General biodiversity survey of the habitats of Shingle Street, East Suffolk

Appendices A-F

February 2016

Abstract:

The following document constitutes a report on the floral and faunal species found in the habitats of Shingle Street, East Suffolk. This report combined all available data sets and identified gaps in the data that needed addressing. These included terrestrial mollusc, aquatic invertebrate and an NVC survey of the areas outside the SSSI.

Prior to 2015 there had been 1,052 species identified from 5,064 records over 70 years. In 2015, 2,375 records were made of 737 species, this brought the total to 1,362 species of flora and fauna to date. This report provides an appraisal of these finds and includes three reports on areas lacking from the dataset.

This report has been commissioned by the residents of Shingle Street with support from the Touching the tide, Environment Agency, Suffolk Coastal District Council, Suffolk County Council and Scarfe Charitable Trust.

Shingle Street BIODIVERSITY SURVEY

abrehart ecology

Appendix A: Alde-Ore Estuary Complex SSSI citation

Source: Natural England website
http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1003208

Accessed by Rosie Jackson 18/09/2015

County: Suffolk **Site name:** Alde-Ore Estuary

District: Suffolk Coastal

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended.

Local Planning Authority: Suffolk County Council, Suffolk Coastal District Council

National grid reference: from TM 394 757 to TM 358 402

Area: 2,554.3 (ha) 6,311.7 (acres)

Ordnance Survey sheet: 1:50,000: 156, 159 1: 10,000: TM 45 SE, TM 44 NW,

TM 34 SE, TM 45 SW,

TM 34 NE, TM 35 SW,

TM 44 NE, TM 45 NE,

TM /45 NW

Date notified (Under 1949 Act): 1952 Date of last revision: 1980

Date notified (under 1981 Act): 1985 Date of last revision: 1992

Other information

The site has been extended at the 1992 revision. It includes the Orfordness-Havergate NNR (part of which is designated as a Special Protection Area), and previously named Orfordness-Havergate SSSI and part of the previously named Snape Warren and Blackheath Wood SSSI. Orfordness and Gedgrave Cliff are listed as being of national importance in the Geological Conservation Review.

Description and reasons for notification

This site stretches along the coast from Bawdsey to Aldeburgh and inland to Snape. It includes Orfordness, Shingle Street, Havergate Island, and the Butley, Ore and Alde Rivers. The scientific interests of the site are outstanding and diverse. The shingle structures of Orfordness and Shingle Street are of great physiographic importance whilst the cliff at Gedgrave is of geological interest. The site also contains a number of coastal formations and estuarine features including mud-flats, saltmarsh, vegetated shingle and coastal lagoons which are of special botanical and ornithological value.

Geomorphology

Orfordness, together with Shingle Street, is one of three major shingle landforms in the British Isles and

is the only one which combines a shingle spit with a cuspate foreland. This large feature comprises a complex sequence of shingle ridges deposited over a long period of time which record stages in the evolution of the landform. The distal end of the spit is still subject to rapid changes and is dynamically related to events at Shingle Street on the mainland shore. This well documented site is of the highest educational and research value.

Geology

The cliff at Gedgrave is a small but renowned exposure of Coralline Crag about 3 m in height. Here the sandwave faces, which is characterised by large-scale cross stratification, overlies highly fossiliferous silty crag with marked unconformity. Clasts of the lower facies can be found in the sandwave faces and are evidence of contemporaneous erosion. A rich shell fauna is present in the lower facies which includes many species of molluscs and bryozoan. The site is also notable for the occasional occurrence of articulated specimens of the brachiopod *Terebratula maxima*, the world's largest species of terebratulid. The site is of great historical as well as palaeontological interest and is one of the only Coralline Crag localities to show the lower erosional contact of the sandwave faces.

Botany

The botanical interest of this site is enriched by the variety of habitats present, including mudflats, saltmarsh, brackish lagoons, shingle beach, reedbeds, grassland, freshwater and brackish ditches. Mudflats of mixed clay, silt and shingle border the Ore, Butley and Alde rivers and Havergate Island within a tidal range of up to 2 metres. In places this supports the rare intertidal flowering plant *Zostera angustifolia*. Narrow fringes of saltmarsh occur along the length of the rivers with wider expanses at Shingle Street, Havergate Island, Stony Ditch, the upper reaches of the Butley river and in places by the Alde river. These are mostly dominated by sea purslane *Halimione portulacoides* and sea lavender *Limonium vulgare*, but a wide range of other saltmarsh species also occur, including sea-heath *Frankenia laevis*, glasswort *Salicornia pusilla*, small cord-grass *Spartina maritima* and Borrer's saltmarsh grass *Puccinellia fasciculata*. It is representative of the *Halimione portulacoides* community as described in the National Vegetation Classification. Saltmarsh elements also occur around the lagoons and borrow pits on Shingle Street, Havergate Island and the Kings and Lantern Marshes on Orfordness. These also contain the rare tassel pondweeds *Ruppia spiralis* and *R. maritima.*

The site contains the second largest and best preserved area of vegetated shingle in Britain. This is a nationally rare and delicate habitat which supports a highly specialised flora. Species typical of exposed, shifting shingle such as sea pea *Lathyrus japonicus* and sea kale *Crambe maritima* are abundant whilst extensive areas of sea campion *Silene maritima* and stonecrops *Sedum acre* and *S. anglicum* occur on more stable ground. Orfordness contains one of the best examples of zonation in the shingle vegetation. Above the high water mark *Rumex crispus* and *Glaucium flavum* give a highly

distinctive character to the mainly bare shingle, with *Lathyrus japonicus* becoming much more abundant within the matrix further inland. This vegetation gives way in turn to grassland dominated by *Arrhenatherum elatius* and *Silene maritima*. A wide range of rare or local species also occur including yellow vetch *Vicia lutea* and the dwarf clovers *Trifolium suffocatum, T. glomeratum, T. striatum, T. scabrum* and bur medick *Medicago minima*. Lichen communities are also well developed here with extensive areas of *Cladonia* heath. A unique feature for East Anglia beach formations is the abundance on the ground of normally epiphytic lichens *Parmelia caperata* and *Evernia prunastre*.

Higher saltmarsh blending to neutral grassland, dominated by sea couch grass, *Elymus pungens*, occurs on former grazing marsh on Havergate Island and Orfordness and on the extensive system of clay embankments throughout the site. There are small areas of reed bed at the head of the Butley River and

at Iken.

Ornithology

The site is of national importance for its birdlife. Havergate Island holds the largest breeding colony of avocets in Britain, and they also feed in large numbers of Hazelwood Marshes and the Alde mudflats. Other breeding birds on the Island and elsewhere on the site include gadwall, shoveler, oystercatcher, ringed plover, common tern, Arctic tern, sandwich tern and little tern, common gull, short-eared owl, wheatear and marsh harrier. There are also very large breeding colonies of black-headed gull, lesser-black-backed gull and herring gull on Orfordness. In winter and during migration the site is visited by nationally important numbers of wildfowl and shore-birds, including Bewick's swan, shelduck, teal, wigeon, redshank and avocet.

Invertebrates

The lagoons at Shingle street are notable for a number of brackish water species particularly the rare anthozoan *Nematostella vectensis* and the site is also noted for a number of rare spiders. Several nationally rare and scarce insects are found within ditches running through Hazelwood Marshes.

SAC Citation

Annex I habitats that are a primary reason for selection of this site

1150 Coastal lagoons * Priority feature

Note: not a marine feature as occur landward of Highest Astronomical Tide Orfordness – Shingle Street encompasses a series of percolation **lagoons** on the east coast of England, and, together with Benacre to Easton Bavents and The Wash and North Norfolk Coast, forms a significant part of the percolation lagoon resource concentrated in this part of the UK. The lagoons at this site have developed in the shingle bank adjacent to the shore at the mouth of the Ore estuary. The salinity of the lagoons is maintained by percolation through the shingle, although at high tides sea water can overtop the shingle bank. The fauna of these lagoons includes typical lagoon species, such as the cockle *Cerastoderma glaucum*, the ostracod *Cyprideis torosa* and the gastropods *Littorina saxatilis tenebrosa* and *Hydrobia ventrosa*. The nationally rare starlet sea anemone *Nematostella vectensis* is also found at the site.

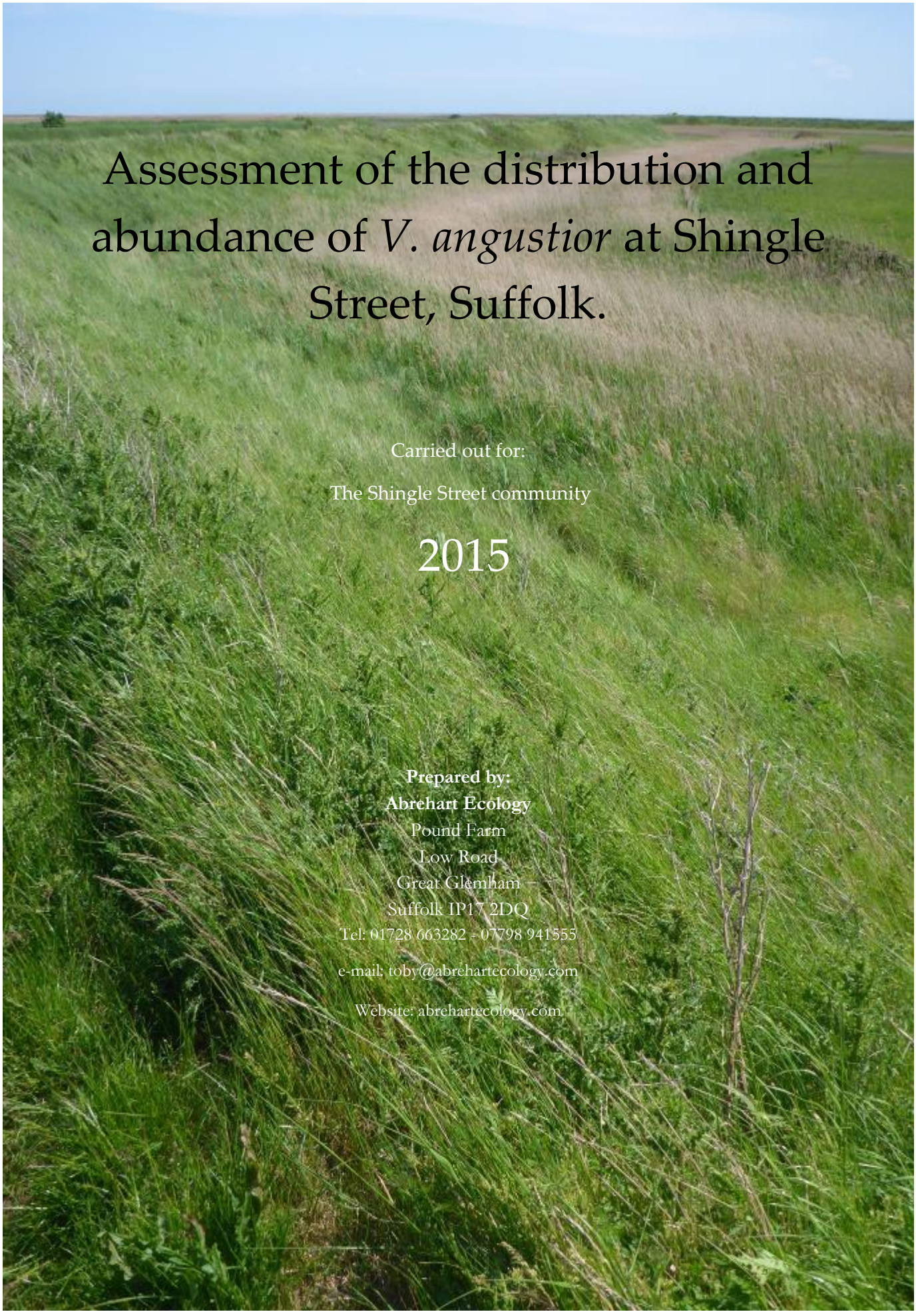
1210 Annual vegetation of drift lines

Orfordness is an extensive shingle spit some 15 km in length and is one of two sites representing **Annual vegetation of drift lines** on the east coast of England. In contrast to Minsmere to Walberswick Heaths and Marshes, drift-line vegetation occurs on the sheltered, western side of the spit, at the transition from shingle to saltmarsh, as well as on the exposed eastern coast. The drift-line community is widespread on the site and comprises sea beet *Beta vulgaris* ssp. *maritima* and orache *Atriplex* spp. in a strip 2-5 m wide.

1220 Perennial vegetation of stony banks

Orfordness is an extensive shingle structure on the east coast of England and consists of a foreland, a 15 km-long spit and a series of recurves running from north to south on the Suffolk coast. This spit has been selected as it supports some of the largest and most natural sequences in the UK of shingle vegetation affected by salt spray. The southern end of the spit has a particularly fine series of undisturbed ridges, with zonation of communities determined by the ridge pattern. Pioneer communities with sea pea *Lathyrus japonicus* and false oat-grass *Arrhenatherum elatius* grassland occur. Locally these are nutrient-enriched by the presence of a gull colony; elsewhere they support rich lichen communities. The northern part of Orfordness has suffered considerable damage from defence-related activities but a restoration programme for the shingle vegetation is underway.

Appendix B: Mollusc survey report



Assessment of the distribution and abundance of *V. angustior* at Shingle Street, Suffolk.

Carried out for:

The Shingle Street community

2015

Prepared by:
Abrehart Ecology
Pound Farm
Low Road
Great Glemham
Suffolk IP17 2DQ
Tel: 01728 663282 - 07798 941555
e-mail: toby@abrehartecology.com
Website: abrehartecology.com

1. Introduction

The presence of narrow-mouthed whorl snail (figure 1) at Shingle Street, Suffolk was known from a previous survey carried out in 2008 for the Environment Agency (Abrehart, 2008), however this only very briefly looked at the area and indicated the potential of the site for this species and indicated that additional surveys in the area were needed.

In December 2013, there was a storm surge on the East Anglian coast, much of the lower areas of Shingle Street were inundated following a breach in the eastern sea wall. Following on from this it was considered for important to survey the site to determine if and where this species was still present (figure X).

Narrow-mouthed whorl snail *Vertigo angustior* is a Red Data Book Species, the conservation importance of the species has meant its inclusion in various schedules and red data lists. Thus it is categorised as Rare (category 1) in the UK Red Data Books (Bratton 1991). Whilst more recently the snail has been classed as vulnerable on the recent IUCN based UK red list review (Seddon *et al* 2014). The species is listed in Annex IIa of the European Community Habitats and Species Directive (92/43/EEC); it has also been identified as a 'Species of Principle Importance in England', further to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (having formerly being recognised as a UK BAP species).

Despite more intensive survey efforts to determine the habitat preferences and distribution of the mollusc in Suffolk and further afield throughout East Anglia, its exact ecological requirements have yet to be pinned down. It is known to be a detritivore and at only 2mm high is difficult to locate in its damp grassland habitat.

The aim of this survey was to establish the distribution and abundance of *V. angustior (*in particular), and other molluscs present within the survey area.

Sites surveyed were:

1. the length of the sea wall;

2. adjacent grassland, and

3. Grasslands near southern coastal lagoon

The survey was conducted on the 23rd July 2015.

2. Field survey method

To enable a full coverage of the site one sample was taken from each sample location, (a point sample). A total of 30 samples were taken. Please refer to figure 1 for the locations of these.

Terrestrial mollusc sampling methods

The sampling strategy and recording procedure was designed to provide information on the population and distribution of *Vertigo angustior*, including some finer scale distribution.

- terrestrial mollusc community—For the present survey a plastic tray method be used. This requires that at each sample site, the vegetation is beaten into the tray at six places within an area of approximately 0.5m². These six samples were combined and the numbers of *Vertigo angustior* (adult and juvenile) were counted. This was then further inspected in the field for other molluscs. The number of individuals of each species of mollusc was counted;
- thatch depth—the layer of litter at the base of the grassland vegetation was be measured in centimetres (table 1);
- Soil moisture—moisture level of the soil (scale of 1-5, where 1= dry and 5=saturated); (Table 2) and
- vegetation composition including vegetation height (via recording the abundance of plant species on a DAFOR scale (table 3)); and
- a 10 figure grid reference was be taken for each sample location.

Botanical methods

Quadrats were used to provide information on vegetation composition throughout a (desirably uniform) stand of vegetation around the mollusc sample sites. Depending on the records made (here species present were specified), they can take less time than more detailed records typically made in permanent plots. Here, frequency determinations were made on a compartment basis.

In this "sample site specific survey", the emphasis was on covering the area immediately around the mollusc sample sites and detecting as many of the species as possible. At each site chosen by the surveyor for detailed works a minimum of five minutes was spent to record all within an area of one metre from the centre point. This time was to focus the surveyor's attention at intervals on the whole ecosystem cross-section and to ensure that as much of value was found in the limited time available.

DAFOR scale	Percentage cover
D - Dominant	Over 75% cover
A - Abundant	75-51% cover
F - Frequent	50-26% cover
O - Occasional	25-11% cover
R - Rare	10 - 1% cover

Table 1. DAFOR scale categories and definitions

Soil moisture	Definition
1	Ground dry: possibly cracked, and no evidence of surface moisture
2	Ground damp: Moisture observed on the surface but water does not rise under
3	Ground wet: No surface veneer, but water rises under light (foot) pressure
4	Ground wet: Surface veneer of water less than 1-2cm deep
5	Ground very wet: water depth greater than 2cm which may cover the sward and

Table 2. Soil moisture values and definitions

Thatch depth categories (cm)
1-5
6-10
11-15
16-20
20+

Table 3. Thatch depth categories

3. Results

A total of 30 samples were taken on 23rd July 2015 across the survey area in habitat that was most suitable for narrow mouthed whorl snail *Vertigo angustior*.

3.1 Sea wall

11 samples were taken from the sea wall, this ran from the road closest to the sluice, heading east then south and re-joining the road near to the hamlet. All these samples were taken in the grasslands that were generally dominated with *Elytrigia atherica*. These coarse coastal grasslands are well known to have the potential to support *V. angustior*.

Nine of the samples were taken from the main sea wall. In these *V. angustior* was present in six of the samples, in the northern section of the sea wall it was found in very high densities (some of the highest seen in Suffolk in 2015). *V. angustior* was found on all aspects of the sea wall with the highest densities on the northern section of the site close to Barthorp's Creek, up to 110 animals were recorded in a single small sample. This is following on from the large tidal event in December 2013 where the site was badly flooded.

Two samples were taken from a small section of sea wall leading north off the main sea wall heading into the saltmarshes at the northern end of the site. This low dry tussocky grass covered sea wall held a high (85 animals) to moderate (13 animals) density population along its length. The number of animals decreased the drier the habitat became.

3.2 Roadside sample points

Five samples were taken from the roadsides, two samples from the roadside that crosses Barthorp's Creek (near to the sluice) and the other three from the grasslands either side of the road towards the first car parking area.

The first two samples were taken where there was a known population recorded in 2008. In 2008 there was a very large dense population found in these wet grasslands. During this survey they were only found in the higher dense grasslands closest to the roadside. The density of animals here was moderately high with 28 animals found in a single sample, mollusc diversity in this habitat is limited. With two other species of mollusc that were common species of poor grasslands.

In the other sample by the road within the dense *Elytrigia atherica* there were no *V. angustior* found, though interestingly though there were large numbers of two pulmonate species of mollusc, *Assiminea grayana* and *Myosotella myosotis*. These are semi-marine species commonly found in saltmarshes. These were not present in the 2008 samples and indicate that the site is becoming effected by coastal squeeze with these species encroaching higher up the saltmarsh grasslands over the past seven years. The lowest sections of this part of the site, where the 2008 samples were taken, was now effectively saltmarsh where as in 2008 this was a dense *Festuca rubra* grassland.

The other three samples were taken from the dampest roadside grasslands that were available. This was limited, especially after such a dry summer on the site. There was a positive find in the location to the north of Oxley Dairy. Though only one *V. angustior* was found here, the other two species found in

this sample were catholic species with a slight preference to drier habitats.

3.3 Adjacent grasslands and marshes

Three samples were taken in two areas of grassland on the site in the most suitable habitat that was available. In the northern section of the site on the vegetated shingle close to the saltmarshes, there was an area of *Elytrigia atherica* grassland that was sampled. In this small area there was one *V. angustior* found and one *Myosotella myosotis*, indicating that the site is becoming quite saline and thus has a reduced potential for *V. angustior* in the future.

3.4 Southern marshes

Eight samples were taken in three small clusters in the southern grasslands. Here the species diversity was poor, the site had been heavily grazed over the summer, which had a drastic effect on the tussocky nature of the grassland here by reducing the density of the thatch and creating an area of standalone tussocks, where before the tussocks joined to form an interesting structure and micro-climate on the site. All the grassland species were common species found across the survey area.

Two samples were taken from the shallow *Bolboscheonus maritima* filled ditches. This only supported one species of mollusc, *Potamopyrgus antipodarum*, an introduced species from New Zealand which has become ubiquitous across the county.

3.5 Additional mollusc records

Outside of the *V. angustior* survey a few other records were made of molluscs that warrant inclusion in this report. In the saltmarshes adjacent to Barthorp's Creeks are a small number of saltmarsh pools. These were searched for molluscs, in particular those within the botanically rich marshes on the northern edge of the survey area (within the SM13c vegetation community). Here only two species were noted one *Peringa ulvae* is a ubiquitous mollusc found in all saltmarsh on the east coast of the UK, here it was recorded at a low density in all the pools searched. But, whilst looking into a pool a small gastropod species was noted. This was a small sea slug (2mm long)—*Limapontia depressa*, of which there was only one previous Suffolk record (TRA) from the Blyth estuary in very similar conditions. Of the six saltmarsh pools only one held this species, though on return visits it was only found in an adjacent saltmarsh pool. There were large varying salinities within these pools over the summer and at high tides or in wet weather they move from pool to pool to found suitable conditions.

Figure 1—*Limapontia depressa*,
© Abrehart Ecology

During this survey period a number of mollusc records were made in conjunction with other groups surveyed. An additional 31 species of mollusc were recorded through these means. These were mainly found in the aquatic invertebrate survey samples with a small number of records from other work carried out on the site in 2013 and 2008 (TRA). In all a total of 231 individual mollusc records were made for the survey area.

4. Discussion

The distribution and numbers of *V. angustior* fluctuate considerably from year to year depending on the weather conditions. In dry years their numbers can be very low, in 2015 the weather had been damp though not wet, so moderate conditions for this rare mollusc. It was found across the survey area, concentrated to the east of the Shingle Street road. It was most abundant in the grasslands along the sea wall, especially in the vegetation of the north-east sea wall. The density in this section of the site was the highest found anywhere in Suffolk in 2015. Which in turn will be the highest densities recorded in the UK in 2015. Although it does not cover a large area, the number of this species can reach 100's of thousands. The main area of high density covers 5000m² with a possible density of 800m² giving a basic population guestimate of over 5 million animals at Shingle Street.

A total of 26 species of mollusc were recorded during this terrestrial mollusc survey. This is a moderate number of species for a very dry coastal habitat with little variation in habitat across the site. Other than the headline species—*Vertigo angustior* - all other species were typical for a coastal site in Suffolk.

The total number of all mollusc species recorded for Shingle Street is 56 species, this is a third of the number of species found in Suffolk which is a quarter of the species found in the UK.

Coastal lagoonal species were noted during 2015 and in private survey in 2013 (TRA), a total of 14 species of mollusc strongly associated with lagoons were recorded. Of these species eight are uncommon in the UK, two are brackish water pulmonate species, *Myosotella myosotis* and *Leucophytia bidentata*, the later only being recorded under 20 times in Suffolk. *Hydrobia neglecta* RDB3 is rare in coastal lagoons in Suffolk it has been recorded eight times at Shingle Street and always in the lagoons or the more saline borrow dyke in the northern and eastern sections of the site.

Other notable species at Shingle Street include *Onoba aculeus* and *Onoba semicostata*. No other records of these species are found for terrestrial Suffolk. They were found alive by sieving deep slightly muddy shingle on the landward side of the shingle ridge at the lagoons edge. These species are more rarely recorded in off shore samples and rarely from East Anglia. Only small samples were taken and high numbers were recorded for these species, it was also within this habitat that *Leucophytia bidentata* was recorded too. All the lagoonal species mentioned here are very small species, none grow longer than 3.5mm in height. Some are considerably smaller.

Whilst carrying out the botanical survey for Shingle Street the saltmarsh pools were looked at and a second county record of the sea slug *Limapontia depressa* was made.

So although there was not a very high number of species recorded for the site what was found was of great significance for the fauna of Suffolk.

Table 4: records of *Vertigo angustior* presence absence from Shingle Street recorded during species specific survey 2015.

Sample site	Grid ref	Vertigo angustior Adults	Juveniles	Total	Site description
1	TM3677743985	28	0	28	Road side verge
2	TM3677043975	0	0	0	SM24 and S4 saltmarsh
3	TM3688943970	35	12	47	Seaward face of seawall. Too dry for accurate salinity measurement
4	TM3703243975	0	0	0	Saltmarsh pool. SM13c
5	TM3716043948	70	40	110	Seaward face of seawall
6	TM3718843932	60	30	90	Fold of seawall
7	TM3730043965	65	20	85	Landward face of seawall
8	TM3734444017	12	1	13	Base of the embankment. Too dry to produce salinity measurement
9	TM3736744082	1	0	1	SM24 with saltmarsh
10	TM3728843852	2	0	2	Too dry for salinity. Very dry base of seawall
11	TM3722343714	0	0	0	Landward surface. Very deep thatch. Too dry to measure salinity
12	TM3721043640	0	0	0	Shingle heath. Too dry to measure salinity
13	TM3713743463	0	0	0	Shingle heath/lagoon edge. Too dry to measure salinity
14	TM3708843401	0	0	0	Landward side of seawall. Too dry for salinity measure
15	TM3707043376	1	0	1	Very dry reed bed
16	TM3704743285	7	0	7	Damp channel at the bottom of the seawall. Too dry for salinity
17	TM3702343275	0	0	0	Dry reed bed
18	TM3696243205	0	0	0	Too dry for salinity reading. Edge of reed bed
19	TM3693543190	0	0	0	Grass. Too dry for salinity reading
20	TM3699543383	0	0	0	Too dry for salinity. Road verge
21	TM3694643611	0	0	0	Too dry for salinity. Roadside verge
22	TM3686943779	1	0	1	Road side verge. Too dry for salinity
23	TM3653242686	0	0	0	Edge of embankment. Salinity not recorded for most samples
24	TM3649442633	0	0	0	Edge of ditch
25	TM3652942628	0	0	0	Beneath scrub
26	TM3650542519	0	0	0	Grassland
27	TM3650242471	0	0	0	Grassland depression in field
28	TM3647942420	0	0	0	Grassland depression in field
29	TM3636842295	0	0	0	Grassland next to shallow vegetated ditch
30	TM3632842314	0	0	0	Grassland.

Table 5: Additional mollusc records of interest from Shingle Street recorded during several of the other surveys or casual observations.

Year	Scientific Name	Abundance	Grid reference
2015	*Anodonta anatina*	9	TM3610142948
2015	*Assiminea grayana*	2	TM3682143957
2015	*Assiminea grayana*	3	TM3677043975
2015	*Bithynia leachii*	2	TM3610142948
2015	*Hydrobia acuta subsp. neglecta*	2471	TM3646542572
2015	*Hydrobia acuta subsp. neglecta*	230	TM3640642396
2015	*Hydrobia acuta subsp. neglecta*	518	TM3646542572
2013	*Hydrobia acuta subsp. neglecta*	8000	TM3692043300
2013	*Hydrobia acuta subsp. neglecta*	2	TM3716643280
2013	*Hydrobia acuta subsp. neglecta*	1	TM3716643280
2013	*Hydrobia acuta subsp. neglecta*	1000+	TM3724943609
2015	*Hydrobia acuta subsp. neglecta*	1759	TM3640942392
2015	*Hydrobia ventrosa*	8	TM3640942392
2013	*Leucophytia bidentata*	200+	TM3716643280
2013	*Leucophytia bidentata*	100+	TM3716643280
2015	*Limapontia depressa*	100	TM3703243975
2013	*Onoba aculeus*	48	TM3716643280
2013	*Onoba aculeus*	36	TM3716643280
2013	*Onoba semicostata*	22	TM3716643280
2013	*Onoba semicostata*	18	TM3716643280
1991	*Pupilla muscorum*	1	TM366425
2008	*Pupilla muscorum*	4	TM3711543470
2015	*Pupilla muscorum*	1	TM3728843852
2008	*Vertigo substriata*	1	TM3711543470
2008	*Vertigo substriata*	5	TM3706543322
2015	*Vertigo pusilla*	2	TM3688943970
2015	*Vertigo pusilla*	2	TM3728843852
2015	*Vertigo substriata*	2	TM3718843932
2015	*Vertigo substriata*	1	TM3728843852

Figure 1. Location and abundance of *Vertigo angustior* at Shingle Street 2015.

Figure 2. Distribution of aquatic molluscs of interest at Shingle Street, 2015.

Figure 3. Distribution of terrestrial molluscs of interest at Shingle Street, 2015.

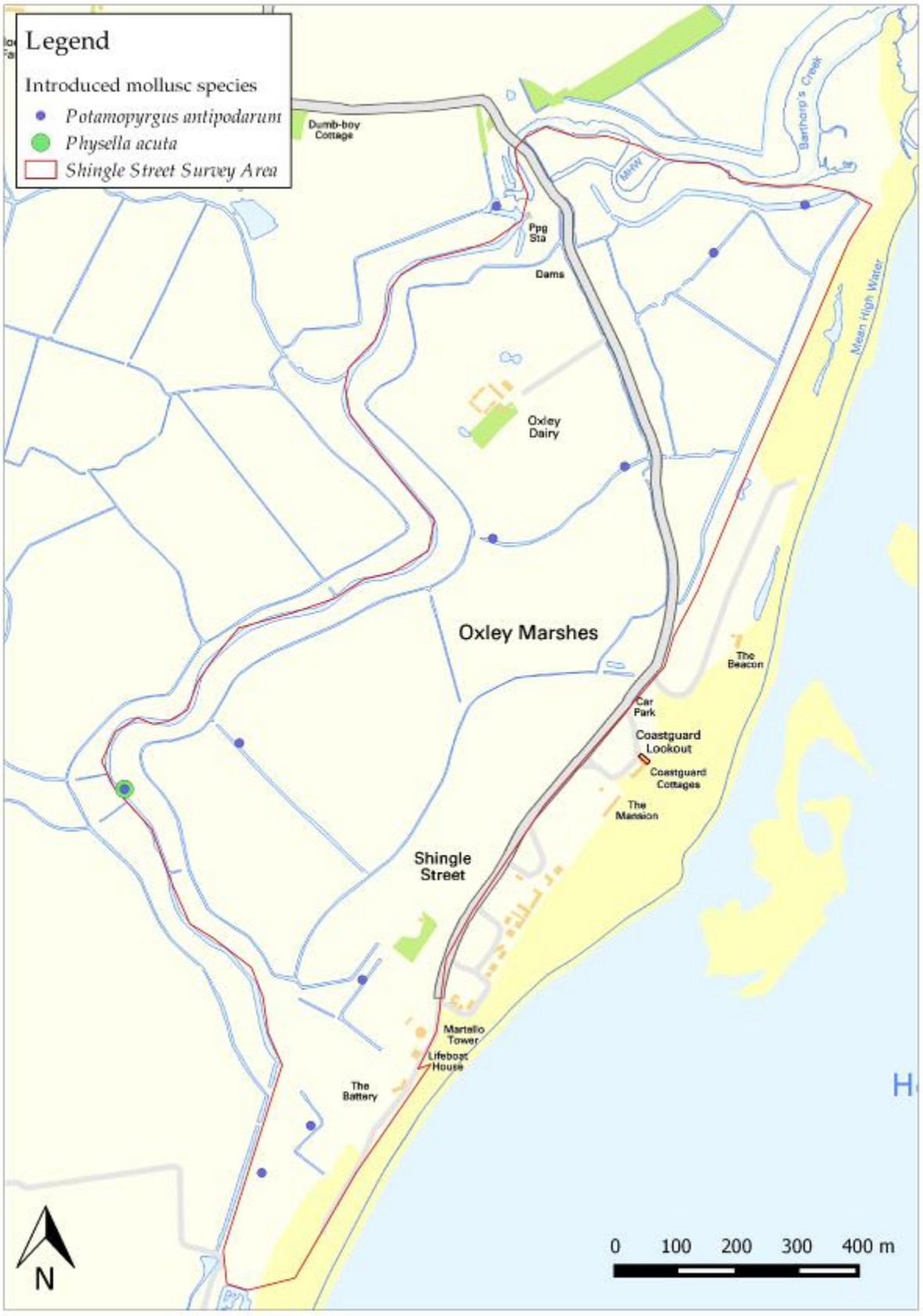


Figure 4. Distribution of introduced mollusc species at Shingle Street, 2015.

Pound Farm
Low Road
Great Glemham
Suffolk IP17 2DQ
Tel: 01728 663282 - 07798 941555

e-mail: toby@abrehartecology.com

Website: abrehartecology.com

Appendix C: Aquatic invertebrate survey report

Assessment of the Aquatic invertebrate communities at Shingle Street, Suffolk.

Carried out for:

The Shingle Street community

2015

Prepared by:
Abrehart Ecology
Pound Farm
Low Road
Great Glemham
Suffolk IP17 2DQ
Tel: 01728 663282 - 07798 941555
e-mail: toby@abrehartecology.com
Website: abrehartecology.com

1. Introduction and background

1.1 Purpose of the report

This project was commissioned by Jeremy Mynott on behalf of the Shingle Street community. The aim of this project was to assess the diversity of the aquatic and saline lagoonal invertebrate communities inhabiting the aquatic environments of Shingle Street Marshes outside of the SSSI boundaries. An assessment of aquatic environment conditions was to be carried out through detailed analysis of the aquatic macroinvertebrate communities.

1.2 Site description

Shingle Street Marshes covers a range of habitats consisting mainly of coastal grazing marshes with a large IDB channel and a couple of small brackish ephemeral coastal lagoons on the southern edge of the of the Alde-Ore Estuary Complex on the Suffolk Coast, UK (figure 1); central grid reference: TM3695743567. The site is located to the south and west of the mouth of the River Alde.

The marshes are under private ownership and managed in accordance to their farming requirements. The grazing marshes under investigation are low-lying, approximately 90ha in extent and are generally protected from the saline influence of the estuary by a sea wall which encompasses the northern and eastern borders of the site. Within the marshes drainage of the land is managed by a series of dykes that feed into the main IDB channel to the west. A main borrowdyke runs parallel to the sea wall from TM3683543930 to TM3705743332. In wet winters there are a number of pools of standing water in the series of marshes to the east of the Shingle Street road, these are ephemeral and dry in the summer. On the southern end of the site there are a small number of pools that are fed mainly by rain and by a small amount of percolation through the shingle ridge to the east. As there is some connection to the sea these can be considered coastal lagoons.

2. Methods

2.1 Field survey method

The aquatic invertebrate survey was undertaken on 24th April 2015 and 7th September 2015. A sampling strategy was designed to cover the full range of aquatic environments on the site and therefore provide a comprehensive baseline dataset. A total of 10 sampling sites were chosen across the grazing marsh dyke system the IDB drain and the saline habitats on the southern border of the site. The following were recorded at each sample location:

- Ten figure grid reference co-ordinate using a handheld GPS unit;
- Written description of the habitat type;
- Dyke characteristics width and depth;
- Water conductivity (ppm);
- Primary land use;
- The aquatic macrophyte, emergent and bankside plant species were identified and the abundance of each species was recorded on the DAFOR scale:

  D – Dominant (over 70% cover)

  A – Abundant (70-40% cover)

  F – Frequent (10-40% cover)

  O – Occasional (3-10% cover)

  R – Rare (less than 3% cover)

- Photograph taken to further document the site conditions and to enable direct comparisons of the sampling sites with future monitoring surveys.

A single aquatic macroinvertebrate sample was collected at each location using a standard International Standards Organisation (ISO) "ecologist's" hand-net. A "figure-of-eight" sweep technique was employed for a total of two minutes per site. All materials retained in the net was transferred to a 5 litre, sealable plastic sample bucket and returned to the laboratory for subsequent processing.

Figure 1. Location of aquatic invertebrate sampling sites Shingle Street Marshes. 2015

2.2 Laboratory procedures and analyses

All invertebrates were separated from the retained sediment, detritus and vegetation under 40 - 80x stereo, binocular microscopes. These were then further separated into the major taxonomic groups, preserved in alcohol (70% IMS) and referred to the appropriate taxonomist for identification.

Where possible, all specimens were identified to species level. Exceptions to this are groups that require specialist, time-consuming preparatory techniques such as head capsule dissection for chironomid larvae and prolonged clearing procedures for oligochaetes species. Such procedures are beyond the remit of the present study. In these cases, specimens are allocated to *observed taxonomic units* (OTUs).

Given that (i) the objectives of the survey were to characterise the invertebrate community of the aquatic habitats and not undertake an extensive, fully quantitative survey and (ii) the sampling methods appropriate to sampling still-water habitats are considered semi-quantitative, directly comparable quantitative units (e.g. number per metre^2) could not be used to provide rigorous quantitative descriptions of invertebrate abundance. Consequently, the data for the invertebrate taxa and assemblages are presented as "numbers per species per sample".

2.3 Limitations of the study

The field work was carried out across the summer of 2015, this was an appropriate time of year to sample aquatic invertebrates.

3. Results

3.1 Grazing marsh and dyke characteristics

Refer to appendix A and B for sample site details and photos, respectively.

Shingle Street survey area consisted of over 8km of intersected dykes, these were separated by the Shingle Street road and from the river Alde and North Sea by the seawall. The dykes ranged from 0.5m to 15m wide and 0.4m to 1.5m deep. The small southern lagoon changed shape during the survey period ranging from 30m x 30m to 0.4m x 20m.

The salinity across the site ranged from fresh water to hypersaline. All of the site with the exception of the IDB drain were inundated in the December 2013 overtopping event. The water from these dykes drained through the IDB channel into the River Ore. The salinity across the site was still moderately high indicating a residual salinity from the over topping, or the most likely fact that the site is so low that it is drawing in water from the estuary as ground water. This is unlikely to change with rising sea levels and will inevitably get more saline in the future.

The marginal flora in the dykes consisted of a matrix of *Phragmites australis, Bolboscheonus maritimus, Juncus inflexus* and *Berula erecta*. Many of the dykes had a low density of aquatic macrophytes, including *Lemna trisulca, Lemna minor* and *Potamogeton pectinatus.* The IDB drain held moderate quantities of *Elodea canadensis, Myriophyllum spicatum, Potamogeton crispus* and *Zannichellia palustris.*

3.2 Aquatic macroinvertebrate communities

The ten sampling sites were sampled three time across the summer of 2015. A total of 13,385 aquatic invertebrates were recorded from 135 taxa, consisting of 18 higher taxonomic groups (table 1). A list of all invertebrate taxa and species identified across the Shingle Street site, along with their associated status classification can be found in table 2. Refer to appendix A for the abundance of aquatic invertebrates identified in each sample. A total of 109 taxa were identified to species level.

The most diverse major taxonomic groups were Coleoptera (43 taxa, 32% of total taxon count) followed by Hemiptera (20 taxa, 15% total taxon count), Gastropoda (17 taxa, 13% of total taxon count), Diptera (17 taxa, 13% total taxon count), and Bivalva (3 taxa, 2% of total taxon count) (figure 2). The remaining 13 taxonomic groups were less diverse and ranged from 1 to 5 taxa, equating to approximately 1 to 3% of the total taxon count (figure 4).

The most abundant taxonomic groups were Gastropoda (54.4%) followed by Ostracoda (11.6%), Amphipoda (10.1%), Isopoda (7%), Cladocera (4.5%) and Hemiptera (2.746%) (figure 3). The remaining 22 major taxonomic groups were less abundant and ranged from 0.003% to 1.187% of all aquatic invertebrates identified.

Figure 4: Aquatic invertebrate sample locations at Shingle Street, photos taken in April 2015.

Table 1. Number of taxa and abundance of aquatic invertebrates identified in each major taxonomic group from Shingle Street Marshes in 2015.

Major taxonomic group	Number of taxa	Abundance of invertebrates
Amphipoda	3	876
Arachnida	4	31
Bivalvia	3	80
Coleoptera	43	1162
Collembola	2	217
Crambid	1	3
Decapoda	2	36
Diptera	17	2018
Gasterosteiformes	2	280
Gastropoda	17	8041
Hemiptera	20	403
Hirudinea	2	22
Isopoda	1	31
Odonata	10	160
Oligochaeta	1	3
Ostracoda	1	5
Trichoptera	2	16
Tricladida	1	1
Grand Total	**135**	**13,385**

The abundance of aquatic invertebrates in each major taxonomic group differed from their diversity. Coleoptera was the most diverse taxonomic group, but consisted of 9% of the total number of aquatic invertebrates identified. None of the taxonomic groups identified were both most diverse and most abundant, however Tricladida was one of the least diverse groups, and one of the least abundant taxonomic groups identified.

3.3 Notable species

The macroinvertebrates identified in this survey have been designated conservation status classifications, and any notable species are presented in table 2 and figures 1 and 2.

Species highlighted in bold are in the major taxonomic group Coleoptera (beetles). These species have been further investigated to determine their habitat classifications. The 'broad assemblage type' (BAT) designation of M3: Saltmarsh, estuary and mud flat, has been designated to the beetle species *Enrochus halophilus, Agabus conspersus,* the tiny *Ochthebius marinus* as well as the water boatman species *Corixa affinis* and the abundant gammarid *Gammarus deubeni.* The BAT designation of W3: Permanent wet mire, has been designated to the species, *Enochrus quadripunctatus* and *Rhantus frontalis.* The BAT designation of W2: Open water on disturbed mineral sediments, and litter-rich fluctuating marsh, has been designated to the species *Helochares lividus, Dytiscus circumcintus* and *Peltodytes caesus,* as well as the pondweed bug species *Mesovelia furcata*.

Uncommon species of aquatic invertebrate:

Hygrotus parallelogrammus: This small black and yellow water beetle *Hygrotus (Coelambus) parallelogrammus* is most frequently recorded in the coastal marshes of the south-east, though records range to Durham and Cheshire. It is found in brackish dykes and ponds.

Hydrochus brevis: This Hydrochid beetle is a sluggish crawling water beetle with coarse punctures over the thorax resembling dents. *H. brevis* is 3mm long and black, being slightly bulbous in shape and found in brackish water sites.

Enochrus halophilus: this beetle was found abundantly across the site in the more brackish water dykes.

Ochthebius marinus: A clearly halophilic species, but it apparently tolerates very low salinity and may occasionally be found in fresh water far from the coast.

Corix affinis: this backswimmer was found scattered across the site though in low densities and always in the brackish water habitats here.

Sigara selecta: recorded on two occasions, once in 2013 and again in 1954 at the same location of a coastal lagoon.

3.4 Aquatic molluscs

Within the 30 samples taken for this report 22 species of aquatic mollusc were recorded with a total number of 13,385 animals found in the 30 samples.

Bivalva:

Three species of Bivalva were recorded at Shingle Street Marshes, two of which are uncommon species, *Musculum lacustre*, found scattered across the county though only recorded three times during this survey. The other species of interest was duck mussel (*Anodonta anatina)* only found in one sample in the IDB drain. Though several were noted on the banks of the drain which appeared to have been predated, possibly by the local otters or by herons and little egrets that frequent the area.

Gastropoda:

Seventeen species were recorded at Shingle Street Marshes during this survey. Only three species were of interest;

Hydrobia neglecta, this was found in two sample locations at the southern end of the site in the coastal lagoon and nearby brackish dyke. It was found in enormous numbers with upwards of 2,500 in a sample indicating at least 10,000 per metre.

Bithynia leachii, only two specimens were located, they were in the best freshwater habitat on the site in the IDB drain as opposed to the brackish grazing marshes.

Potamopyrgus antipodarum, this was found in 13 samples scattered across the site. This is an introduced species that is common within Suffolk.

Figure 1. Location of notable aquatic beetles across sampling sites Shingle Street Marshes, April to September 2015.

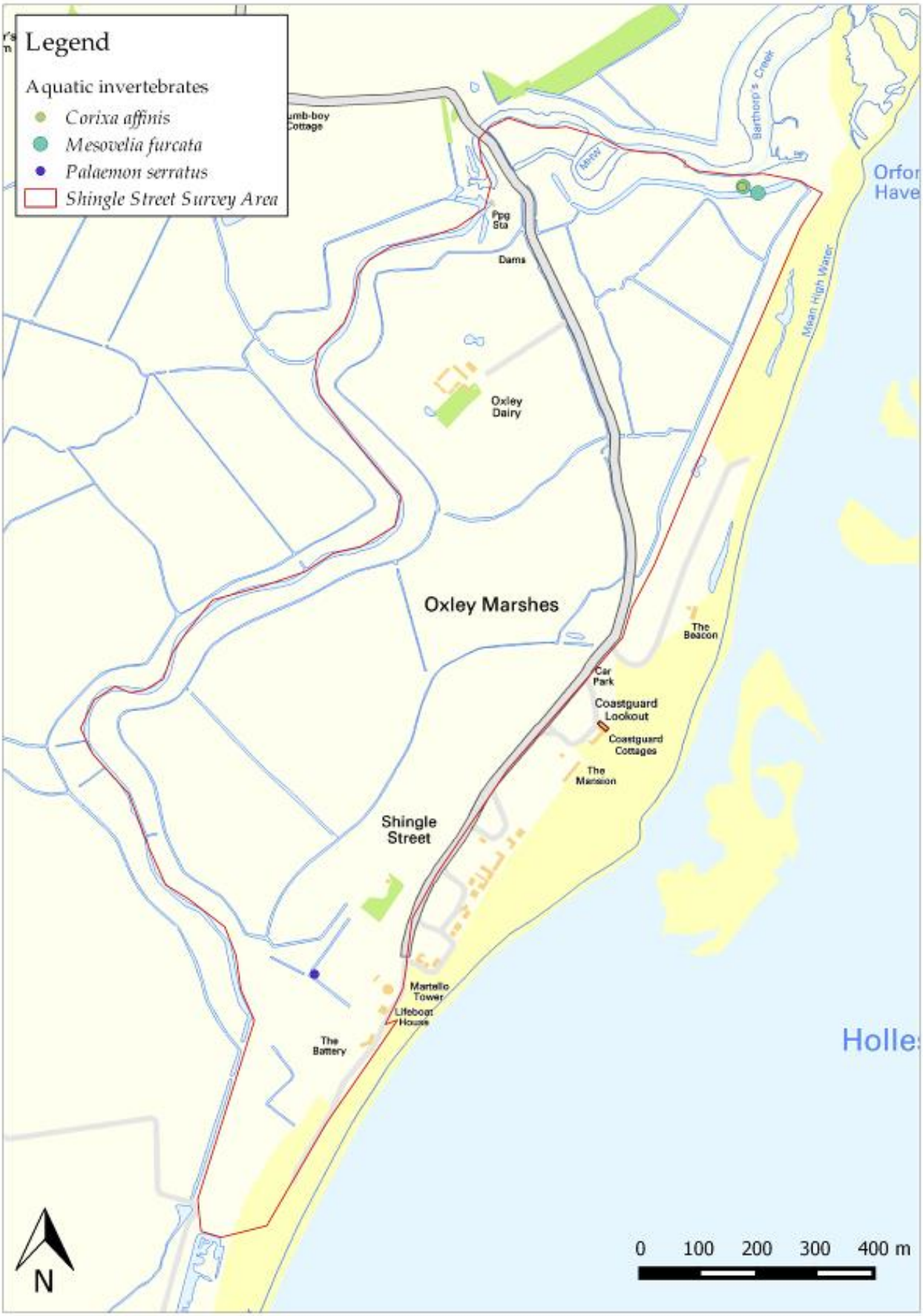


Figure 2. Location of notable aquatic invertebrates (excluding beetles) across sampling sites Shingle Street Marshes, April to September 2015, by Abrehart Ecology.

Table 2. Status classifications of notable species identified at Shingle Street Marshes 2015.

Species	Taxonomic group	Status
Agabus conspersus	Coleoptera	Nb
Anacaena bipustulata	Coleoptera	Nb
Corixa affinis	Hemiptera	Nr
Crangonyx pseudogracilis	Amphipoda	Lc
Dytiscus circumcinctus	Coleoptera	Na
Enochrus halophilus	Coleoptera	Na
Enochrus quadripunctatus	Coleoptera	Nb
Gammarus duebeni	Amphipoda	Lc
Helochares lividus	Coleoptera	Nb
Helophorus alternans	Coleoptera	Na
Hydrobia neglecta	Gastropoda	RDB3
Mesovelia furcata	Hemiptera	Nr
Noterus crassicornis	Coleoptera	Nb
Ochthebius bicolon	Coleoptera	Nb
Ochthebius marinus	Coleoptera	Nb
Peltodytes caesus	Coleoptera	Nb
Rhantus frontalis	Coleoptera	Nb
Rhantus grapii	Coleoptera	Nb

National Status Definitions In the description of species, terms such as 'Common' are used to indicate frequency of occurrence country wide, as far as is established. The following are based on the National Status definitions produced originally by English Nature. RDB1 Endangered: In danger of extinction in Britain RDB2 Vulnerable: Likely to move into the Endangered category in future RDB3 Rare: At risk, with only small populations in Britain Nationally Scarce or Notable Notable a (Na) Notable b (Nb) Uncommon in Britain, estimated to occur in: between 16 – 30 10km squares of the British National Grid between 30 – 100 10km squares of the British National Grid Regionally Scarce (Nr) Infrequent, present in 5 or less 10km squares in any region (a region is approx 1 eighth total area of England Local Confined to a habitat type, a geographic area or widespread but nonetheless infrequently encountered. Occasional Occurring in up to 10% of samples from similar habitats Frequent Occurring in 10-25 % of samples from similar habitats Common Occurring in 25-50% of samples from similar habitats Very Common Occurring in 50-100% of samples from similar habitats.

4.Discussion

Structure and condition of the dyke

The structure and condition of the dykes indicated that a number of the dykes to the west of the road had been cleared within the past year and that the borrowdyke had been cleared out in the past five years. This clearance had removed a considerable amount of silt and debris and created a firm base to many of the dykes. The inland grazing marsh dykes held limited emergent and aquatic macrophytes, with limited poached margins reducing the possible range of habitats for invertebrates.

Patterns of salinity

The salinity across the site was as varied as would be expected on a coastal grazing marsh. With the highest salinities found in the coastal lagoon where it was recorded at up to 40ppt, the borrow dyke was the next highest with 9-11ppt, there will be underlying shingle below the sea wall this will allow a certain amount of percolation into the marshes behind. Especially with the increasing sea levels. Though in general there were high salinities across the site with the exception of the main IDB channel which was consistently fresh water.

General macro-invertebrate diversity of the marshes

A total of 109 species of aquatic invertebrate were identified from 135 taxa across the 30 samples taken from April to September 2015. This shows that the site has a high diversity and a very rich beetle fauna with 41 species noted, the range of Hemiptera was high too with 20 species recorded. The site as a whole has a very high species diversity and is of local or national importance.

Notable species

Sixteen notable species were recorded during this survey. Thirteen of these were beetles (Coleoptera), two were aquatic bugs (Hemiptera) and one was a mollusc (Gastropoda). The majority of these species are found in coastal habitats and have a tolerance to slightly brackish conditions. The distribution of these species across the site showed no discernible pattern, they were evenly distributed around the full range of dykes across the site.

Introduced species

There was only one introduced species found during this survey.

Potamopyrgus antipodarum is a nocturnal grazer, feeding on plant and animal detritus, epiphytic and periphytic algae, sediments and diatoms (Broekhuizen et al. 2001). This species is euryhaline, establishing populations in fresh and brackish water. The optimal salinity is probably near or below 5 ppt, but *P. antipodarum* is capable of feeding, growing, and reproducing at salinities of 0–15 ppt and can tolerate 30–35 ppt for short periods of time (Costil et al. 2001, Gerard et al. 2003, Jacobsen and Forbes 1997, Leppakoski and Olenin 2000, Zaranko et al. 1997). It tolerates temperatures of 0–34°C (Cox and Rutherford 2000, Zaranko et al. 1997).

Impact of Introduction: It may compete for food and space occupied by native snails. It was interesting to note that no native *Hydrobia neglecta* or *Hydrobia ventrosa* were recorded in the borrow dyke, where they would normally be frequent.

Appendix 1: abundance of aquatic invertebrates identified in each sample at Shingle Street. 2015

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Gasterosteiformes	Pungitius pungitius	5	TM3671643911	3
Gastropoda	Radix balthica	4	TM3671643911	3
Bivalvia	Musculium lacustre	5	TM3671643911	3
Gastropoda	Planorbis planorbis	22	TM3671643911	3
Gastropoda	Anisus vortex	42	TM3671643911	3
Arachnida	Spider sp. 1	8	TM3671643911	3
Coleoptera	Carabidae sp. 1	12	TM3671643911	3
Amphipoda	Crangonyx pseudogracilis	3	TM3671643911	3
Isopoda	Asellus aquaticus	1	TM3671643911	3
Gastropoda	Potamopyrgus antipodarum	34	TM3671643911	3
Collembola	Sminthurides aquaticus	108	TM3671643911	3
Coleoptera	Rhantus frontalis	1	TM3671643911	3
Coleoptera	Noterus clavicornis	2	TM3671643911	3
Coleoptera	Hydrobius fuscipes	1	TM3671643911	3
Gastropoda	Valvata cristata	3	TM3671643911	3
Odonata	Coenagrion puella	1	TM3671643911	3
Odonata	Ischnura elegans	1	TM3671643911	3
Coleoptera	Hygrotus inaequalis	5	TM3671643911	3
Coleoptera	Haliplus lineatocollis	1	TM3671643911	3
Coleoptera	Haliplus ruficollis	1	TM3671643911	3
Coleoptera	Hydroporus memnonius	1	TM3671643911	3
Amphipoda	Gammarus duebeni	1	TM3695543709	4
Coleoptera	Peltodytes caesus	1	TM3695543709	4
Coleoptera	Hygrotus inaequalis	3	TM3695543709	4
Coleoptera	Haliplus lineatocollis	1	TM3695543709	4
Trichoptera	Limnephilus affinis	1	TM3695543709	4
Coleoptera	Haliplus ruficollis	1	TM3695543709	4
Coleoptera	Rhantus frontalis	1	TM3695543709	4
Coleoptera	Hydrobius fuscipes	4	TM3695543709	4
Coleoptera	Gyrinus caspius	15	TM3695543709	4
Collembola	Sminthurides aquaticus	11	TM3695543709	4
Diptera	Chironomid sp. 1	50	TM3695543709	4
Coleoptera	Rhantus frontalis	4	TM3669543370	5
Coleoptera	Hygrotus inaequalis	12	TM3669543370	5
Amphipoda	Gammarus duebeni	48	TM3669543370	5
Coleoptera	Hydrobius fuscipes	3	TM3669543370	5
Coleoptera	Gyrinus caspius	1	TM3669543370	5
Coleoptera	Hygrotus impressopunctatus	1	TM3669543370	5
Diptera	Oxycera sp.	9	TM3669543370	5
Arachnida	Spider sp. 1	2	TM3669543370	5
Coleoptera	Carabidae sp. 1	4	TM3669543370	5
Odonata	Coenagrion puella	1	TM3669543370	5
Hemiptera	Saldula saltatoria	1	TM3669543370	5
Coleoptera	Cymbiodyta marginellus	1	TM3669543370	5
Coleoptera	Helophorus brevipalpis	2	TM3669543370	5
Coleoptera	Hydroporus memnonius	5	TM3669543370	5
Coleoptera	Hydroporus incognitus	1	TM3669543370	5
Coleoptera	Ochthebius bicolon	2	TM3669543370	5
Coleoptera	Ochthebius marinus	2	TM3669543370	5
Coleoptera	Enochrus quadripunctatus	9	TM3669543370	5
Coleoptera	Enochrus halophilus	7	TM3669543370	5
Hemiptera	Paracorixa concinna	1	TM3669543370	5
Amphipoda	Gammarus duebeni	59	TM3691443464	6
Coleoptera	Hydrobius fuscipes	4	TM3691443464	6
Coleoptera	Hygrotus impressopunctatus	1	TM3691443464	6
Coleoptera	Carabidae sp. 1	3	TM3691443464	6

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Coleoptera	Hydroporus incognitus	8	TM3691443464	6
Coleoptera	Enochrus quadripunctatus	3	TM3691443464	6
Gasterosteiformes	Pungitius pungitius	1	TM3691443464	6
Coleoptera	Gyrinus caspius	4	TM3691443464	6
Coleoptera	Hygrotus inaequalis	7	TM3691443464	6
Hemiptera	Gerris odontogaster	1	TM3691443464	6
Coleoptera	Agabus sturmii	1	TM3691443464	6
Coleoptera	Haliplus ruficollis	2	TM3691443464	6
Coleoptera	Anacaena bipustulata	2	TM3691443464	6
Coleoptera	Anacaena globulus	1	TM3691443464	6
Hemiptera	Hydrometra stagnorum	1	TM3612543009	7
Coleoptera	Rhantus frontalis	1	TM3612543009	7
Amphipoda	Gammarus duebeni	67	TM3612543009	7
Coleoptera	Hydrobius fuscipes	1	TM3612543009	7
Diptera	Oxycera sp.	1	TM3612543009	7
Arachnida	Spider sp. 1	3	TM3612543009	7
Odonata	Coenagrion puella	1	TM3612543009	7
Coleoptera	Cymbiodyta marginellus	8	TM3612543009	7
Coleoptera	Hydroporus memnonius	2	TM3612543009	7
Coleoptera	Hydroporus incognitus	1	TM3612543009	7
Coleoptera	Ochthebius marinus	1	TM3612543009	7
Coleoptera	Hygrotus inaequalis	25	TM3612543009	7
Coleoptera	Anacaena bipustulata	5	TM3612543009	7
Hemiptera	Plea minutissima	1	TM3612543009	7
Odonata	Ischnura elegans	2	TM3612543009	7
Gasterosteiformes	Pungitius pungitius	7	TM3612543009	7
Diptera	Chironimidae sp.1	5	TM3612543009	7
Diptera	Campsicnemus sp.	2	TM3612543009	7
Coleoptera	Coleoptera sp.	3	TM3612543009	7
Coleoptera	Hyphydrus ovatus	1	TM3612543009	7
Coleoptera	Noterus crassicornis	1	TM3612543009	7
Hemiptera	Microvelia reticulata	11	TM3612543009	7
Hemiptera	Gerris lateralis	1	TM3612543009	7
Coleoptera	Helochares lividus	1	TM3612543009	7
Collembola	Sminthurides aquaticus	2	TM3612543009	7
Isopoda	Asellus aquaticus	3	TM3610142948	8
Gastropoda	Radix balthica	210	TM3610142948	8
Gastropoda	Bithynia tentaculata	105	TM3610142948	8
Gastropoda	Planorbis planorbis	107	TM3610142948	8
Gastropoda	Anisus vortex	19	TM3610142948	8
Oligochaeta	Oligocheata	3	TM3610142948	8
Bivalvia	Sphaerium corneum	7	TM3610142948	8
Trichoptera	Limnephilus affinis	3	TM3610142948	8
Gasterosteiformes	Pungitius pungitius	4	TM3610142948	8
Gastropoda	Physella acuta	1	TM3610142948	8
Coleoptera	Peltodytes caesus	1	TM3610142948	8
Coleoptera	Haliplus ruficollis	3	TM3610142948	8
Coleoptera	Graptodytes pictus	1	TM3610142948	8
Amphipoda	Gammarus pulex	22	TM3610142948	8
Coleoptera	Enochrus halophilus	77	TM3640942392	9
Diptera	Chironimidae sp. 2	21	TM3640942392	9
Coleoptera	Ochthebius marinus	17	TM3640942392	9
Diptera	Stratiomyid sp. 1	5	TM3640942392	9
Diptera	Oxycera sp.	2	TM3640942392	9
Mollusca	Hydrobia neglecta	1759	TM3640942392	9
mollusca	Hydrobia ventrosa	8	TM3640942392	9

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Gastropoda	Potamopyrgus antipodarum	3	TM3640942392	9
Hemiptera	Saldula saltatoria	1	TM3640942392	9
Ostracoda	Ostracoda sp.	5	TM3640942392	9
Amphipoda	Gammarus duebeni	67	TM3640942392	9
Coleoptera	Helochares lividus	1	TM3640942392	9
Gastropoda	Radix balthica	2	TM3640942392	9
Gastropoda	Anisus vortex	1	TM3640942392	9
Amphipoda	Talitrus saltator	9	TM3640942392	9
Diptera	Chironimidae sp.1	3	TM3646542572	10
Coleoptera	Ochthebius marinus	3	TM3646542572	10
Gastropoda	Hydrobia acuta	2471	TM3646542572	10
Trichoptera	Limnephilus affinis	1	TM3646542572	10
Diptera	Campsicnemus sp.	9	TM3646542572	10
Arachnida	Spider sp. 1	5	TM3646542572	10
Odonata	Aeshna mixta	1	TM3646542572	10
Coleoptera	Hydrobius fuscipes	2	TM3646542572	10
Coleoptera	Cymbiodyta marginellus	8	TM3646542572	10
Coleoptera	Noterus crassicornis	1	TM3646542572	10
Coleoptera	Hydroporus incognitus	6	TM3646542572	10
Coleoptera	Anacaena bipustulata	83	TM3646542572	10
Coleoptera	Rhantus grapii	1	TM3646542572	10
Gasterosteiformes	Pungitius pungitius	46	TM3671643911	3
Gasterosteiformes	Gasterosteus aculeatus	31	TM3671643911	3
Isopoda	Asellus aquaticus	17	TM3671643911	3
Gastropoda	Potamopyrgus antipodarum	5	TM3671643911	3
Gastropoda	Radix balthica	271	TM3671643911	3
Gastropoda	Stagnicola fuscus	8	TM3671643911	3
Gastropoda	Planorbis planorbis	445	TM3671643911	3
Gastropoda	Bithynia tentaculata	5	TM3671643911	3
Odonata	Ischnura elegans	2	TM3671643911	3
Gastropoda	Anisus vortex	84	TM3671643911	3
Collembola	Sminthurides aquaticus	81	TM3671643911	3
Trichoptera	Limnephilus affinis	3	TM3671643911	3
Coleoptera	Hygrotus inaequalis	8	TM3671643911	3
Bivalvia	Musculium lacustre	2	TM3671643911	3
Bivalvia	Sphaerium corneum	2	TM3671643911	3
Coleoptera	Hydroporus palustris	2	TM3671643911	3
Coleoptera	Hydroporus angustatus	1	TM3671643911	3
Gastropoda	Bathyomphalus contortus	1	TM3671643911	3
Hemiptera	Cymatia coleoptrata	1	TM3671643911	3
Coleoptera	Haliplus lineatocollis	1	TM3671643911	3
Coleoptera	Ilybius quadriguttatus	1	TM3671643911	3
Hemiptera	Ilyocoris cimicoides	9	TM3720143924	1
Coleoptera	Rhantus frontalis	2	TM3720143924	1
Gasterosteiformes	Pungitius pungitius	13	TM3720143924	1
Coleoptera	Hygrotus inaequalis	33	TM3720143924	1
Hemiptera	Plea minutissima	7	TM3720143924	1
Hemiptera	Corixa sp.	39	TM3720143924	1
Arachnida	Spider sp. 1	4	TM3720143924	1
Gastropoda	Radix balthica	7	TM3720143924	1
Gastropoda	Armiger crista	1	TM3720143924	1
Gastropoda	Potamopyrgus antipodarum	2	TM3720143924	1
Gastropoda	Anisus vortex	1	TM3720143924	1
Diptera	Chironomid sp. 1	93	TM3720143924	1
Coleoptera	Hyphydrus ovatus	1	TM3720143924	1
Amphipoda	Gammarus duebeni	9	TM3720143924	1

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Hemiptera	Notonecta glauca	1	TM3720143924	1
Odonata	Brachytron pratense	2	TM3720143924	1
Odonata	Aeshna mixta	19	TM3720143924	1
Odonata	Enallagma cyathigerum	2	TM3720143924	1
Diptera	Stratiomyid sp. 1	3	TM3720143924	1
Odonata	Libellula quadrimaculata	8	TM3720143924	1
Odonata	Sympetrum striolatum	3	TM3720143924	1
Hemiptera	Mesovelia furcata	1	TM3720143924	1
Coleoptera	Haliplus ruficollis	1	TM3720143924	1
Hemiptera	Gerris thoracicus	8	TM3720143924	1
Hemiptera	Gerris lacustris	3	TM3720143924	1
Coleoptera	Gyrinus sp.	3	TM3720143924	1
Collembola	Sminthurides aquaticus	2	TM3720143924	1
Gasterosteiformes	Pungitius pungitius	4	TM3728443882	2
Coleoptera	Hygrotus inaequalis	3	TM3728443882	2
Hemiptera	Corixa sp.	8	TM3728443882	2
Diptera	Chironimidae sp.1	189	TM3728443882	2
Amphipoda	Gammarus duebeni	25	TM3728443882	2
Hemiptera	Notonecta glauca	1	TM3728443882	2
Odonata	Aeshna mixta	2	TM3728443882	2
Coleoptera	Gyrinus sp.	3	TM3728443882	2
Collembola	Sminthurides aquaticus	5	TM3728443882	2
Coleoptera	Coleoptera sp.	12	TM3728443882	2
Hemiptera	Paracorixa concinna	2	TM3728443882	2
Coleoptera	Helophorus brevipalpis	2	TM3728443882	2
Gasterosteiformes	Gasterosteus aculeatus	1	TM3692843481	6
Gasterosteiformes	Pungitius pungitius	3	TM3692843481	6
Gastropoda	Potamopyrgus antipodarum	2	TM3692843481	6
Gastropoda	Radix balthica	3	TM3692843481	6
Coleoptera	Hygrotus inaequalis	5	TM3692843481	6
Odonata	Libellula quadrimaculata	2	TM3692843481	6
Diptera	Chironimidae sp.1	35	TM3692843481	6
Hemiptera	Sigara sp.	14	TM3692843481	6
Odonata	Sympetrum striolatum	1	TM3692843481	6
Coleoptera	Gyrinus caspius	4	TM3692843481	6
Coleoptera	Cercyon sp.	1	TM3692843481	6
Coleoptera	Hydroporus incognitus	1	TM3692843481	6
Coleoptera	Gyrinus substriatus	1	TM3692843481	6
Gasterosteiformes	Gasterosteus aculeatus	7	TM3669843373	5
Gasterosteiformes	Pungitius pungitius	8	TM3669843373	5
Gastropoda	Radix balthica	1	TM3669843373	5
Coleoptera	Hygrotus inaequalis	8	TM3669843373	5
Coleoptera	Hydroporus palustris	2	TM3669843373	5
Coleoptera	Rhantus frontalis	3	TM3669843373	5
Diptera	Tipula sp.	1	TM3669843373	5
Odonata	Libellula quadrimaculata	3	TM3669843373	5
Odonata	Enallagma cyathigerum	1	TM3669843373	5
Odonata	Ischnura elegans	1	TM3669843373	5
Diptera	Chironimidae sp.1	52	TM3669843373	5
Amphipoda	Gammarus duebeni	17	TM3669843373	5
Hemiptera	Sigara sp.	23	TM3669843373	5
Odonata	Sympetrum striolatum	1	TM3669843373	5
Odonata	Aeshna mixta	1	TM3669843373	5
Coleoptera	Enochrus quadripunctatus	3	TM3669843373	5
Hemiptera	Sigara falleni	1	TM3669843373	5
Coleoptera	Hygrotus impressopunctatus	3	TM3669843373	5

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Coleoptera	Helophorus brevipalpis	8	TM3669843373	5
Coleoptera	Hydrobius fuscipes	4	TM3669843373	5
Coleoptera	Helophorus alternans	5	TM3669843373	5
Coleoptera	Enochrus fuscipennis	1	TM3669843373	5
Coleoptera	Rhantus grapii	1	TM3669843373	5
Coleoptera	Ochthebius marinus	2	TM3669843373	5
Coleoptera	Hydroporus incognitus	3	TM3669843373	5
Coleoptera	Ilybius quadriguttatus	1	TM3669843373	5
Coleoptera	Gyrinus substriatus	1	TM3669843373	5
Coleoptera	Enochrus halophilus	5	TM3669843373	5
Gasterosteiformes	Pungitius pungitius	8	TM3695543720	4
Gasterosteiformes	Gasterosteus aculeatus	3	TM3695543720	4
Coleoptera	Hygrotus inaequalis	12	TM3695543720	4
Coleoptera	Rhantus frontalis	2	TM3695543720	4
Diptera	Tipula sp. 1	1	TM3695543720	4
Coleoptera	Noterus clavicornis	7	TM3695543720	4
Gastropoda	Galba trancatuluta	1	TM3695543720	4
Odonata	Libellula quadrimaculata	2	TM3695543720	4
Odonata	Enallagma cyathigerum	3	TM3695543720	4
Odonata	Ischnura elegans	2	TM3695543720	4
Diptera	Chironimidae sp. 2	119	TM3695543720	4
Coleoptera	Coleoptera sp.	3	TM3695543720	4
Coleoptera	Gyrinus sp.	1	TM3695543720	4
Amphipoda	Gammarus duebeni	3	TM3695543720	4
Coleoptera	Hygrotus impressopunctatus	1	TM3695543720	4
Coleoptera	Helophorus brevipalpis	5	TM3695543720	4
Coleoptera	Hydrobius fuscipes	1	TM3695543720	4
Coleoptera	Helophorus alternans	1	TM3695543720	4
Coleoptera	Gyrinus caspius	2	TM3695543720	4
Hemiptera	Gerris thoracicus	2	TM3695543720	4
Coleoptera	Enochrus fuscipennis	1	TM3695543720	4
Coleoptera	Haliplus lineatocollis	1	TM3695543720	4
Coleoptera	Rhantus grapii	1	TM3695543720	4
Gasterosteiformes	Gasterosteus aculeatus	3	TM3610142948	8
Gastropoda	Planorbis planorbis	142	TM3610142948	8
Gastropoda	Anisus vortex	91	TM3610142948	8
Coleoptera	Hygrotus inaequalis	1	TM3610142948	8
Diptera	Stratiomyid sp. 1	2	TM3610142948	8
Coleoptera	Coleoptera sp.	2	TM3610142948	8
Odonata	Aeshna mixta	2	TM3610142948	8
Odonata	Libellula quadrimaculata	1	TM3610142948	8
Odonata	Coenagrion sp.	2	TM3610142948	8
Odonata	Ischnura elegans	1	TM3610142948	8
Coleoptera	Noterus clavicornis	1	TM3610142948	8
Coleoptera	Enochrus halophilus	1	TM3610142948	8
Gastropoda	Radix balthica	167	TM3610142948	8
Gastropoda	Bithynia tentaculata	329	TM3610142948	8
Gastropoda	Bithynia leachii	2	TM3610142948	8
Gastropoda	Physa fontinalis	18	TM3610142948	8
Bivalvia	Sphaerium corneum	36	TM3610142948	8
Bivalvia	Musculium lacustre	3	TM3610142948	8
Gastropoda	Lymnaea stagnalis	1	TM3610142948	8
Gastropoda	Potamopyrgus antipodarum	3	TM3610142948	8
Amphipoda	Gammarus pulex	17	TM3610142948	8
Isopoda	Asellus aquaticus	2	TM3610142948	8
Gastropoda	Valvata piscinalis	1	TM3610142948	8

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Collembola	Sminthurides aquaticus	3	TM3610142948	8
Trichoptera	Limnephilus affinis	1	TM3610142948	8
Hirudinea	Glossiphonia complanata	1	TM3610142948	8
Coleoptera	Graptodytes pictus	1	TM3610142948	8
Bivalvia	Anodonta anatina	9	TM3610142948	8
Coleoptera	Helophorus brevipalpis	1	TM3610142948	8
Coleoptera	Haliplus ruficollis	4	TM3610142948	8
Trichoptera	Mystacides longicornis	1	TM3610142948	8
Gasterosteiformes	Gasterosteus aculeatus	11	TM3612143014	7
Gasterosteiformes	Pungitius pungitius	37	TM3612143014	7
Gastropoda	Planorbis planorbis	4	TM3612143014	7
Gastropoda	Anisus vortex	5	TM3612143014	7
Coleoptera	Hygrotus inaequalis	21	TM3612143014	7
Hemiptera	Notonecta sp.	1	TM3612143014	7
Diptera	Chironimidae sp.1	19	TM3612143014	7
Diptera	Stratiomyid sp. 1	5	TM3612143014	7
Diptera	Tipula sp.	3	TM3612143014	7
Coleoptera	Coleoptera sp.	24	TM3612143014	7
Hemiptera	Corixa sp.	7	TM3612143014	7
Coleoptera	Gyrinidae larvae	3	TM3612143014	7
Hemiptera	Gerris sp.	1	TM3612143014	7
Odonata	Aeshna grandis	1	TM3612143014	7
Odonata	Aeshna mixta	5	TM3612143014	7
Odonata	Brachytron pratense	1	TM3612143014	7
Odonata	Libellula quadrimaculata	1	TM3612143014	7
Odonata	Coenagrion sp.	9	TM3612143014	7
Amphipoda	Gammarus duebeni	8	TM3612143014	7
Odonata	Ischnura elegans	2	TM3612143014	7
Coleoptera	Hyphydrus ovatus	1	TM3612143014	7
Coleoptera	Ochthebius marinus	1	TM3612143014	7
Coleoptera	Noterus clavicornis	1	TM3612143014	7
Hemiptera	Microvelia reticulata	28	TM3612143014	7
Coleoptera	Agabus sturmii	1	TM3612143014	7
Coleoptera	Hydroporus incognitus	24	TM3612143014	7
Coleoptera	Hydroporus palustris	3	TM3612143014	7
Coleoptera	Enochrus halophilus	1	TM3612143014	7
Coleoptera	Enochrus quadripunctatus	1	TM3612143014	7
Coleoptera	Laccobius striatulus	1	TM3612143014	7
Coleoptera	Gyrinus caspius	2	TM3612143014	7
Coleoptera	Gyrinus marinus	1	TM3612143014	7
Coleoptera	Gyrinus substriatus	2	TM3612143014	7
Gasterosteiformes	Gasterosteus aculeatus	3	TM3640642396	9
Gasterosteiformes	Pungitius pungitius	1	TM3640642396	9
Diptera	Tipula sp.	5	TM3640642396	9
Gastropoda	Hydrobia acuta	230	TM3640642396	9
Coleoptera	Enochrus halophilus	28	TM3640642396	9
Coleoptera	Ochthebius marinus	35	TM3640642396	9
Coleoptera	Helophorus brevipalpis	2	TM3640642396	9
Coleoptera	Hydrophilidae sp.	15	TM3640642396	9
Coleoptera	Hydrochus brevis	16	TM3640642396	9
Diptera	Chironimidae sp.1	163	TM3640642396	9
Gastropoda	Hydrobia acuta	518	TM3646542572	10
Gastropoda	Radix balthica	3	TM3646542572	10
Gastropoda	Physa fontinalis	1	TM3646542572	10
Gastropoda	Planorbis planorbis	2	TM3646542572	10
Gastropoda	Anisus vortex	2	TM3646542572	10

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Diptera	Chironimidae sp.1	19	TM3646542572	10
Hemiptera	Gerris sp.	1	TM3646542572	10
Gastropoda	Bithynia tentaculata	2	TM3646542572	10
Odonata	Aeshna mixta	3	TM3646542572	10
Decapoda	Palaemon sp.	18	TM3646542572	10
Amphipoda	Gammarus duebeni	41	TM3646542572	10
Decapoda	Palaemon serratus	18	TM3646542572	10
Hemiptera	Ilyocoris cimicoides	2	TM3722643913	1
Hemiptera	Nepa cinerea	1	TM3722643913	1
Hemiptera	Mesovelia furcata	14	TM3722643913	1
Gasterosteiformes	Gasterosteus aculeatus	6	TM3722643913	1
Gasterosteiformes	Pungitius pungitius	6	TM3722643913	1
Gasterosteiformes	Fish fry	9	TM3722643913	1
Coleoptera	Dytiscidae larvae	23	TM3722643913	1
Coleoptera	Hydrobius fuscipes	1	TM3722643913	1
Hemiptera	Plea minutissima	43	TM3722643913	1
Coleoptera	Peltodytes caesus	5	TM3722643913	1
Coleoptera	Noterus clavicornis	1	TM3722643913	1
Odonata	Coenagrion sp.	22	TM3722643913	1
Odonata	Coenagrion puella	3	TM3722643913	1
Odonata	Ischnura elegans	1	TM3722643913	1
Hemiptera	Corixa sp.	2	TM3722643913	1
Hemiptera	Sigara sp.	18	TM3722643913	1
Diptera	Chironimidae sp.1	29	TM3722643913	1
Gastropoda	Potamopyrgus antipodarum	2	TM3722643913	1
Gastropoda	Cepaea nemoralis	1	TM3722643913	1
Coleoptera	Hygrotus inaequalis	9	TM3722643913	1
Hemiptera	Notonecta maculata	2	TM3722643913	1
Diptera	Tipula sp.	1	TM3722643913	1
Diptera	Oxycera sp.	2	TM3722643913	1
Crambid	Crambidae sp. 1	1	TM3722643913	1
Amphipoda	Gammarus duebeni	28	TM3722643913	1
Hemiptera	Gerris sp.	4	TM3722643913	1
Hemiptera	Gerris lateralis	2	TM3722643913	1
Hemiptera	Hebrus ruficeps	1	TM3722643913	1
Coleoptera	Ochthebius marinus	1	TM3722643913	1
Coleoptera	Helochares lividus	1	TM3722643913	1
Coleoptera	Anacaena globulus	2	TM3722643913	1
Coleoptera	Haliplus lineatocollis	14	TM3722643913	1
Coleoptera	Haliplus ruficollis	13	TM3722643913	1
Coleoptera	Haliplus sp.	8	TM3722643913	1
Hemiptera	Sigara stagnalis	8	TM3722643913	1
Arachnida	Spider sp. 1	1	TM3722643913	1
Hemiptera	Ilyocoris cimicoides	22	TM3719943924	1
Gastropoda	Cepaea nemoralis	1	TM3719943924	1
Gastropoda	Radix balthica	10	TM3719943924	1
Gastropoda	Potamopyrgus antipodarum	3	TM3719943924	1
Collembola	Sminthurides aquaticus	2	TM3719943924	1
Amphipoda	Gammarus duebeni	6	TM3719943924	1
Diptera	Chironimidae sp.1	19	TM3719943924	1
Gastropoda	Armiger crista	3	TM3719943924	1
Gastropoda	Stagnicola fuscus	1	TM3719943924	1
Hemiptera	Plea minutissima	8	TM3719943924	1
Coleoptera	Noterus clavicornis	16	TM3719943924	1
Coleoptera	Peltodytes caesus	2	TM3719943924	1
Coleoptera	Hygrotus inaequalis	3	TM3719943924	1

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Coleoptera	Hydroporus memnonius	1	TM3719943924	1
Gasterosteiformes	Pungitius pungitius	1	TM3719943924	1
Coleoptera	Dytiscus circumcinctus	2	TM3719943924	1
Coleoptera	Gyrinus substriatus	2	TM3719943924	1
Coleoptera	Enochrus fuscipennis	2	TM3719943924	1
Coleoptera	Haliplus lineatocollis	3	TM3719943924	1
Hemiptera	Gerris odontogaster	1	TM3719943924	1
Hemiptera	Gerris lacustris	2	TM3719943924	1
Diptera	Stratiomyid sp. 1	1	TM3719943924	1
Diptera	Clinocera sp.	6	TM3719943924	1
Diptera	Campsicnemus sp.	1	TM3719943924	1
Odonata	Ischnura elegans	2	TM3719943924	1
Hemiptera	Corixa affinis	2	TM3719943924	1
Hemiptera	Sigara stagnalis	2	TM3719943924	1
Hemiptera	Corixa punctata	1	TM3719943924	1
Amphipoda	Gammarus duebeni	6	TM3722200000	2
Diptera	Chironomid sp. 1	38	TM3722200000	2
Gasterosteiformes	Pungitius pungitius	1	TM3722200000	2
Hemiptera	Gerris thoracicus	1	TM3722200000	2
Diptera	Clinocera sp.	2	TM3722200000	2
Diptera	Campsicnemus sp.	1	TM3722200000	2
Odonata	Ischnura elegans	1	TM3722200000	2
Hemiptera	Sigara stagnalis	3	TM3722200000	2
Trichoptera	Limnephilus affinis	4	TM3722200000	2
Coleoptera	Haliplus ruficollis	1	TM3722200000	2
Gastropoda	Anisus vortex	101	TM3722200000	2
Gastropoda	Planorbis planorbis	62	TM3722200000	2
Gastropoda	Radix balthica	15	TM3722200000	2
Gastropoda	Potamopyrgus antipodarum	25	TM3722200000	2
Gastropoda	Cepaea nemoralis	1	TM3727443865	2
Arachnida	Spider sp. 1	2	TM3727443865	2
Diptera	Chironimidae sp.1	3	TM3727443865	2
Isopoda	Asellus aquaticus	1	TM3727443865	2
Amphipoda	Gammarus duebeni	53	TM3727443865	2
Coleoptera	Anacaena globulus	3	TM3727443865	2
Coleoptera	Helochares lividus	3	TM3727443865	2
Coleoptera	Hydroporus palustris	2	TM3727443865	2
Coleoptera	Hydroporus incognitus	1	TM3727443865	2
Gasterosteiformes	Pungitius pungitius	2	TM3707543834	3
Coleoptera	Anacaena globulus	2	TM3707543834	3
Coleoptera	Hydroporus palustris	1	TM3707543834	3
Coleoptera	Hydroporus incognitus	2	TM3707543834	3
Trichoptera	Limnephilus affinis	1	TM3707543834	3
Odonata	Coenagrion puella	1	TM3707543834	3
Hemiptera	Plea minutissima	1	TM3707543834	3
Coleoptera	Hygrotus inaequalis	2	TM3707543834	3
Gastropoda	Planorbis planorbis	236	TM3707543834	3
Gastropoda	Radix balthica	40	TM3707543834	3
Gastropoda	Anisus vortex	44	TM3707543834	3
Gastropoda	Stagnicola fuscus	31	TM3707543834	3
Gastropoda	Potamopyrgus antipodarum	3	TM3707543834	3
Coleoptera	Enochrus quadripunctatus	1	TM3707543834	3
Coleoptera	Rhantus frontalis	2	TM3696043706	4
Coleoptera	Noterus clavicornis	1	TM3696043706	4
Coleoptera	Noterus sp.	8	TM3696043706	4
Coleoptera	Hygrotus inaequalis	1	TM3696043706	4

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Diptera	Chironomid sp. 1	14	TM3696043706	4
Diptera	Dixa sp.	1050	TM3696043706	4
Odonata	Ischnura elegans	13	TM3696043706	4
Odonata	Aeshna mixta	14	TM3696043706	4
Odonata	Aeshna grandis	2	TM3696043706	4
Amphipoda	Gammarus duebeni	1	TM3696043706	4
Hemiptera	Gerris lacustris	1	TM3696043706	4
Coleoptera	Ochthebius marinus	3	TM3696043706	4
Coleoptera	Haliplus ruficollis	1	TM3696043706	4
Coleoptera	Anacaena limbata	1	TM3696043706	4
Coleoptera	Gyrinus caspius	2	TM3696043706	4
Coleoptera	Enochrus quadripunctatus	1	TM3696043706	4
Coleoptera	Rhantus grapii	1	TM3696043706	4
Coleoptera	Agabus conspersus	1	TM3696043706	4
Coleoptera	Noterus clavicornis	4	TM3671043362	5
Coleoptera	Hygrotus inaequalis	1	TM3671043362	5
Diptera	Dixa sp.	2	TM3671043362	5
Odonata	Ischnura elegans	1	TM3671043362	5
Amphipoda	Gammarus duebeni	4	TM3671043362	5
Hemiptera	Gerris lacustris	1	TM3671043362	5
Coleoptera	Ochthebius marinus	1	TM3671043362	5
Coleoptera	Gyrinus caspius	2	TM3671043362	5
Gasterosteiformes	Gasterosteus aculeatus	3	TM3671043362	5
Gasterosteiformes	Pungitius pungitius	3	TM3671043362	5
Hemiptera	Nepa cinerea	2	TM3671043362	5
Gastropoda	Potamopyrgus antipodarum	4	TM3671043362	5
Arachnida	Spider sp. 1	1	TM3671043362	5
Coleoptera	Agabus nebulosus	1	TM3671043362	5
Coleoptera	Hydrobius fuscipes	2	TM3671043362	5
Coleoptera	Haliplus lineatocollis	1	TM3671043362	5
Coleoptera	Anacaena globulus	3	TM3671043362	5
Coleoptera	Hydroporus incognitus	2	TM3671043362	5
Coleoptera	Hydroporus memnonius	1	TM3671043362	5
Coleoptera	Hygrotus impressopunctatus	1	TM3671043362	5
Hemiptera	Sigara stagnalis	18	TM3671043362	5
Coleoptera	Cymbiodyta marginellus	2	TM3671043362	5
Coleoptera	Agabus bipustulatus	1	TM3671043362	5
Hemiptera	Callicorixa praeusta	35	TM3671043362	5
Coleoptera	Enochrus halophilus	3	TM3671043362	5
Gasterosteiformes	Gasterosteus aculeatus	9	TM3629143024	6
Gastropoda	Radix balthica	1	TM3629143024	6
Gastropoda	Potamopyrgus antipodarum	13	TM3629143024	6
Collembola	Sminthurides aquaticus	3	TM3629143024	6
Crambid	Crambidae sp. 1	2	TM3629143024	6
Hemiptera	Corixa sp.	2	TM3629143024	6
Isopoda	Asellus aquaticus	2	TM3629143024	6
Diptera	Chironimidae sp.1	2	TM3629143024	6
Diptera	Oxycera sp.	1	TM3629143024	6
Odonata	Coenagrion sp.	3	TM3629143024	6
Odonata	Ischnura elegans	1	TM3629143024	6
Arachnida	Spider sp. 1	1	TM3629143024	6
Hemiptera	Callicorixa praeusta	7	TM3629143024	6
Hemiptera	Sigara stagnalis	2	TM3629143024	6
Diptera	Dixa sp.	1	TM3629143024	6
Amphipoda	Gammarus duebeni	70	TM3629143024	6
Coleoptera	Anacaena globulus	4	TM3629143024	6

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Coleoptera	Cymbiodyta marginellus	1	TM3629143024	6
Coleoptera	Helochares lividus	1	TM3629143024	6
Coleoptera	Enochrus quadripunctatus	1	TM3629143024	6
Coleoptera	Ochthebius marinus	4	TM3629143024	6
Coleoptera	Gyrinus caspius	9	TM3629143024	6
Coleoptera	Hydrochus brevis	1	TM3629143024	6
Odonata	Aeshna grandis	1	TM3613243014	7
Gasterosteiformes	Gasterosteus aculeatus	8	TM3613243014	7
Gasterosteiformes	Pungitius pungitius	28	TM3613243014	7
Hemiptera	Nepa cinerea	1	TM3613243014	7
Coleoptera	Hydrobius fuscipes	2	TM3613243014	7
Coleoptera	Rhantus frontalis	1	TM3613243014	7
Gastropoda	Cepaea nemoralis	5	TM3613243014	7
Gastropoda	Potamopyrgus antipodarum	9	TM3613243014	7
Isopoda	Asellus aquaticus	4	TM3613243014	7
Coleoptera	Noterus clavicornis	58	TM3613243014	7
Coleoptera	Hygrotus inaequalis	21	TM3613243014	7
Diptera	Tipula sp.	1	TM3613243014	7
Diptera	Oxycera sp.	1	TM3613243014	7
Diptera	Chironimidae sp.1	3	TM3613243014	7
Diptera	Dixa sp.	4	TM3613243014	7
Amphipoda	Gammarus duebeni	28	TM3613243014	7
Coleoptera	Hydroporus incognitus	26	TM3613243014	7
Odonata	Aeshna mixta	1	TM3613243014	7
Coleoptera	Anacaena globulus	11	TM3613243014	7
Coleoptera	Anacaena limbata	3	TM3613243014	7
Coleoptera	Hyphydrus ovatus	1	TM3613243014	7
Coleoptera	Agabus bipustulatus	1	TM3613243014	7
Coleoptera	Ilybius ater	1	TM3613243014	7
Coleoptera	Haliplus ruficollis	5	TM3613243014	7
Diptera	Dixa sp.	7	TM3707543831	8
Amphipoda	Gammarus duebeni	1	TM3707543831	8
Coleoptera	Hydroporus incognitus	6	TM3707543831	8
Coleoptera	Anacaena globulus	3	TM3707543831	8
Coleoptera	Hydroporus memnonius	1	TM3707543831	8
Coleoptera	Colymbetes fuscus	2	TM3707543831	8
Coleoptera	Hydrobius fuscipes	1	TM3707543831	8
Coleoptera	Ochthebius marinus	3	TM3707543831	8
Coleoptera	Hydroporus sp.	8	TM3707543831	8
Gasterosteiformes	Gasterosteus aculeatus	6	TM3663943171	9
Gasterosteiformes	Pungitius pungitius	1	TM3663943171	9
Hemiptera	Nepa cinerea	3	TM3663943171	9
Arachnida	Spider sp. 1	2	TM3663943171	9
Odonata	Ischnura elegans	3	TM3663943171	9
Diptera	Chironimidae sp.1	4	TM3663943171	9
Amphipoda	Gammarus duebeni	275	TM3663943171	9
Coleoptera	Colymbetes fuscus	1	TM3663943171	9
Coleoptera	Ochthebius marinus	1	TM3663943171	9
Diptera	Tabanus sp.	2	TM3663943171	9
Hemiptera	Notonecta maculata	1	TM3663943171	9
Hemiptera	Gerris sp.	1	TM3663943171	9
Hemiptera	Sigara stagnalis	7	TM3663943171	9
Coleoptera	Cymbiodyta marginellus	1	TM3663943171	9
Odonata	Aeshna cyanea	1	TM3612042925	10
Gastropoda	Lymnaea stagnalis	2	TM3612042925	10
Gastropoda	Bithynia tentaculata	51	TM3612042925	10

MAJOR GROUP NAME	Species	Number of individuals	Grid reference	Sample name
Gastropoda	Radix balthica	12	TM3612042925	10
Gastropoda	Physa fontinalis	6	TM3612042925	10
Gastropoda	Planorbis planorbis	130	TM3612042925	10
Gastropoda	Anisus vortex	80	TM3612042925	10
Bivalvia	Sphaerium corneum	16	TM3612042925	10
Hemiptera	Ilyocoris cimicoides	3	TM3612042925	10
Coleoptera	Noterus clavicornis	1	TM3612042925	10
Isopoda	Asellus aquaticus	1	TM3612042925	10
Coleoptera	Peltodytes caesus	2	TM3612042925	10
Trichoptera	Limnephilus affinis	1	TM3612042925	10
Gasterosteiformes	Pungitius pungitius	1	TM3612042925	10
Diptera	Tipula sp.	7	TM3612042925	10
Amphipoda	Gammarus pulex	8	TM3612042925	10
Tricladida	Polycelis nigra	1	TM3612042925	10
Arachnida	Spider sp. 1	2	TM3612042925	10
Coleoptera	Ochthebius marinus	1	TM3612042925	10
Coleoptera	Hygrotus inaequalis	1	TM3612042925	10
Coleoptera	Graptodytes pictus	2	TM3612042925	10
Coleoptera	Haliplus lineatocollis	19	TM3612042925	10
Coleoptera	Haliplus ruficollis	3	TM3612042925	10
Coleoptera	Haliplus sp.	8	TM3612042925	10
Coleoptera	Anacaena globulus	2	TM3612042925	10
Coleoptera	Anacaena limbata	1	TM3612042925	10
Hirudinea	Glossiphonia complanata	20	TM3612042925	10
Hemiptera	Corixa sp.	3	TM3612042925	10
Coleoptera	Coleoptera sp.	3	TM3612042925	10
Hirudinea	Erpobdella testacea	1	TM3612042925	10
Coleoptera	Enochrus fuscipennis	6	TM3612042925	10

Pound Farm
Low Road
Great Glemham
Suffolk IP17 2DQ
Tel: 01728 663282 - 07798 941555

e-mail: toby@abrehartecology.com

Website: abrehartecology.com

Appendix D: NVC survey report

An NVC survey of areas outside the SSSI at Shingle Street, Suffolk.

Carried out for:

The Shingle Street community

2015

Prepared by:
Abrehart Ecology
Pound Farm
Low Road
Great Glemham
Suffolk IP17 2DQ
Tel: 01728 663282 - 07798 941555
e-mail: toby@abrehartecology.com
Website: abrehartecology.com

TABLE OF CONTENTS

1. INTRODUCTION

Abrehart Ecology was commissioned by J. Mynott and the Shingle Street community to undertake a National Vegetation Survey of the area of land outside the SSSI as demarked in Figure 1.

2. METHODS

2.1Field survey method

Fieldwork was carried out on 3rd June 2015 with reference to the standard NVC survey techniques described by Rodwell (1991, 1992, 1995; 2000, 2006) and Sneddon & Randall (1993). Survey methods appropriate to each habitat were used to carry out this survey.

Firstly, during a walkover survey of the survey area homogenous stands of vegetation, in terms of their botanical content and structure, were identified and recorded in the form of hand drawn habitat maps on printed high resolution aerial images. The NVC community of each stand was noted on the map for verification at a later stage using quadrat data.

Quadrat sampling of the vegetation within each homogenous stand was then carried out to 'ground-truth' the habitat mapping process. Where possible, a minimum of two quadrat samples were recorded in each vegetation type per SSSI unit. Each quadrat was 2x2 m, with the exception of vegetation stands where the vegetation structure dictated that this was not appropriate, for example, small pure stands were recorded in their entirety and the total area of the vegetation was noted (e.g. 2x5m or 1x4m). Firstly, a short written description of the vegetation was recorded along with the location (10 figure grid reference), substrate, aspect and slope angle. Within each quadrat the botanical composition was recorded as percentage cover of each species, in addition the structure was recorded through estimations of the average height of each visually distinct layer of vegetation and the percentage cover of each layer.

Stands of vegetation consistently composed of more than one NVC community were recorded as 'mosaics'. These mosaics often occurred in undulating habitats and where it was not possible to distinguish between vegetation communities in the habitat mapping process. Surveyors aimed to record at least one quadrat in each community comprising the mosaic to fully record its' botanical composition. The component vegetation communities of the mosaic were recorded alongside their percentage cover of the total mosaic area. For example, SM24(50%) + S4(50%) indicates a mosaic of SM24 *Elytrigia pycnanthus* grassland and S4 *Phragmites australis* reedbed communities both of which occupy half of the total area of the mosaic.

In addition to on site habitat mapping and quadrat data collection, the location and abundance of any locally or nationally rare flora or fauna species was also recorded. Furthermore, notes were made to cover all features and characteristics of the site considered important, these included comments on management, subjective views on habitat quality and any issues arising from these.

The raw data collected during the field work phase on the survey was processed and analysed using the methods set out in Section 2.2.

Please refer to Results for a full list of the NVC communities and sub-communities used to record the vegetation. Please note that shingle communities were recorded according to Sneddon & Randall (1993) shingle community classification. This system was considered more appropriate and informative than the Rodwell editions classification for shingle vegetation.

2.2Data analysis method

Vegetation (sub) community finalisation

The botanical composition data collected for each quadrat was assessed with reference to Rodwell (1991a; 1991b; 1992, 1995 and 2000) and Sneddon & Randall (2000) to finalise an NVC community or preferably sub-community for each quadrat. In addition, the data was run through MAVIS software to validate the choice of (sub) community. A final assessment of the (sub) community for each quadrat was made by the field surveyor once all of the information was presented.

The quadrat data was then used to validate the (sub) community assigned to each vegetation stand defined in the habitat mapping carried out in the field.

The hand drawn maps were then digitised in GIS using georeferenced, high resolution aerial photography of the SSSI and surrounding site from 2011 and 2012, at a scale of between 1:400 and 1:2000 depending on the complexity of the habitat.

Please note that 10 figure grid references for each quadrat were collected using a handheld GPS unit accurate at best to 5 ft. and at worst to 10 ft., therefore there are some discrepancies in the location of quadrats and corresponding habitat polygons, especially in highly complex habitats.

3. RESULTS

The following sections present the results of the Shingle Street NVC survey of 2015. Firstly, Sections 3.2- 3.10 give details of the location, extent, botanical composition, structure and form of each (sub) community. Refer to Appendix B for habitat maps.

Secondly, Section 3.11 describes records of species of conservation interest. Refer to Figure 2 for maps of species of conservation interest distribution.

3.1 Introduction

The communities discussed below are grouped into broad categories and discussed in a community and sub-community level in the sections below.

32 sub-communities were recorded in the survey area, from nine main vegetation groups (table 1)

Table 1: Areas of all habitat communities found during the NVC survey at Shingle Street. 2015

Main communities	**Area in hectares**
Vegetated Shingle	2.75
Saltmarsh	2.29
Driftline grasslands	2.20
Mesotrophic grassland	81.72
Acid grassland	1.39
Aquatic	1.54
Marginal	6.95
Open vegetation	0.37
Scrub	2.09
Total	101.29

3.2 Shingle communities

The site held only a small amount of vegetated shingle covering 2.06 hectares of the survey area.

SH40 Arrhenatherum elatius - Festuca rubra - Silene uniflora - Hypochaeris radicata grassland community

Structure and form

This community is a stable mature grassland, away from the close influences of the sea. There may be localised disturbance in the community with over grazing by rabbits or foot traffic though these are limited across an area. This is a typically a short grassland that is maintained by grazing by rabbits and brown hares. Key species within this grassland include those named in its title, and frequent mosses and abundant lichens. Many species can be found here too including *Aria praecox, Rumex acetosella* and *Myosotis ramosissima*. Occasionally sea pea *Lathyrus japonica* can be found too in the more disturbed sections.

Distribution

This community was only found in three main areas within the survey area, these were all behind the houses. This grassland dominates where the shingle is still close to the surface. When it becomes more mature the acid grasslands start to develop.

SH43 Dicranum scoparium - Festuca rubra - Plantago lanceolata grassland community

Structure and form

This grassland is more mature than SH40 with more mosses present within the community. It is herb rich with numerous interesting species, it is here that *Vicia lutea* is found.

Distribution

It was found in two areas of the site, the area behind the central section of houses and to the south of the Martello Tower where it formed the upper grasslands before the less well vegetated shingle dominates, which is outside this survey area.

3.3 Saltmarsh communities

The site held only limited areas of saltmarsh with 4.23 hectares mapped

SM2 Ruppia maritima saltmarsh community

Structure and form

This aquatic community is found in the more saline borrow dykes with limited shading from *Phragmites australis*. It can become a very dominant community swamping all other aquatic groups out. It inhabits dykes and lagoons that range from a metre deep to being ephemeral. The main species within this community is *Ruppia maritima*, though *Ruppia cirrhosa* and *Zannichellia maritima* can also become frequent. This community is very important in Suffolk. It is within this community that many of the coastal lagoon specialist invertebrates reside.

Distribution

This mainly aquatic community was found in the borrow dykes at the northern end of the site. Outside the survey area this community is found in the lagoons of the SSSI.

SM13a Puccinellia maritima saltmarsh community, Puccinellia maritima sub-community

Structure and form

This saltmarsh grassland sward is dominated with *Puccinellia maritima* and if often a species poor community. It may hold some of the more attractive species including occasional *Limonium vulgare* and *Armeria maritima*, though these are always at a low density. This is a taller community than the SM13c below. It occurs here where there has been past grazing or disturbance creating a more broken sward.

Distribution

This was only found in small areas within the survey area. It was along a small narrow section of the saltmarsh adjacent to Barthorp's Creek and a very narrow strip around the edge of the small lagoon south of the Martello Tower.

SM13c Puccinellia maritima saltmarsh community, Limonium vulgare-Armeria maritima sub-community

Structure and form

This is the most attractive saltmarsh community; it is a short sward with numerous herb species dominating the light *Puccinellia maritima* grassland. There can often be drifts of *Armeria maritima* in early summer in the lower level of this community with *Limonium vulgare* becoming more frequent at slightly high elevations. This is a species rich habitat with up to 15 species found within a single quadrat.

Distribution

This was found only along the saltmarshes at the edge of Barthorp's Creek. Here it formed extensive stands near to the roadside and to the north within the SSSI itself. It is within these saltmarshes that small saltmarsh pools occur and this is where the tiny sea slug *Limapontia depressa* occurred.

SM18 Juncus maritimus saltmarsh community

Structure and form

Extensive tussocks of *Juncus maritima* dominate this community, with often very few other species present, though there is always *Atriplex portulacoides* present in varying degrees.

Distribution

This was only found in one small area of the site along the south side of Barthorp's Creek where it is surrounded by the short SM13c community. There are small tussocks of *Juncus maritima* on the southern section of the site though these are within the mesotrophic grassland and are not dominant enough to warrant mapping as a full community.

3.4 Driftline communities

These upper saltmarsh communities were found covering 2.2 hectares on the survey area.

SM16 Festuca rubra saltmarsh community

Structure and form

The dominant species within this habitat is the grass red fescue *Festuca rubra*. This forms a dense tussock of grasses and is often a species poor community, though it may support several uncommon species, including extended sedge *Carex extensa* in the north and distant sedge *Carex distans* to the south.

Distribution

This dense grassland was found in two areas of the site. In the north it was dominantly on the west of the road at Barthorp's Creek. At the south of the site it was located to the south and west of the small ephemeral lagoon. In the north it was around the edges of the creeks where increased tidal activity allows the subtle deposition of more muds, raising the edges here these small levees being higher allow this community to develop here. In the south of the survey area they form a small saline patch of grassland that is occasionally flooded in the winter and dries in the summer.

SM24 Elymus pycnanthus saltmarsh community

Structure and form

This tall robust grassland is found at the upper limits of saline influence within a saltmarsh community. It is a species poor community though may support several interesting species. At its lower edges close to the saltmarshes there may be occasional lax-flowered sea lavender *Limonium humile*, at the northern end of the site this is where a large proportion of the *Carex extensa* is found. On the slope of the sea wall occasional grass vetchling *Lathyrus nissolia* is found and in other section of the estuary this habitat is where to look for the rare slender hare's-ear *Bupleurum tenuissimum*. This is the main habitat of the rare mollusc narrow-mouthed whorl snail *Vertigo angustior*.

Distribution

This was found mainly in the north of the site along Barthorp's Creek sea wall defences, and in a similar habitat on the south of the site on the sea wall and the grasslands abutting this.

3.5 Grassland communities

The grasslands were the most abundant community on within the survey area, with 81 hectares covered.

MG1a Arrhenatherium elatius mesotrophic grasslands community Festuca rubra sub-community

Structure and form

This grassland was common on the site where there was more stability in the grassland and less influence from the coast. This was another species poor grassland with only a small number of species associated with it. It formed a tall robust grassland where it was found, especially on the sea walls north of the hamlet. On the rear of the sea wall though it was becoming swamped out by the increasing common reed *Phragmites australis*. At the south of the site it had been heavily grazed by sheep and was only left on tussocks through the grassland.

Distribution

This was commonly found along the roadside near to the houses and it was the grasslands to the south of the Martello Tower. It was on the sea walls where the coastal influence was reduced too.

MG1b Arrhenatherium elatius mesotrophic grasslands, Urtica dioica sub-community

Structure and form

A tall rough grassland with ruderal species *Cirsium arvense* and *Urtica dioica* as common components in the habitat. This community on the site had been heavily grazed over the summer, reducing the vigour of the vegetation and through such a high grazing level the grasses were left with much bare soil around them, this was then becoming vegetated with the more ruderal species.

Distribution

This was commonly found along the ronds of the IDB drain. Here it formed the majority of the habitat and was noticeable by its disturbed nature.

MG6a Lolium perenne - Cynosurus cristatus grassland Typical sub-community

Structure and form

This is a very species poor grassland community, that there is used as a hay crop and then heavily grazed. It is then 'sweetened' and rolled in the summer.

Distribution

This community was the dominant community on the site, this covered the majority of the pasture either side of the road.

MG7d Lolium perenne leys and related grasslands, Lolium perenne Alopecurus pratensis sub-community

Structure and form

This is a moderately poor grassland with the inclusion of a few more plant species within the sward, than the MG6a above.

Distribution

This was the second most abundant community on the site and formed the remainder of the pasture of the grazing marshes. This was a community found at slightly higher elevations than the MG6a

3.6 Acid grassland communities

These were found in one main area of the site and covered 1.39 hectares.

U1 Festuca ovina – Agrostis capillaris – Rumex acetosella community

Structure and form

This short tussocky grassland was a grass rich and herb poor community. It was found developing from the mature shingle grasslands where there was an increase in the humus layer in this dry habitat. There was more sand in the soil and there was no visible shingle present. This was another community where *Vicia lutea* can be found. It was often heavily rabbit grazed and frequently trampled so was often a short grassland.

Distribution

This was found in the grasslands to the west of the houses and west of the shingle communities, towards the road.

3.7 Aquatic communities

These were limited to the IDB drain and covered 1.54 hectares.

A11b Potamogeton pectinatus – Myriophyllum spicatum community, Elodea canadensis sub-community

Structure and form

This community was within the freshwater IDB drain. The vegetation here was scattered throughout the channel where the water clarity was good. The vegetation rising from the bottom of the channel was mainly the common water-starwort. *Callitriche stagnalis*. Along the margins of the channel at the surface there was a frequent and constant layer of filamentous algae, indicating a moderate level of eutrophication within the water, as would be expected with the water running off arable land to the south and west. No uncommon species were recorded though there were

small amounts of *Potamogeton pectinatus* and *P. crispus* in the southern end of the channel. *Myriophyllum spicatum* was well scattered throughout and there were areas of *Lemna minor* on the surface in places along the water course.

Distribution

The IDB drain ran along the west to north-western side of the site and formed the western boundary to the survey area.

A2 Lemna minor community

Structure and form

This community was dominated with *Lemna minor* and little else living under the surface.

Distribution

This was found in small patches along the IDB channel but in particular it was found close to the sluices at the northern ends of the site.

3.8 Marginal swamp communities

These communities were only found on the margins of any of the water bodies on site and covered 6.95 hectares

S26 Phragmites australis – Urtica dioica community

Structure and form

This species poor tall rank vegetation community was mainly scattered along the edges of water bodies. It was on the banks of the channels often where there had been clearance in the past three years. There was only a narrow band of this community, where it typically formed a two-meter margin from the water's edge onto the wide rond above.

Distribution

This was only found along the margins of the IDB channel, where it was the site of a mute swan *Cygnus olor* nest.

S4a Phragmites australis community, typical sub-community

Structure and form

This community was dominated with common reed *Phragmites australis*, and found only in the fresh water habitats on the site. There were often very few constant other species present in the community.

Distribution

This was only found along the margin of the IDB channel.

S4d Phragmites australis community, Atriplex prostrata sub-community

Structure and form

This community was found in and on the margins of the dykes and on the sea walls. The *Phragmites australis* ranged from tall 1.8m high to short stunted growth of 0.5m high. The height of the

vegetation was related to the levels of salinity, the higher the salinity the shorter the growth. A constant component in the communities was that of the ruderal *Atriplex* species that was nearly always present in small amounts through the vegetation. Very few other species of plant were in this habitat.

Distribution

This community was found across the site in all wet habitats that where not fully fresh, so all the ditches running through the grazing marshes and on the sea walls where there was a small amount of seepage through damaged sections of wall. This community is developing quickly on the rear faces of the sea walls as increased sea levels put extra strain on these walls and there is some water creeping through.

S21 Scirpus maritimus community

Structure and form

This is often a *Bolboscheonus maritimus* pure community with very few additional species present.

Distribution

This was found on the edge of several dykes across the survey area, with more present on the eastern side of the road.

3.9 Open vegetation communities

These two communities were found covering 0.37 hectares.

OV23c Lolium perenne – Dactylis glomerata community, Plantago major – Trifolium repens sub-community

Structure and form

This disturbed community was associated with either foot traffic or vehicle traffic. This very short community was often one of the most species diverse in the survey area. It was within this habitat that many of the rare and scarce trefoils were present and the rare bulbous meadow-grass *Poa bulbosa*.

Distribution

At 0.07 hectares this was the one of the smallest communities of the survey area and was predominately found around the car parks at either side of the hamlet.

OV25 Urtica dioica – Cirsium arvense community

Structure and form

This community was found where there had been considerable grazing and where there was debris from dredging. These eutrophic conditions suit the main species well with both *Urtica dioica* and *Cirsium arvense* being the most abundant species present on each location.

Distribution

This was only found along the margin of the IDB channel where the dredging's had been place on the ronds and the vegetation had not established in to anything else due to grazing and depth of material.

3.10 Scrub and woodland communities

There was very little of either on the site with only 2.08 hectares across the survey area.

W21 Crataegus monogyna – Hedera helix scrub

Structure and form

Tall rangy bushes of hawthorn Crataegus monogyna on the tops of banks, rarely forming dense hedges and with a limited understorey. The vegetation was often heavily grazed and used by sheep to rest at night. A species poor community

Distribution

This community was scattered along the IDB drain retaining walls, especially on the eastern and northern parts of the site. There were small sections of broken hawthorn along the roadside too.

W22 Prunus spinosa – Rubus fruticosus scrub

Structure and form

A dense scrub dominated with blackthorn *Prunus spinosa* mainly in pure stands were it was located. It had a very depauperate understorey due to the dense nature of the vegetation above.

Distribution

This was mainly located in three parts of the site. Two along the roadside and one to the south of the Martello Tower.

W23b Ulex europeus – Rubus fruticosus scrub, Rumex acetosella sub-community

Structure and form

This was a *Ulex europeus* dominated community, where it was scattered around the edges of the grasslands it formed a dense canopy of *Ulex europeus* with minimal understorey.

Distribution

This community was only found on the well vegetated shingle behind (to the west) of the central portion of houses at Shingle Street.

W24 Rubus fruticosus – Holcus lanatus underscrub

Structure and form

A bramble dominated community

Distribution

This was predominately found on the northern section of the site on the higher ground near to the borrow dykes and ditches. Here it formed a dense canopy that was ideal for breeding birds.

3.11 Species of interest

Extended sedge *Carex extensa* results from a survey carried out for Natural England in the winter of 2014.

Pre 2013 records—Seven records were made in two areas (data not included) of Shingle Street between

1974 and 2008. The original site was at the edge of a narrow footpath by the northern lagoon, the other area was adjacent to a lagoon to the south of this footpath.

2013—18 records (Table C1) were made from four main sites of Shingle Street, these were split into seven areas.

- area 1 had 125 plants, this area was to the west of the road leading to Shingle Street
- area 2 had five plants, this was the original site (Suffolk Flora 2008) at the northern end of Shingle Street
- area 3 had 85 plants, this was in an occasionally flooded section of mature shingle vegetation where *J. gerardii* was abundant.
- area 4 had 120 plants, this was alongside the creek channel, an area of old shingle ridge, the plants were only found on the eastern side of this ridge
- area 5 had 11 plants near to the tank blocks running to the sea wall
- area 6 had 315 plants, this area was to the south of Shingle Street along the edge of two lagoons.
- area 7 had 6 plants along the edge of the dry lagoons.

total number of individuals in 2013: 667

2014—50 records (Table C2) were made from around four main sites of Shingle Street, these were split into eight areas.

- area 1 had 61 plants, this site was to the west of the road leading to Shingle Street
- area 2 had one plant, this was the original site at the northern end of Shingle Street
- area 3 had six plants, this was in an occasionally flooded section of mature shingle vegetation where J. gerardii was present. This site was under water at the time of the survey.
- area 4 had 129 plants, this was alongside the creek channel, an area of an old shingle ridges, the plants were only found on the eastern side of this ridge.
- area 5 had 6 plants near to the tank blocks running towards the sea wall.
- area 6 had 710 plants along the edge of one lagoon to the south of the hamlet.
- area 7 had 1 plants at the edge of the flooded lagoons.
- area 8 had 102 plants, along the *Atriplex portulacoides* zone on the western side of the lagoon only.

total number of individuals in 2014: 1016

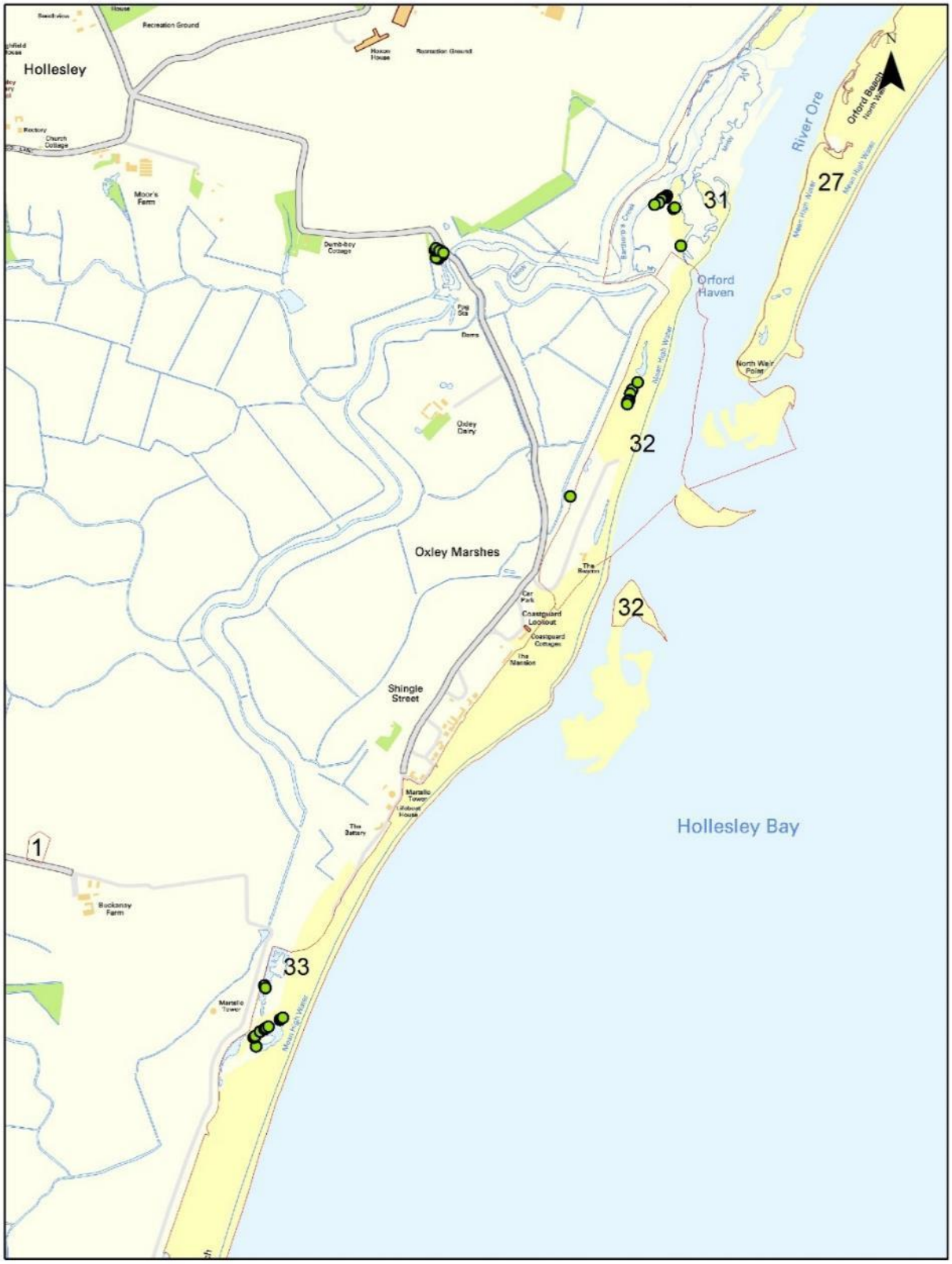


Figure 1: Distribution of extended sedge at Shingle Street in December 2014.

4. DISCUSSION

101 hectares of vegetation was recorded and mapped across the survey area. The majority of the site (82%) was dominated with a range of grasslands. These formed the backbone of the grazing marshes, the sea walls and the adjacent habitats.

Quality of the habitats present

The quality of the habitats is limited in the survey area. The best habitats occurred on the SSSI itself with only very small areas of protected communities outside of that area. The only community of importance was the vegetated shingle communities found the west of the hamlet itself on the slope towards the roadside. Here there were only 2.75 hectares of the habitat, which is still an important addition to the areas of this within the SSSI itself. Several species were found in the new surveyed area that are scarce and uncommon, with the most noticeable being yellow vetch *Vicia lutea*.

Additional works

As with any surveys there can always be more work carried out and Shingle Street is no exception. Even though there has been an impressive list of species found across the site, there are undoubtedly many more to find. And many enjoyable hours of searching to be had.

Extended Sedge -Carex extensa

C. extensa was found in the upper saltmarsh zone at each of the sites. The dominant associated flora was a matrix of *Juncus gerardii, Festuca rubra,* and other commonly associated species included *Aster tripolium* and *Atriplex portulacoides.*

All the sites where *C. extensa* was found in the estuary were in areas of saltmarsh that were protected from the full force of the wave action, on the sheltered sides of raised ground, or facing a direction where there was only minimal fetch at high tide.

Areas outside the estuaries were all associated with the edges of saline lagoons to the north and south of Shingle Street. At the time of the survey the most southern lagoons were under 10cm of water. The water levels within the lagoons fluctuate over long periods of time as opposed to the daily changes in the estuaries, and it can be assumed that this is not detrimental to the species, as it was in these sites that the highest densities were recorded. The original site (1974) at the northern end of Shingle Street has been reduced to a single plant, and the edge of this lagoon has steadily been eroded or overtopped with encroaching shingle during storm events. This population is unlikely to survive in the long term and this shingle ridge along this section of the river is rapidly migrating inland.

Changes in distribution from 2013:

There were limited changes in the distribution for this species across it's known range (figures B1 and B2). The number of plants are each site was slightly different. This was more likely due to more accurate counts in 2014 than when recorded in 2013. *C. extensa* was not located from two small areas on the saltmarsh sites only. These were on a small raised section of former shingle ridge, adjacent to the main creek, which has been divided into five small areas of *Elytrigia atherica* grassland, each one dissected by creeks leading from the saltmarsh. It was the third and fourth of these where *C. extensa* was not found during the 2014 survey, and approximately 60 were found in 2013. These last two areas were in locations that would have the greatest exposure of all the sites to wave action and tidal movement. All the other sites were more protected and closer to higher land with minimal fetch at high tide. Another area where there was a decrease in numbers was at the reported first site for this species at Shingle Street (TM3737944042). Here, there were five plants in 2013 and only one found in 2014. This area would

have had the full force of the tide when it overtopped the shingle ridge, pushing the shingle bar inland by a few feet at the same time.

Here there were no other physical differences to this site across the two years. The site was not grazed or managed in any way. All the other areas across Shingle Street appeared to be in a similar state to before the flood event. Whether the 2013 tidal event created these changes is open to further discussion, and all the sites where this species was found were under water for a considerable period of time in 2013. This though is true of the estuarine sites at high spring tides, which are all under water for a period of time. The lagoonal sites have highly fluctuating water levels and corresponding salinity levels too. During the 2014 survey the lagoons at the southern end of the site were under 10cm of water which were fully saline, so it can be concluded that fully saline water is unlikely to effect this species. The main differences were levels of exposure to tides and wave action see Abrehart & Jackson 2014.

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Appendix I: National Vegetation Communities found at Shingle Street 2015

NVC code	Acid grassland	Aquatic	Driftline	Grassland	Marginal	Open vegetation community	Saltmarsh	Scrub	Shingle	Grand Total hectares
A11b		1.50								1.50
A2		0.04								0.04
MG1				0.81						0.81
MG1a				7.67						7.67
MG1a/SM24				0.48						0.48
MG1b				11.90						11.90
MG6a				39.26						39.26
MG7d				20.94						20.94
OV23c						0.07				0.07
OV25						0.30				0.30
S21					0.42					0.42
S26d					1.23					1.23
S4a					0.87					0.87
S4d					4.44					4.44
SD1									0.68	0.68
SH40									0.62	0.62
SH43									1.44	1.44
SM13a							0.17			0.17
SM13c							1.62			1.62
SM15							0.30			0.30
SM16			0.25							0.25
SM18							0.01			0.01
SM2							0.18			0.18
SM24			1.95							1.95
SM24/S4				0.66						0.66
SM4							0.01			0.01
U1	0.93									0.93
U1a	0.46									0.46
W21								0.97		0.97
W22								0.50		0.50
W23b								0.36		0.36
W24								0.26		0.26
Grand Total	**1.39**	**1.54**	**0.25**	**81.72**	**6.95**	**0.37**	**4.23**	**2.09**	**2.75**	**101.29**

Table 2: Area of each NVC community and sub-community recorded during the Shingle Street NVC survey in 2015.

Appendix II: Habitat maps of the NVC at Shingle Street 2015

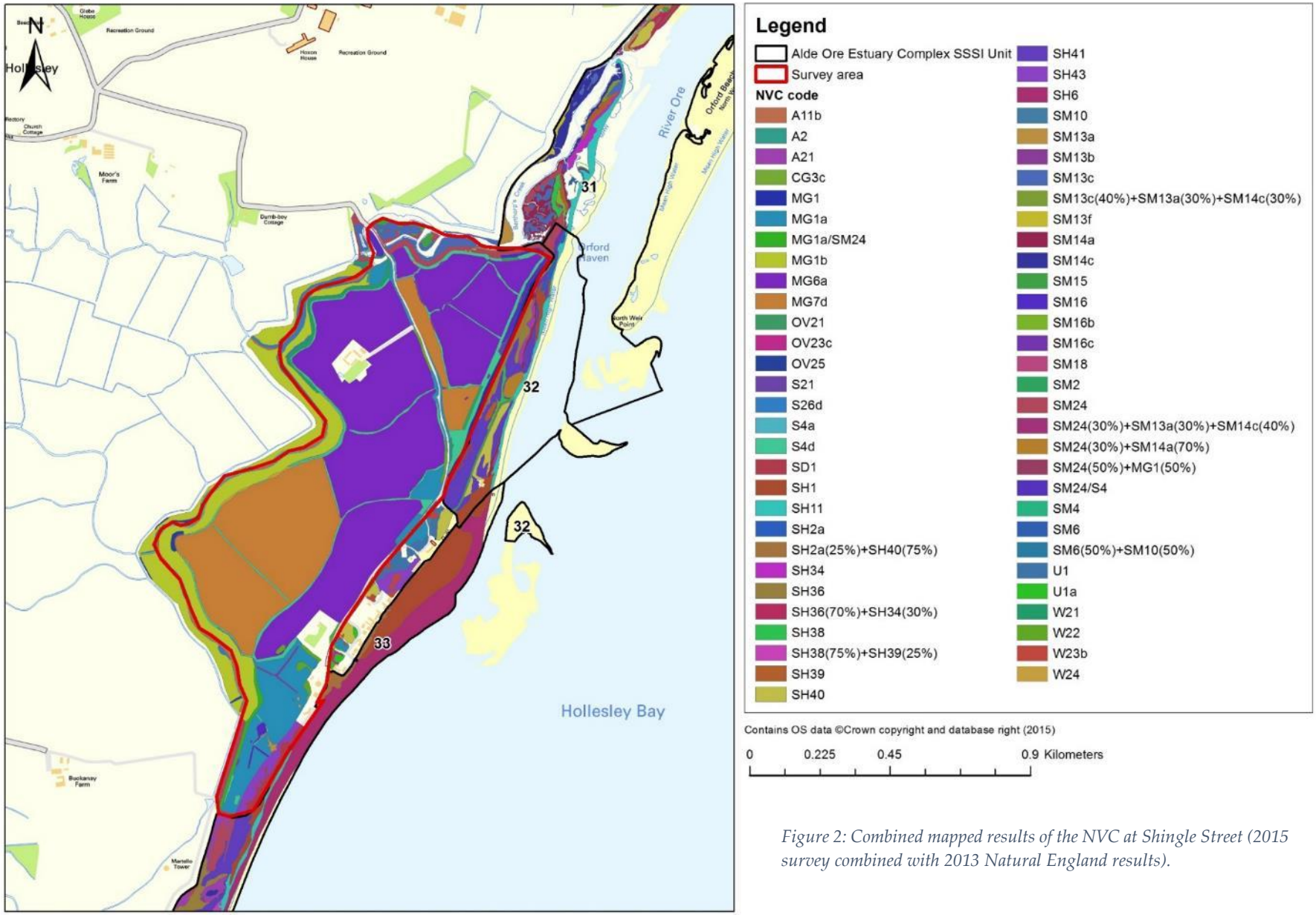

Figure 2: Combined mapped results of the NVC at Shingle Street (2015 survey combined with 2013 Natural England results).

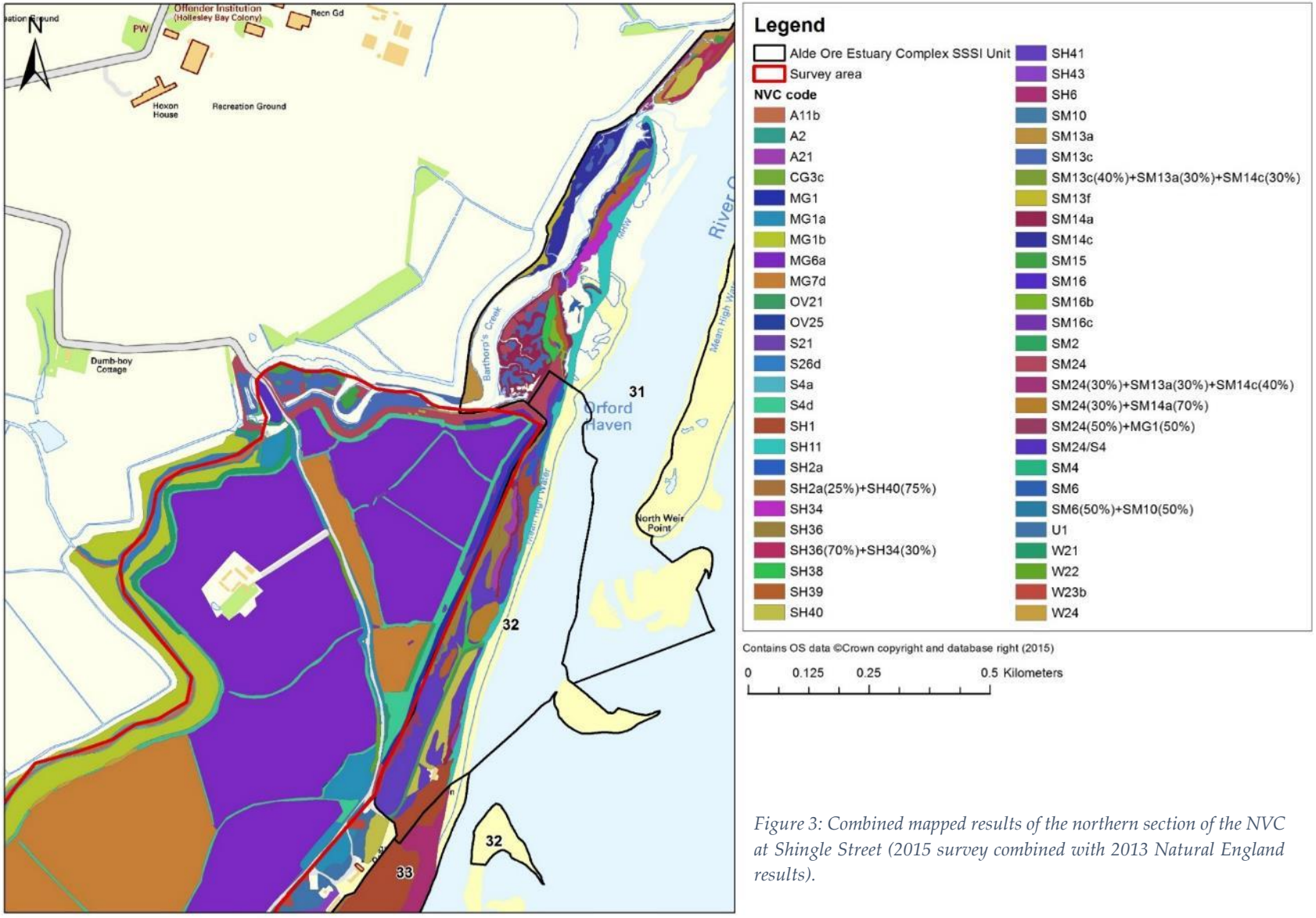

Figure 3: Combined mapped results of the northern section of the NVC at Shingle Street (2015 survey combined with 2013 Natural England results).

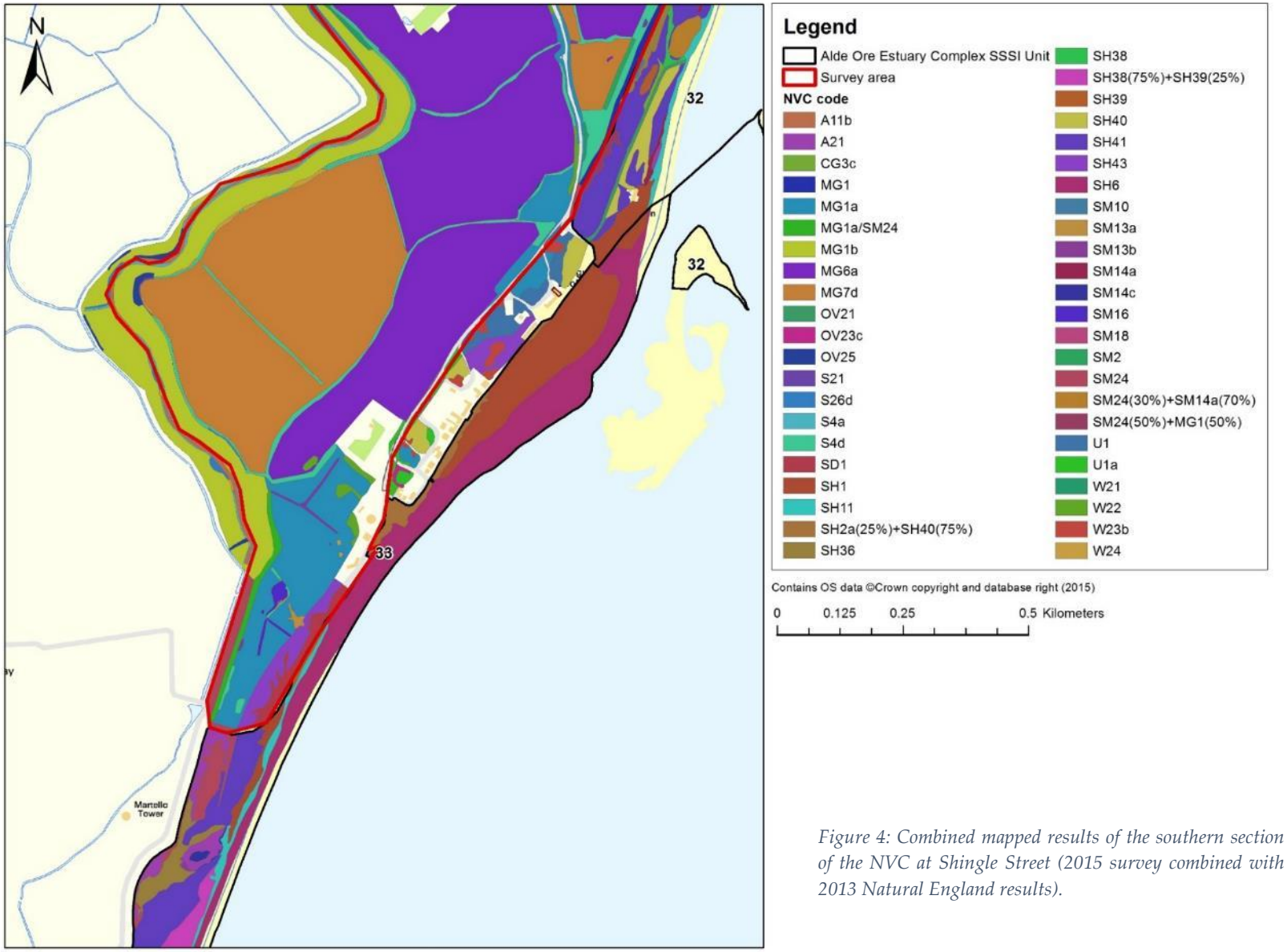

Figure 4: Combined mapped results of the southern section of the NVC at Shingle Street (2015 survey combined with 2013 Natural England results).

Pound Farm
Low Road
Great Glemham
Suffolk IP17 2DQ
Tel: 01728 663282 - 07798 941555

e-mail: toby@abrehartecology.com

Website: abrehartecology.com

Appendix E: NVC survey - quadrat data

P074

Location - unit number	Grid referance	Region	Author
Unit 0	TM3665542643	East Suffolk	Toby Abrehart

Grasslands to the south of the southern car park. These grasses are slightly rabbit grazed, there is an area of Smynium olustrum close to the houses. Also there is a well trodden track running to the road from the parking area.

NVC code

MG1a Arrhenatherum elatius grassland, Festuca rubra sub-community

Date	Quadrat Number
15/12/2015	1759
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

40cm15cm5cm

Layers Cover

30%40%30%

Geology:

Sandy soils with underlying shingle

Species list

Plant Name	Plant Density
Achillea millefolium	3
Arrhenatherum elatius	5
Bromus hordeaceus	5
Crepis vesicaria	3
Erodium cicutarium	3
Festuca rubra	30
Geranium dissectum	1
Geranium molle	2

Hypnum cuppressiforme	30
Plantago lanceolata	5
Poa trivialis	10
Ranunculus bulbosus	5
Saxifraga granulata	5
Senecio jacobaea	2
Trifolium pratense	1
Trifolium striatum	2

P075

Location - unit number	Grid referance	Region	Author
Unit 0	TM3666442664	East Suffolk	Toby Abrehart

Car park, very short sward. Here the shingle was visable in sections due to vehicular actions. The turf all around this area was very short with many species stunted by this action. Large rosettes of Echium vulgare were evident around this section of the site.

NVC code

OV23c Lolium perenne-Dactylis glomerata community, Plantago major-Trifolium repens sub-community

Date	Quadrat Number
15/12/2015	1760
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

5cm

Layers Cover

100%

Geology:

Shingle

Species list

Plant Name	Plant Density
Achillea millefolium	2
Bromus hordeaceus subs	3
Carduus nutans	2
Cerastium diffusum	2
Cerastium fontanum	2
Echium vulgare	20
Erodium cicutarium	3
Festuca rubra	2
Lolium perenne	40
Medicago arabica	2
Plantago major	2
Poa annua	30
Reseda lutea	1
Senecio jacobaea	3
Trifolium dubium	1
Trifolium glomeratum	2

P076

Location - unit number	Grid referance	Region	Author
Unit 0	TM3668442705	East Suffolk	Toby Abrehart

To the west of Shingle Street residental houses. Vegetation characterisitic of vegetated shingle communities with lichens. There were few scattered plants of the rare Vicia lutea within this section. Mosses were very evident through the eastern section of this community developing a more lichen rich zone in the middle of the vegetated shingle.

NVC code

U1a Festuca ovina-Agrostis capillaris-Rumex acetosella grassland, Cornicularia aculeata-Cladonia arbuscula sub-community

Date	Quadrat Number
07/01/2016	1761
Altitude	**Soil Depth**
0	0
Stand Area	**Sample Area**
	2x2m

Layers mean height

5cm

Layers Cover

100%

Geology:

Shingle

Species list

Plant Name	Plant Density
Cerastium fontanum	5
Cladonia rangiformis	20
Festuca ovina	30
Hypnum cupressiforme	40
Pilosella officinarum	29
Plantago coronopus	5
Rumex acetosella	10
Sedum acre	10

Senecio jacobaea	5
Silene uniflora	20
Veronica arvensis	3
Vicia lutea	2
Vicia sativa subsp. Nigra	2
Vicia tetrasperma	2

P077

Location - unit number	Grid referance	Region	Author
Unit 0	TM3674542852	East Suffolk	Toby Abrehart

Grassland margin by the roadside. Scattered Rubus spp. through the community. Consistent habitat with areas of slight disturbed soils/shingle coming to the surface. Here the grasses were more robust and less grazed than within the main section of the vegetated shingles further to the east. Mainly Festuca rubra dominated community with a small amount of Elytrigia atherica showing in the grasslands.

NVC code

U1 Festuca ovina-Agrostis capillaris-Rumex acetosella grassland

Date	Quadrat Number
07/01/2016	1762
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

40cm20cm2cm

Layers Cover

30%50%20%

Geology:

Species list

Plant Name	Plant Density
Achillea millefolium	10
Arrhenatherum elatius	1
Campylopus introflexus	30
Claytonia perfoliata	5
Elytrigia atherica	3
Festuca ovina	50
Galium verum	10
Hypnum cupressiforme	2
Plantago lanceolata	2
Rumex acetosella	10
Senecio vulgaris	2
Trisetum flavescens	2

P078

Location - unit number	Grid referance	Region	Author
Unit 0	TM3680742911	East Suffolk	Toby Abrehart

Heavily grazed heathland community running between the scrub and slightly disturbed shingle. Grassland dominated with Rumex acetosella and a number of coastal species scattered throughout. Stands of Silene uniflora were evident throughout this area of vegetated shingle.

NVC code

U1 Festuca ovina-Agrostis capillaris-Rumex acetosella grassland

Date	Quadrat Number
15/12/2015	1763
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

6cm1cm

Layers Cover

50%50%

Geology:

Species list

Plant Name	Plant Density
Achillea millefolium	2
Anthriscus caucalis	2
Aphanes arvensis	3
Arenaria serpyllifolia sub	3
Campylopus introflexus	30
Cerastium fontanum	2
Claytonia perfoliata	2
Dicranum scoparium	2

Festuca ovina	50
Galium verum	3
Geranium pusillum	3
Hypnum cupressiforme	10
Myosotis ramosissima	2
Plantago lanceolata	5
Potentilla argentea	2
Rumex acetosella	30

P079

Location - unit number	Grid referance	Region	Author
Unit 0	TM3690443015	East Suffolk	Toby Abrehart

Tall grassland to the north of the tennis court. There was deeper soil and taller vegetation across this section of the site. The tussocky nature of the grassland sward created a deep thatch, the sample was species poor compared to the grazed vegetated shingle.

NVC code

MG1a Arrhenatherum elatius grassland, Festuca rubra sub-community

Date	Quadrat Number
15/12/2015	1764
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

45cm20cm0cm

Layers Cover

40%50%30%

Geology:

Sandy over shingle

Species list

Plant Name	Plant Density
Elytrigia atherica	5
Festuca rubra	60
Holcus lanatus	10
Hyonum cupressiforme	30
Poa trivialis	5
Vicia hirsuta	1
Vicia lutea	5
Vicia sativa	2
Vicia tetrasperma	5

P080

Location - unit number	Grid referance	Region	Author
Unit 0	TM3692843034	East Suffolk	Toby Abrehart

Depression within the grassland supporting a saltmarsh community on a shingle substrate.

NVC code

SM13a Puccinellia maritima salt-marsh community, Puccinellia maritima sub-community

Date	Quadrat Number
15/12/2015	1765
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

50cm30cm

Layers Cover

30%70%

Geology:

Shingle

Species list

Plant Name	Plant Density
Agrostis stolonifera	10
Aster tripolium	10
Bolboschoenus maritimu	5
Elytrigia atherica	5
Glaux maritima	30
Puccinellia maritima	60
Rumex crispus	2

P081

Location - unit number	Grid referance	Region	Author
Unit 0	TM3695743085	East Suffolk	Toby Abrehart

Scrub to the south of the middle car park. Mostly gorse and blackthorn with heavily grassed grasslands around their margins.

NVC code

W23b Ulex europaeus-Rubus fruticosus scrub, Rumex acetosella sub-community

Date	Quadrat Number
15/12/2015	1766
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	5x5

Layers mean height

150cm50cm

Layers Cover

80%20%

Geology:

Shingle

Species list

Plant Name	Plant Density
Anthriscus caucalis	5
Cerastium fontanum	4
Festuca ovina	3
Hypnum cupressiforme	10
Pilosella officinarum	3
Plantago lanceolata	3
Prunus spinosa	10
Rumex acetosella	5
Sambucus nigra	10
Ulex europaeus	70

P082

Location - unit number	Grid referance	Region	Author
Unit 0	TM3700443237	East Suffolk	Toby Abrehart

Roadside verge to the north of Phragmites australis reedbed. Verge consisted of scrub and grasslands dominating the habitat with a small encroachment of Phragmites australis spreading in from the west.

NVC code

MG1b Arrhenatherum elatius grassland, Urtica dioica sub-community

Date	Quadrat Number
15/12/2015	1767
Altitude	**Soil Depth**
0	0
Stand Area	**Sample Area**
0	2x2m

Layers mean height

80cm50cm10cm

Layers Cover

50%40%10%

Geology:

Species list

Plant Name	Plant Density
Achillea millefolium	2
Arrhenatherum elatius	30
Centaurea nigra	2
Cirsium vulgare	30
Heracleum sphondylium	2
Phragmites australis	20
Poa trivialis	10
Potentilla reptans	2
Pseudoscleropodium pur	2
Ranunculus repens	2
Rubus ulmifolius	40
Urtica dioica	2
Vicia sativa subsp. Nigra	2

P083

Location - unit number	Grid referance	Region	Author
Unit 0	TM3706843473	East Suffolk	Toby Abrehart

Hay meadows to the east of the road. Small depressions scattered throughout the area support MG13 grassland community. Much of this area will be under water at some point during the winter, as is evident in the communities present.

NVC code

MG13 Agrostis stolonifera-Alopecurus geniculatus grassland

Date	Quadrat Number
15/12/2015	1768
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

10cm

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Agrostis stolonifera	30
Alopecurus geniculatus	50
Bolboschoenus maritimu	3

P084

Location - unit number	Grid referance	Region	Author
Unit 0	TM3705843488	East Suffolk	Toby Abrehart

Typical species poor grassland found throughout the hay meadows.

NVC code

MG7d Lolium perenne leys and related grasslands, Lolium perenne-Alopecurus pratensis grassland

Date	Quadrat Number
15/12/2015	1769
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

30cm

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Agrostis stolonifera	2
Alopecurus pratensis	5
Anthriscus sylvestris	2
Arrhenatherum elatius	5
Bromus hordeaceus	20
Dactylis glomerata	5
Elytrigia repens	60
Festuca pratensis	2
Geranium dissectum	1
Vicia sativa subsp. Nigra	0

P085

Location - unit number	Grid referance	Region	Author
Unit 0	TM3695543719	East Suffolk	Toby Abrehart

Marginal vegetation of a dyke set within the grazing marsh. The dyke itself was covered in a thick film of green/brown algae. No aquatic macrophytes were present.

NVC code
S21 Scirpus maritimus swamp

Date	Quadrat Number
15/12/2015	1770
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height
60cm

Layers Cover
100%

Geology:

Species list

Plant Name	Plant Density
Agrostis stolonifera	3
Bolboschoenus maritimu	95
Ranunculus sceleratus	2

P086

Location - unit number	Grid referance	Region	Author
Unit 0	TM3706443796	East Suffolk	Toby Abrehart

Typical species poor grassland found throughout hay meadows.

NVC code

MG7d Lolium perenne leys and related grasslands, Lolium perenne-Alopecurus pratensis grassland

Date	Quadrat Number
15/12/2015	1771
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

30cm10cm

Layers Cover

30%70%

Geology:

Species list

Plant Name	Plant Density
Alopecurus pratensis	5
Bromus hordeaceus	8
Dactylis glomerata	8
Festuca rubra	60
Holcus lanatus	10
Lolium perenne	10
Ranunculus sardous	1
Trifolium dubium	1

P087

Location - unit number	Grid referance	Region	Author
Unit 0	TM3682143957	East Suffolk	Toby Abrehart

Saltmarsh to east of road. Southern margin of creek. All marginal areas supported Atriplex portulacoides. Tall Juncus maritima was scattered throughout this area, with small areas of Elytrigia atherica on the higher ground. Low areas dominated with Armeria maritima community.

NVC code

SM13c Puccinellia maritima salt-marsh community, Limonium vulgare-Armeria maritima sub-community

Date	Quadrat Number
15/12/2015	1772
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

8cm

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Armeria maritima	30
Atriplex portulacoides	5
Limonium vulgare	25
Plantago maritima	5
Puccinellia maritima	30
Salicornia europaea	2
Suaeda maritima	10
Triglochin maritimum	3

P088

Location - unit number	Grid referance	Region	Author
Unit 0	TM3685543975	East Suffolk	Toby Abrehart

Upper edge of saltmarsh. Coarse Elytrigia atherica dominated grasslands with a band of Cochlearia anglica along the high tide frass line. The Elytrigia atherica spread up the sea wall and down the rear face to the borrow dyke.

NVC code

SM24 Elymus pycnanthus salt-marsh community

Date	Quadrat Number
15/12/2015	1773
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

60cm30cm

Layers Cover

40%60%

Geology:

Species list

Plant Name	Plant Density
Cochlearia anglica	15
Elytrigia atherica	80
Glaux maritima	10
Puccinellia maritima	10

P089

Location - unit number	Grid referance	Region	Author
Unit 0	TM3699243936	East Suffolk	Toby Abrehart

Eastern sea wall. Grassland community scattered with Cirsium arvensis and Rubus sps. Along the fold there was a developing strip of Phragmites australis, which appears to be spreading up the sea wall.

NVC code

SM24 Elymus pycnanthus salt-marsh community

Date	Quadrat Number
15/12/2015	1774
Altitude	**Soil Depth**
2m	
Stand Area	**Sample Area**
	2x2m

Layers mean height

60cm

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Anthriscus sylvestris	2
Arrhenatherum elatius	5
Cirsium arvense	20
Elytrigia atherica	70
Galium aparine	2
Rumex crispus	2
Vicia sativa subsp. Nigra	2

P090

Location - unit number	Grid referance	Region	Author
Unit 0	TM3720143924	East Suffolk	Toby Abrehart

Borrow dyke habitat. Margins hold narrow band of Bolboscheonus maritima. Aquatic macrophyte vegetation consists of Ruppia maritima only.

NVC code

SM2 Ruppia maritima salt-marsh community

Date	Quadrat Number
15/12/2015	1775
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

60cm0cm

Layers Cover

40%60%

Geology:

Species list

Plant Name	Plant Density
Bolboschoenus maritimu	40
Brown algae	20
Filamentous algae	10
Rumex crispus	1
Ruppia maritima	60

P091

Location - unit number	Grid referance	Region	Author
Unit 0	TM3728343850	East Suffolk	Toby Abrehart

Typical sea wall grassland habitat. Dominated with Arrhenatherium elatius with frequent Elytrigia atherica and Phragmites australis community developing lower down the slope near to the borrow dyke.

NVC code

MG1 Arrhenatherum elatius grassland

Date	Quadrat Number
15/12/2015	1776
Altitude	**Soil Depth**
2m	
Stand Area	**Sample Area**
	2x2m

Layers mean height

50cm30cm

Layers Cover

70%30%

Geology:

Species list

Plant Name	Plant Density
Arrhenatherum elatius	60
Elytrigia atherica	10
Galium aparine	5
Lactuca virosa	10
Phragmites australis	30

P092

Location - unit number	Grid referance	Region	Author
Unit 0	TM3720543915	East Suffolk	Toby Abrehart

Aquatic vegetation.

NVC code

SM2 Ruppia maritima salt-marsh community

Date	Quadrat Number
01/06/2015	1777
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

50cm0cm

Layers Cover

40%60%

Geology:

Species list

Plant Name	Plant Density
Bolboschoenus maritimu	40
Potamogeton pectinatus	60
Rumex crispus	1

P093

Location - unit number	Grid referance	Region	Author
Unit 0	TM3728743849	East Suffolk	Toby Abrehart

Sea wall grassland vegetation.

NVC code

MG1 Arrhenatherum elatius grassland

Date	Quadrat Number
01/06/2015	1778
Altitude	**Soil Depth**
0	0
Stand Area	**Sample Area**
	2x2m

Layers mean height

60cm20cm

Layers Cover

80%20%

Geology:

Species list

Plant Name	Plant Density
Arrhenatherum elatius	60
Cirsium arvense	10
Dactylis glomerata	5
Elytrigia atherica	10
Galium aparine	5
Phragmites australis	10

P094

Location - unit number	Grid referance	Region	Author
Unit 0	TM3650042582	East Suffolk	Toby Abrehart

Grazed meadow south of Martello tower. Rough grasslands extending from the sea wall to the south, northwards to the end of Shingle Street residential area. Small areas of Juncus maritima scattered throughout the grassland.

NVC code

MG11 Festuca rubra-Agrostis stolonifera-Potentilla anserina grassland

Date	Quadrat Number
15/12/2015	1780
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

30cm

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Arrhenatherum elatius	10
Dactylis glomerata	10
Elytrigia atherica	5
Festuca rubra	70
Juncus maritimus	1
Potentilla anserina	3
Urtica dioica	1

P095

Location - unit number	Grid referance	Region	Author
Unit 0	TM3644442362	East Suffolk	Toby Abrehart

Saline lagoon which appears to be emphemeral, especially this year. Site heavily grazed in the spring 2015.

NVC code

SM13 Puccinellia maritima salt-marsh community

Date	Quadrat Number
27/07/2015	1781
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

10cm

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Atriplex portulacoides	1
Elytrigia atherica	30
Glaux maritima	3
Juncus maritimus	1
Puccinellia maritima	50
Salicornia europaea	5
Spergularia media	2

P096

Location - unit number	Grid referance	Region	Author
Unit 0	TM3634742469	East Suffolk	Toby Abrehart

Main dyke running through western end of site. Clear water within the channel despite abundant filamentous algae. Moderate density of aquatic macrophytes, with Potamogeton crispus notable though scattered.

NVC code

A11b Potamogeton pectinatus-Myriophyllum spicatum community, Elodea canadensis sub-community

Date	Quadrat Number
15/12/2015	1782
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

0

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Apium nodiflorum	10
Callitriche stagnalis	5
Elodea canadensis	50
Lemna minor	10
Myriophyllum alterniflor	10
Phragmites australis	5
Potamogeton crispus	10
Ranunculus aquatilis	10

P097

Location - unit number	Grid referance	Region	Author
Unit 0	TM3632742642	East Suffolk	Toby Abrehart

Main grassland either side of the main channel, holds the same community throughout. Rough grasslands which move into an edge of tall herb fen and the edge of the channel. Here the vegetation was dominated with Phragmites australis and Iris pseudacorus.

NVC code

MG1a Arrhenatherum elatius grassland, Festuca rubra sub-community

Date	Quadrat Number
07/01/2016	1783
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

45cm

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Agrostis stolonifera	10
Anisantha sterilis	4
Anthriscus sylvestris	15
Arrhenatherum elatius	25
Bromus hordeaceus subs	10
Cirsium arvense	10
Dactylis glomerata	30
Festuca pratensis	10

Geranium dissectum	1
Holcus lanatus	4
Picris echioides	3
Rubus ulmifolius	2
Smyrnium olusatrum	2
Urtica dioica	2
Vicia sativa	1
Vicia tetrasperma	1

P098

Location - unit number	Grid referance	Region	Author
Unit 0	TM3615542953	East Suffolk	Toby Abrehart

Dyke adjacent to pasture. Recently cleared out leaving a more open channel, though still highly eutrophic and full of fine filamentous algae.

No Photo

NVC code
S21 Scirpus maritimus swamp

Date	Quadrat Number
01/06/2015	1784
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height
70cm

Layers Cover
100%

Geology:

Species list

Plant Name	Plant Density
Atriplex patula	10
Bolboschoenus maritimu	90

P099

Location - unit number	Grid referance	Region	Author
Unit 0	TM3618043061	East Suffolk	Toby Abrehart

Aquatic vegetatation dominated by Elodea canadensis and Potamogeton pectinatus.

NVC code

A11b Potamogeton pectinatus-Myriophyllum spicatum community, Elodea canadensis sub-community

Date	Quadrat Number
15/12/2015	1785
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

0m

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Callitriche stagnalis	40
Elodea canadensis	10
Lemna minor	5
Myriophyllum spicatum	10
Potamogeton pectinatus	15
Ranunculus aquatilis	5
Rorippa nasturtium-aqu	10

P100

Location - unit number	Grid referance	Region	Author
Unit 0	TM3664543369	East Suffolk	Toby Abrehart

Grassland rond by channel, low density of ruderal species within the Arrhenatherium elatius community.

NVC code

MG1b Arrhenatherum elatius grassland, Urtica dioica sub-community

Date	Quadrat Number
15/12/2015	1786
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

80cm50cm30cm

Layers Cover

10%50%40%

Geology:

Species list

Plant Name	Plant Density
Agrostis stolonifera	10
Anthriscus sylvestris	10
Arrhenatherum elatius	40
Cirsium arvense	10
Dactylis glomerata	30
Galium aparine	5
Geranium dissectum	1
Picris echioides	3
Urtica dioica	5

P101

Location - unit number	Grid referance	Region	Author
Unit 0	TM3661543402	East Suffolk	Toby Abrehart

Aquatic vegetatation dominated by Potamogeton pectinatus.

NVC code

A11b Potamogeton pectinatus-Myriophyllum spicatum community, Elodea canadensis sub-community

Date	Quadrat Number
01/06/2015	1787
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height

0m

Layers Cover

100%

Geology:

Species list

Plant Name	Plant Density
Callitriche stagnalis	10
Carex riparia	10
enteromorpha intestinali	40
Lemna minor	10
Potamogeton crispus	20
Potamogeton sp	5
Ranunculus aquatilis	10

P102

Location - unit number	Grid referance	Region	Author
Unit 0	TM3662043480	East Suffolk	Toby Abrehart

Grassland species poor and typical of the surrounding hay meadow.

NVC code
MG1 Arrhenatherum elatius grassland

Date	Quadrat Number
15/12/2015	1788
Altitude	**Soil Depth**
0	
Stand Area	**Sample Area**
	2x2m

Layers mean height
45cm

Layers Cover
100%

Geology:

Species list

Plant Name	Plant Density
	0
Alopecurus pratensis	10
Anisantha sterilis	10
Anthriscus sylvestris	10
Arrhenatherum elatius	15
Dactylis glomerata	45
Galium aparine	1
vicia sativa subsp. Nigra	5

Appendix F: Bird inventory

Shingle Street bird list, 2002-2015—J. Mynott

[bracketed species are probable feral birds or escapes or interesting subspecies]

Red-throated diver *Gavia stellata*: regular winter visitor in small numbers offshore

Black- throated diver *Gavia arctica*: occasional winter visitor offshore

Great northern diver *Gavia immer*: occasional winter visitor offshore

Little grebe *Tachybatus ruficollis*: resident and winter visitor; breeds nearby (and possibly in SS occasionally)

Great crested grebe *Podiceps cristatus*: resident and winter visitor (breeds nearby)

Red-necked grebe *Podiceps grisegena*: rare winter visitor

Slavonian grebe *Podiceps auritus*: rare winter visitor

Fulmar *Fulmarus glacialis*: occasional, autumn and winter, offshore

Gannet *Morus bassanus*: passage migrant offshore

Sooty shearwater *Puffinus griseus*: unusual passage migrant offshore

Manx shearwater *Puffinus puffinus*: unusual passage migrant off-shore

Cormorant *Phalacrocorax carbo*: resident and winter visitor, roosts in large numbers on offshore islands

Shag *Phalacrocorax aristotelis*: occasional winter visitor

Grey Heron *Ardea cinerea*: resident

Purple heron *Ardea purpurea*: rare spring or summer visitor

Little egret *Egretta garzetta*: common resident, probably breeding nearby

Spoonbill *Platalea leucorodia*: occasional visitor, summer sightings becoming more regular

Glossy ibis *Plegadis falcinellus*: rare visitor but becoming more frequent

Mute swan *Cygnus olor*: breeding resident and winter visitor

Whooper swan *Cygnus cygnus*: rare winter visitor

Bewick's swan *Cygnus columbianus*: uncommon winter visitor

Pink-footed goose *Anser brachyrhynchus*: uncommon winter visitor

White- fronted goose *Anser albifrons*: rare winter visitor

Bean goose *Anser fabalis*: rare winter visitor

Greylag goose *Anser anser*: resident and winter visitor

Canada goose *Branta canadensis*: resident and winter visitor

Barnacle goose *Branta leucopsis*: rare winter visitor, some feral flocks visit

Dark-bellied brent goose *Branta bernicla*: regular winter visitor

[Pale-bellied brent goose *Branta hrota* : subspecies of above (Greenland race), unusual]

[Ruddy shelduck *Tadorna ferrugina*: vagrant, (one record, July 2006, probably feral)]

Egyptian goose *Alopochen aegyptiacus*: unusual winter visitor

Shelduck *Tadorna tadorna*: resident in small numbers

Wigeon *Anas penelope*: common winter visitor

Gadwall *Anas strepera*: resident in small numbers (breeds nearby)

Teal *Anas crecca*: common winter visitor

Garganey *Anas querquedula*: occasional summer visitor

Mallard *Anas platyrhynchos*: common breeding resident

[Wood duck *Aix sponsa* : one record, November 2003, presumed feral]

Shoveler *Anas clypeata*: regular visitor, mainly winter

Pochard *Aythya ferina*: regular visitor, mainly winter

Tufted duck *Aythya fuligula*: resident (breeds nearby)

Scaup *Aythya marila*: unusual winter visitor

[Red-crested pochard *Netta rufina*: rare visitor, presumed feral]

Common scoter *Melanitta nigra*: winter visitor offshore

Velvet scoter *Melainitta fusca* : uncommon but regular winter visitor offshore

Long-tailed duck *Clangula hyemalis*: rare winter visitor offshore

Goldeneye *Bucephala clangula*: uncommon winter visitor offshore

Eider *Somateria mollissima*: uncommon winter visitor offshore

Red-breasted merganser *Mergus serator*: regular winter visitor offshore

[Ruddy duck *Oxyura jamaicensis*: once an occasional visitor, now effectively extinct in UK]

Honey buzzard *Pernis apivorus*: rare passage migrant

Common buzzard *Buteo buteo*: now resident in area and breeds nearby

Red kite *Milvus milvus*: rare visitor

Marsh harrier *Circus aeruginosus*: present all year, has bred

Hen harrier *Circus cyaneus*: uncommon winter visitor

Montagu's harrier *Circus pyargus*: rare summer migrant

Sparrowhawk *Accipiter nisus* : breeding resident

Osprey *Pandion haliaetus*: rare passage migrant

Kestrel *Falco tinnunculus*: common resident

Peregrine *Falco peregrinus*: uncommon winter visitor

Merlin *Falco columbarius*: uncommon but regular winter visitor

Hobby *Falco subbuteo*: uncommon summer visitor, breeds nearby

Red-legged partridge *Alectoris rufa*: resident breeder

Grey partridge *Perdix perdix*: once a resident breeder, now very uncommon

Quail *Coturnix coturnix*: rare summer visitor

Pheasant *Phasianus colchicus*: common resident

Water rail *Rallus aquaticus*: uncommon winter visitor, may occasionally breed

Moorhen *Gallinula chloropus*: common breeding resident

Coot *Fulica atra*: common resident

Oystercatcher *Haemotopus ostralegus* : common resident and winter visitor

Avocet *Recurvirostra avosetta*; unusual visitor, mainly summer; has bred in SS

Ringed plover *Charadrius hiaticula*: resident, breeds on shingle

Little ringed plover *Charadrius dubius* : rare passage migrant

Golden plover *Pluvialis apricaria*: common winter visitor

Grey plover *Pluvialis squatarola*: common winter visitor

Lapwing *Vanellus vanellus*: resident and winter visitor

Knot *Calidris canutus*: occasional winter visitor

Dunlin *Calidris alpina*: common winter visitor

Little stint *Calidris minuta*: unusual autumn migrant

Sanderling *Calidris alba*: regular winter visitor in small numbers

Common snipe *Gallinago gallinago*: mainly now a winter visitor

Jack snipe *Lymnocryptes minimus*: unusual winter visitor

Woodcock *Scolopax rusticola*: unusual winter migrant

Black-tailed godwit *Limosa limosa*: regular on passage

Bar- tailed godwit *Limosa lapponica*: occasional on passage

Whimbrel *Numenius phaeopus*: regular spring and autumn migrant

Curlew *Numenius arquata*: common winter visitor and on passage

Redshank *Tringa erythropus*: common resident and winter visitor

Greenshank *Tringa nebularia*: regular passage migrant

Green sandpiper *Tringa ochropus*: regular passage migrant

Wood sandpiper *Tringa glareola*: uncommon passage migrant

Common sandpiper *Actitis hypoleucos*: common passage migrant

Turnstone *Arenaria interpres*: common winter visitor

Great skua *Stercorarius skua*: rare passage visitor, offshore

Arctic skua *Stercorarius parasiticus*: unusual passage migrant, offshore

Mediterranean gull *Larus melanocephalus*: occasional visitor

Little gull *Larus minutus*: occasional passage migrant

Black-headed gull *Chroicocephalus ridibundus*: common resident

Common gull *Larus canus*: mainly a winter visitor

Lesser black-backed gull *Larus fuscus*: common resident and summer visitor; breeds nearby

Herring gull Larus *argentatus*: common resident, breeds nearby

Great black-backed gull *Larus marinus*: common visitor, mainly winter

Sandwich tern *Sterna sandvicensis*: summer visitor; has bred nearby

Common tern *Sterna hirundo*: common summer visitor, breeds nearby

Arctic tern *Sterna paradisaea*: unusual passage migrant (mainly autumn and probably under-recorded)

Little tern *Sterna albifrons*: summer visitor, usually attempts breeding at SS, sometimes successfully

Black tern *Chlidonias niger*: unusual passage migrant offshore (generally autumn)

Guillemot *Uria aalge*: occasional winter visitor offshore

Razorbill *Alca torda*: ditto

Little auk *Alle alle*: occasional winter sightings off-shore or groundings after storms

Stock dove *Columba oenas*: resident breeder

Wood pigeon *Columba palumbus*: common resident breeder

Turtle dove *Streptopelia turtur*: former summer visitor, now rare

Collared dove *Streptopelia decaocto*: common resident

Ring-necked parakeet *Psittacula krameri*: rare visitor (one record, April 2007)

Cuckoo *Cuculus canorus*: summer visitor

Barn owl *Tyto alba*: resident, has bred

Little owl *Athene noctua*: resident breeder

Tawny owl *Strix aluco*: resident, breeds nearby

Short-eared owl *Asio flammeus*: regular visitor, especially in winter; has bred nearby

Long-eared owl *Asio otus*: occasional winter visitor, probably breeds nearby

Nightjar *Caprimulgus europaeus*: very occasional visitor, breeds nearby

Swift *Apus apus*: summer visitor, mainly on passage

European bee-eater *Merops apiaster*: rare passage migrant

Hoopoe *Upupa epops*: rare passage migrant

Kingfisher *Alcedo atthis*: resident and winter visitor

Wryneck *Jynx torquilla*: unusual but regular autumn migrant

Green woodpecker *Picus viridis*: once common resident, but recently becoming scarcer

Great spotted woodpecker *Dendrocopos major*: uncommon visitor, resident breeder nearby

Skylark *Alauda arvensis*: common resident breeder and winter visitor

Sand martin *Riparia riparia*: summer visitor, mainly on passage, breeds nearby

Swallow *Hirundo rustica*: summer visitor, breeds

House martin *Delichon urbica*: summer visitor, breeds

Meadow pipit *Anthus pratensis*: breeding resident and winter visitor

Tree pipit *Anthus trivialis*: unusual autumn migrant, used to breed nearby

Rock pipit *Anthus petrosus*: regular winter visitor on salt marsh and shore

Water pipit *Anthus spinoletta*: occasional winter visitor

Yellow wagtail *Motacilla flavissima*: summer visitor (breeds nearby)

Grey wagtail *Motacilla cinerea*: mainly winter visitor

Pied wagtail *Motacilla alba*: common resident

Waxwing *Bombycilla garrulous*: uncommon winter visitor

Wren *Troglodytes troglodytes*: common resident

Dunnock *Prunella modularis*: common resident

Robin *Erithacus rubecula*: common resident

Nightingale *Luscinia megarhynchos* : occasional passage migrant (breeds nearby)

Bluethroat *Luscinia svecica*: rare passage migrant

Redstart *Phoenicurus phoenicurus*: unusual but regular passage migrant

Black redstart *Phoenicurus ochruros*: unusual but regular passage migrant and winter visitor

Whinchat *Saxicola rubetra*: regular passage migrant, mainly autumn

Stonechat *Saxicola torquata*: resident and winter visitor, breeds in small numbers

Wheatear *Oenanthe oenanthe*: summer and passage migrant, sometimes breeds

Ring ouzel *Turdus torquata*: unusual passage migrant (mainly autumn)

Blackbird *Turdus merula*: common resident

Fieldfare *Turdus pilaris*: common winter visitor

Song thrush *Turdus philomelos*: common resident

Redwing *Turdus iliacus*: common winter visitor

Mistle thrush *Turdus viscivorus*: uncommon resident, breeds nearby

Cetti's warbler *Cettia cetti*: breeding resident in small numbers

Grasshopper warbler *Locustella naevia* : summer visitor, probably breeds

Sedge warbler *Acrocephalus schoenobaenus*: common summer visitor, breeds

Reed warbler *Acrocephalus scirpaceus*: common summer visitor, breeds

Lesser whitethroat *Sylvia curruca*: summer visitor (breeding) and passage migrant

Common whitethroat *Sylvia communis*: common summer visitor, breeds

Barred warbler *Sylvia nisoria*: rare autumn passage migrant (one record, August 2004)

Dartford warbler *Sylvia undata*: rare visitor (one record), breeds nearby

Icterine warbler *Hippolais icterina*: rare passage migrant

Garden warbler *Sylvia borin*: unusual but regular summer visitor and migrant

Blackcap *Sylvia atricapilla*: summer visitor, breeds

Chiffchaff *Phylloscopus collybita*: summer visitor and passage migrant

Willow warbler *Phylloscopus trochilus*: summer visitor (but no longer breeding) and passage migrant

Yellow- browed warbler *Phylloscopus inornatus*: rare late autumn migrant (becoming more regular)

Radde's warbler *Phylloscopus schwarzi*: very rare vagrant (one record, September 2008)

Dusky warbler *Phylloscopus fuscatus*: very rare vagrant (one ringed, November 2011)

Goldcrest *Regulus regulus*: resident and winter visitor, breeds nearby

Firecrest *Regulus ignicapillus*: unusual but increasingly regular passage migrant

Spotted flycatcher *Muscicapa striata*: summer visitor and passage migrant, has declined sharply

Red-breasted flycatcher *Ficedula parva*: rare passage migrant (autumn)

Pied flycatcher *Ficedula hypoleuca*: unusual but regular passage migrant in autumn

Bearded tit *Panurus biarmicus*: unusual visitor (autumn irruptions), breeds nearby

Long -tailed tit *Aegithalos caudatus*: resident

Blue tit *Parus caeruleus*: common resident

Great tit *Parus major*: common resident

Coal tit *Parus ater* : resident nearby, uncommon visitor; occasional continental migrant (*Parus ater ater*)

Red-backed shrike *Lanius collurio*: rare passage migrant

Lesser grey shrike *Lanius minor*: vagrant, one record only (July 2006)

Great-grey shrike *Lanius excubitor*: occasional winter visitor

Magpie *Pica pica*: common resident

Jay *Garrulus glandiarius*: resident nearby

Jackdaw *Corvus monedula*: common resident

Rook *Corvus frugilegus*: common resident, rookery very close

Carrion crow *Corvus corone*: common resident

Raven *Corvus corax*: occasional visitor (most recently January 2015)

Starling *Sturnus vulgaris*: common resident

House sparrow *Passer domesticus*: common resident, against the national trend

Tree sparrow *Passer montanus*: occasional visitor, getting rarer

Chaffinch *Fringilla coelebs*: common resident

Brambling *Fringilla montifringilla*: unusual winter visitor

Greenfinch *Carduelis chloris*: common resident

Bullfinch *Pyrrhula pyrrhula*: uncommon visitor, breeds nearby

Goldfinch *Carduelis carduelis*: common breeding resident

Siskin *Carduelis spinus*: regular passage and winter migrant

Linnet *Carduelis cannabis*: common resident, breeds

Common crossbill *Loxia curvirostra*: occasional fly-over visitor (breeds nearby)

Lesser redpoll *Carduellis flammea*: occasional passage and winter migrant

Snow bunting *Plectophenax nivalis*: regular winter visitor in small numbers

Reed bunting *Emberiza schoeniclus*: common breeding resident

Yellowhammer *Emberiza citrinella*: now only an unusual visitor (breeds nearby)

Corn bunting *Milaria calandra*: scarce resident and breeder

6 November 2015

Appendix G: Rare species designations

Taxon group: **Amphibian**

Scientific name: ***Bufo bufo*** **Common name:** **Common Toad**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: **Bird**

Scientific name: ***Acanthis cabaret*** **Common name:** **Lesser Redpoll**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Alauda arvensis*** **Common name:** **Eurasian Skylark, Skylark, Sky Lark**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Anthus trivialis*** **Common name:** **Tree pipit**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Aythya marila*** **Common name:** **Greater Scaup**

Designation	Source	Year

Taxon group: **Bird**

England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Branta bernicla subsp. bernicla*** **Common name:** **Dark-bellied Brent Goose**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Caprimulgus europaeus*** **Common name:** **Nightjar**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Circus cyaneus*** **Common name:** **Hen harrier**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Bird**

Scientific name: ***Clangula hyemalis*** **Common name:** **Long-tailed Duck**

Designation	Source	Year
Vulnerable	The IUCN Red List of Threatened Species (2010)	2009

Scientific name: ***Cuculus canorus*** **Common name:** **Common Cuckoo**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Emberiza citrinella*** **Common name:** **Yellowhammer**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Emberiza schoeniclus*** **Common name:** **Reed Bunting**

Designation	Source	Year

Taxon group: **Bird**

England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Gavia arctica*** **Common name:** **Black-throated Diver**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Jynx torquilla*** **Common name:** **Eurasian Wryneck**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Lanius collurio*** **Common name:** **Red-backed Shrike**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Limosa limosa*** **Common name:** **Black-tailed Godwit**

Designation	Source	Year
Near Threatened	The IUCN Red List of Threatened Species (2010)	2008

Taxon group: **Bird**

Scientific name: ***Locustella naevia*** **Common name:** **Grasshopper warbler**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Lullula arborea*** **Common name:** **Wood Lark**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Melanitta fusca*** **Common name:** **White-winged Scoter, Velvet Scoter**

Designation	Source	Year
Endangered	The IUCN Red List of Threatened Species (2010)	2009

Scientific name: ***Melanitta nigra*** **Common name:** **Common Scoter**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: **Bird**

England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Milvus milvus*** **Common name:** **Red Kite**

Designation	Source	Year
Near Threatened	The IUCN Red List of Threatened Species (2010)	2009

Scientific name: ***Muscicapa striata*** **Common name:** **Spotted flycatcher**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Numenius arquata*** **Common name:** **Eurasian Curlew**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Near Threatened	The IUCN Red List of Threatened Species (2010)	2008

Taxon group: **Bird**

Scientific name: ***Passer domesticus*** **Common name:** **House Sparrow**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Passer montanus*** **Common name:** **Eurasian Tree Sparrow**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Perdix perdix*** **Common name:** **Grey Partridge**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: **Bird**

Scientific name: ***Puffinus griseus*** **Common name:** **Sooty Shearwater**

Designation	Source	Year
Near Threatened	The IUCN Red List of Threatened Species (2010)	2010

Scientific name: ***Stercorarius parasiticus*** **Common name:** **Arctic Skua**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Streptopelia turtur*** **Common name:** **Turtle dove**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Sylvia undata*** **Common name:** **Dartford Warbler**

Designation	Source	Year
Near Threatened	The IUCN Red List of Threatened Species (2010)	2008

Taxon group: **Bird**

Scientific name: ***Turdus torquatus*** **Common name:** **Ring ouzel**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Vanellus vanellus*** **Common name:** **Northern Lapwing**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Flowering Plant**

Scientific name: ***Filago vulgaris*** **Common name:** **Common Cudweed**

Designation	Source	Year
Near Threatened	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Scientific name: ***Hypochaeris glabra*** **Common name:** **Smooth Cat's-ear**

Designation	Source	Year
Vulnerable	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Scientific name: ***Medicago minima*** **Common name:** **Bur Medick**

Designation	Source	Year
Vulnerable	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Scientific name: ***Myosurus minimus*** **Common name:** **Mousetail**

Designation	Source	Year

Taxon group: **Flowering Plant**

Vulnerable	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Scientific name: ***Myriophyllum verticillatum*** **Common name:** **Whorled Water-milfoil**

Designation	Source	Year
Vulnerable	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Scientific name: ***Potentilla argentea*** **Common name:** **Hoary Cinquefoil**

Designation	Source	Year
Near Threatened	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Scientific name: ***Puccinellia fasciculata*** **Common name:** **Borrer's Saltmarsh-grass**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Vulnerable	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Taxon group: **Flowering Plant**

Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Ruppia cirrhosa*** **Common name:** **Spiral Tasselweed**

Designation	Source	Year
Near Threatened	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Scientific name: ***Vicia lutea*** **Common name:** **Yellow-vetch**

Designation	Source	Year
Near Threatened	The Vascular Plant Red Data List for Great Britain - 2006 Cheffings, C. and Farrell, L. (Editors) and A tool for assessing the current conservation status of vascular plants on SSSIs in England- May 2006, ENRR 690 (Leach & Rusbridge)	2005

Taxon group: **Insect - Beetle (coleoptera)**

Scientific name: ***Berosus (Enoplurus) fulvus*** **Common name:** **Berosus (Enoplurus) fulvus**

Designation	Source	Year
Vulnerable	A review of the scarce and threatened Coleoptera of Great Britain Part (3)- Water beetles of Great Britain	2010

Scientific name: ***Hydrochus brevis*** **Common name:** **Hydrochus brevis**

Designation	Source	Year
Near Threatened	A review of the scarce and threatened Coleoptera of Great Britain Part (3)- Water beetles of Great Britain	2010

Scientific name: ***Hygrotus (Coelambus) parallelogra*** **Common name:** **Hygrotus (Coelambus) parallelogra**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened beetles of Great Britain Part 1 (Hyman, P.S. revised and updated by M.S. Parsons.)	1992

Scientific name: ***Ochthebius (Ochthebius) viridis*** **Common name:** **Ochthebius (Ochthebius) viridis**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened beetles of Great Britain Part 1 (Hyman, P.S. revised and updated by M.S. Parsons.)	1992

Taxon group: **Insect - Butterfly**

Scientific name: ***Celastrina argiolus*** **Common name:** **Holly blue**

Designation	Source	Year
Schedule 5	Wildlife (Northern Ireland) Order (1985)	1985

Scientific name: ***Coenonympha pamphilus*** **Common name:** **Small Heath**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007
Near Threatened	The Butterfly Red List for Great Britain, 2010	2010

Scientific name: ***Hipparchia semele*** **Common name:** **Grayling**

Designation	Source	Year
Vulnerable	The Butterfly Red List for Great Britain, 2010	2010
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: **Insect - Butterfly**

Scientific name: ***Lasiommata megera*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Near Threatened	The Butterfly Red List for Great Britain, 2010	2010
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Papilio machaon*** **Common name:** **Swallowtail**

Designation	Source	Year
Near Threatened	The Butterfly Red List for Great Britain, 2010	2010

Taxon group: **Insect - Hymenopteran**

Scientific name: ***Ponera coarctata*** **Common name:** **Indolent Ant**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened bees, wasps and ants of Great Britain (Falk, S.J.)	1991

Taxon group: **Insect - Moth**

Scientific name: ***Acronicta psi*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Acronicta rumicis*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Agrochola litura*** **Common name:** **Brown-spot Pinion**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Insect - Moth**

Scientific name: ***Agrochola lychnidis*** **Common name:** **Beaded Chestnut**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Allophyes oxyacanthae*** **Common name:** **Green-brindled Crescent**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Amphipoea oculea*** **Common name:** **Ear Moth**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Insect - Moth**

Scientific name: ***Amphipyra tragopoginis*** **Common name:** **Mouse Moth**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Anania verbascalis*** **Common name:** **Anania verbascalis**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Apamea remissa*** **Common name:** **Dusky Brocade**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Aphomia zelleri*** **Common name:** **Aphomia zelleri**

Designation	Source	Year
Rare	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Taxon group: **Insect - Moth**

Scientific name: ***Aporophyla lutulenta*** **Common name:** **Deep-brown Dart**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Archanara neurica*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Rare	Red Data Book of Insects	1987
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Arctia caja*** **Common name:** **Garden Tiger**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Insect - Moth**

Scientific name: ***Calamotropha paludella*** **Common name:** **Calamotropha paludella**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Caradrina morpheus*** **Common name:** **Mottled Rustic**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Celaena leucostigma*** **Common name:** **The Crescent**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Chiasmia clathrata*** **Common name:** **Latticed Heath**

Designation	Source	Year

Taxon group: **Insect - Moth**

England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Cynaeda dentalis*** **Common name:** **Cynaeda dentalis**

Designation	Source	Year
Rare	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Diarsia rubi*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Ethmia bipunctella*** **Common name:** **Ethmia bipunctella**

Designation	Source	Year
Vulnerable	A review of the scarce and threatened Ethmiidae, Gelechiidae and Stathmopodidae moths of Great Britain (Parsons, M.S.)	1995

Taxon group: **Insect - Moth**

Scientific name: ***Eugnorisma glareosa*** **Common name:** **Autumnal Rustic**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Euxoa tritici*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2008

Scientific name: ***Evergestis extimalis*** **Common name:** **Marbled Yellow Pearl**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Graphiphora augur*** **Common name:**

Designation	Source	Year

Taxon group: **Insect - Moth**

England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Gymnancyla canella*** **Common name:** **Gymnancyla canella**

Designation	Source	Year
Nationally Notable A	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Heliothis viriplaca*** **Common name:** **Marbled Clover**

Designation	Source	Year
Rare	Red Data Book of Insects	1987

Scientific name: ***Hepialus humuli*** **Common name:** **Ghost Moth**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Hoplodrina blanda*** **Common name:** **The Rustic**

Designation	Source	Year

Taxon group: **Insect - Moth**

Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Hydraecia micacea*** **Common name:** **Rosy Rustic**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Lycia hirtaria*** **Common name:** **Brindled Beauty**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Malacosoma castrensis*** **Common name:** **Ground Lackey**

Designation	Source	Year
Rare	Red Data Book of Insects	1987

Taxon group: **Insect - Moth**

Scientific name: ***Melanchra persicariae*** **Common name:** **Dot Moth**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Melanchra pisi*** **Common name:** **Broom Moth**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Mesoligia literosa*** **Common name:** **Rosy Minor**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Insect - Moth**

Scientific name: ***Mythimna comma*** **Common name:** **Shoulder-striped Wainscot**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Noctua orbona*** **Common name:** **Lunar Yellow Underwing**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Orthosia gracilis*** **Common name:** **Powdered Quaker**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Insect - Moth**

Scientific name: ***Pediasia contaminella*** **Common name:** **Waste Grass-veneer**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Pelurga comitata*** **Common name:** **Dark Spinach**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Pima boisduvaliella*** **Common name:** **Pima boisduvaliella**

Designation	Source	Year
Rare	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Platytes alpinella*** **Common name:** **Hook-tipped Grass-veneer**

Designation	Source	Year
Rare	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Taxon group: **Insect - Moth**

Scientific name: ***Rhizedra lutosa*** **Common name:** **Large Wainscot**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2008
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Schoenobius gigantella*** **Common name:** **Giant Water-veneer**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Scopula marginepunctata*** **Common name:** **Mullein Wave**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Scopula rubiginata*** **Common name:** **Tawny Wave**

Designation	Source	Year
Rare	Red Data Book of Insects	1987

Taxon group: **Insect - Moth**

Scientific name: ***Scotopteryx chenopodiata*** **Common name:** **Shaded Broad-bar**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Spilosoma lubricipeda*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Spilosoma luteum*** **Common name:** **Buff Ermine**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Insect - Moth**

Scientific name: ***Synaphe punctalis*** **Common name:** **Long-legged Tabby**

Designation	Source	Year
Nationally Notable B	A review of the scarce and threatened pyralid moths of Great Britain (Parsons, M.S.)	1993

Scientific name: ***Tholera cespitis*** **Common name:**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Tholera decimalis*** **Common name:** **Feathered Gothic**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Timandra comae*** **Common name:** **Blood-vein**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: **Insect - Moth**

England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Tyria jacobaeae*** **Common name:** **The Cinnabar**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Watsonalla binaria*** **Common name:** **Oak Hook-tip**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: **Marine Mammal**

Scientific name: ***Balaenoptera physalus*** **Common name:** **Fin Whale**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007
Endangered	The IUCN Red List of Threatened Species (2010)	2008
Annex 4	Habitats Directive	1992
Schedule 2	The Conservation (Nature Habitats, etc.) Regulations (Northern Ireland) 1995, amended 2004	1995
Schedule 2	The Conservation of Habitats and Species Regulations 2010	1994

Scientific name: ***Halichoerus grypus*** **Common name:** **Grey Seal**

Designation	Source	Year
Schedule 5	Wildlife (Northern Ireland) Order (1985)	1985

Scientific name: ***Phoca vitulina*** **Common name:** **Common Seal**

Designation	Source	Year
Schedule 5	Wildlife (Northern Ireland) Order (1985)	1985
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Marine Mammal**

Priority Species	UK list of Priority Habitats and Species	2007

Scientific name: ***Phocoena phocoena*** **Common name:** **Harbour porpoise**

Designation	Source	Year
Schedule 2	The Conservation (Nature Habitats, etc.) Regulations (Northern Ireland) 1995, amended 2004	1995
Schedule 2	The Conservation of Habitats and Species Regulations 2010	1994
Annex 4	Habitats Directive	1992
ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS)	2008
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007
OSPAR	OSPAR List of Threatened and/or Declining Species and Habitats, 2008	2008

Taxon group: **Reptile**

Scientific name: ***Anguis fragilis*** **Common name:** **Slow-worm**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Natrix natrix*** **Common name:** **Grass Snake**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Zootoca vivipara*** **Common name:** **Viviparous Lizard**

Designation	Source	Year
Schedule 5	Wildlife (Northern Ireland) Order (1985)	1985
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Taxon group: **Spider (araneae)**

Scientific name: ***Pseudeuophrys obsoleta*** **Common name:** **Jumping spider**

Designation	Source	Year
Rare	Red Data Book of Invertebrates	1991
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Trichoncus affinis*** **Common name:** **Trichoncus affinis**

Designation	Source	Year
Vulnerable	Red Data Book of Invertebrates	1991

Taxon group: Terrestrial Mammal

Scientific name: *Arvicola amphibius* **Common name:** **Water Vole**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: *Erinaceus europaeus* **Common name:** **West European Hedgehog**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: *Lepus europaeus* **Common name:** **Brown Hare**

Designation	Source	Year
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: Terrestrial Mammal

Scientific name: ***Lutra lutra*** **Common name:** **Otter**

Designation	Source	Year
Annex 4	Habitats Directive	1992
Schedule 2	The Conservation of Habitats and Species Regulations 2010	1994
Schedule 2	The Conservation (Nature Habitats, etc.) Regulations (Northern Ireland) 1995, amended 2004	1995
Priority Species	UK list of Priority Habitats and Species	2007
Near Threatened	The IUCN Red List of Threatened Species (2010)	2008
England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Scientific name: ***Meles meles*** **Common name:** **Badger**

Designation	Source	Year
Protection of Badgers Act (1992)	Protection of Badgers Act (1992)	1992
Schedule 5	Wildlife (Northern Ireland) Order (1985)	1985

Scientific name: ***Micromys minutus*** **Common name:** **Harvest Mouse**

Designation	Source	Year
Priority Species	UK list of Priority Habitats and Species	2007

Taxon group: Terrestrial Mammal

England NERC S.41	Natural Environment and Rural Communities Act 2006 - Secies of Principal Importance in England (section 41) and Wales (section 42)	2008

Pound Farm
Low Road
Great Glemham
Suffolk IP17 2DQ
Tel: 01728 663282 - 07798 941555

e-mail: toby@abrehartecology.com

Website: abrehartecology.com