <i>Glaux maritima</i> and <i>Juncus gerardii</i> are present in a limited stand.
14	TA12518168	Maritime grassland subject to eutrophication, much creeping thistle.

TN	Grid ref	Note
15	TA12978160	Many orchids present, probably pyramidal.
16	TA12208128	Rosa rugosa present.
17	TA12298177	Improved grassland (MG6) is reverting to maritime grassland. Light grazing noted.
18	TA12408167	Large, shallow pond with poached edges. Nuttall's pondweed and common spike-rush present. No sign of Crassula helmsii despite close proximity.
19	TA10018292	Erosion event disturbing calcareous grassland
20	TA08438382	Active erosion of a large area, much bare ground.
21	TA09898304	Species-poor MG5
22	TA08518372	Species-poor neutral grassland dominated by Yorkshire fog and red fescue with red clover, ribwort plantain and black knapweed.

Mosaic Data

Where mosaics are shown on the figures they are labelled with a unique code from A – AG.

Table 54 – The sub-communities present and percentages are as indicated in the table below

Mosaic Label	Mosaic Data
A	MG5b (35%) / MG11b (60%) / MC8f (5%)
B	MG5b (10%) / MG11b (90%)
C	MC8f (90%) / MG5b (10%)
D	MG11b (90%) / MC8f (10%)
E	MC8f (70%) / MG5b (20%) / CG2c (10%)
F	MG5b (60%) / MG11b (40%)
G	MG11b (70%) / MG5b (30%)
H	Bare ground (72%) / MG11b (25%) / MG5b (3%)
I	MG5b (80%) / bare ground (10%) / MG11b (5%) / MC8f (5%)
J	Bare ground (60%) / MG11b (38%) / MG5b (2%)
K	MG11b (70%) / MC8f (30%)
L	MG1b / scattered scrub
M	MG5b (80%) / MC8f (10%) / MG11b (10%)
N	MG11b (95%) / MC8f (5%)

O	MG11b (95%) / MC8f (5%)
P	MG11b (75%) / MC8f (15%) / CG2c (10%)
Q	CG2c with scattered scrub
R	MG11b (90%) / MC9a (10%)
S	MC8f (50%) / MG11b (50%)
T	MG11b (60%) / MC8f (40%)
U	MC8f (60%) / MG11b (40%)
V	MC8f (80%) / MG11b (20%)
W	MG11b (60%) / MC8f (40%)
X	Bare ground (58%) / MC8f (40%) / MG11b (2%)
Y	Bare ground (58%) / MC8f (40%) / MG11b (2%)
Z	MG5b (80%) / MG11b (20%)
AA	MG11b (70%) / MG5b (30%)
AB	MG11b (70%) / MG5b (30%)
AC	MC8f (50%) / MG12a (25%) / MG11b (20%) / MG5b (5%)
AD	CG2c (70%) / MG5b (30%)
AE	MC8f (40%) / MG5b (40%) / MG11b (20%)
AF	MC8f (80%) / MG5b (20%)
AG	MG11b (94%) / MC10b (5%) / MC9a (1%)

Discussion

Comparison with previous vegetation survey

Previous vegetation survey of this study area was undertaken by the author in 2012 and 2013 (Haycock and Jay 2013a & 2013b). Reference to these reports has been made to compare the results of the current survey with vegetation recorded in 2012 /13.

The current survey identified a complex interplay of factors which were found to be influencing grassland and maritime vegetation communities. These include soils and underlying geology, aspect, slope, amount of input from salt-spray, drainage and locally on hard-cliffs, enrichment by sea birds. The major influence is the dynamic nature of the soft cliffs with natural processes causing slippage and erosion at varying rates in different parts of the site.

The degree of maritime influence was found to be generally limited, though apparent on some more exposed slopes, notably at Filey Brigg where maritime grassland is abundant on the exposed northern side. There is evidence that significant change in vegetation has taken place since 2012 with the loss of established maritime grassland on exposed north-facing slopes. The sheltered southern slopes of Filey Brigg and stabilised slopes above Filey Sands support both calcareous and neutral species-rich grassland.

Sub-maritime grassland was recorded along much of the coast; these are essentially lowland grasslands occurring on maritime cliff and consequently supporting an unusual assemblage of species including some species limited to coastal sites. These grasslands appear to be stable in extent, and perhaps bolstered by a significant increase in low input grassland being managed on the landward side (replacing arable with the associated fertiliser and herbicide drift issues). This is considered to be a positive development.

Sub-maritime and para-maritime features, in particular dense scrub and woodland, were also recorded. In these cases the influence of the sea is not immediately apparent, however, the sculpting of these features by constant strong winds from the sea is clear, and some climatic maritime influence is likely. The extent of dense scrub and woodland appears to be remarkably stable with no evidence that scrub encroachment onto maritime vegetation is a pressure.

Hard cliff zones provide a more stable environment for vegetation communities to develop over time. Consequently there are large areas of unimproved calcareous grassland on steep slopes below hard cliffs at Gristhorpe which have been maintained in extent since 2012 apart from the one major rock fall recorded at the Wyke (TN19). This stochastic erosion event is not likely to represent a threat to unimproved calcareous grassland resource in the long term even though in the short term it has led to the covering of calcareous grassland by debris. Vegetation is now recolonising naturally and will no doubt form calcareous grassland in time if there is a period of low disturbance.

Maritime cliff and ledge communities appear to have maintained extent, and in sheltered inlets strandline vegetation continues to occur.

East of the Wyke, cliffs have steep slopes of eroded material below them which appeared to be suffering a degree of eutrophication in 2012, possibly due to percolation of water from adjacent intensively managed arable fields. This led to the development of grassland dominated by coarse grasses with a narrow band of maritime grassland by the sea. This eutrophic grassland was very apparent in 2012, but appears to have decreased in extent replaced by para-maritime and maritime grassland. This may be due to the increased extent of buffer zones on the cliff top reducing fertiliser 'spill' from arable land onto maritime cliff and slope vegetation.

Comments on coastal erosion

Observations during this survey include recording where vegetation is being actively impacted by coastal erosion processes, and from this it is possible to infer that these are places where active coastal processes are currently most abundant. However, it should be noted that these are observations of vegetation by an ecologist, and in order to obtain accurate information about coastal erosion at this location a study by a qualified coastal geomorphologist is recommended.

Areas of soft cliff are limited to Filey Sands, Gristhorpe Sands and Lebberston Cliff. At Filey Sands there have been attempts to stabilise the soft cliff and the Sailing Club is perched on soft cliff bolstered by much concrete. Despite this, soft cliff erosion processes continue to be active albeit curtailed in places.

Soft cliff erosion was noted to be particularly active at Gristhorpe Sands where the sea removes clay and debris at the toe of the cliff with each high tide. Consequently there are extensive areas of bare ground and rotational slippage to form wetlands (e.g. TN7 and TN20). At TN20 erosion is particularly notable and the area has changed significantly since 2012. At current rates the cliff top will likely be outside the SSSI boundary within a few years. It is possible that use of this area at TN20 as a route to walk down to the beach is exacerbating erosion.

Soft cliff at Lebberston Cliff appears much more stable with little change since 2012.

From the Wyke to Filey Brigg the cliffs are hard with perched soft cliff to a varying degree. There appears to have been little change in these cliffs since 2012.

Filey Brigg is a rocky peninsula supporting some of the most species-rich vegetation encountered during the current survey. Since 2012 there appears to have been significant erosion on the north-facing slope of Filey Brigg, and it is considered likely that exposure to northern storms has caused a decrease in maritime grassland MC9a on Filey Brigg replaced by species-poor MG11 with much bare ground. Monitoring by geomorphological specialists may be helpful in ascertaining whether the effect seen is a limited stochastic event, or part of a trend towards increased pressure due to the intensity and frequency of storms.

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Appendices

FIGURE 1 – NVC 2021 SURVEY MAPS (supplied as separate document)

APPENDIX 1 – QUADRAT PHOTOGRAPHS (attached as separate document)

APPENDIX 2 – OVERVIEW OF VEGETATION DATA (attached as separate spreadsheet)

APPENDIX 3 – NVC COMMUNITIES LISTED BY MORPHOLOGICAL SECTION (attached as a separate document)