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Site Grid Reference: 517,399 419,271
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Legend

Most Prominent Species

- Aster tripolium var. tripolium
- Bare ground
- Bolboschoenus maritimus
- Phragmites australis
- Puccinellia maritima
- Spartina anglica

NVC Plant Communities

- Intertidal mudflats
- Low water and creeks
- Small stands of SM6
- Small stands of SM8
- S4
- SM6
- SM8
- SM12
- SM24
- S21
- Survey Area



Drawing Ref		NABL114/30641/1	
Scale at A3		1:1,700	
Drawn	JH	Checked	EA
Date	30/09/2020	Date	30/09/2020
Client		Able UK	
Figure Number		2c	

Figure Title

Figure 15 - Killingholme Marsh
Foreshore NVC Plant
Communities – Transects 10 to 12

Filepath: S:\Letchworth\Projects\NABL114 - Fish population surveys\Mapping\Working\Separate Fig 2s\NABL114_Fig2d_NVCSurveyResults_JH_230920.mxd
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Legend

Most Prominent Species

- Arrhenatherum elatius
- Bare ground
- Bolboschoenus maritimus
- Elytrigia atherica
- Plantago maritima
- Spartina anglica
- Triglochin maritimum

NVC Plant Communities

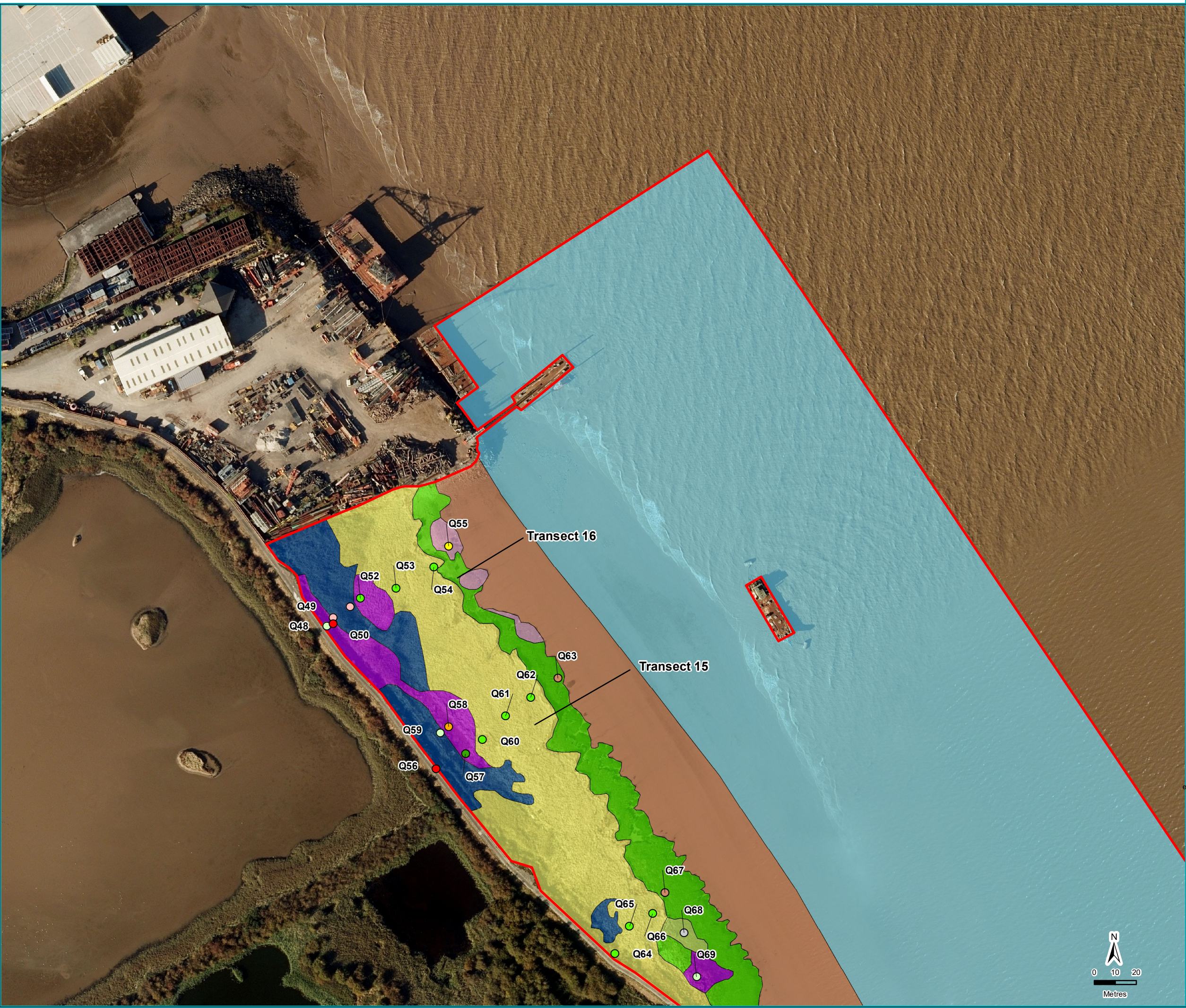
- Intertidal mudflats
- Low water and creeks
- MG1
- Shingle
- Small stands of SM6
- Small stands of SM8
- S4
- SM6
- SM13
- SM24
- S21
- Survey Area



Drawing Ref		NABL114/30641/1	
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Drawn	JH	Checked	EA
Date	30/09/2020	Date	30/09/2020
Client			
Able UK			
Figure Number		2d	
Figure Title			

Figure 16 - Killingholme Marsh
Foreshore NVC Plant
Communities – Transects 13 to 14

Filepath: S:\Letchworth\Projects\NABL114 - Fish population surveys\Mapping\Working\Separate Fig 2s\NABL114_Fig2e_NVCSurveyResults_JH_230920.mxd
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Legend

Most Prominent Species

- Bolboschoenus maritimus
- Elytrigia atherica
- Festuca rubra
- Glaux maritima
- Juncus gerardii
- Phragmites australis
- Plantago maritima
- Spartina anglica
- Triglochin maritimum

NVC Plant Communities

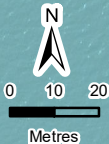
- Intertidal mudflats
- Low water and creeks
- S4
- SM6
- SM12
- SM13
- SM24
- S21
- Survey Area



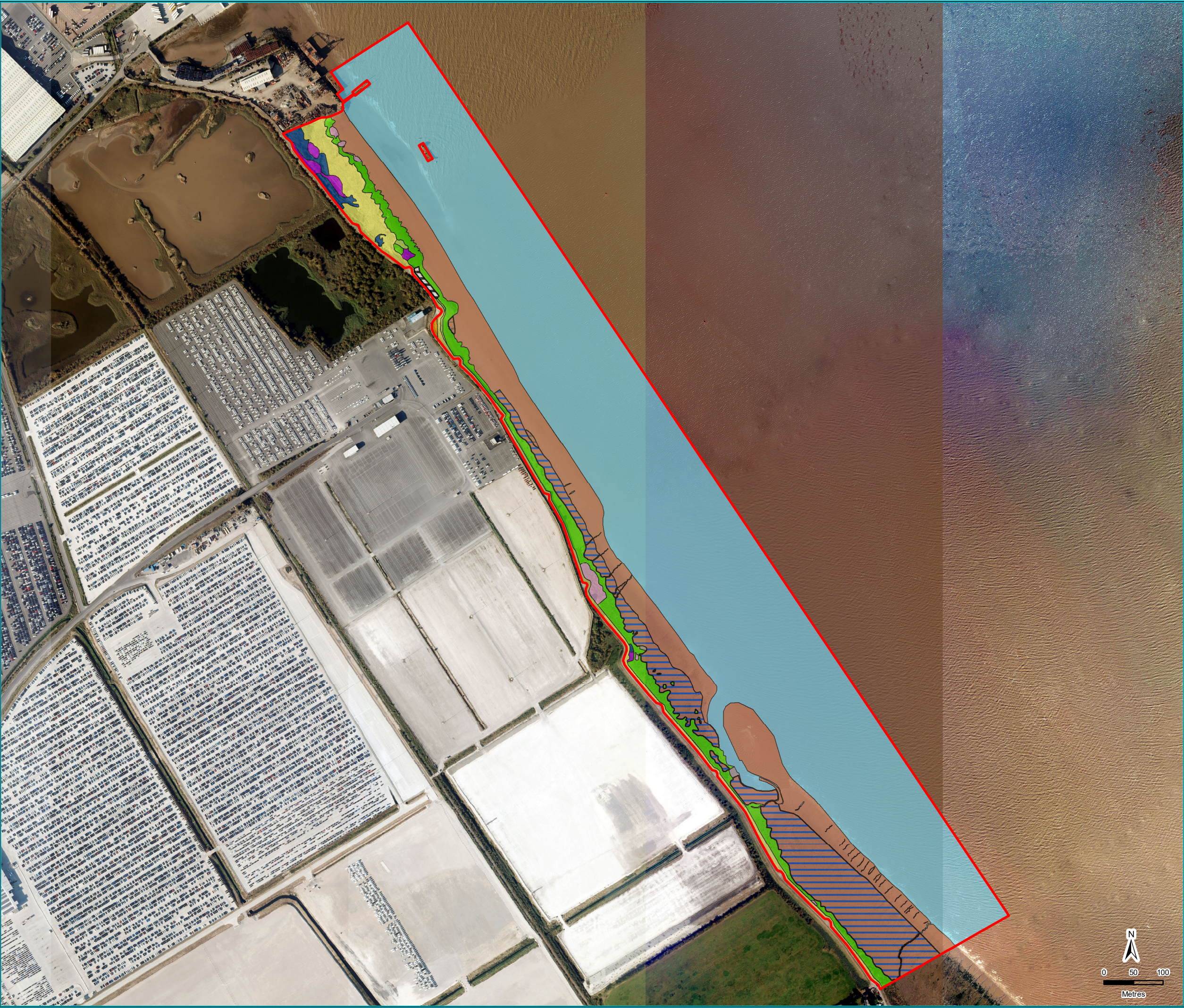
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Date	30/09/2020	Date	30/09/2020
Client		Able UK	
Figure Number		2e	

Figure Title

Figure 17 - Killingholme Marsh
Foreshore NVC Plant
Communities – Transects 15 to 16



Filepath: S:\Letchworth\Projects\NABL114 - Fish population surveys\Mapping\Working\NABL114_Fig4_NVCCommunities_JH_051020.mxd
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- Legend
- NVC Plant Communities**
- Intertidal mudflats
 - Low water and creeks
 - MG1
 - Shingle
 - Small stands of SM6
 - Small stands of SM8
 - S4
 - SM6
 - SM8
 - SM12
 - SM13
 - SM24
 - S21
 - Survey Area

Drawing Ref
NABL114/30747/1

Scale at A3
1:6,000

Drawn JH	Checked EA
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Date 30/09/2020	Date 30/09/2020
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Client
Able UK

Figure Number
4

Figure Title
NVC Communities

4. Rare or Noteworthy Species

The following species are considered rare or noteworthy and their conservation status in England is provided based on *A Vascular Plant Red List for England* (Stroh *et al.*, 2014).

4.1 Wall Bedstaw *Galium parisiense*

GB status: Vulnerable; **English status:** Vulnerable

This is an annual species found on old walls and bare ground, usually on calcareous or neutral substrates, although in the past ten years it has expanded its range and its habitats, and has been recorded in pavement cracks and waste ground across the south of England. The reason for this expansion of range is not known, but in part could be due to better recording and separation of this species with the very common and widespread Cleavers *Galium aparine*, with which it shares a superficial appearance. See Figure 19.



Figure 19 - Wall Bedstrow, on sea wall in south-eastern section of site

4.2 Sea Wormwood *Artemisia maritima*

GB status: least Concern; English status: Near Threatened

This attractive aromatic perennial (Figure 20) is an uncommon component of the upper, drier parts of saltmarshes, and is also found on walls close to the sea (Preston *et al.* 2002). It has experienced declines historically, to the extent where it was assessed as Near Threatened in England, although the past twenty years have seen a general stabilisation in distribution, especially in the east of England, where it is present in most coastal 10 km squares, although it is absent from a point starting at the mouth of the Humber, north to Redcar. This species was last recorded in our survey area in 1997.



Figure 20 - Sea Wormwood on sea wall in south-eastern section of site

4.3 Common Valerian *Valeriana officinalis*

GB status: least Concern; English status: Near Threatened

Common Valerian *Valeriana officinalis* is assessed as Near Threatened in England (Stroh *et al.*, 2014). It is associated with fens, river sides and wet woodlands, and has declined in England over the last 50 years. In the survey area, it was present on the edges of the Seaward berm opposite the start of Transect 13, and also within vegetation at the top of the saltmarsh (Q70). A surprising find, as it is not known to have a tolerance for the saline conditions which must surely be present here (Hill *et al.* 2004).

4.4 Other species considered of local interest

4.4.1 Thrift *Armeria maritima*

Although a common coastal species throughout the British Isles, our record of Thrift is the first for the 10 km square since 1977, when it was found at the North Killingholme Haven Nature Reserve. On the south side of the Humber, although there is a scattering of pre-2000 records, there is only one post-2000 record, further north at Goxhill Haven, despite intensive recording for the next *Atlas of the British and Irish Flora*. In this context, the species is considered to be of local importance.



Figure 21 - Thrift growing within a species-rich area of SM12 vegetation in the vicinity of quadrat Q55 (transect 15), far north-western end of site

5. Conclusions

Saltmarsh vegetation is present and has been mapped along a 1.7 km section between the Killingholme North Low Lighthouse at Station Road (TA1780518496) to the sea wall beside the old port buildings (south-east of the jetties) at TA1679419997.

For much of this area, saltmarsh vegetation is present as a narrow band (less than 10m wide), lacks zonation and is dominated by the common saltmarsh community SM6 dominated by Common Cord-grass *Spartina anglica*. However, a wider and more complex area of saltmarsh vegetation (to 70m wide) has developed in the area close to the jetties by North Killingholme Haven (TA1687920017). The greater proportion of land between the lower edge of saltmarsh vegetation and the tidal low water mark comprises exposed intertidal mudflats without vegetation.

In total, eight NVC plant communities have been recorded (SM6, SM8, SM12, SM13, SM24, S4, S21b and MG1).

Vegetation recorded along the seaward berm and sea wall comprised mainly common, ruderal species. However, a number of saline-tolerant plants that are components of saltmarsh vegetation communities were present, and one nationally 'Vulnerable' species was found on the sea wall.

One nationally 'Vulnerable' species, two Near Threatened species and one locally notable species were recorded during the survey.

6. References

Rodwell, J.S. (ed.). 1992. *British Plant Communities Volume 3: Grassland and montane communities*. Cambridge: Cambridge University Press.

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Rodwell, J.S. (ed.). 2000. *British Plant Communities Volume 5: Maritime communities and vegetation of open habitats*. Cambridge: Cambridge University Press

Stace, C. 1991. *New Flora of the British Isles*. Cambridge: Cambridge University Press.

Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A. Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. & Taylor, I. (2014). *A vascular plant Red List for England*. Botanical Society of Britain and Ireland: Bristol.

7. Appendix I: Quadrat Data

Killingholme Marsh foreshore quadrat data

Transect	Quadrat	Species	% cover	Grid Reference
T1	1	<i>Spartina anglica</i>	15	TA1779818483
T1	1	<i>Puccinellia maritima</i>	80	
T1	1	<i>Suaeda maritima</i>	4	
T1	1	<i>Atriplex prostrata</i>	2	
T1	1	<i>Salicornia europaea agg.</i>	1	
T1	1	Bare ground	1	
T1	1	Sward height	10	
T1	2	<i>Spartina anglica</i>	90	TA1780118487
T1	2	<i>Puccinellia maritima</i>	3	
T1	2	<i>Suaeda maritima</i>	2	
T1	2	<i>Salicornia europaea agg.</i>	1	
T1	2	<i>Aster tripolium s.l.</i>	3	
T1	2	Bare ground	4	
T1	2	Sward height	40	
T1	3	<i>Spartina anglica</i>	5	TA1781718500
T1	3	<i>Salicornia europaea agg.</i>	1	
T1	3	Bare ground	94	
T1	3	Sward height	10	
T1	4	<i>Spartina anglica</i>	2	TA1783218506
T1	4	<i>Puccinellia maritima</i>	1	
T1	4	<i>Salicornia europaea agg.</i>	55	
T1	4	<i>Aster tripolium s.l.</i>	1	
T1	4	Bare ground	40	
T1	4	Sward height	8	
T1	5	<i>Spartina anglica</i>	2	TA1787318543
T1	5	<i>Suaeda maritima</i>	1	
T1	5	<i>Salicornia europaea agg.</i>	6	
T1	5	Bare ground	90	
T1	5	Sward height	8	
T2	6	<i>Spartina anglica</i>	70	TA1773918551
T2	6	<i>Puccinellia maritima</i>	20	
T2	6	<i>Aster tripolium s.l.</i>	1	
T2	6	<i>Salicornia europaea agg.</i>	2	
T2	6	Bare ground	6	
T2	6	Sward height	35	
T2	7	<i>Spartina anglica</i>	95	TA1774718558

Transect	Quadrat	Species	% cover	Grid Reference
T2	7	<i>Puccinellia maritima</i>	3	
T2	7	<i>Salicornia europaea</i> agg.	1	
T2	7	<i>Suaeda maritima</i>	1	
T2	7	Bare ground	4	
T2	7	Sward height	50	
T2	8	<i>Spartina anglica</i>	20	TA1775118562
T2	8	<i>Puccinellia maritima</i>	2	
T2	8	<i>Aster tripolium</i> s.l.	1	
T2	8	<i>Salicornia europaea</i> agg.	3	
T2	8	<i>Suaeda maritima</i>	1	
T2	8	Bare ground	80	
T2	8	Sward height	30	
T2	9	<i>Spartina anglica</i>	2	TA1775918563
T2	9	<i>Aster tripolium</i> s.l.	1	
T2	9	<i>Salicornia europaea</i> agg.	1	
T2	9	Bare ground	98	
T2	9	Sward height	10	
T3	10	<i>Spartina anglica</i>	45	TA1769118614
T3	10	<i>Puccinellia maritima</i>	30	
T3	10	<i>Salicornia europaea</i> agg.	1	
T3	10	<i>Aster tripolium</i> var. <i>tripolium</i>	25	
T3	10	<i>Aster tripolium</i> var. <i>discoidea</i>	1	
T3	10	<i>Spergularia media</i>	2	
T3	10	<i>Plantago maritima</i>	1	
T3	10	Bare ground	2	
T3	10	Sward height	40	
T3	11	<i>Spartina anglica</i>	80	TA1769318615
T3	11	<i>Puccinellia maritima</i>	8	
T3	11	<i>Salicornia europaea</i> agg.	4	
T3	11	<i>Aster tripolium</i> var. <i>discoidea</i>	4	
T3	11	Bare ground	6	
T3	11	Sward height	40	
T3	12	<i>Spartina anglica</i>	100	TA1769918618
T3	12	Bare ground	1	
T3	12	Sward height	50	
T3	13	<i>Spartina anglica</i>	2	TA1770718625
T3	13	<i>Puccinellia maritima</i>	2	
T3	13	Bare ground	96	
T3	13	Sward height	6	
T3	14	<i>Spartina anglica</i>	2	TA1772318643

Transect	Quadrat	Species	% cover	Grid Reference
T3	14	<i>Salicornia europaea</i> agg.	1	TA1763218683
T3	14	<i>Suaeda maritima</i>	1	
T3	14	Bare ground	96	
T3	14	Sward height	4	
T4	15	<i>Spartina anglica</i>	20	
T4	15	<i>Suaeda maritima</i>	1	
T4	15	<i>Salicornia europaea</i> agg.	3	
T4	15	<i>Puccinellia maritima</i>	2	
T4	15	Bare ground	75	TA1764518688
T4	15	Sward height	25	
T4	16	<i>Spartina anglica</i>	4	
T4	16	Bare ground	96	
T4	16	Sward height	3	
T4	17	<i>Spartina anglica</i>	7	
T4	17	Bare ground	93	
T4	17	Sward height	10	
T4	18	<i>Spartina anglica</i>	1	TA1767118708
T4	18	<i>Suaeda maritima</i>	1	
T4	18	Bare ground	98	
T4	18	Sward height	2	
T4	19	<i>Spartina anglica</i>	2	
T4	19	Bare ground	98	
T4	19	Sward height	8	
T5	20	<i>Spartina anglica</i>	25	TA1759218768
T5	20	Bare ground	75	
T5	20	Sward height	25	
T5	21	<i>Spartina anglica</i>	35	
T5	21	Bare ground	65	
T5	21	Sward height	30	
T5	22	<i>Spartina anglica</i>	2	
T5	22	Bare ground	98	
T5	22	Sward height	4	TA1760018766
T5	23	<i>Spartina anglica</i>	1	
T5	23	Bare ground	99	
T5	23	Sward height	2	
T6	24	<i>Spartina anglica</i>	90	
T6	24	<i>Salicornia europaea</i> agg.	5	
T6	24	<i>Puccinellia maritima</i>	8	
T6	24	<i>Aster tripolium</i> s.l.	1	
T6	24	<i>Suaeda maritima</i>	1	

Transect	Quadrat	Species	% cover	Grid Reference
T6	24	Bare ground	4	
T6	24	Sward height	35	
T6	25	<i>Spartina anglica</i>	90	TA1754118833
T6	25	<i>Salicornia europaea agg.</i>	3	
T6	25	<i>Aster tripolium s.l.</i>	1	
T6	25	Bare ground	7	
T6	25	Sward height	25	
T6	26	<i>Spartina anglica</i>	7	TA1754518835
T6	26	<i>Salicornia europaea agg.</i>	12	
T6	26	<i>Spergularia media</i>	1	
T6	26	Bare ground	82	
T6	26	Sward height	18	
T6	27	<i>Spartina anglica</i>	5	TA1755118833
T6	27	<i>Salicornia europaea agg.</i>	10	
T6	27	Bare ground	85	
T6	27	Sward height	8	
T6	28 extra	<i>Spartina anglica</i>	5	TA1753718831
T6	28 extra	<i>Salicornia europaea agg.</i>	75	
T6	28 extra	<i>Puccinellia maritima</i>	2	
T6	28 extra	<i>Aster tripolium s.l.</i>	1	
T6	28 extra	<i>Suaeda maritima</i>	2	
T6	28 extra	Bare ground	14	
T6	28 extra	Sward height	20	
T7	29	<i>Spartina anglica</i>	8	TA1747918890
T7	29	<i>Aster tripolium var. tripolium</i>	8	
T7	29	<i>Suaeda maritima</i>	3	
T7	29	<i>Puccinellia maritima</i>	90	
T7	29	<i>Atriplex prostrata</i>	1	
T7	29	Bare ground	1	
T7	29	Sward height	40	
T7	30	<i>Spartina anglica</i>	60	TA1749518880
T7	30	<i>Puccinellia maritima</i>	8	
T7	30	<i>Aster tripolium s.l.</i>	2	
T7	30	<i>Salicornia europaea agg.</i>	12	
T7	30	Bare ground	12	
T7	30	Sward height	35	
T7	31	<i>Spartina anglica</i>	40	TA1749718898
T7	31	<i>Suaeda maritima</i>	1	
T7	31	<i>Salicornia europaea agg.</i>	3	
T7	31	Bare ground	55	

Transect	Quadrat	Species	% cover	Grid Reference
T7	31	Sward height	20	
T7	32	<i>Spartina anglica</i>	35	TA1750118902
T7	32	<i>Salicornia europaea</i> agg.	1	
T7	32	Bare ground	65	
T7	32	Sward height	30	
T7	33	<i>Spartina anglica</i>	75	TA1750718906
T7	33	<i>Suaeda maritima</i>	1	
T7	33	<i>Puccinellia maritima</i>	4	
T7	33	<i>Salicornia europaea</i> agg.	2	
T7	33	Bare ground	20	
T7	33	Sward height	35	
T8	34	<i>Spartina anglica</i>	40	TA1742718954
T8	34	<i>Puccinellia maritima</i>	55	
T8	34	<i>Atriplex prostrata</i>	1	
T8	34	<i>Aster tripolium</i> s.l.	3	
T8	34	Bare ground	2	
T8	34	Sward height	45	
T8	35	<i>Spartina anglica</i>	97	TA1743018961
T8	35	Bare ground	3	
T8	35	Sward height	50	
T8	36	<i>Spartina anglica</i>	35	TA1744518977
T8	36	<i>Puccinellia maritima</i>	1	
T8	36	<i>Salicornia europaea</i> agg.	2	
T8	36	Bare ground	65	
T8	36	Sward height	35	
T8	37	<i>Spartina anglica</i>	30	TA1745918990
T8	37	Bare ground	70	
T8	37	Sward height	30	
T8	38	<i>Spartina anglica</i>	15	TA1747018997
T8	38	Bare ground	85	
T8	38	Sward height	30	
T9	39	<i>Plantago maritima</i>	3	TA1737019031
T9	39	<i>Triglochin maritimum</i>	3	
T9	39	<i>Aster tripolium</i> var. <i>tripolium</i>	6	
T9	39	<i>Atriplex prostrata</i>	4	
T9	39	<i>Puccinellia maritima</i>	85	
T9	39	<i>Glaux maritima</i>	1	
T9	39	<i>Spergularia media</i>	3	
T9	39	<i>Spartina anglica</i>	1	
T9	39	Bare ground	1	

Transect	Quadrat	Species	% cover	Grid Reference
T9	39	Sward height	6	
T9	40 extra	<i>Triglochin maritimum</i>	4	TA1736319033
T9	40 extra	<i>Aster tripolium</i> var. <i>tripolium</i>	3	
T9	40 extra	<i>Atriplex prostrata</i>	2	
T9	40 extra	<i>Puccinellia maritima</i>	5	
T9	40 extra	<i>Spergularia media</i>	1	
T9	40 extra	<i>Spartina anglica</i>	2	
T9	40 extra	<i>Bolboschoenus maritimus</i>	80	
T9	40 extra	<i>Phragmites australis</i>	3	
T9	40 extra	Bare ground	1	
T9	40 extra	Sward height	70	
T9	41 extra	<i>Aster tripolium</i> var. <i>tripolium</i>	3	TA1737319037
T9	41 extra	<i>Spartina anglica</i>	1	
T9	41 extra	<i>Bolboschoenus maritimus</i>	2	
T9	41 extra	<i>Phragmites australis</i>	95	
T9	41 extra	Bare ground	1	
T9	41 extra	Sward height	85	
T9	42	<i>Aster tripolium</i> var. <i>tripolium</i>	5	TA1737819031
T9	42	<i>Puccinellia maritima</i>	3	
T9	42	<i>Spartina anglica</i>	95	
T9	42	Bare ground	2	
T9	42	Sward height	40	
T9	43	<i>Aster tripolium</i> var. <i>tripolium</i>	85	TA1738219031
T9	43	<i>Puccinellia maritima</i>	8	
T9	43	<i>Spartina anglica</i>	9	
T9	43	<i>Salicornia europaea</i> agg.	1	
T9	43	Bare ground	2	
T9	43	Sward height	45	
T9	44	<i>Aster tripolium</i> var. <i>tripolium</i>	2	TA1739219035
T9	44	<i>Puccinellia maritima</i>	4	
T9	44	<i>Spartina anglica</i>	45	
T9	44	Bare ground	50	
T9	44	Sward height	35	
T9	45	<i>Aster tripolium</i> var. <i>tripolium</i>	1	TA1739619042
T9	45	<i>Spartina anglica</i>	80	
T9	45	<i>Salicornia europaea</i> agg.	3	
T9	45	Bare ground	15	
T9	45	Sward height	35	
T9	46	<i>Aster tripolium</i> var. <i>tripolium</i>	1	TA1739919042
T9	46	<i>Puccinellia maritima</i>	2	

Transect	Quadrat	Species	% cover	Grid Reference
T9	46	<i>Spartina anglica</i>	3	TA1741219049
T9	46	<i>Salicornia europaea agg.</i>	12	
T9	46	Bare ground	85	
T9	46	Sward height	7	
T9	47	<i>Puccinellia maritima</i>	1	
T9	47	<i>Spartina anglica</i>	6	TA1682519870
T9	47	<i>Salicornia europaea agg.</i>	1	
T9	47	Bare ground	94	
T9	47	Sward height	6	
T10	48	<i>Bolboschoenus maritimus</i>	85	
T10	48	<i>Triglochin maritimum</i>	8	TA1682819874
T10	48	<i>Apium graveolens</i>	2	
T10	48	<i>Atriplex prostrata</i>	2	
T10	48	<i>Elytrigia atherica</i>	3	
T10	48	Bare ground	1	
T10	48	Sward height	65	TA1682819871
T10	49 extra	<i>Bolboschoenus maritimus</i>	35	
T10	49 extra	<i>Triglochin maritimum</i>	2	
T10	49 extra	<i>Apium graveolens</i>	6	
T10	49 extra	<i>Atriplex prostrata</i>	4	
T10	49 extra	<i>Elytrigia atherica</i>	3	TA1683619879
T10	49 extra	<i>Juncus gerardii</i>	45	
T10	49 extra	Bare ground	2	
T10	49 extra	Sward height	40	
T10	50 extra	<i>Bolboschoenus maritimus</i>	2	
T10	50 extra	<i>Phragmites australis</i>	98	TA1684119883
T10	50 extra	Bare ground	1	
T10	50 extra	Sward height	95	
T10	51	<i>Bolboschoenus maritimus</i>	7	
T10	51	<i>Triglochin maritimum</i>	3	
T10	51	<i>Apium graveolens</i>	4	TA1684119883
T10	51	<i>Juncus gerardii</i>	90	
T10	51	<i>Phragmites australis</i>	3	
T10	51	<i>Plantago maritima</i>	3	
T10	51	<i>Glaux maritima</i>	2	
T10	51	Bare ground	1	TA1684119883
T10	51	Sward height	23	
T10	52	<i>Elytrigia atherica</i>	99	
T10	52	Bare ground	1	TA1684119883
T10	52	Sward height	50	

Transect	Quadrat	Species	% cover	Grid Reference
T10	53	<i>Elytrigia atherica</i>	99	TA1685819888
T10	53	Bare ground	1	
T10	53	Sward height	52	
T10	54	<i>Elytrigia atherica</i>	99	TA1687619898
T10	54	Bare ground	1	
T10	54	Sward height	38	
T10	55 extra	<i>Plantago maritima</i>	13	TA1688319908
T10	55 extra	<i>Glaux maritima</i>	35	
T10	55 extra	<i>Aster tripolium</i> var. <i>tripolium</i>	8	
T10	55 extra	<i>Spartina anglica</i>	7	
T10	55 extra	<i>Spergularia media</i>	5	
T10	55 extra	<i>Puccinellia maritima</i>	25	
T10	55 extra	<i>Armeria maritima</i>	1	
T10	55 extra	<i>Cochlearia anglica</i>	2	
T10	55 extra	<i>Suaeda maritima</i>	1	
T10	55 extra	Bare ground	2	
T10	55 extra	Sward height	10	
T11	56	<i>Phragmites australis</i>	93	TA1687719802
T11	56	<i>Puccinellia maritima</i>	4	
T11	56	<i>Atriplex prostrata</i>	1	
T11	56	<i>Bolboschoenus maritimus</i>	2	
T11	56	Bare ground	1	
T11	56	Sward height	95	
T11	57	<i>Phragmites australis</i>	6	TA1689119809
T11	57	<i>Festuca rubra</i>	75	
T11	57	<i>Elytrigia atherica</i>	20	
T11	57	<i>Glaux maritima</i>	1	
T11	57	Bare ground	1	
T11	57	Sward height	50	
T11	58 extra	<i>Bolboschoenus maritimus</i>	22	TA1688319822
T11	58 extra	<i>Triglochin maritimum</i>	14	
T11	58 extra	<i>Apium graveolens</i>	2	
T11	58 extra	<i>Atriplex prostrata</i>	1	
T11	58 extra	<i>Plantago maritima</i>	26	
T11	58 extra	<i>Aster tripolium</i> var. <i>tripolium</i>	1	
T11	58 extra	Bare ground	2	
T11	58 extra	Sward height	5	
T11	59 extra	<i>Bolboschoenus maritimus</i>	90	TA1687919819
T11	59 extra	<i>Aster tripolium</i> var. <i>tripolium</i>	4	
T11	59 extra	Bare ground	6	

Transect	Quadrat	Species	% cover	Grid Reference
T11	59 extra	Sward height	38	
T11	60	<i>Elytrigia atherica</i>	99	TA1689919816
T11	60	Bare ground	1	
T11	60	Sward height	50	
T11	61	<i>Elytrigia atherica</i>	99	TA1691019827
T11	61	Bare ground	1	
T11	61	Sward height	65	
T11	62	<i>Elytrigia atherica</i>	100	TA1692219836
T11	62	Bare ground	0	
T11	62	Sward height	35	
T11	63	<i>Spartina anglica</i>	78	TA1693519845
T11	63	<i>Aster tripolium</i> var. <i>tripolium</i>	3	
T11	63	<i>Suaeda maritima</i>	5	
T11	63	<i>Puccinellia maritima</i>	15	
T11	63	<i>Salicornia europaea</i> agg.	1	
T11	63	<i>Plantago maritima</i>	2	
T11	63	<i>Aster tripolium</i> var. <i>discoidea</i>	2	
T11	63	<i>Spergularia media</i>	1	
T11	63	<i>Cochlearia anglica</i>	1	
T11	63	Bare ground	3	
T11	63	Sward height	22	
T12	64	<i>Phragmites australis</i>	35	TA1696219714
T12	64	<i>Bolboschoenus maritimus</i>	2	
T12	64	<i>Elytrigia atherica</i>	65	
T12	64	Bare ground	1	
T12	64	Sward height	55	
T12	65	<i>Elytrigia atherica</i>	98	TA1696919727
T12	65	<i>Atriplex prostrata</i>	1	
T12	65	Bare ground	1	
T12	65	Sward height	40	
T12	66	<i>Elytrigia atherica</i>	98	TA1698019733
T12	66	Bare ground	2	
T12	66	Sward height	28	
T12	67	<i>Atriplex prostrata</i>	1	TA1698619743
T12	67	<i>Atriplex portulacoides</i>	2	
T12	67	<i>Spartina anglica</i>	65	
T12	67	<i>Spergularia media</i>	2	
T12	67	<i>Plantago maritima</i>	25	
T12	67	<i>Aster tripolium</i> var. <i>tripolium</i>	2	
T12	67	<i>Triglochin maritimum</i>	1	

Transect	Quadrat	Species	% cover	Grid Reference
T12	67	<i>Cochlearia anglica</i>	1	TA1699519724
T12	67	<i>Suaeda maritima</i>	1	
T12	67	Bare ground	4	
T12	67	Sward height	20	
T12	68 extra	<i>Atriplex portulacoides</i>	1	
T12	68 extra	<i>Spartina anglica</i>	2	
T12	68 extra	<i>Spergularia media</i>	2	
T12	68 extra	<i>Plantago maritima</i>	8	
T12	68 extra	<i>Aster tripolium</i> var. <i>tripolium</i>	4	
T12	68 extra	<i>Triglochin maritimum</i>	60	
T12	68 extra	<i>Glaux maritima</i>	35	TA1700119703
T12	68 extra	<i>Agrostis stolonifera</i>	2	
T12	68 extra	Bare ground	2	
T12	68 extra	Sward height	8	
T12	69 extra	<i>Bolboschoenus maritimus</i>	92	
T12	69 extra	<i>Atriplex prostrata</i>	4	
T12	69 extra	<i>Triglochin maritimum</i>	2	
T12	69 extra	<i>Suaeda maritima</i>	2	
T12	69 extra	<i>Glaux maritima</i>	2	
T12	69 extra	Bare ground	3	
T12	69 extra	Sward height	68	TA1704719574
T13	70	<i>Arrhenatherum elatius</i>	75	
T13	70	<i>Dipsacus fullonum</i>	3	
T13	70	<i>Sonchus arvensis</i>	1	
T13	70	<i>Taraxacum</i> agg.	1	
T13	70	<i>Valeriana officinalis</i>	4	
T13	70	<i>Helminthotheca echioides</i>	1	
T13	70	<i>Atriplex prostrata</i>	2	
T13	70	<i>Elytrigia atherica</i>	3	
T13	70	<i>Festuca rubra</i>	2	
T13	70	<i>Vicia tetrasperma</i>	1	
T13	70	<i>Daucus carota</i>	1	TA1706119581
T13	70	Bare ground	7	
T13	70	Sward height	14	
T13	71	<i>Elytrigia atherica</i>	92	
T13	71	<i>Plantago maritima</i>	1	
T13	71	Bare ground	5	
T13	71	Sward height	25	
T13	72	<i>Plantago maritima</i>	65	
T13	72	<i>Triglochin maritimum</i>	15	

Transect	Quadrat	Species	% cover	Grid Reference
T13	72	<i>Atriplex portulacoides</i>	1	
T13	72	<i>Glaux maritima</i>	15	
T13	72	<i>Spergularia media</i>	3	
T13	72	<i>Puccinellia maritima</i>	12	
T13	72	Bare ground	2	
T13	72	Sward height	6	
T13	73	<i>Spartina anglica</i>	85	TA1707019584
T13	73	<i>Puccinellia maritima</i>	3	
T13	73	<i>Aster tripolium</i> var. <i>tripolium</i>	4	
T13	73	<i>Salicornia europaea</i> agg.	12	
T13	73	Bare ground	3	
T13	73	Sward height	7	
T13	74	<i>Salicornia europaea</i> agg.	2	TA1707419589
T13	74	Bare ground	98	
T13	74	Sward height	3	
T14	75	<i>Salicornia europaea</i> agg.	7	TA1720319381
T14	75	<i>Spartina anglica</i>	20	
T14	75	<i>Puccinellia maritima</i>	2	
T14	75	Bare ground	73	
T14	75	Sward height	15	
T14	76	<i>Salicornia europaea</i> agg.	2	TA1720419384
T14	76	<i>Spartina anglica</i>	5	
T14	76	<i>Puccinellia maritima</i>	2	
T14	76	Bare ground	90	
T14	76	Sward height	4	
T14	77	<i>Salicornia europaea</i> agg.	1	TA1720519383
T14	77	<i>Spartina anglica</i>	95	
T14	77	Bare ground	5	
T14	77	Sward height	35	
T14	78	<i>Salicornia europaea</i> agg.	1	TA1721119388
T14	78	Bare ground	99	
T14	78	Sward height	4	
T15	79	<i>Glaux maritima</i>	1	TA1727119269
T15	79	<i>Spartina anglica</i>	30	
T15	79	Bare ground	70	
T15	79	Sward height	15	
T15	80	<i>Spartina anglica</i>	8	TA1727719273
T15	80	Bare ground	92	
T15	80	Sward height	6	
T15	81	<i>Spartina anglica</i>	1	TA1728219281

Transect	Quadrat	Species	% cover	Grid Reference
T15	81	Bare ground	99	
T15	81	Sward height	3	
T16	82	<i>Spartina anglica</i>	20	TA1731019159
T16	82	<i>Triglochin maritimum</i>	2	
T16	82	<i>Aster tripolium</i> var. <i>tripolium</i>	7	
T16	82	<i>Puccinellia maritima</i>	75	
T16	82	<i>Spergularia media</i>	1	
T16	82	Bare ground	1	
T16	82	Sward height	45	
T16	83	<i>Spartina anglica</i>	45	TA1731519164
T16	83	<i>Aster tripolium</i> var. <i>tripolium</i>	50	
T16	83	<i>Puccinellia maritima</i>	25	
T16	83	<i>Suaeda maritima</i>	1	
T16	83	Bare ground	2	
T16	83	Sward height	60	
T16	84	<i>Spartina anglica</i>	35	TA1732319167
T16	84	<i>Aster tripolium</i> var. <i>tripolium</i>	45	
T16	84	<i>Puccinellia maritima</i>	25	
T16	84	<i>Salicornia europaea</i> agg.	2	
T16	84	Bare ground	2	
T16	84	Sward height	50	
T16	85	<i>Spartina anglica</i>	95	TA1732319173
T16	85	<i>Salicornia europaea</i> agg.	3	
T16	85	Bare ground	3	
T16	85	Sward height	35	
T16	86	<i>Spartina anglica</i>	4	TA1733419177
T16	86	Bare ground	96	
T16	86	Sward height	4	
T16	87	<i>Spartina anglica</i>	3	TA1734219183
T16	87	Bare ground	97	
T16	87	Sward height	3	

8. Appendix II: Complete Plant Species List

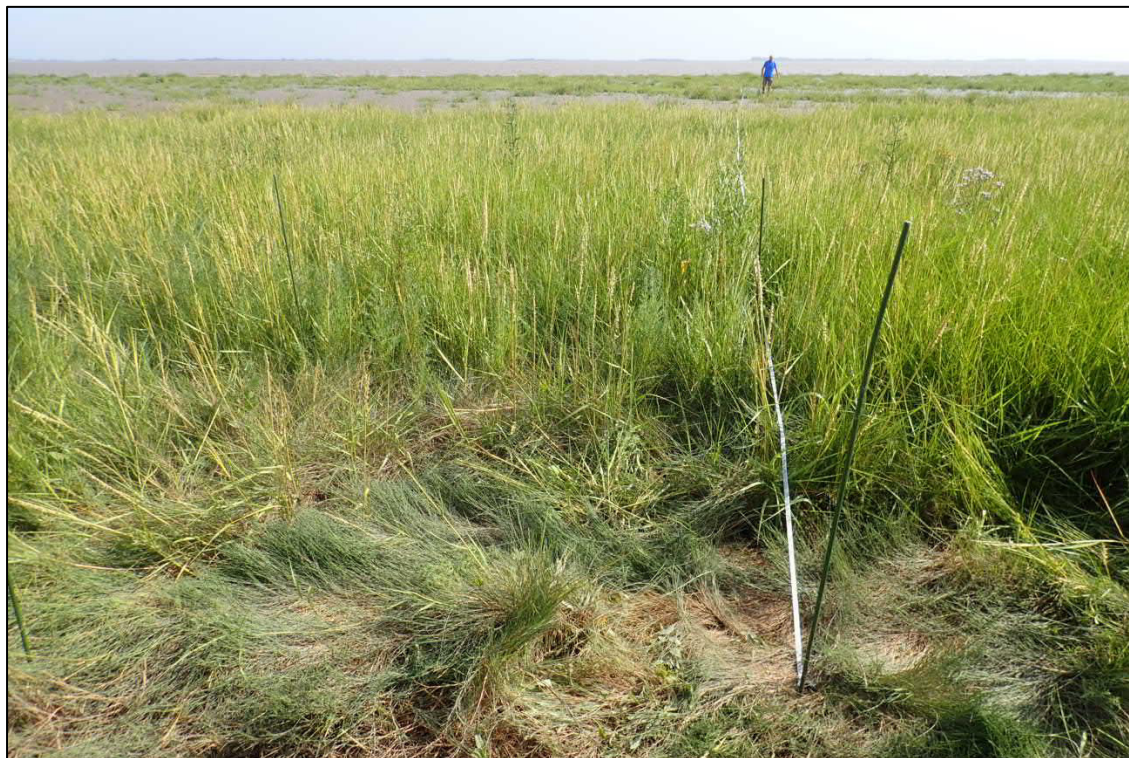
Killingholme Marsh Foreshore – complete plant species list

Latin Name	English Name	Occurrence on site
<i>Agrostis stolonifera</i>	Creeping Bent	
<i>Angelica sylvestris</i>	Wild Angelica	Seaward berm
<i>Apium graveolens</i>	Wild Celery	Within S21 swamp (NW section of side)
<i>Armeria maritima</i>	Sea Wormwood	Sea wall
<i>Arrhenatherum elatius</i>	False-oat	
<i>Artemisia maritima</i>	Sea Wormwood	Seaward berm
<i>Artemisia vulgaris</i>	Mugwort	Seaward berm
<i>Aster tripolium</i>	Sea Aster	Including <i>Aster tripolium</i> var. <i>tripolium</i> and <i>Aster tripolium</i> var. <i>discoidea</i>
<i>Atriplex portulacoides</i>	Sea-purslane	
<i>Atriplex prostrata</i>	Spear-leaved Orache	
<i>Blackstonia perfoliate</i>	Yellow-wort	Seaward berm
<i>Bolboschoenus maritimus</i>	Sea Club-rush	
<i>Centaurea nigra s.l.</i>	Common Knapweed	Seaward berm
<i>Cirsium vulgare</i>	Spear Thistle	Seaward berm
<i>Cochlearia anglica</i>	English Scurvygrass	
<i>Conium maculatum</i>	Hemlock	Seaward berm
<i>Crateagus monogyna</i>	Hawthorn	Seaward berm
<i>Daucus carota</i>	Wild carrot	
<i>Dipsacus fullonum</i>	Teasel	
<i>Elytrigia atherica</i>	Sea Couch	
<i>Festuca rubra</i>	Red Fescue	
<i>Galium parisiense</i>	Wall Bedstraw	Seaward berm
<i>Glaux maritima</i>	Sea Milk-wort	

Latin Name	English Name	Occurrence on site
<i>Helminthotheca echioides</i>	Bristly Ox-tongue	
<i>Heracleum sphondylium</i>	Hogweed	Seaward berm
<i>Hypochaeris radicata</i>	Cat's-ear	Seaward berm
<i>Juncus gerardii</i>	Saltmarsh Rush	
<i>Lactuca serriola</i>	Prickly Lettuce	Seaward berm
<i>Linaria purpurea</i>	Purple Toadflax	Seaward berm
<i>Phragmites australis</i>	Reed	As stands close to sea wall
<i>Plantago maritima</i>	Sea Plantain	
<i>Potentilla reptans</i>	Creeping Cinquefoil	Seaward berm
<i>Puccinellia maritima</i>	Common Saltmarsh-grass	
<i>Pulicaria dysenterica</i>	Common Fleabane	Seaward berm
<i>Rosa canina</i> agg.	Dog Rose	Seaward berm
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Seaward berm
<i>Salicornia europaea</i> agg.	Common Glasswort	Middle and lower marsh
<i>Salix caprea</i>	Sallow	Seaward berm
<i>Sagina procumbens</i>	Procumbent Pearlwort	Seaward berm
<i>Sambucus nigra</i>	Elder	Seaward berm
<i>Scrophularia auriculata</i>	Water Figwort	Seaward berm
<i>Sedum acre</i>	Biting Stonecrop	Seaward berm
<i>Senecio jacobaea</i>	Ragwort	Seaward berm
<i>Senecio squalidosus</i>	Oxford Ragwort	Seaward berm
<i>Sonchus arvensis</i>	Perennial Sow-thistle	
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	
<i>Spartina anglica</i>	Common Cord-grass	
<i>Spergularia maritima</i>	Lesser Sea-spurrey	Seaward berm
<i>Spergularia media</i>	Greater Sea-spurrey	

Latin Name	English Name	Occurrence on site
<i>Suaeda maritima</i>	Annual Sea-blite	
<i>Taraxacum agg.</i>	Dandelion	
<i>Tragopogon pratensis</i>	Goat's-beard	Seaward berm
<i>Triglochin maritimum</i>	Sea Arrowgrass	
<i>Tussilago farfara</i>	Coltsfoot	Seaward berm
<i>Urtica dioica</i>	Stinging Nettle	Seaward berm
<i>Valeriana officinalis</i>	Valerian	
<i>Vicia tetrasperma</i>	Smooth Tare	

9. Appendix III: Monitoring Photographs (Transects)



Transect 1



Transect 2



Transect 3



Transect 4



Transect 5



Transect 6