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No. 124

National Sand Dune Vegetation Survey  
Site Report No. 74  
Winterton to Horsey Dunes,  
Norfolk  
1989

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## NCC COASTAL ECOLOGY RESEARCH PROGRAMME

The Coastal Ecology Branch of the Chief Scientist Directorate was established in August 1979. One of the functions of the Branch is to coordinate a programme of research and survey in the field of terrestrial coastal conservation. To this end a research programme has been developed with four main aims:

1. To describe the size, location and quality of the main coastal habitats in Great Britain (salt marshes, sand dunes, vegetated shingle, sea cliffs, strandlines, "reclaimed land" and maritime islands).
2. To assess the impact of major development projects on sites of national importance for nature conservation.
3. To provide guidance on the management of the main coastal habitats for nature conservation.
4. To investigate the role of physical and biological processes in the maintenance of natural and semi-natural coastal habitats.

The results are disseminated in a variety of Nature Conservancy Council publications:

- a. CSD contract reports: limited numbers with specialist interest are produced. Copies are usually prepared by the contractor and are made available as a Chief Scientist Directorate Report in microfiche through the Nature Conservancy Council's Information and Library Services.
- b. Contract survey reports
- c. Research and survey in nature conservation
- d. Focus on nature conservation

If you would like any further information on this report or on the research programme please contact Dr. Doody in Peterborough.

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## 1. BACKGROUND AND OBJECTIVES

Horseley and Winterton dunes were surveyed as part of the Sand Dune Survey of Great Britain. This project is one of a series of strategic surveys of coastal habitats currently being undertaken by the Nature Conservancy Council. The survey has two aims:

- i. to produce a vegetation map and description for each sand dune system which will be useful to those involved directly in its conservation;
- ii. to produce a national inventory of the range and extent of sand dune habitats in Great Britain. Such an inventory will then allow the interest of any particular site or group of sites to be placed in its national context.

## 2. METHODS

Horseley and Winterton dunes were surveyed using the standard techniques of the Sand Dune Survey of Great Britain. Collecting data in a consistent manner will enable valid comparisons to be made between sites on a national basis.

The field survey technique and subsequent analysis of the data were carried out using methods similar to those suggested by the National Vegetation Classification. Further details of the field techniques, data analysis and vegetation mapping are included in Annex 1.

## 3. GENERAL DESCRIPTION OF THE SITE

Winterton dunes, together with the adjacent Horseley dunes to the north, is a dune system of variable width extending for 8-9km along the coast. The site is of physiographic significance in being one of a number of "ness" features which are characteristic of the East Anglian coast. Many parts of the Winterton to Horseley section are eroding, and this has led in recent years to the proliferation of concrete seawall along parts of the foredune. However, the ness at Winterton appears to be accreting and there is evidence of some accumulation of sand locally at the bases of the sea defences.

Behind the rather broad dune ridge present at the northern section of Winterton dunes (north of Winterton village), lies a low, relatively flat area of wind blown sand. However the topography of this area fluctuates on the smaller scale, dipping down to, or below, the water table in many places. This area lies adjacent to an expanse of arable, pump drained marshland. In the Horseley area to the north, the foredunes are considerably narrower, a single ridge in some places, but again this gives way to areas of blown sand stretching some way

inland. Pump drained marshland under a grassland regime backs this section of dune. Between the two areas lies a stretch of dune consisting only of a narrow foredune ridge. Here, as over much of the coastline, concrete seawalls have been installed which are locally accumulating sand at their bases, which has been colonised by foredune vegetation.

The southern section of Winterton dunes (Winterton to Hemsby) is physically very different. Behind a wide dune ridge lies a valley; this marks the location of an earlier coastline. Landward of this valley the ground rises steeply. As a consequence this section of dunes is backed by ground at about 10 metres above sea level.

The Winterton section to the north of the village is a National Nature Reserve, whilst most of the rest of the dune system is a Site of Special Scientific Interest. Between the villages of Winterton and Hemsby (to the south) there has been some development on the dunes in the form of several car parking areas and many beach huts, although much of this lies outside the notified area, whilst landward of this section, extensive caravan parks and holiday accommodation are situated. This has led to the dunes becoming increasingly disturbed by visitor pressure and erosion is severe, particularly around the car parking areas at Winterton and Hemsby.

There was some light grazing by cattle and sheep within enclosed fields on the landward areas of blown sand on the Horsey and north Winterton sections. Rabbits are distributed throughout the site and have some impact, although they do not achieve the numbers seen at Blakney Point.

#### 4. VEGETATION DESCRIPTION.

The pioneer dune community, dominated by Sand Couch Grass (Elymus farctus) (SD4) exists along the northern part of the Winterton section. However, Marram (Ammophila arenaria) dominated foredune vegetation (SD6) is present along the whole of the Horsey and Winterton dune system. The Marram (Ammophila arenaria) and Sand Couch Grass (Elymus farctus) (SDb) sub-community occupying the seaward edge, which grades landward into the Marram (Ammophila arenaria) and Red Fescue (Festuca rubra) (SD6e) sub-community. Moving further inland this changes to the semi-fixed dune community characterised by Marram (Ammophila arenaria) and Red Fescue (Festuca rubra) (SD7), and in turn this gives way to the lichen rich, Sand Sedge (Carex arenaria) (SD11) community.

The area of wind blown sand behind the dune ridge at the Horsey section, consists of a mosaic of various grassland types. Namely, False Oat Grass (Arrhenatherum elatius) (MG1), Wavy Hair-grass (Deschampsia flexuosa) (U2a), Creeping Soft-grass (Holcus mollis) (non-NVC), Yorkshire Fog (Holcus lanatus) and Soft Rush (Juncus effusus)

(MG10), Sharp Flowered Rush (Juncus acutiflorus) (M23) and tall herb rich fen (S25) containing Reed (Phragmites australis) and Hemp Agrimony (Eupatorium cannabinum), onto which a patchwork of smaller areas of various fixed dune grassland types exists.

Landward of the dune ridge, the northern part of the Winterton dune system is dominated by a mosaic of heath (H1d) and wet heath (M16e), characterised by Heather (Calluna vulgaris) Cross-leaved Heath (Erica tetralix) Sheeps Fescue (Festuca ovina) and Purple Moor-grass (Molinia caerulea), several small areas of standing water and small clumps of Sallows (Salix cinerea) (W1), over a background of the Sand Sedge (Carex arenaria) and the lichen Cornicularia aculeata (SD11) community. The landward margin of this section of dune is occupied by a dense fringe of invasive Rhododendron (Rhododendron ponticum), backed by woodland predominantly of Birch (Betula sp.).

The southern part of Winterton dune system lacks the heath and wet heath communities. The broad valley landward of the dune ridge is occupied by the Sand Sedge (Carex arenaria), Sheeps Fescue (Festuca ovina) and the lichen Cornicularia aculeata (SD11b) community. While the vegetation on the steep landward bank is dominated by Bracken (Pteridium aquilinum) and Bramble (Rubus fruticosus agq.) (W25) community.

#### 5. RARE SPECIES.

The nationally scarce Round Leaved Wintergreen (Pyrola rotundifolia) is present within the Winterton dunes National Nature Reserve, whilst two nationally scarce grasses are present in some abundance throughout the site; Grey Hair Grass (Corynephorus canescens) and Rush-leaved Fescue (Festuca juncifolia). The nationally rare Crested Buckler-fern (Dryopteris cristata) has also been recorded from the site in the recent past.

#### 6. ASSESSMENT.

The Horsey to Winterton dunes is a large acidic dune system, and is the only one on the east coast of England that is still in good condition. Ross Links in Northumberland is the only other site demonstrating similar acid heath. However there the vegetation has all but been destroyed by cattle.

Interestingly, its the H1d heath community that is present at this site. This community is confined to the more continental lowlands of eastern England. However regional climate has an important influence on the general composition of the community. This kind of heath is characteristic of those parts of Britain with low rainfall and a wide range of annual temperatures. It is this continental climate that severely restricts the distribution in eastern England of a variety of oceanic

west European species which are of major importance in heaths in parts of Britain with an equable climate. Under such conditions this community is replaced by the H11 Heather (Calluna vulgaris)-Sand Sedge (Carex arenaria) heath.

This site is notable for the number of rare plant species, including an abundance of the Grey Hair Grass (Corynephorus canescens). This site also boasts a variety of wetland habitats in the form of damp slacks and shallow freshwater pools, within which a breeding population of nationally rare Natterjack Toads is maintained.

#### 7. COMMENTS AND SUGGESTIONS.

In recent years there has been an effort to prevent the further invasion, and indeed reduce the area of Rhododendron (Rhododendron ponticum) and other scrub present at Winterton Dunes NNR. Further reduction in the amount of Rhododendron at the site would be beneficial, particularly in areas where the ground flora persists.

It is important to maintain the integrity of the site by resisting proposed developments within its boundaries.

## Annex 1

### Methods

#### Field techniques - vegetation recording

The vegetation was first divided by the surveyor into apparently homogeneous stands. Within each stand type typical sample areas were chosen and the vegetation recorded from inside a 2m x 2m quadrat.

The NVC manual recommends that a minimum of 5 quadrats should be recorded from each stand type. The time constraints of a wide ranging national survey did not allow this recommendation to be followed, but care was taken to ensure that at least one full quadrat was taken from each stand type.

Within the quadrats all vascular plants, bryophytes and lichens were identified and recorded using the domin cover/abundance scale. This information was recorded on a standard field recording form along with information on aspect, soil pH, slope, bare ground, litter layer, vegetation height and grazing.

The information on grazing was collected using the scales devised by Dr. L. Boorman for his survey of grazing management on sand dunes. A brief written description was also made of the quadrats and any other relevant features noted.

Extensive use was made of target notes, these were used for two distinct purposes:

- i. to note particular features or to comment on land use;
- ii. to supplement quadrat records, particularly in areas subject to local disturbance or modification, in the more localised or restricted plant communities and in vegetation mosaics and transitions which are difficult to describe purely by means of quadrats.

The target notes consist of a written description of the feature or vegetation types with or without a list of species found in the area. In a few cases approximate domin scores were given to the species recorded.

#### Field techniques - vegetation mapping

The site was mapped in the field using transparent overlays onto aerial photographs. The photographs used were flown by B.K.S Surveys Ltd for Norfolk County Council on the 7 September 1988. They were vertical, colour and at a scale of 1:10,000. The position of all quadrats and the boundaries of the apparently homogeneous



stands of vegetation recognised in the field were mapped onto the overlays together with major physical features.

#### Vegetation analysis

Quadrat data was entered onto computer using the VESPAN suite of programs devised by Andrew Malloch of Lancaster University. A TWINSPAN analysis was performed on this data as an aid to the classification of the quadrats. The end groups resulting from this analysis were displayed using the "Table" programme and then compared with the keys, tables and written descriptions provided in the various chapters of the National Vegetation Classification (NVC). In most cases these end groups did correspond to an NVC group. Occasionally the twinspan analysis split to a different level and some re-interpretation of the end groups was necessary to achieve a satisfactory classification. In a few cases non-NVC terms had to be used to describe the vegetation. With the benefit of this analysis the target notes were then examined and, where appropriate, these were also allocated to NVC types.

#### Final map preparation

The information on the aerial photograph overlays drawn in the field was first transferred onto an enlarged 1:10,000 Ordnance Survey base map using the Grant Enlarger at the Department of Geography of Cambridge University. A final map was then prepared using the results of the vegetation analysis to determine the mapping units.

#### General information

Additional information on the site was obtained from the files of the East Anglia Region of the Nature Conservancy Council. At the conclusion of the survey a standard recording form was completed for the site giving details of the type of dune system, its ownership, land use, management, use by the public and dynamic state. The completed form is reproduced in Annex 2.

## ANNEX 2.

This consists of a computer generated form summarising some general information on the site. The following explanatory notes are intended to help interpret this information.

1. In the sections where grazing is recorded, the form provides a series of options. The grazing level can be either light, moderate or heavy for example. If an option is selected then a 'Y' is entered, otherwise it is left blank. A similar system is used to record erosion damage and vehicle damage, except here if an option is recorded it can be either localised 'L' or widespread 'W'. 'Y' is also used to signify the presence of stock feeding and of scrub control.

2. In most other fields, such as sea defences, entries are selected from a series of standardised alternatives. If no text follows these headings it means that none of the alternatives has been selected.

3. In a few cases, such as the sections on forestry golf courses and fires, the recorder is asked to estimate the area involved. If the particular feature does not occur, then a zero will have been entered. A blank means that this information was not recorded.

4. A distinction is drawn between marine erosion, which is used to describe the removal of dune by the sea, and erosion damage, which is used to describe wear on the dunes due to human or animal usage.

Any other queries concerning data contained in this section may be referred to the authors.

Code 59 Country *England* Region *East Anglia*  
 Site name Winterton and Horsey Dunes Area ha  
 Grid reference 10 km square TG41  
 TG 461246 TG51  
 TG 506173 TG42

Administrative unit NORELK Norfolk  
 Source Date of record  
 FIELD SURVEY 26/06/89

Status NN NNR  
 SS SSSI

Marine erosion? 28 % Accretion? 14 % Blow-outs? 3 ha

Dune type Watercourses  
 Prograding Dunes, Ness

Sea defences Mineral extraction  
 Sea Wall  
 Groynes

Dumping  
 Fly Tipping  
 Garden Waste

Grazing by stock

Animal species	Level of grazing			Season				Area grazed ha.
	light	mod	heavy	win	spr	sum	aut	
Cattle	Y	Y			Y	Y		
Sheep	Y				Y	Y		

Non stock grazing

Animal species	Level of grazing			Season				Area grazed ha.
	light	mod	heavy	win	spr	sum	aut	
Rabbits	Y	Y		Y	Y	Y	Y	

Stock feeding

Agricultural improvement  
 nature of improvement area involved

Evidence of fires 0.5 ha

Erosion Damage (L/H)	Vehicle Damage (L/H)
Negligible W	Negligible L
Light W	Light
Moderate L	Moderate
Severe L	Severe L

Development Golf course  
 Car park Total area 0 Ha  
 Beach huts  
 Military installation Approx % of area within course

Transport installatio Un modified  
Houses Modified  
"Improved"

Forestry

Conifer area 0 Ha Scrub control (Y/N) Y

Broadleaf area 0 Ha

Stabilisation works

Fencing

Marram planting

Adjacent land use

Agriculture-Arable

Agriculture-Livestock

Development-Urban

Leisure development

Adjacent semi-natural vegetation

UNIMPROVED PASTURE

DECIDUOUS WOODLAND

MARSH

Aerial Photographs used for mapping

Flown by BKS SURVEYS LTD

Date flown 1988

Sortie No

Scale 1:10,000

Print Nos 4307,4599,

### ANNEX 3. VEGETATION TYPES.

This section contains a brief description of each of the National Vegetation Classification (NVC) types found here with, where appropriate, notes on how they vary from the typical. The descriptions are based partly on the relevant chapters of the NVC and partly on the data collected. Each type is identified by a standard code, the first part of which specifies the NVC volume. The following volumes were used to describe the vegetation of this site:

SD	Shingle, strandline and sand dune communities
MG	Mesotrophic grassland
U	Calcifugous grassland
W	Woodlands
S	Swamp and tall herb fens
H	Heaths
M	Mires

#### SD2      Honkenya peploides Cakile maritima community

This community is the characteristic pioneer vegetation of sand and fine shingle strandlines on the less exposed beach tops around the British coast. Honkenya peploides may persist through the winter and tolerate occasional salt water inundation. In the summer it is joined by Cakile maritima and other nitrophilous annuals which exploit the organic detritus deposited by the sea during the winter and spring. The extent and distribution of this community can vary greatly from year to year as it exists in a state of perpetual instability.

#### SD4      Elymus farctus ssp. borealis-atlanticus foredune community

This is the most widespread form of pioneer dune vegetation in Britain. It occurs on, and binds together, wind blown sand on foreshores in the zone that is still vulnerable to salt water inundation. The community is particularly associated with the advancing fronts of accreting dune systems but also occurs in areas subject to cyclical erosion and accretion. It is normally a very open type of vegetation and quite species poor. Elymus farctus, a sand binding grass that is relatively salt tolerant, is often the only species that is abundant. The community will also normally contain some strandline species, and may include small quantities of other dune building grasses, perhaps marking areas that are transitional between this community and the other foredune types.

#### SD6a      Ammophila arenaria mobile dune community, Elymus farctus sub-community

This is normally a very open type of foredune community in which small amounts of Elymus farctus are a constant feature. Other salt tolerant plants of the strandline and pioneer dune zone such as Honkenya peploides also occur in this sub-

community alongside species typical of the community as a whole. This type of vegetation often occurs at the seaward edge of the Ammophila dominated dunes and immediately behind dunes dominated by Elymus farctus (SD4). It is associated with considerable sand mobility.

SD6b      Ammophila arenaria mobile dune community,  
            Elymus farctus Leymus arenarius sub-community

Both Elymus farctus and Leymus arenarius grow with Ammophila in this sub-community. The relative quantities of the two subsidiary species is very variable and either or both may be sub-dominant. The other species associated with this sub-community are mainly salt tolerant plants of the strandline and pioneer zone. This type of vegetation is found mainly along the seaward margins of the Ammophila dominated foredunes. In areas where Leymus is not a major component of the dune vegetation this sub-community can be found in small patches in disturbed and possibly enriched areas such as the edges of major footpaths through the foredunes. It is associated with considerable sand mobility.

SD6d      Ammophila arenaria mobile dune community,  
            "typical" sub-community

This sub-community, though described as typical, is far from being the most extensive type of Ammophila foredune. It occurs in areas where the rate of sand deposition is so rapid that few plants other than Ammophila can survive. Such extreme conditions may occur on very actively accreting foredunes or at the down wind end of large blowouts.

SD6e      Ammophila arenaria mobile dune community,  
            Festuca rubra sub-community

This type of vegetation is found where there is still considerable movement and deposition of sand but where the rates are slow enough to permit a wider range of plants to survive. It is still a very open community but Festuca rubra is consistently present beneath the marram. There are very few strandline species in this sub-community but the number of associated species is greater than in the more mobile areas of dune. They include some highly distinctive species, especially in the southern part of Britain, where this is the main foredune community. A few bryophytes may occur in this type of vegetation.

SD6.g      Ammophila arenaria mobile dune community,  
            Carex arenaria sub-community

Carex arenaria and Ammophila are often the only species to occur in any quantity in this sub-community. It is particularly associated with areas of secondary instability

such as blowouts, especially near the margins of slacks and pools where the ground is a little moister.

SD7        Ammophila arenaria Festuca rubra semi-fixed dune community

This community is the major vegetation type of less mobile coastal sands where Ammophila is still usually the dominant, but where conditions are such as to allow the development of a fairly rich and often abundant associated flora over the stabilised dune surface. Due to the lack of preferential species present, this community could not be allocated to one of its five sub-communities.

SD7a       Ammophila arenaria Festuca rubra semi-fixed dune community, "typical" sub community.

This community is the major vegetation type of less mobile coastal sands where accretion has slowed but where there has been little modification of the soil. Ammophila is normally still prominent in the vegetation but is less vigorous than in the more mobile foredunes. The smaller grasses, especially Festuca rubra, are more abundant, there is a characteristic assemblage of dicotyledonous plants and bryophytes are a consistent feature. The "typical" sub community is less species rich than the others, but is not necessarily the commonest. It is found where the succession from mobile foredune to stable dune grassland is still at an early stage. The type lacks species such as Ononis repens which have a southern distribution.

SD7e       Ammophila arenaria Festuca rubra semi fixed dune community, Elymus pycnanthus sub-community.

This community is the major vegetation type of less mobile coastal sands where accretion has slowed but where there has been little modification of the soil. Ammophila is normally still prominent in the vegetation but is less vigorous than in the more mobile foredunes. The smaller grasses, especially Festuca rubra, are more abundant, there is a characteristic assemblage of dicotyledonous plants and bryophytes are a consistent feature. This sub-community is marked by the occurrence within semi-stable dune vegetation of the grass Elymus pycnanthus. This grass is normally associated with upper saltmarshes and with sea walls. However, along parts of the east and south coasts of Britain it also occurs in dunes. Apart from the Elymus itself there is little to distinguish this sub-community, which is often rather species-poor.

SD9a       Ammophila arenaria Arrhenatherum elatius dune grassland, typical sub community.

Dune grassland plants make a major contribution to this type, but the sward is generally rather rank and tussocky with

Arrhenatherum elatius present in some quantity, along with other species of coarse grassland. The community tends to occur on stabilised dunes that are undergrazed and where there has been some soil enrichment.

SD10 Carex arenaria dune community.

Carex arenaria is the dominant species in this type of vegetation forming closed stands, usually in areas that are revegetating after secondary disturbance. This vegetation does not possess Festuca rubra or Festuca ovina the species that define the sub-communities.

SD10b Carex arenaria dune community, Festuca ovina sub community.

Carex arenaria is usually the most abundant species in this type of vegetation forming either open or closed stands, usually in areas that are revegetating after secondary disturbance. In this sub community Carex arenaria is associated with Festuca ovina, and fore dune species are absent. Although this community is associated with areas of open sand, it can tolerate only limited accretion.

SD10/11 Carex arenaria/Carex arenaria Cornicularia aculeata transition.

This is a transition between the two NVC communities. It is not a good fit to SD10 as stands possess a moderate lichen and moss component, atypical for this community. Similarly, it is not a SD11, in that it is not lichen-rich and sand sedge is not the only constant vascular plant, Ammophila being a frequent component of this vegetation type

SD11 Carex arenaria Cornicularia aculeata community.

Carex arenaria is the only constant vascular plant in this community and even this is never a vigorous dominant. The most notable feature is the abundance of lichens. These often form a continuous grey carpet over the ground. There may also be substantial amounts of mosses present, though they are seldom as abundant as the lichens. The community is characteristic of very nutrient poor sands and areas that are subject to severe drought.

SD11a Carex arenaria Cornicularia aculeata community, Ammophila arenaria sub community.

Carex arenaria and Ammophila arenaria are the only constant vascular plant in this sub-community and even these are never vigorous dominants. However, the most notable feature is the abundance of lichens. These often form a continuous grey carpet over the ground. There may also be substantial amounts of



mosses present, though they are seldom as abundant as the lichens. The community is characteristic of very nutrient poor sands and areas that are subject to severe drought.

SD11b Carex arenaria Cornicularia aculeata community,  
Festuca ovina sub community.

Carex arenaria is the only constant vascular plant in this community and even this is never a vigorous dominant. The Fescue associated with this sub community is almost always Festuca ovina, and Ammophila is absent. The most notable feature of the community is the abundance of lichens. These often form a continuous grey carpet over the ground. There may also be substantial amounts of mosses present, though they are seldom as abundant as the lichens. The community is characteristic of very nutrient poor sands and areas that are subject to severe drought.

SD12 Carex arenaria Festuca ovina Agrostis capillaris  
grassland.

Dune grassland of this type is most common in the north and west of Britain, where leaching is faster and droughts generally less severe. The community typically forms a closed sward which is often kept short by grazing. Galium saxatile is perhaps the most distinctive of a group of dicotyledonous plants which mark this community from the more calcicolous types.

12a Carex arenaria Festuca ovina Agrostis capillaris  
grassland, Anthoxanthum odoratum sub community.

Dune grassland of this type is most common in the north and west of Britain, where leaching is faster and droughts generally less severe. The community typically forms a closed sward which is often kept short by grazing. Ammophila is often found, but seldom at high density. Galium saxatile is perhaps the most distinctive of a group of dicotyledonous plants which mark this community from the more calcicolous types. In this sub community Anthoxanthum odoratum and Luzula campestris are constants.

SD18 Hippophae rhamnoides scrub.

During the early stages of this community, when the Hippophae canopy is still open, a recognisable dune or dune grassland vegetation still persists between the bushes, though this is often already rather rank and species poor. This community also represents well developed Hippophae scrub where there is a dense, continuous canopy. The presence of this canopy shades out the dune and dune grassland species whilst the enrichment of the soil by the Hippophae allows the growth of nitrophilous species. In older stands there may be a significant cover of Sambucus nigra in the canopy.

MG1. Arrhenatherum elatius coarse grassland,

This vegetation is generally grass dominated with abundant Arrhenatherum elatius and Dactylis glomerata.

MG1.2 Arrhenatherum elatius coarse grassland, Urtica dioica sub community.

In this subcommunity Urtica and other large weedy species are abundant and conspicuous. They may at times account for up to 90% of the total cover.

MG10 Holcus lanatus Juncus effusus rush pasture.

This community is characterised by prominent tussocks of Juncus effusus in a generally species poor and shorter grassy sward. Holcus lanatus and Agrostis stolonifera are the only constant grasses and each, or both, may be abundant. It is to be found on permanently moist sites over a wide range of oligotrophic and mesotrophic mineral soils of varying pH.

U2a Deschampsia flexuosa grassland, Festuca ovina Agrostis capillaris sub-community.

Deschampsia flexuosa is the obvious dominant in this grassland community. It is found in association with Festuca ovina, Agrostis capillaris, Galium saxatile and Potentilla erecta. It is characteristic of base poor soils, free-draining soils. Grazing is often important in maintaining the community and stands have probably been derived secondarily from heaths and even mires.

U20 Pteridium aquilinum Galium saxatile community.

In this community Pteridium is the sole dominant in the very familiar acidophilous bracken vegetation, in which it is overwhelmingly abundant.

W1 Salix cinerea Galium palustre woodland

This community is found at this site as patches of scrub in which Salix cinerea is the dominant species. However this is occasionally joined by Betula pubescens. The species commonly recorded in the field layer include Galium palustre, Mentha aquatica and Juncus effusus. It is essentially a community of wet mineral soils on the margins of open waters and in moist hollows, mainly in the lowlands. It occurs often as a narrow fringe or scattered fragments around ponds, dune slacks and ditches.

W2            Salix cinerea Betula pubescens Phragmites australis  
woodland.

This vegetation is usually initiated by the invasion of Salix cinerea, it is then taken over by Betula pubescens. This community is usually found on organic fen peats. However at this site, although on a mineral substrate, stands dominated by the three species that characterise this community were to be found. It was present as small patches, forming a mosaic in damp hollows and around ponds.

W23            Ulex europaeus Rubus fruticosus agg. scrub.

This scrub community has a fairly low woody cover, usually between 1 and 2m high, in which Ulex europaeus is the dominant plant. Usually, the only other members of the scrubby cover are Rubi: Rubus fruticosus agg., though its cover is generally low. This community is characteristic of moderately to strongly acid brown soils, free-draining though not always dry and not markedly oligotrophic.

W24            Rubus fruticosus agg Holcus lanatus underscrub.

This community consists of a mixture of brambles, rank grasses and tall dicotyledons. It was not possible to assign these stands to a sub-community.

W24a            Rubus fruticosus agg Holcus lanatus underscrub,  
Cirsium arvense-Cirsium vulgare sub-community.

This community consists of a mixture of brambles, rank grasses and tall dicotyledons. However taller, weedy species are more frequent, particularly Urtica dioica, Cirsium arvense, Cirsium vulgare and Epilobium angustifolium. A very typical community of abandoned and neglected ground in the British lowlands.

W25            Pteridium aquilinum Rubus fruticosus agg. underscrub.

This community brings together vegetation dominated by mixtures of bracken and bramble. Pteridium is generally the more abundant, excluding all other species except the Rubi..

Sn scrub    Sambucus nigra scrub.

The ground flora of these Elder dominated stands is very similar to that of established Hippophae scrub. In the dune situation the two types of scrub also often occur together scrub dominated by Elder is not a community recognised by the NVC.

Rhododendron ponticum scrub.

This vegetation comprises of very dense, single species stands of Rhododendron ponticum, up to 3m tall. This community is not recognised by the NVC.

S4.a        Phragmites australis swamp, Phragmites australis sub-community.

This sub-community includes pure and very species poor swamps and reed beds in which Phragmites australis is the sole constant.

S6        Carex riparia swamp.

This community is generally dominated by Carex riparia. The vegetation is typically rather species poor and pure stands are not uncommon. It seems to be most characteristic of wet or waterlogged, mesotrophic to eutrophic, circumneutral mineral soils.

S8        Scirpus lacustris ssp. lacustris swamp.

This community typically has a somewhat open cover. It can occur as pure stands or mixed stands with Phragmites australis and/or Sparganium erectum. It is generally to be found in deeper waters in larger pools and lakes.

S12        Typha latifolia swamp.

Typha latifolia is always dominant in this community forming an open or closed cover. No other species is frequent and pure stands are common. It is characteristic of standing or slow moving waters, mesotrophic to eutrophic.

S20        Scirpus lacustris ssp. tabernaemontani swamp.

Scirpus lacustris ssp. tabernaemontani always dominates this vegetation. The community occurs most frequently in moist, brackish sites with soft, anaerobic raw gleys of silt or clay.

S21        Scirpus maritimus swamp.

Scirpus maritimus always dominates this vegetation. The community is characteristic of ill-drained brackish sites on coastal salt marshes, occurring as small patches in pans and pools.

S25        Phragmites australis Eupatorium cannabinum tall herb fen.

The most consistent feature of the rather variable vegetation included in this community is the prominence of tall herbaceous dicotyledons among which Eupatorium cannabinum, Angelica sylvestris, Lythrum salicaria, Cirsium palustre, Fillipendula ulmaria and Epilobium hirsutum are the most frequent throughout. This community is most characteristic of moderately eutrophic situations where mineral or organic soils are irrigated and frequently waterlogged by usually calcareous and base rich waters.

S26.b      Phragmites australis Urtica dioica tall-herb fen  
Arrhenatherum elatius sub community.

Arrhenatherum forms an understorey beneath the Reed in this species poor type of fen vegetation. Galium aparine and other weedy species are also characteristic. This community can occur in undisturbed locations but is especially characteristic of the eutrophic conditions produced by the drying and disturbance of fen surfaces.

H1d      Calluna vulgaris Festuca ovina heath, Carex arenaria  
sub-community.

This community is heather dominated, very poor in vascular associates, though sometimes showing a modest diversity among the bryophytes and, more especially, the lichens. In this sub-community, the heather is often tall and somewhat open with scattered plants or dense, intervening patches of Carex arenaria, which is sometimes so abundant as to be co-dominant. This heath vegetation is confined to base poor and oligotrophic sandy soils in the more continental lowlands of eastern England.

M16e      Erica tetralix Sphagnum compactum wet heath,  
sub-community lacking Sphagna.

This community is characteristically dominated by mixtures of Erica tetralix, Calluna vulgaris and Molinia caerulea, but the proportions of these are very variable, being influenced by differences in the water regime and trophic status of the soil. The Ericetum tetralicis is a community of acid and oligotrophic mineral soils or shallow peats that are at least seasonally waterlogged. It is largely confined to the relatively dry lowlands of Britain.

M16e/H1d      Erica tetralix Sphagnum compactum wet heath,  
sub-community lacking Sphagna and Calluna vulgaris Festuca ovina heath, Carex arenaria  
sub-community transition.

A transition between the two communities in which all the constants for both communities are present. This transition probably reflects variations in the water table.

M23a        Juncus effusus Juncus acutiflorus Galium palustre  
rush-pasture,

This vegetation is characterised by the abundance of Juncus acutiflorus and Juncus effusus, with a range of mesophytic herbs of moister agricultural grasslands. It is most common in the west of Britain on moderately acid to neutral soils particularly on ill-drained and relatively unimproved or reverted pasture.

M23b        Juncus effusus Juncus acutiflorus Galium palustre  
rush-pasture, Juncus effusus sub-community.

This vegetation is characterised by the abundance of Juncus effusus with a range of mesophytic herbs of moister agricultural grasslands. Juncus acutiflorus is uncommon or absent in this sub-community. It is most frequently found in the west of Britain on moderately acid to neutral soils particularly on ill-drained and relatively unimproved or reverted pasture.

Table 1. Dunes, Horsey to Winterton.

Quadrat number	1	23	7	9	11	28	30		
NVC community	SD6g	SD7a							
1 Grid reference 100km square	TG	TG	TG	TG	TG	TG	TG		
2 Grid reference easting	458	489	463	465	472	497	501		
3 Grid reference northing	245	213	245	242	235	200	194		
5 Slope (degrees)	0	3	45	0	15	0	50		
6 Aspect (degrees)		330	50		230		270		
10 Shrub height (metres)									
11 Herb height (centimetres)	70	50	18	15	46	15	10		
17 Ph (2 numerals)	3.5		7.1	6.4	6.5	7.2	7.2		
22 Bare soil/litter (incl.sand)	0	5	10	5	0	0	2		
2780 <i>Ammocalamagrostis baltica</i>	7	V				5		I	
159 <i>Ammophila arenaria</i>	-	-	8	5	6	6	6	V	
576 <i>Festuca rubra</i>	-	-	6	8	8	8	10	10	V
706 <i>Hypochoeris radicata</i>	-	-	1	4	3	1	3	3	V
304 <i>Carex arenaria</i>	4	V		1		4	2	3	IV
680 <i>Holcus lanatus</i>	2	V	2			4			II
2880 <i>Mnium</i> sp									
2835 <i>Dryopteris carthusiana</i>	4	V							-
1586 <i>Ceratodon purpureus</i>	-	-	2	4	6			3	IV
125 <i>Aira praecox</i>	-	-	1	3	3				III
613 <i>Galium verum</i>	-	-	3						I
965 <i>Hieracium pilosella</i> group	-	-	1						I
1015 <i>Polypodium vulgare</i>	-	-	1						I
1239 <i>Senecio jacobaea</i>	-	-	1						I
1422 <i>Viola canina</i>	-	-	2						I
2359 <i>Cladonia fimbriata</i>	-	-		2					I
3075 <i>Corynephorus canescens</i>	-	-		1			3	2	III
381 <i>Cerastium diffusum diffusum</i>	-	-		2	3				II
385 <i>Cerastium semidecandrum</i>	-	-		3					I
415 <i>Cirsium arvense</i>	-	-				1			I
3046 <i>Brachythecium</i> sp	-	-					2		I
513 <i>Leymus arenarius</i>	-	-					1		I
283 <i>Calystegia soldanella</i>	-	-					3		I
675 <i>Hieracium 'indeterminate'</i>	-	-					1		I
682 <i>Honkenya peploides</i>	-	-					3		I
718 <i>Jasione montana</i>	-	-					2		I





Table 3. Heaths &amp; mires, Horsey to Winterton.

Quadrat number	22 25		15 17 19			18	4	
NVC Community	H1d		H1d/M16			M16e	M23	
1	Grid reference 100km square	TG TG	TG TG TG	TG	TG			
2	Grid reference easting	488 486	485 484 488	486	462			
3	Grid reference northing	212 208	218 246 213	215	244			
5	Slope (degrees)	0 0	0 0 0	0	0			
6	Aspect (degrees)							
10	Shrub height (metres)							
11	Herb height (centimetres)	15 10	25 26 20	25	20			
17	Ph (2 numerals)	3.8 3.8		4.1	4.5			
22	Bare soil/litter (incl.sand)	1 1	0 0	0	0			
278	<i>Calluna vulgaris</i>	9 10	V 2 3 8	V	-	-	-	-
1766	<i>Hypnum cupressiforme</i>		2	II	-	-	-	-
574	<i>Festuca ovina</i>	2 2	V	-	-	-	-	-
1638	<i>Dicranum scoparium</i>	3	III 2 2	IV	-	-	-	-
304	<i>Carex arenaria</i>	2 3	V 3 9 3	V	1	V	2	V
542	<i>Erica tetralix</i>		10 * 6	IV	10	V		-
1179	<i>Salix repens</i> agg.			-	3	V		-
719	<i>Juncus acutiflorus</i>		1	II	2	V	6	V
576	<i>Festuca rubra</i>		4	II		-	3	V
730	<i>Juncus effusus</i>			-		-	2	V
680	<i>Holcus lanatus</i>			-		-	7	V
802	<i>Lotus uliginosus</i>			-		-	3	V
120	<i>Agrostis canina</i>		1 2 2	V	3	V		-
729	<i>Juncus conglomeratus</i>			-	1	V	3	V
1136	<i>Rubus fruticosus</i> agg.		2	II		-	1	V
1576	<i>Campylopus introflexus</i>	1 4	V	-		-		-
2340	<i>Cladonia arbuscula</i>	4 1	V	-		-		-
2416	<i>Hypogymnia physodes</i>		3 2	IV		-		-
122	<i>Agrostis stolonifera</i>			-		-	5	V
171	<i>Anthoxanthum odoratum</i>			-		-	4	V
384	<i>Cerastium fontanum triviale</i>			-		-	1	V
418	<i>Cirsium palustre</i>			-		-	4	V
499	<i>Dryopteris dilatata</i>		3	II		-		-
690	<i>Hydrocotyle vulgaris</i>			-		-	3	V
931	<i>Osmunda regalis</i>			-	1	V		-
961	<i>Phragmites australis</i>			-	3	V		-
988	<i>Poa pratensis</i>			-		-	1	V
1043	<i>Potentilla anserina</i>			-		-	2	V
1046	<i>Potentilla erecta</i>			-	1	V		-
1140	<i>Rumex acetosella</i>		1	II		-		-
1411	<i>Vicia cracca</i>			-		-	3	V
2244	<i>Ptilidium ciliare</i>	3	III	-		-		-
2347	<i>Cladonia coccifera</i>	3	III	-		-		-
2388	<i>Cladonia subulata</i>		3	II		-		-
2802	<i>Betula seedling/sp</i>			-	1	V		-
3292	<i>Lophocolea sp</i>	1	III	-		-		-
681	<i>Holcus mollis</i>		*	-		-		-
736	<i>Juncus squarrosus</i>			-	*	-		-
807	<i>Luzula campestris</i>			-		-	*	-
2604	<i>Betula pubescens (s)</i>		*	-		-		-

Table 4. Woodlands, Horsey to Winterton.

Quadrat number	33		16	
NVC Community	W25		B. pubescens/R. ponticum	
1 Grid reference 100km square	TG		TG	
2 Grid reference easting	500		484	
3 Grid reference northing	185		215	
5 Slope (degrees)	15		0	
6 Aspect (degrees)	80			
10 Shrub height (metres)				
11 Herb height (centimetres)	95		30	
17 Ph (2 numerals no point)				
22 Bare soil/litter (incl. sand)	0		0	
1066 <i>Pteridium aquilinum</i>	10	V	-	
1136 <i>Rubus fruticosus</i> agg.	*			
236 <i>Betula pubescens</i> (c)		-	8	V
2743 <i>Rhododendron ponticum</i> (c)		-	5	V
499 <i>Dryopteris dilatata</i>	1	V	4	V
171 <i>Anthoxanthum odoratum</i>		-	3	V
333 <i>Carex nigra</i>		-	5	V
574 <i>Festuca ovina</i>		-	3	V
1482 <i>Aulacomnium palustre</i>		-	6	V
1766 <i>Hypnum cupressiforme</i>		-	6	V
1894 <i>Polytrichum juniperinum</i>		-	4	V

ANNEX 4      BIBLIOGRAPHY.

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Map.no comments..... Winterton to Horsey Dunes..... sppfull..... domin Keywords.....

1 Area of rather dense sward of medium height with dense litter.  
Holcus mollis dominant.

Amnophila arenaria H.MOL  
Carex arenaria  
Holcus mollis  
Rubus fruticosus agg.  
Dryopteris spinulosa now D.car

2 A mosaic of damp grassland types.

Juncus effusus MG1/M23B  
Arrhenatherum elatius MOSAIC  
Lychnis flos-cuculi  
Lotus uliginosus  
Rubus fruticosus agg.  
Equisetum palustre  
Poa pratensis  
Galium palustre  
Agrostis stolonifera  
Hydrocotyle vulgaris  
Holcus lanatus  
Stellaria palustris  
Corydalis claviculata  
Dryopteris sp  
Epilobium angustifolium

3 Concrete sea wall.

OTHER

4 Clumps of Sallow in a grassy sward, containing two damp hollows.

Salix cinerea (s) M23/S12  
Phragmites communis now P.aust A INTERMEDIATE  
Holcus lanatus A  
Juncus acutiflorus O  
Juncus conglomeratus LA  
Hydrocotyle vulgaris A  
Ranunculus repens R  
Lotus uliginosus A  
Anthoxanthum odoratum O  
Stellaria graminea O  
Carex nigra O  
Cirsium palustre R  
Dactylorhiza praetermissa now R  
Rubus fruticosus agg. LA  
Typha latifolia  
Galium palustre  
Eleocharis palustris  
Alisma plantago-aquatica  
Callitriche seedling/sp  
Calliargon cordifolium

5 Small area of bare sand, the result of small scale sand extraction.

OTHER  
EXTRACTION

6 Small clump of young pines with Rubus fruticosus ag. underscrub.

OTHER

7 AWA depot.

OTHER

8 Low scrub (probably planted) and associated underscrub.

Acer pseudoplatanus (s) W24  
Alnus glutinosa (s)  
Salix seedling/sp  
Rubus fruticosus agg.  
Lonicera periclymenum (g)  
Holcus lanatus  
Dryopteris dilatata  
Salix alba

9 Area of scrub with underscrub adjoining a damp area.

Salix cinerea (s) D W1

Winterton to Horsay Dunes.....

sppfull..... domain Keywords.....

Betula pubescens (s) 0 W24  
 Lonicera periclymenum (g) M24  
 Rubus fruticosus agg.  
 Holcus lanatus

10 Car park slack vegetation with areas of bare sand, dumped gravel,  
 a damp hollow and a derelict tin shack.

Juncus acutiflorus OTHER

Ranunculus acris  
 Potentilla anserina  
 Ranunculus repens  
 Holcus lanatus  
 Dactylorhiza praetermissa now  
 Cirsium palustre  
 Centaurium erythraea  
 Ophioglossum vulgatum  
 Juncus conglomeratus  
 Lotus uliginosus  
 Anthoxanthum odoratum  
 Juncus effusus  
 Sagina procumbens  
 Hypochoeris radicata  
 Carex arenaria  
 Drepanocladus aduncus  
 Agrostis stolonifera  
 Prunella vulgaris  
 Senecio jacobaea  
 Poa annua  
 Juncus bufonius  
 Plantago major  
 Bellis perennis  
 Juncus articulatus  
 Plantago coronopus  
 Lolium perenne  
 Rumex acetosella  
 Luzula campestris/multiflora  
 Galium palustre  
 Potentilla erecta  
 Lychnis flos-cuculi  
 Calluna vulgaris  
 Cerastium holosteoides now C.f  
 Salix cinerea (s)  
 Dryopteris dilatata  
 Betula seedling/sp  
 Phragmites communis now P.aust

11 Abandoned car park, has wetland, ruderal and dune elements growing  
 on a matrix of bare sand and hardcore.

Holcus lanatus OTHER

Juncus bufonius  
 Juncus effusus  
 Juncus conglomeratus  
 Cirsium palustre  
 Senecio sylvaticus  
 Stellaria media  
 Juncus articulatus  
 Sagina procumbens  
 Poa annua  
 Isoetes setacea  
 Funaria hygrometrica  
 Potentilla anserina  
 Reseda luteola  
 Bryum sp  
 Ranunculus repens  
 Rumex acetosella

	Agrostis stolonifera	
	Carex arenaria	
	Lotus uliginosus	
	Urtica dioica	
	Chenopodium sp.	
	Rumex obtusifolius	
	Cerastium glomeratum	
12 Disturbed area of duna	Rubus fruticosus agg.	OTHER
	Ulex europaeus (s)	
	Lychnis flos-cuculi	
	Verbascum thapsus	
	Peplis portula now Lythrum por	
	Typha latifolia	
	Salix cinerea (s)	
	Phragmites communis now P.aust	
13 Area of Q6 vegetation that has been burnt and is now recovering.		SD11A
14 A ditch.	Juncus effusus	M23A
	Juncus acutiflorus	D
	Holcus lanatus	
	Equisetum fluviatile	
	Hydrocotyle vulgaris	
	Cirsium palustre	
	Stellaria palustris	
	Ranunculus repens	
15 Artificial ridge between marsh and reedswamp, area of rush pasture and some large stands of Deschampsia flexuosa.	Carex arenaria	SD10
	Holcus lanatus	M23A
	Rubus fruticosus agg.	Q2A
	Epilobium angustifolium	MOSAIC
	Juncus acutiflorus	
	Lotus uliginosus	
	Hydrocotyle vulgaris	
	Poa pratensis	
	Festuca rubra	
	Carex disticha	
	Deschampsia flexuosa	
16 Mosaic of the above, with Q3 and Q2.		M23A SD10 H.MOLLIS GRASSLAND MOSAIC
17 Artificial bank surrounding pool with open water.	Scirpus lacustris tabernaemont	S20
	Scirpus maritimus	S21
	Typha latifolia	S12
	Alisma plantago-aquatica	OW
	Potamogeton sp	SD6G/MG10
	Ammodramagrostis baltica	
	Holcus lanatus	
	Carex arenaria	
	Rubus fruticosus agg.	
	Juncus effusus	
18 Carex riparia swamp.	Carex riparia	S6
	Equisetum palustre	
	Hydrocotyle vulgaris	
	Urtica dioica	
	Rubus fruticosus agg.	
	Arrhenatherum elatius	

Winterton to Horsey Dunes

sppfull.....

domin Keywords.....

19 Narrow band (2-3m ) of SD6a ,slumping at front in "cliffs".

20 Tall herb fen community.

21 Rather more species fen area.

22 Rush pasture;a mosaic of MG10,Q10,Q4 and Q2a.

23 Recently dug pond with associated spoil heaped to one side.

24 Disturbed area of bare sand and small shingle.

25 Bare sandy earth with small pebbles.

Galium aparine		
Cakile maritima	R	SD6A
Juncus acutiflorus	D	M23A/S25
Carex riparia	F	INTERMEDIATE
Equisetum arvense	F	
Eupatorium cannabinum	F	
Rubus fruticosus agg.	F	
Cirsium arvense	O	
Cirsium palustre	O	
Festuca pratensis	R	
Epilobium hirsutum	O	
Urtica dioica	R	
Galium palustre		
Solanum dulcamara		
Lotus uliginosus		
Hydrocotyle vulgaris		
Carex riparia		M23/S25
Juncus acutiflorus		INTERMEDIATE
Lycopus europaeus		
Hydrocotyle vulgaris		
Ophioglossum vulgatum		
Holcus lanatus		
Valeriana officinalis		
Equisetum arvense		
Scutellaria galericulata		
Juncus conglomeratus		M23A
Carex nigra		MG10
Festuca rubra		Q2A
Anthoxanthum odoratum		MOSAIC
Potentilla erecta		
Hypnum sp		
Dryopteris spinulosa now D.car		
Aulacomnium palustre		
Sphagnum recurvum		
Luzula multiflora		
Deschampsia flexuosa		
Juncus acutiflorus		
Typha latifolia		S12
Potamogeton natans		OW
Callitriche seedling/sp		OTHER
Juncus bufonius		
Sagina procumbens		
Ranunculus seedling/sp		
Rumex acetosella		OTHER
Veronica officinalis		
Holcus lanatus		
Polytrichum juniperinum		
Hypochoeris radicata		
Erodium cicutarium		
Lotus corniculatus		
Viola canina		
Agrostis tenuis now A.capillar		
Luzula campestris/multiflora		
Poa annua		OTHER
Carex arenaria		
Holcus lanatus		

26 An old neglected ditch.	Trifolium repens Stellaria media		
27 Concrete sea wall with bare sand ,associated with a slumped area of SD6d where Marram has been planted.	Juncus effusus Agrostis stolonifera Holcus lanatus Hydrocotyle vulgaris Lotus uliginosus	D	M23     SD6D (ARTIFICIAL)
28 Level area above sea wall where Marram has been planted.			SD6D (ARTIFICIAL)
29 Damp area of Rush pasture.	Juncus gerardi Agrostis stolonifera Phragmites communis now P.aust Hydrocotyle vulgaris Potentilla anserina Carex nigra	LA D A A O A	MG10
30 Pond.	Scirpus lacustris lacustris Phragmites communis now P.aust Rubus fruticosus agg. Salix cinerea (s)		S4 S8 OTHER
31 Damp area poached by cattle.	Agrostis stolonifera Carex nigra Ranunculus sceleratus Hydrocotyle vulgaris Juncus effusus Juncus acutiflorus	D F-0 R R O- O	M23A
32 Grassland heavily poached by cattle,a distinct version of Q12.	Carex arenaria Holcus lanatus Agrostis tenuis now A.capillar Cirsium arvense Capsella bursa-pastoris Hypochoeris radicata Stellaria media Rumex acetosella Urtica dioica Trifolium repens Vicia segetalis now V.sativa n Sisymbrium officinale	FA A A OF O R R O O O O R O	SD12
33 Base of sea wall where blown sand is accumulating.	Honkenya peploides Cakile maritima Salsola kali		SD6A/SD4 INTERMEDIATE
34 Stand of Phragmites australis dominated vegetation growing on sand.	Phragmites communis now P.aust Holcus lanatus Cirsium arvense Senecio sylvaticus Hypochoeris radicata Arrhenatherum elatius Dactylis glomerata Hieracium umbellatum Rubus fruticosus agg. Senecio jacobaea Poa pratensis	D A F OR O OR OLF OR OF OF OF	S26B



Horsey to Winterton Dunes

sppfull..... domin Keywords.....

Heracleum sphondylium OR  
 Potentilla anserina OLF  
 Festuca rubra OF-LA  
 Lonicera periclymenum (g) LF  
 Cirsium palustre R  
 Eupatorium cannabinum R  
 Carex arenaria LF  
 Vicia cracca O  
 Juncus maritimus R  
 Dactylorhiza praetermissa now 36 SP  
 Samolus valerandi R  
 Lotus uliginosus R

35 Area with Phragmites and Juncus maritimus as codominants.

Cirsium palustre OTHER  
 Festuca rubra  
 Potentilla anserina  
 Lotus uliginosus  
 Dactylorhiza praetermissa now  
 Pulicaria dysenterica

36 Clump of Sea buckthorn scrub, at around 3m tall.

Hippophae rhamnoides SD18

37 Small slack.

Holcus lanatus OTHER  
 Lotus uliginosus  
 Festuca rubra  
 Vicia sativa  
 Plantago lanceolata  
 Centaurium erythraea  
 Carex arenaria  
 Cirsium palustre  
 Sagina procumbens  
 Dactylorhiza praetermissa now  
 Ophioglossum vulgatum  
 Ranunculus repens  
 Juncus conglomeratus  
 Plantago major  
 Phragmites communis now P.aust  
 Juncus acutiflorus  
 Hydrocotyle vulgaris

38 Tall rank vegetation with small clumps of scrub.

Amophila arenaria SD7A  
 Festuca rubra SN SCRUB  
 Cirsium arvense  
 Hypochaeris radicata  
 Cerastium holosteoides now C.f  
 Carex arenaria  
 Holcus lanatus  
 Sambucus nigra (s)  
 Rubus fruticosus agg.  
 Urtica dioica  
 Arrhenatherum elatius  
 Dactylis glomerata  
 Annocalamagrostis baltica

39 Strandline of Cakile maritima and Salsola kali.

SD2

40 Damp marshy area.

Juncus conglomeratus M23/MG10  
 Holcus lanatus INTERMEDIATE  
 Potentilla erecta  
 Juncus effusus  
 Hydrocotyle vulgaris

Horse to Winterton Dunes

sppfull..... domin Keywords.....

41 Dense Bracken.

Agrostis stolonifera  
 Rubus fruticosus agg.  
 Ammocalamagrostis baltica

Pteridium aquilinum D 020  
 Holcus mollis R  
 Hydrocotyle vulgaris R

42 Reed bed.

Phragmites communis now P.aust D S4A  
 Holcus mollis  
 Rubus fruticosus agg.  
 Hydrocotyle vulgaris  
 Juncus effusus  
 Pteridium aquilinum O  
 Cirsium palustre

43 Area of concrete slabs (foundations of an old house).

Festuca ovina SD11B  
 Carex arenaria  
 Tortula ruralis ssp ruraliform  
 Funaria hygrometrica  
 Bryum sp  
 Cerastium semidecandrum  
 Cladonia foliacea  
 Cladonia furcata  
 Cladonia fimbriata  
 Tortula muralis  
 Xanthoria parietina

44 Mosaic of wet and dry (like Q14) areas.

Juncus effusus D SD12A/10B  
 Anthoxanthum odoratum D M23  
 Holcus lanatus D MOSAIC  
 Carex nigra  
 Juncus acutiflorus  
 Potentilla erecta  
 Festuca ovina  
 Carex arenaria

45 Betula pendula scrub over a Rush pasture vegetation.

Betula verrucosa (s) now Betul B.PENDOLA SCRUB  
 Holcus lanatus MG10  
 Luzula multiflora  
 Juncus effusus  
 Carex arenaria

46 Strip of coarse, scrubby grassland along the edge of a track.

Ammophila arenaria OTHER  
 Holcus lanatus  
 Agrostis canina  
 Rubus fruticosus agg.  
 Calluna vulgaris  
 Dryopteris dilatata

47 Area in which scrub has been cleared and heath species are regenerating although much bare ground still remains.

Carex arenaria H1D  
 Calluna vulgaris BG  
 Holcus lanatus CLEARED SCRUB  
 Festuca ovina  
 Anthoxanthum odoratum  
 Rumex acetosella

48 Like Q15.

Erica tetralix A M16/H1D  
 Carex arenaria OLA OTHER  
 Calluna vulgaris LF  
 Agrostis canina A  
 Dicranum scoparium F

*Horsey to Winterton Dunes*

sppfull..... domin Keywords.....

Pleurozium schreberi F  
 Hypnum cupressiforme OF  
 Potentilla anserina O  
 Cladonia impexa LO  
 Festuca rubra F  
 Rumex acetosella R  
 Salix repens agg. LF  
 Salix cinerea (s) R  
 Betula verrucosa (g) now Betul O  
 Phragmites communis now P.aust LO  
 Pedicularis sylvatica LF  
 Dactylorhiza praetermissa now R  
 Luzula multiflora O  
 Juncus acutiflorus R  
 Lotus uliginosus LO

49 Vegetation adjacent to kidney shaped pond.

Carex arenaria D SD10/H16E  
 Holcus lanatus INTERMEDIATE  
 Juncus conglomeratus  
 Erica tetralix

50 Very damp area.

Juncus acutiflorus O OTHER  
 Salix repens agg. A  
 Salix cinerea (s) R  
 Phragmites communis now P.aust F  
 Erica tetralix A  
 Hydrocotyle vulgaris O  
 Agrostis canina F

51 Extensive area of open, trampled heath, mostly open grassland but with some dwarf shrub.

Carex arenaria A H1D  
 Festuca ovina OLF  
 Campylopus introflexus A  
 Ptilidium ciliare O  
 Cladonia floerkeana LF  
 Cladonia impexa O  
 Calluna vulgaris F  
 Dicranum scoparium O  
 Hypogynia physodes O  
 Anemophila arenaria R  
 Cladonia squamules/sp A  
 Corynephorus canescens O  
 Rumex acetosella R  
 Polytrichum juniperinum O  
 Poa pratensis LF  
 Cladonia uncialis F  
 Rhododendron ponticum R

52 Similar to above but cover of Calluna much more evident and extensive invasion of Rhododendron.

Calluna vulgaris AD H1D  
 Rhododendron ponticum (c) AD R. PONTICUM SCRUB  
 Dicranum scoparium FA  
 Cladonia furcata O  
 Cladonia impexa OF  
 Campylopus introflexus F  
 Erica tetralix R  
 Carex arenaria LF  
 Polytrichum juniperinum R  
 Cladonia floerkeana R  
 Cladonia coccifera R  
 Cladonia glauca  
 Cornicularia aculeata

Map no comments

Horseay to Winterton Dunes

sppfull..... domin Keywords.....

53 Small areas of open water, surrounded by a mosaic of Rush and Reed dominated vegetation, there is also a small amount of scrub (3m).

Phragmites communis now P.aust FLD S4  
 Juncus conglomeratus LD OW  
 Juncus acutiflorus D M16  
 Salix repens agg. FLA M23  
 Hydrocotyle vulgaris F  
 Erica tetralix LF  
 Juncus effusus O  
 Sphagnum recurvum LO  
 Holcus lanatus LA  
 Agrostis stolonifera LA  
 Lotus uliginosus LF  
 Cirsium palustre LO  
 Polygala serpyllifolia R  
 Galium palustre LO  
 Carex arenaria OR  
 Carex acutiformis LA  
 Salix cinerea (s) O  
 Agrostis canina LF  
 Osmunda regalis R  
 Eleocharis palustris R  
 Betula seedling/sp OR  
 Lycopus europaeus R  
 Juncus articulatus R  
 Radiola linoides R  
 Rhododendron ponticum (c)  
 Dryopteris dilatata

54 Sand cliff at eroding front of dunes.

Cakile maritima SD4  
 Elymus farctus boreali-atlanti  
 Ammophila arenaria

55 Pool divided in half by a raised path, parts of both pools have been recently cleared.

Nymphoides peltata OTHER  
 Juncus acutiflorus  
 Hydrocotyle vulgaris  
 Salix repens agg.  
 Galium palustre  
 Holcus lanatus  
 Juncus articulatus  
 Juncus bufonius  
 Agrostis stolonifera  
 Eleocharis palustris  
 Typha latifolia  
 Phragmites communis now P.aust  
 Ranunculus flammula  
 Salix cinerea (s)  
 Mentha aquatica  
 Juncus effusus  
 Littorella uniflora  
 Alisma plantago-aquatica  
 Drepanocladus revolvens  
 Ailacommium palustre

56 Area of dwarf shrub heath being colonised by scrub.

Calluna vulgaris AD H1D/M16E  
 Erica tetralix AD SCRUB  
 Carex arenaria O  
 Juncus conglomeratus R  
 Dicranum scoparium O  
 Salix cinerea (s) R  
 Betula verrucosa (s) now Betul F  
 Rhododendron ponticum O  
 Quercus seedling/sp O

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sppfull..... domin Keywords.....

57 Pathway in this area mostly bare sand.

Juncus squarrosus OTHER  
 Juncus bufonius  
 Poa annua  
 Agrostis tenuis now A.capillar  
 Juncus articulatus

58 Slack surrounded by relatively steep dunes, containing a mosaic of wet heath and Sallow scrub vegetation.

Erica tetralix D M16X  
 Juncus conglomeratus OLF W2SCRUB  
 Agrostis canina LF  
 Osmunda regalis OF  
 Rhododendron ponticum R  
 Salix cinerea (s) LD  
 Betula pubescens (s) O  
 Alnus glutinosa (s) R  
 Hydrocotyle vulgaris LF  
 Juncus effusus O  
 Carex nigra R  
 Potentilla erecta LO  
 Sphagnum fimbriatum OF  
 Juncus acutiflorus LF  
 Drepanocladus revolvens LF  
 Rubus fruticosus agg. R  
 Calamagrostis canescens OF

59 Small Matherjack pool surrounded by bare sand with clumps of Juncus effusus and J.acutiflorus.

OW

60 Complex area of dry hummocks and two wet hollows. The hollows are dominated by E.tetralix (Q19), the raised areas by Calluna.

Betula seedling/sp H1D/M16  
 Cladonia arbuscula H1D  
 Carex arenaria SD11B  
 Festuca ovina SD10  
 Ammophila arenaria MOSAIC  
 Dryopteris dilatata  
 Rhododendron ponticum  
 Quercus robur (g)

61 Disturbed area of heath around sheep drinking troughs.

Carex arenaria OTHER  
 Holcus lanatus  
 Stellaria media

62 Open Betula pubescens scrub over a mosaic of damp heath and Rush pasture.

Carex arenaria M16/H1D  
 Erica tetralix M23  
 Calluna vulgaris W24  
 Juncus effusus MOSAIC  
 Holcus lanatus  
 Agrostis stolonifera  
 Stellaria graminea  
 Ulex europaeus (s)  
 Rubus fruticosus agg.

63 Area of tussocky Marram sward with elements of scrub/dwarf shrub.

Ammophila arenaria AD SD7/H1  
 Calluna vulgaris OF INTERMEDIATE  
 Betula pubescens (s) OR  
 Dryopteris dilatata O  
 Dicranum scoparium OF  
 Festuca rubra AD  
 Carex arenaria FA  
 Deschampsia flexuosa R

*Horsey to Winterton Dunes*.....

sppfull.....

domin Keywords.....

		Hypnum cupressiforme		
		Cladonia impexa	LF	
		Rubus fruticosus agg.	OR	
64 Concrete sea wall.				OTHER
65 Open foredune.		Amphiphila arenaria		SD6B
		Elymus farctus boreali-atlanti		
		Leymus arenarius		
		Honkenya peploides		
		Salsola kali		
66 Betula scrub (1-3m) with areas of dry heath at the margins, dominated by Molinia tussocks.		Dryopteris spinulosa now D.car		W4
		Galium palustre		
		Carex nigra		
		Juncus conglomeratus		
		Erica tetralix		
		Rubus fruticosus agg.	O	
		Quercus robur (s)	O	
67 Area of mostly bare sand.		Corynephorus canescens	D	OTHER
		Amphiphila arenaria	F	
68 Damp grassland in slack.		Juncus conglomeratus	OF	OTHER
		Erica tetralix	FO	
		Salix repens agg.	OF	
		Molinia caerulea	AD	
		Carex nigra	OF	
		Juncus acutiflorus	O	
		Osmunda regalis	R	
		Eriophorum angustifolium	OR	
		Calamagrostis canescens	R	
		Sphagnum sp	R	
69 Similar to T63.A zone of transition between foredune and dune heath.		Calluna vulgaris	FLD	SD10/H1D
		Amphiphila arenaria	FLD	TRANSITION
		Festuca rubra	LA	
		Carex arenaria	FA	
		Dryopteris dilatata	O	
		Dicranum scoparium	LF	
		Betula pubescens (g)	O	
		Cladonia arbuscula	LF	
		Luzula multiflora	OR	
70 Area of tussocky Marram sward that has been burnt in the past.The vegetation has much bare sand and litter.		Amphiphila arenaria		SD6G
		Carex arenaria		BURNT
71 Large dune slack with tall tussocky Ammocalamagrostis sward, similar to Q1 but of greater diversity.		Ammocalamagrostis baltica	D	OTHER
		Calluna vulgaris	LF	
		Salix repens agg.	O	
		Hypochoeris radicata	F	
		Centaurium erythraea	OR	
		Holcus lanatus	O	
		Agrostis stolonifera	R	
		Amphiphila arenaria		
		Corynephorus canescens		
72 Back of foredune ridge, containing large areas of bare sand (50%).		Carex arenaria	O	SD6A
		Corynephorus canescens	O	SD6E
		Amphiphila arenaria	LD	SD6D

*Horsay to Winterton Dunes*

sppfull..... domin Keywords.....

Viola canina OR MOSAIC  
 Elymus farctus boreali-atlanti LO  
 Hypochaeris radicata OR  
 Festuca rubra LA

Juncus conglomeratus W2  
 Calamagrostis canescens H1D/M16  
 Osmunda regalis  
 Agrostis canina  
 Calluna vulgaris  
 Erica tetralix  
 Carex arenaria

73 Small hollow of Salix and Betula scrub.

74 At head of "gash" of bare sand an area of accreting embryo dune, Marram dominated with some Corynephorus canescens.

SD6D

75 Damp slack in which some scrub clearance has occurred, however clumps of Birch and Sallow (3m) are present.

Calluna vulgaris W4  
 Erica tetralix M16E  
 Juncus acutiflorus M23A  
 Juncus bufonius MOSAIC  
 Holcus lanatus  
 Calamagrostis canescens

76 Wet heath.

Erica tetralix M16E/M23  
 Calluna vulgaris  
 Juncus effusus  
 Carex arenaria  
 Salix repens agg. R  
 Betula seedling/sp  
 Bryum sp

77 Small drumlin-like hummocks amid Q22 (ungrazed dry heath) type vegetation. The hummocks possess a low tussocky sward in which moss and lichen spp. are prominent (Q24).

Festuca ovina FA H1D  
 Cladonia arbuscula F SD11  
 Dicranum scoparium MOSAIC  
 Carex arenaria FLA  
 Rumex acetosella O  
 Campylopus introflexus D  
 Cornicularia aculeata F  
 Cladonia foliacea F  
 Polytrichum juniperinum O  
 Corynephorus canescens O  
 Calluna vulgaris R  
 Molinia caerulea R

78 Slack with scrub and wet heath vegetation.

Erica tetralix FA H1D/M16  
 Calluna vulgaris FA W1  
 Molinia caerulea LF MOSAIC  
 Juncus effusus LO  
 Carex nigra R  
 Polytrichum commune LO  
 Drepanocladus sp LO  
 Carex arenaria R  
 Sphagnum sp O  
 Juncus bulbosus LF  
 Nardus stricta R  
 Agrostis canina R  
 Betula verrucosa (s) now Betul F  
 Salix cinerea (s) O  
 Quercus petraea (s) R  
 Osmunda regalis R

*Horseay to Wintaton Dunes*

Map.no comments..... sppfull..... domin Keywords.....

79 Band of Gorse scrub with some Birch and Oak mixed in. There is a gradation in height, scrub at 3-4 metres being the maximum, whilst the area is bounded by Q22 vegetation.			W23
			H1D MOSAIC
80 Small area of Birch scrub with an understorey of Phragmites, Molinia and J. effusus. The area is bounded by Q22 vegetation.			W4 H1D
81 Mosaic of dry sparsely vegetated hollows, wet hollows and some regenerating scrub.	Corynephorus canescens		W2
	Carex arenaria		M23B
	Juncus effusus		OTHER
	Agrostis stolonifera		MOSAIC
	Bryum caespiticiun		
	Salix cinerea (s)		
	Betula pubescens (s)		
82 Area of open scrub and heath, part of which has been burnt.	Ulex europaeus (s)		W23/W4
	Calluna vulgaris		H1D
	Betula seedling/sp		BURNT
	Carex arenaria		
	Molinia caerulea		
	Rubus fruticosus agg.		
	Festuca ovina		
	Dryopteris dilatata		
83 Area in centre of slack damp grassland of Molinia/J. effusus, surrounded by a zone intermediate between Q22 and Q19.	Molinia caerulea	AD	M23A
	Juncus effusus	A	H1D/M16
	Juncus acutiflorus	O	MOSAIC
	Carex nigra	OR	
	Salix cinerea (s)	R	
	Betula verrucosa (s) now Betul	OR	
	Luzula multiflora	R	
	Polytrichum juniperinum	R	
	Erica tetralix	O	
	Potentilla erecta	O-R	
	Agrostis canina	O	
	Holcus lanatus	R	
	Calluna vulgaris		
84 Bank of coarse rank Marram sward, possibly an area of comparatively active accretion.	Amnophila arenaria	D	SD6G
	Holcus lanatus	OF	
	Corynephorus canescens	LF	
	Carex arenaria	O	
85 Mixed Sallow and Birch scrub. The site of some fly tipping.	Salix cinerea (s)		W2
	Betula verrucosa (s) now Betul		
	Holcus lanatus		
	Galium aparine		
	Stellaria media		
	Rubus fruticosus agg.		
	Lonicera periclymenum (g)		
	Dryopteris dilatata		
	Solanum tuberosum		
86 An area of open Marram vegetation of medium height, close to human habitation and clearly rather trampled.	Amnophila arenaria	ALD	SD7A
	Festuca rubra	FA	



Horsay to Winterton Dunes

sppfull..... domin Keywords.....

	Lotus corniculatus	F	
	Vicia sativa	O	
	Poa pratensis	O	
	Holcus lanatus	O	
	Hypochoeris radicata	O	
	Crepis capillaris	OR	
	Carex arenaria	R	
	Cladonia fimbriata	R	
	Trifolium repens	O	
	Senecio jacobaea	OR	
	Corynephorus canescens	OR	
	Medicago lupulina	OR	
	Festuca ovina	OR	
	Trifolium campestre	O	
	Rumex acetosella	OR	
	Dicranum scoparium	R	
	Cerastium tomentosum	R	
	Epilobium angustifolium	R	
	Rumex crispus	OR	
	Silene alba	R	
	Armoracia rusticana		
87 <i>Amphiphila arenaria</i> / <i>Elymus farctus</i> foredune.	<i>Leymus arenarius</i>		SD6B
	<i>Honkenya peploides</i>		
88 Ridge accreting sand from offshore winds. Steep with much bare sand.	<i>Amphiphila arenaria</i>	D	SD6A
	<i>Festuca rubra</i>	LF	SD6D
	<i>Elymus farctus boreali-atlanti</i>	O	SD6E
	<i>Cakile maritima</i>	O	MOSAIC
	<i>Festuca juncifolia</i>	F	
89 Disturbed area with clay surface, also mixed with sand and fragments of concrete.	<i>Festuca rubra</i>		OTHER
	<i>Crepis capillaris</i>		
	<i>Carex arenaria</i>		
	<i>Holcus lanatus</i>		
	<i>Amphiphila arenaria</i>		
	<i>Hypochoeris radicata</i>		
	<i>Centaurium erythraea</i>		
	<i>Bryum sp</i>		
90 Disturbed area.	<i>Arrhenatherum elatius</i>	D	MG1/SD7E
	<i>Amphiphila arenaria</i>	O	INTERMEDIATE
	<i>Carex arenaria</i>	R	
	<i>Urtica dioica</i>	R	
	<i>Agrostis stolonifera</i>	R	
	<i>Dactylis glomerata</i>	R	
	<i>Rubus fruticosus agg.</i>	LF	
	<i>Epilobium angustifolium</i>	O	
	<i>Armoracia rusticana</i>	O	
	<i>Anthriscus sylvestris</i>	O	
91 Area resembling Q26 but slightly more foredune in character.	<i>Amphiphila arenaria</i>	F	SD11/SD7
	<i>Calystegia soldanella</i>	LA	
	<i>Jasione montana</i>	LA	
	<i>Dicranum scoparium</i>	A	
	<i>Polytrichum sp</i>	A	
	<i>Corynephorus canescens</i>	A	
	<i>Festuca ovina</i>	A	
	<i>Hypochoeris radicata</i>	A	
	<i>Carex arenaria</i>	A	
	<i>Cladonia foliacea</i>	A	

Horsey to Winterton Dunes

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92 Eroded foredune with many patches of bare sand.

*Ammophila arenaria* SD6E  
*Festuca rubra*  
*Leymus arenarius*  
*Elymus farctus boreali-atlanti*

93 Disturbed area of tipped material.

*Lolium perenne* OTHER  
*Rumex crispus*  
*Plantago lanceolata*  
*Urtica dioica*  
*Geranium molle*  
*Trifolium dubium*  
*Reseda luteola*  
*Rumex seedling/sp*  
*Artemisia vulgaris*

94 Large patch of *Rosa rugosa* (1.3m).

OTHER

95 Eroding cliff face (4m), with blown sand and slumped SD6e vegetation at base.

*Honkenya peploides* SD6E

96 Rank tall foredune vegetation with a strong mesic element.

*Ammophila arenaria* AD SD9A  
*Arrhenatherum elatius* LA  
*Dactylis glomerata* FLA  
*Elymus pycnanthus* LA  
*Festuca rubra* A  
*Cirsium arvense* O  
*Heracleum sphondylium* OF  
*Calystegia soldanella* O  
*Senecio jacobaea* OR  
*Equisetum arvense* OLF  
*Holcus lanatus* OF  
*Hypochoeris radicata* O  
*Poa pratensis* OF  
*Knautia arvensis* OR  
*Plantago lanceolata* OR  
*Honkenya peploides* OR  
*Acer pseudoplatanus* (g) R

97 Dense scrub on a steep bank.

*Rubus fruticosus* agg. W24A  
*Sambucus nigra* (s)  
*Quercus robur* (s)  
*Crataegus monogyna* (s)  
*Sarothamnus scoparius* now *Cyti*  
*Arrhenatherum elatius*  
*Holcus lanatus*  
*Agrostis tenuis* now *A. capillar*  
*Dryopteris dilatata*

98 Slack with Q27 type vegetation plus a moisture loving element.

*Juncus effusus* OF SD11B/M23  
*Juncus conglomeratus* O INTERMEDIATE  
*Dryopteris dilatata* F  
*Erica tetralix* LF  
*Osmunda regalis* R  
*Pleurozium schreberi* R  
*Holcus lanatus* O  
*Potentilla erecta* O  
*Deschampsia flexuosa* O

99 Mixed dense scrub.

*Ulex europaeus* (s) W23  
*Rubus fruticosus* agg.  
*Quercus robur* (s)  
*Fraxinus excelsior* (s)  
*Dryopteris dilatata*

Horsey to Winterton Dunes

sppfull..... domin Keywords.....

*Polypodium vulgare* agg  
*Ammophila arenaria*  
*Lonicera periclymenum* (g)  
*Festuca ovina*  
*Deschampsia flexuosa*

*Acer pseudoplatanus* (s) OTHER  
*Sambucus nigra* (s) MG1.2  
*Rubus fruticosus* agg.  
*Ligustrum vulgare*  
*Arrhenatherum elatius*  
*Holcus lanatus*  
*Urtica dioica*

*Festuca ovina* W25/SD10  
*Ammophila arenaria* BURNT  
*Rubus fruticosus* agg.  
*Pteridium aquilinum*  
*Carex arenaria*

*Lonicera periclymenum* (g) W23/SD12  
*Ulex europaeus* (s) TRANSITION  
*Rubus fruticosus* agg.  
*Pteridium aquilinum*  
*Ammophila arenaria*  
*Agrostis tenuis* now *A.capillar*  
*Anthoxanthum odoratum*  
*Carex arenaria*  
*Holcus lanatus*  
*Deschampsia flexuosa*  
*Epilobium angustifolium*

*Carex arenaria* D SD10  
*Galium verum*  
*Festuca ovina*  
*Ammophila arenaria* R  
*Holcus lanatus* R  
*Brachytheceium albicans*

*Juncus effusus* M23/SD12  
*Holcus lanatus*  
*Carex arenaria*  
*Pseudoscleropodium purum*  
*Galium saxatile*  
*Anthoxanthum odoratum*  
*Dryopteris dilatata*  
*Betula pubescens* (g)

*Annocalamagrostis baltica* LA SD12A  
*Carex arenaria* A  
*Rubus fruticosus* agg. O  
*Dryopteris spinulosa* now *D.car* O  
*Juncus conglomeratus* LA  
*Holcus lanatus* O  
*Anthoxanthum odoratum* O  
*Agrostis tenuis* now *A.capillar* R  
*Deschampsia flexuosa* O  
*Osmunda regalis* R  
*Lonicera periclymenum* (g) O  
*Ammophila arenaria*

*Ammophila arenaria* SD6G  
*Carex arenaria*

100 Mixture of exotic trees over scrub.

101 Burnt area of Bracken and dune grassland.

102 Tall dune grassland with a scrub component.

103 Level area of sand blown from a blowout.

104 Small damp patch between paths.

105 Patch between paths.

106 Areas of high sand blow around blowout.

107 Mosaic of low scrub and rank Marram dominated grassland like Q34.

Festuca juncifolia

Ligustrum vulgare SCRUB  
 Rubus fruticosus agg. SD10/11  
 Sambucus nigra (s)  
 Lonicera periclymenum (s)  
 Rosa dumalis now R.canina agg.  
 Senecio jacobaea  
 Urtica dioica

108 Bonfire site and rubbish tip.

OTHER  
 BURNT

109 Valley between dune ridges, heavily trampled with large scars exposing bare sand, vegetation similar to Q24.

Carex arenaria SD10

Amophila arenaria

110 Closed Hippophae scrub (2-3m).

Hippophae rhamnoides D SD18A  
 Sambucus nigra (s) O SD18B  
 Senecio jacobaea LO SD6E  
 Senecio sylvaticus LO  
 Festuca juncifolia LO  
 Amophila arenaria O  
 Festuca rubra O  
 Cirsium arvense LO  
 Rubus fruticosus agg. O  
 Galium aparine LO  
 Montia perfoliata LF

111 Disturbed bank at the end of carpark, not on sand.

Arrhenatherum elatius LD MG1.2  
 Urtica dioica LD  
 Cirsium arvense LD  
 Heracleum sphondylium F  
 Dactylis glomerata O  
 Holcus lanatus F  
 Cirsium vulgare O  
 Lupinus arboreus R  
 Raphanus raphanistrum R  
 Elymus repens O  
 Ranunculus repens O  
 Poa trivialis F  
 Salix viminalis R  
 Rumex obtusifolius O  
 Papaver rhoeas O  
 Snyrnium olusatrum O  
 Artemisia vulgaris R

112 Very disturbed dune with chalets and much scrub.

Rubus fruticosus agg. W23  
 Ulex europaeus (s) SN SCRUB  
 Lonicera periclymenum (s) SD12  
 Sambucus nigra (s)  
 Amophila arenaria  
 Carex arenaria  
 Holcus lanatus  
 Anthoxanthum odoratum  
 Urtica dioica  
 Agrostis tenuis now A.capillar  
 Hippophae rhamnoides  
 Polytrichum sp  
 Lupinus arboreus

113 Pool with associated fringing vegetation.

Potamogeton natans M23A  
 Juncus effusus F OW

Horsey to Winterton Dunes.

sppfull..... domin Keywords.....

Juncus articulatus	F
Juncus acutiflorus	R
Juncus conglomeratus	R
Juncus bulbosus	OF
Anagallis tenella	LF
Salix cinerea (s)	LO
Salix repens agg.	F
Juncus bufonius	O
Hydrocotyle vulgaris	LO
Callitriche seedling/sp	R
Calamagrostis canescens	R

Species list for : Winterton and Horsey Dunes

MGR : TG 461246/TG 506173

Species	% Species	Species	% Species
Acer pseudoplatanus (g)	0	Acer pseudoplatanus (s)	1
Agrostis stolonifera	8	Agrostis tenuis now A. capillaris	4
Alnus glutinosa (s)	1	Annacalamagrostis baltica	5
Anagallis tenella	0	Anthoxanthum odoratum	6
Armoracia rusticana	1	Arrhenatherum elatius	6
Aulacomnium palustre	2	Bellis perennis	
Betula pubescens (s)	3	Betula seedling/sp	4
Betula verrucosa (s) now Betula pendula	0	Brachythecium albicans	1
Bryum caespiticium	3	Bryum sp	2
Calamagrostis canescens	3	Calliergon cordifolium	
Calluna vulgaris	12	Calystegia soldanella	1
Capsella bursa-pastoris	0	Carex acutiformis	
Carex disticha	0	Carex nigra	6
Centaurium erythraea	2	Cerastium glomeratum	
Cerastium semidecandrum	0	Cerastium tomentosum	
Chenopodium sp.	0	Cirsium arvense	4
Cirsium vulgare	0	Cladonia arbuscula	4
Cladonia cervicornis (BBC Scotland card)	2	Cladonia coccifera	2
Cladonia floerkeana	3	Cladonia foliacea	2
Cladonia glauca	2	Cladonia impeza	5
Cladonia squamosa	1	Cladonia squamules/sp	
Cladonia uncialis	1	Cornicularia aculeata	4
Corynephorus canescens	11	Crataegus monogyna (s)	
Dactylis glomerata	3	Dactylorhiza praetermissa now D. majalis	4
Dicranum scoparium	12	Drepanocladus aduncus	
Drepanocladus sp	0	Dryopteris dilatata	8
Dryopteris spinulosa now D. carthusiana	6	Eleocharis palustris	2
Elymus pycnanthus	0	Elymus repens	
Epilobium hirsutum	0	Equisetum arvense	2
Equisetum palustre	1	Erica tetralix	10
Erodium cicutarium	0	Eupatorium cannabinum	1
Festuca ovina	8	Festuca pratensis	
Fraxinus excelsior (s)	0	Funaria hygrometrica	1
Galium palustre	4	Galium saxatile	
Geranium molle	0	Heracleum sphondylium	2
Hippophae rhamnoides	2	Holcus lanatus	29
Honkenya peploides	3	Hydrocotyle vulgaris	12
Hypnum sp	0	Hypochoeris radicata	7
Isoetes setacea	0	Jasione montana	
Juncus articulatus	4	Juncus bufonius	4
Juncus conglomeratus	10	Juncus effusus	14
Juncus maritimus	0	Juncus squarrosus	
Leymus arenarius	2	Ligustrum vulgare	1
Lolium perenne	1	Lonicera periclymenum (g)	4
Lophocolea heterophylla	0	Lophocolea sp	
Lotus uliginosus	8	Lupinus arboreus	1
Luzula multiflora	3	Lychnis floa-cuculi	2
Medicago lupulina	0	Mentha aquatica	
Montia perfoliata	0	Mardus stricta	
Ophioglossum vulgatum	2	Osmunda regalis	4
Pedicularis sylvatica	0	Peplis portula now Lythrum portula	
Plantago coronopus	0	Plantago lanceolata	2
Pleurozium schreberi	2	Poa annua	2
Poa trivialis	0	Polygala serpyllifolia	
Polypodium vulgare agg	0	Polytrichum commune	
Polytrichum sp	1	Potamogeton natans	1
Potentilla anserina	4	Potentilla erecta	8
Pseudoscleropodium purum	2	Pteridium aquilinum	3
Pulicaria dysenterica	0	Quercus petraea (s)	
Quercus robur (s)	2	Quercus seedling/sp	
Ranunculus acris	0	Ranunculus flammula	
Ranunculus sceleratus	0	Ranunculus seedling/sp	
Reseda luteola	1	Rhododendron ponticum	2
Rosa dumalis now R. canina agg.	0	Rubus fruticosus agg.	24
Rumex crispus	1	Rumex obtusifolius	1
Sagina procumbens	2	Salix alba	
Salix repens agg.	6	Salix seedling/sp	
Salsola kali	1	Sambucus nigra (s)	4
Sarothamnus scoparius now Cytisus scopar	0	Scirpus lacustris lacustris	
Scirpus maritimus	0	Scutellaria galericulata	
Senecio sylvaticus	2	Sieglingia decumbens now Dantbonia decum	
Sisymbrium officinale	0	Smyrniolus olusatrum	
Solanum tuberosum	0	Sphagnum fibriatum	
Sphagnum sp	1	Stellaria graminea	1
Stellaria palustris	1	Taraxacum seedling/sp	
Tortula ruralis ssp ruraliformis	1	Trifolium caespitose	
Trifolium repens	2	Typha latifolia	
Urtica dioica	7	Valeriana officinalis	
Veronica officinalis	0	Vicia cracca	1
Vicia segetalis now V. sativa nigra	0	Viola canina	3
	0		
		Agrostis canina	5
		Alisma plantago-aquatica	2
		Amophila arenaria	20
		Anthriscus sylvestris	
		Artemisia vulgaris	1
		Betula pubescens (g)	1
		Betula verrucosa (g) now Betula pendula	
		Brachythecium sp	
		Cakile maritima	2
		Callitriche seedling/sp	2
		Campylopus introflexus	6
		Carex arenaria	31
		Carex riparia	2
		Cerastium holosteoides now C. fontanum tr	1
		Ceratodon purpureus	2
		Cirsium palustre	6
		Cladonia bacillaris	1
		Cladonia fimbriata	3
		Cladonia furcata	5
		Cladonia rangiformis	
		Cladonia subulata	
		Corydalis claviculata	
		Crepis capillaris	1
		Deschampsia flexuosa	4
		Drepanocladus revolvens	1
		Dryopteris sp	
		Elymus farctus boreali-atlanticus	3
		Epilobium angustifolium	3
		Equisetum fluviatile	
		Eriophorum angustifolium	
		Festuca juncifolia	2
		Festuca rubra	10
		Galium aparine	2
		Galium verum	
		Hieracium umbellatum	
		Holcus mollis	2
		Hypnum cupressiforme	4
		Hypogymnia physodes	3
		Juncus acutiflorus	12
		Juncus bulbosus	1
		Juncus gerardi	
		Knautia arvensis	
		Littorella uniflora	
		Lonicera periclymenum (s)	1
		Lotus corniculatus	1
		Luzula campestris/multiflora	1
		Lycopus europaeus	1
		Molinia caerulea	3
		Nymphoides peltata	
		Papaver rhoeas	
		Phragmites communis now P. australis	8
		Plantago major	1
		Poa pratensis	4
		Polypodium vulgare	2
		Polytrichum juniperinum	7
		Potamogeton sp	
		Prunella vulgaris	
		Ptilidium ciliare	2
		Quercus robur (g)	
		Radiola linoides	
		Ranunculus repens	4
		Raphanus raphanistrum	
		Rhododendron ponticum (c)	2
		Rumex acetosella	11
		Rumex seedling/sp	
		Salix cinerea (s)	10
		Salix viminalis	
		Saxifraga valerandi	
		Scirpus lacustris tabernaemontani	
		Senecio jacobaea	4
		Silene alba	
		Solanum dulcamara	
		Sphagnum recurvum	1
		Stellaria media	3
		Tortula muralis	
		Trifolium dubium	
		Ulex europaeus (s)	4
		Verbascum thapsus	
		Vicia sativa	1
		Xanthoria parietina	

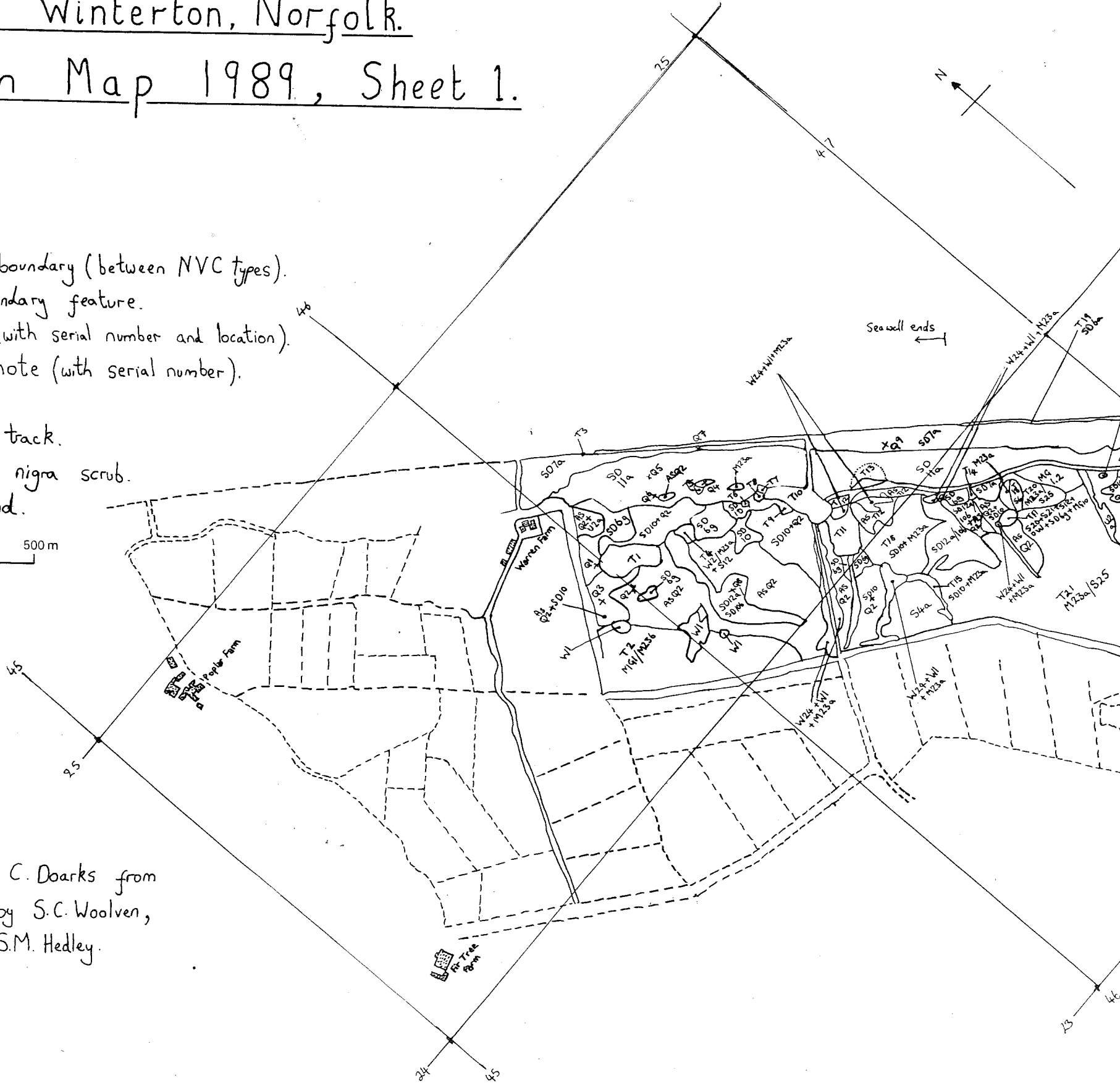
241 Species From 113 Target Notes and 35 Quadrats

# Horsey to Winterton, Norfolk. Vegetation Map 1989, Sheet 1.

## Key.

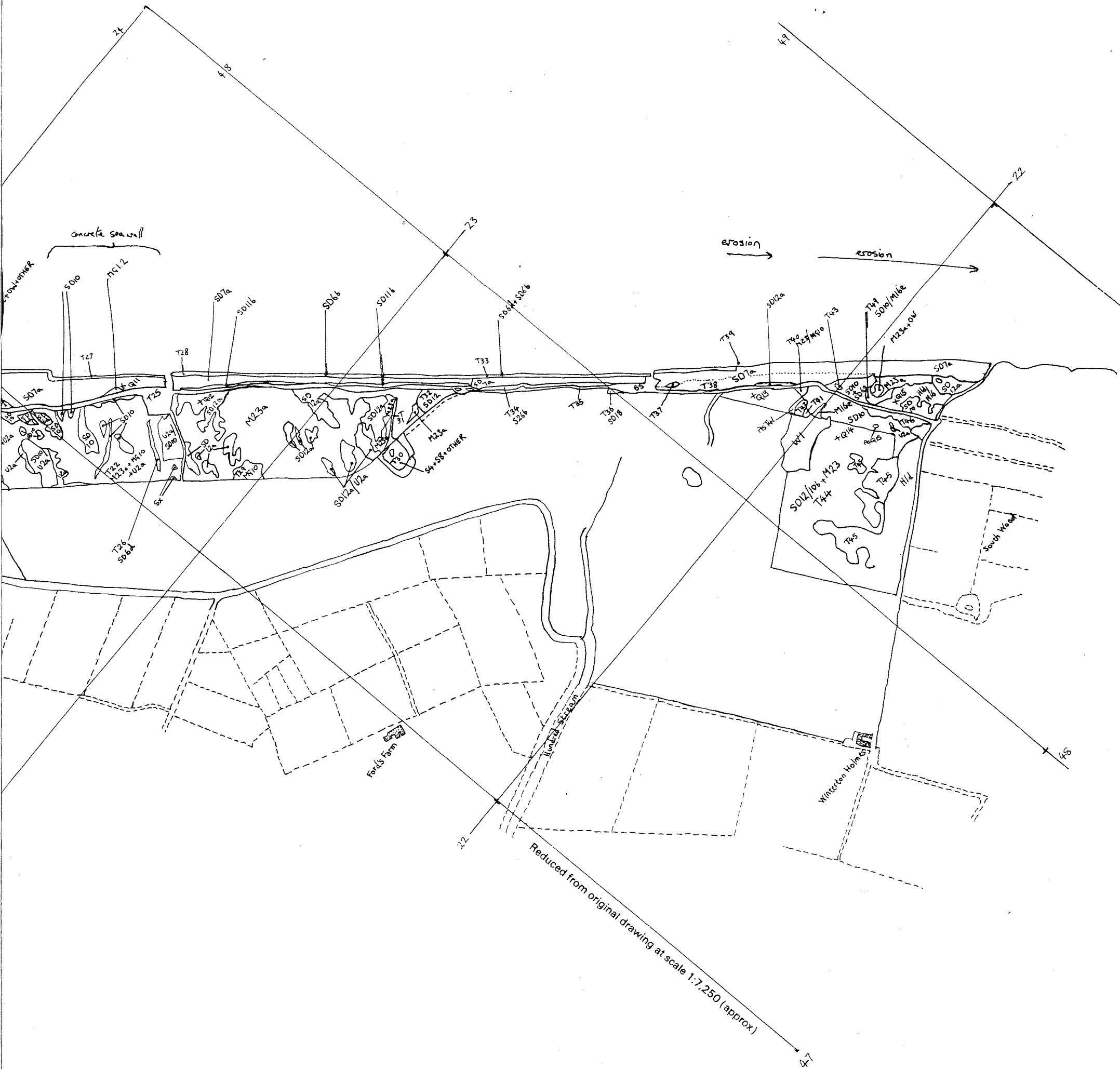
- Vegetation boundary (between NVC types).
- - - Other boundary feature.
- Qn x Quadrat (with serial number and location).
- Tn Target note (with serial number).
- ▒ Building
- == Road or track.
- Sn Scrub *Sambucus nigra* scrub.
- BS Bare Sand.

0 500 m



Map drawn by C. Doarks from  
a field survey by S.C. Woolven,  
G.P. Radley and S.M. Hedley.  
June 1989.

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Reduced from original drawing at scale 1:7,250 (approx)



# Horsey to Winterton, Norfolk Vegetation Map 1989, Sheet 2.

## Key.



- Vegetation boundary (between NVC types).
- - - Other boundary feature.
- Qn x Quadrat (with serial number and location).
- Tn Target note (with serial number).
- ▒ Building
- == Road or track.
- Sn Scrub *Sambucus nigra* scrub.
- BS Bare Sand.

N.B. Other vegetat  
using NVC codes. T  
in the report.

