

The Hall Road - Hightown Shingle Beach

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Introduction

The only shingle beach in Sefton, and indeed the sole example of this habitat in vice-county 59 (South Lancashire), is found on a 2km section of shoreline between Hall Road, Blundellsands and Hightown. It is formed entirely from water-worn house bricks and other rubble eroding from a coast-protection embankment. For most of its length the embankment has been cliffed by wave-action and there is little or no shingle vegetation. Elsewhere, and especially at its northern end, erosion is less severe and plants have colonised the brick rubble to produce a characteristic vegetation type, including species specially adapted to this harsh environment. This is the SD1 *Rumex crispus* – *Glaucium flavum* community defined and described by Rodwell (2000). The community is characterised, nationally, by the near constant presence of Curled Dock (*Rumex crispus* ssp. *littoreus*), Yellow-horned Poppy (*Glaucium flavum*), Sea-kale (*Crambe maritima*), Sea Beet (*Beta vulgaris* ssp. *maritima*), Sea Campion (*Silene uniflora*), Spear-leaved Orache (*Atriplex prostrata*), Common Ragwort (*Senecio jacobaea*), Sticky Groundsel (*S. viscosus*), Creeping Thistle (*Cirsium arvense*), Spear Thistle (*C. vulgare*), Perennial Sow-thistle (*Sonchus arvensis*), Prickly Sow-thistle (*S. asper*) and Prickly Lettuce (*Lactuca serriola*). Where conditions are sandier, Sea Sandwort (*Honckenya peploides*) occurs, but Rock Samphire (*Crithmum maritimum*) is only very occasional (Rodwell 2000).

Vegetated shingle is a relatively rare habitat in Britain, largely confined to the coasts of the warmer south and east of England, though fragments occur as far north as the Clyde. Sea-kale, Yellow-horned Poppy and Rock Samphire are considered to be thermophilous and largely limited by the July 17.5° maximum (Rodwell 2000).

In the Northwest of England, vegetated shingle is particularly rare, most of it being in Cumbria (60ha). The Regional Biodiversity Group (1999) incorrectly states that it is absent south of north Lancashire.

Vegetated shingle is listed in Annex 1 of the EU Habitats Directive and is a UK Key Habitat in the Biodiversity Action Plan. However, perhaps because of its limited extent and artificial origin, shingle does not appear in the north Merseyside BAP.

History in Sefton

The rubble embankment from which the shingle has arisen was tipped from about 1942, initially using Liverpool bomb-damage debris. Tipping continued at intervals until the early 1970s, when spoil from the construction of the second Mersey Tunnel was used (Edmondson *et al.* 1988).

The presence of shingle vegetation at Hightown is not mentioned in several 1970s and early 1980s reports (e.g. Greenwood 1973; Crosby Civic Trust 1975; Smith 1975; Environmental Advisory Unit 1981). I visited the Hightown shore regularly from 1968 but my first sighting of Yellow-horned Poppy there was not until 1st August 1975. Smith (1984) refers to weathered brick rubble as a habitat for Yellow-horned Poppy, at least two plants being known during the 1970s; but, in 1984, the species had become recently extinct. However, in the first NVC survey of the Sefton Coast, Edmondson *et al.* (1988) were able to identify an SD1 type community at the northern end of the rubble embankment near Hightown. They describe it as "Brick rubble foreshore with scattered plants of *Glaucium flavum* and some *Crambe maritima*." A suite of associated plant species is listed. In their report, the mapped SD1 is about 115m long and 10m wide (Grid Reference SD296023).

SGS Environment (1995) conducted a similar survey in 1994, mapping an area of SD1 in the same place and of roughly the same area. They describe a similar range of species but note that Rock Samphire has been present since 1993. It is stated that a small shingle ridge has been thrown up in front of the community, implying that it was rarely inundated by the tide.

There is a brief mention of the fact that SD1 is becoming established on the artificial shingle of the "brick and rubble" revetment shore at Hightown in Atkinson & Houston (1993).

In a reappraisal of his 1984 study, Smith (1999a) provides further information on the special plants of the Hightown shingle. He states that Sea-kale was present by 1988 and is now represented by five plants (one being at Hall Road), Yellow-horned Poppy, which reappeared in the late 1980s, has steadily increased to about 50 large plants, while the Rock Samphire population now consists of five plants.

Under the heading of "Artificial Habitats", George (1999) states that the artificial shore at Blundellsands, Crosby supports plant species unusual for the Liverpool Bay Natural Area, including Yellow-horned Poppy.

According to Smith (1999b), it is usually possible to see 20-50 Yellow-horned Poppies at Hightown, while there were six plants of Sea-kale in 1998.

Smith (2000) lists 63 vascular plant taxa recorded on the northern 250m of the Hightown shingle in 1999 and 2000. These include 122 rosettes of Yellow-horned Poppy, five plants of Sea-kale and five of Rock Samphire, one of which then covered about 1m².

This study was extended in 2003 to the southern section of the shingle beach (SD298006-297010), where it was noted that, for a distance of about 400m north of the Hall Road carpark, the upper 4m or so of the beach had become partly consolidated with much blown sand and had developed a sparse but characteristic plant community (Smith 2003). Thirty vascular plants were listed, the most notable being Sea-kale, two large individuals being found just north of the carpark. Also present was much Sea Beet and occasional large patches of Sea Sandwort. Despite the absence of Yellow-horned Poppy, it was considered that the community accorded with SD1, though samples were not analysed.

By the second NVC survey of the Sefton Coast, the Hightown SD1 community had increased in area from 0.12ha to 0.19ha but, according to Gateley & Michell (2004), was still restricted to the northern site. The authors did not determine SD1 nearer to Hall Road in the area surveyed by Smith (2003) but did map a narrow zone of SD2 (*Honckenya peploides-Cakile maritima* strandline), covering 0.22ha, extending north from the SD1 community at Hightown. They suggest that the characteristic shingle plants have colonised from the North Wales coast.

Current status of vegetated shingle

A further study of the Hightown-Hall Road shingle was conducted in June 2007. The extent of putative SD1 vegetation was determined using a GPS. All vascular taxa (species sub-species and hybrids) were listed, their relative frequency being assessed using the DAFOR scale. Samples were recorded at each site using NVC

methodology. Scientific and English names follow Stace's *New Flora of the British Isles* (Table 1, 2).

Four areas of vegetated shingle were identified as follows: -

Site 1. The original site at Hightown, occupying the northern section of weathered brick-rubble. This now extends for about 425m from SD29584 02306 to SD29570 02730 and is up to 8m wide, though often much less. Its total area is estimated at about 2100m² (0.21ha). Since the previous studies, brick rubble has been moved northwards by long-shore drift. This new extension is more sparsely vegetated and sandier, merging with fore-dunes dominated by Sand Couch (*Elytrigia juncea*) with much Sea Sandwort and was mapped as SD2 by Gateley & Michell (2004). The southern section, consolidated for many years, is partly protected to seaward by a narrow ridge of rubble over 200m long and 1 – 1.5m high, as described by SGS Environment (1995).

A total of 64 vascular taxa was recorded, only four (6.3%) being non-native. Most of the plants listed by Rodwell (2000) as constant components of the SD1 community were present. Only Sea Campion, Sticky Groundsel and Prickly Lettuce were not found. One taxon (Dune Fescue *Vulpia fasciculata*) is nationally scarce, while seven are listed as being regionally notable (i.e. Species of Conservation Importance in North West England) (Table 1).

The new vascular plant list is remarkably similar to that recorded in 1999/2000 when 62 taxa were listed. Twelve taxa were not refound, these being mainly common ruderal plants. Fourteen new taxa have been added, including the regionally notable Sand Cat's-tail (*Phleum arenarium*) and Ray's Knotgrass (*Polygonum oxyspermum* ssp. *raii*) and the locally uncommon Pellitory-of-the-wall (*Parietaria judaica*) and Sea Fern-grass (*Catapodium marinum*). The latter three species appear to be new tetrad records. Only a few species have undergone major changes in frequency. Creeping Bent (*Agrostis stolonifera*), Sand Sedge (*Carex arenaria*) and Hairy Sedge (*C. hirta*) are now much reduced, while Rosebay Willowherb (*Chamerion angustifolium*), Rock Samphire, Red Fescue (*Festuca rubra*) and Japanese Rose (*Rosa rugosa*) have greatly increased.

Counts were made of three of the "special" shingle plants. There were 125 individuals of Yellow-horned Poppy, 53 of Rock Samphire and 11 of Sea-kale, nine of the latter being young specimens. All are encouragingly higher than previous figures.

Site 2. For about 200m north of the carpark at Hall Road (from SD 29850 00640 to 29811 00799), the gently shelving shingle beach merges with embryo dunes dominated by Sand Couch (*Elytrigia juncea*). The vegetated shingle here is about 4m wide at first, gradually narrowing to 2-3m and petering out as an erosion cliff begins to form. Its area is estimated at about 600m². There is no Rock Samphire or Yellow-horned Poppy but three plants of Sea-kale are present just north of the carpark. The vegetation is much less diverse than that at Hightown with only 32 taxa recorded (Table 2), but is otherwise quite similar.

Site 3. At SD 29713 01130, about 350m further north, vegetated shingle begins again where cliffing stops, continuing for about 50m to SD 29701 01171, where the cliff begins again. The strip of vegetation is only 2-3m wide, with an area of about 125m², and merges with coarse grassland on the rubble embankment. Of the "classic" shingle plants, only Sea Beet and Curled Dock are present in a community of 22 vascular taxa (Table 2).

Site 4. A final stretch of vegetated shingle starts at SD 29674 01271, extending for about 240m to SD 29587 01501, near the Alt training bank, where a steep cliff has again formed. The community is 4-5m wide with an indistinct boundary to coarse grassland. An approximate area is 1100m². To the south, Sea Beet is rare but it becomes progressively more frequent northwards. Twenty-seven vascular plants were listed (Table 2).

In total, 73 vascular taxa were identified on the four shingle sites, six (8.2%) being non-native, while one is nationally and seven regionally notable. The total area of vegetated shingle is about 0.39ha.

NVC communities

As the Hightown shingle was described as recently as 2004 (Gateley & Michell 2004), it was decided to concentrate efforts on recording the three sections nearer to Hall

Road. Here, 2 x 2m quadrats were sampled, five each on site 2 and 3 and seven on the larger site 3. These were subject to Tablefit analysis to determine the degree of fit to known communities. The results are summarised in Table 3.

The vegetation of Site 2 accords with SD1a *Rumex crispus* – *Glaucium flavum* shingle, typical sub-community, but the level of fit (28) is poor.

Site 3 is best described by MC6 *Atriplex hastata* (now *A. prostrata*) – *Beta vulgaris* sea-bird cliff community, but again the confidence is poor (29). This community is most characteristic of rocky coastal sites where there is a combination of high maritime influence and intense disturbance (both nutrient deposition and physical damage) by sea-birds. The latter factor does not apply at Hall Road but essentially similar mixtures of *Atriplex* spp. and *Beta* can be found on strandline debris in sandy and shingle foreshores, as here (Rodwell 2000).

Site 4 shows a poor fit (30) to SD3 *Matricaria* (now *Tripleurospermum*) *maritima* – *Galium aparine* strandline. This community is typical of sandy shingle strandlines with drift detritus around more sheltered shores in the cooler, wetter north of Britain (Rodwell 2000).

Discussion

The long-standing section of vegetated artificial shingle at Hightown had an area of about 0.12ha in 1988; it then increased to 0.19ha in 2004 and to 0.21ha currently. Some of the vegetation is referable to the regionally rare SD1 plant community. Since 2004, three new areas of vegetated shingle have developed north of Hall Road with a total area of about 0.18ha. However only the southern section (Site 2; 0.06ha) accords with SD1 and the statistical fit is poor. The other two sections support communities more typical of sand and shingle strandlines. The poor degree of fit to NVC communities suggests that these areas of vegetation are of recent origin and have not yet matured enough to accord with a known community.

The 75 vascular taxa recorded in 2007 on 0.39ha are a mixture of maritime, shingle, sand-dune and ruderal specialists. The proportion of non-natives is low – only 8%, compared with 33% for the dune system as a whole (Smith 2006). This is probably due to the fact that all the shingle sites are remote from the main source of aliens in

domestic gardens. Only one nationally scarce and seven Species of Conservation Importance in North West England were found. However, the proportion of notable taxa (11%) is not much less than the 15% recorded for the whole Sefton Coast (Smith 2006).

As the habitat provides harsh conditions for plant growth, the number of species found is relatively low, ranging from 22 to 64 per site. As might be expected, the oldest site at Hightown supports the largest number of taxa, as there has been time for more plants to become established. However, this is also the largest site and there appears to be a predictably positive relationship between species-richness and site area (Fig. 1).

Counts of the number of Sea-kale, Yellow-horned Poppy and Rock Samphire plants show that their populations are increasing with time. As these "classic" shingle plants are thermophilous, they may be responding to warmer summers. These three species are rare in the vice-county. The South Lancashire Flora Project has recent records of Sea-kale only from Hightown (first in 1987), Hall Road (from 1996) and Formby Point in 1990. Yellow-horned Poppy has a similarly restricted distribution, with recent sightings away from Hightown only at Liverpool Pier Head in 1983, Hall Road (1986) and Birkdale Green Beach (1998 and 2003). Rock Samphire is more widely distributed in the region, post-1982 records emanating from Southport Marine Lake, near Walton in Liverpool, Hall Road, Crosby, Marshside, Southport and Birkdale Green Beach, in addition to the Hightown colony.

Although the shingle beach is of artificial origin, the vegetation has developed naturally, perhaps aided by arrival of propagules from the North Wales coast. This is the only known example of vegetated shingle in South Lancashire, the habitat being rare in North West England. It therefore has a high nature conservation value and could be considered for inclusion in the North Merseyside Biodiversity Action Plan. Although the proportion of alien taxa is low, one species, Japanese Rose, has greatly increased in frequency since 1999 and may eventually require controlling, as elsewhere in the dune system.

A level of statutory protection is afforded, as the northern section lies within the Sefton Coast SSSI/SAC, while the three southern sections are adjacent to the

SSSI/SAC boundary and are part of a Site of Local Biological Interest designated under the Sefton Unitary Development Plan.

No systematic studies of other biota were undertaken but several aculeate Hymenoptera (solitary bees and wasps) were noted during the vegetation survey. This group is represented on the Sefton Coast by many nationally and regionally notable species; therefore surveys of this and other faunal groups could be rewarding.

It will be interesting to follow the future development of the artificial shingle and its plant life, particularly in the context of long-standing proposals for additional coast protection works in this area.

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Table 1. Hightown shingle beach; vascular plant list 2007 compared with that of 1999/2000.

Taxon	English name	Freq. 2007	Freq. 1999	Status
<i>Aegopodium podagraria</i> *	Ground Ivy	r		
<i>Agrostis capillaris</i>	Common Bent		r	
<i>Agrostis stolonifera</i>	Creeping Bent	r	a	
<i>Ammophila arenaria</i>	Marram	r		
<i>Arctium minus</i>	Lesser Burdock		r	
<i>Arrhenatherum elatius</i>	False Oat-grass	lf	r	
<i>Artemisia vulgaris</i>	Mugwort		r	
<i>Atriplex prostrata</i>	Spear-leaved Orache	o	o	
<i>Beta vulgaris maritima</i>	Sea Beet	o	o	
<i>Calystegia sp.</i>	Bindweed	o	r	
<i>Carex arenaria</i>	Sand Sedge	r	la	
<i>Carex hirta</i>	Hairy Sedge	r	lf	
<i>Catapodium marinum</i>	Sea Fern-grass	o		
<i>Cerastium fontanum</i>	Common Mouse-ear	r	o	
<i>Cerastium semidecandrum</i>	Little Mouse-ear	r	r	
<i>Chamerion angustifolium</i>	Rosebay Willowherb	lf	r	
<i>Cirsium arvense</i>	Creeping Thistle	o	o	
<i>Cirsium vulgare</i>	Spear Thistle	o	r	
<i>Cochlearia danica</i>	Danish Scurvy-grass	o	la	
<i>Crambe maritima</i>	Sea-kale	o	r	SCI
<i>Crithmum maritimum</i>	Rock Samphire	lf	r	SCI
<i>Cymbalaria muralis</i> *	Ivy-leaved Toadflax	la	lf	
<i>Dactylis glomerata</i>	Cock's-foot		r	
<i>Echium vulgare</i>	Viper's Bugloss	r	r	

<i>Elytrigia juncea</i>	Sand Couch	r	o	
<i>Elytrigia repens</i>	Couch	lf	o	
<i>Erigeron acer</i>	Blue Fleabane	r		
<i>Eryngium maritimum</i>	Sea Holly	r	o	SCI
<i>Euphorbia paralias</i>	Sea Spurge	lo	r	SCI
<i>Festuca pratensis</i>	Meadow Fescue		r	
<i>Festuca rubra</i>	Red Fescue	ld	f	
<i>Galium aparine</i>	Cleavers	f	f	
<i>Glaucium flavum</i>	Yellow-horned Poppy	o	o	SCI
<i>Hippophae rhamnoides*</i>	Sea Buckthorn	r	r	
<i>Holcus lanatus</i>	Yorkshire-fog	o	r	
<i>Honckenya peploides</i>	Sea Sandwort	la	lf	
<i>Hypochaeris radicata</i>	Cat's-ear	r	r	
<i>Iris pseudacorus</i>	Yellow Iris	r		
<i>Lathyrus pratensis</i>	Meadow Vetchling	o	o	
<i>Leontodon saxatilis</i>	Lesser Hawkbit	o	o	
<i>Leymus arenarius</i>	Lyme-grass	la	la	
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	r	o	
<i>Medicago lupulina</i>	Black Medick		lf	
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	r	r	
<i>Ononis repens</i>	Common Restharrow	lf	la	
<i>Parietaria judaica</i>	Pellitory-of-the-wall	o		
<i>Pastinaca sativa</i>	Wild Parsnip	r		
<i>Phleum arenarium</i>	Sand Cat's-tail	r		SCI
<i>Plantago coronopus</i>	Buck's-horn Plantain	r	o	
<i>Plantago lanceolata</i>	Ribwort Plantain	o	o	
<i>Plantago major</i>	Greater Plantain	r		
<i>Poa annua</i>	Annual Meadow-grass		o	
<i>Poa humilis</i>	Spreading Meadow-grass	la	la	
<i>Polygonum oxyspermum raii</i>	Ray's Knotgrass	r		SCI
<i>Potentilla anserina</i>	Silverweed	r	r	
<i>Ranunculus repens</i>	Creeping Buttercup		o	
<i>Raphanus raphanistrum maritimum</i>	Sea Radish	r		
<i>Reseda lutea</i>	Wild Mignonette	r	lf	
<i>Rosa rugosa*</i>	Japanese Rose	ld	o	
<i>Rubus caesius</i>	Dewberry	la	f	
<i>Rumex crispus</i>	Curled Dock	o	o	
<i>Rumex obtusifolius</i>	Broad-leaved Dock		r	
<i>Salix cinerea</i>	Grey Willow	r		
<i>Salix repens</i>	Creeping Willow	r		
<i>Sedum acre</i>	Biting Stonecrop	lf	lf	
<i>Senecio jacobaea</i>	Common Ragwort	o	o	
<i>Senecio squalidus*</i>	Oxford Ragwort		r	
<i>Silene latifolia</i>	White Campion		r	
<i>Sonchus arvensis</i>	Perennial Sow-thistle	o	o	
<i>Sonchus asper</i>	Prickly Sow-thistle	r	r	
<i>Taraxacum officinale</i> agg.	Dandelion	o	o	

<i>Trifolium repens</i>	White Clover		o	
<i>Tripleurospermum maritimum</i>	Sea Mayweed	o	o	
<i>Tussilago farfara</i>	Colt's-foot	r	r	
<i>Vicia cracca</i>	Tufted Vetch	r		
<i>Vulpia fasciculata</i>	Dune Fescue	r	r	NS
76 taxa, 5 non-native (6.6%)		64	62	

Table 2. Hall Road shingle; vascular plants of three sections, 2007

Taxon	English name	Site 2	3	4	Status
<i>Agrostis capillaris</i>	Common Bent	o			
<i>Agrostis stolonifera</i>	Creeping Bent	vla			
<i>Anthyllis vulneraria</i>	Kidney-vetch	o			
<i>Arrhenatherum elatius</i>	False Oat-grass			r	
<i>Asparagus officinalis</i> *	Garden Asparagus		r		
<i>Atriplex prostrata</i>	Spear-leaved Orache	o		o	
<i>Beta vulgaris maritima</i>	Sea Beet	f	f	la	
<i>Bromus hordeaceus</i>	Soft Brome	o			
<i>Calystegia silvatica</i> *	Large Bindweed		f	o	
<i>Carex arenaria</i>	Sand Sedge		lf		
<i>Catapodium marinum</i>	Sea Fern-grass	vlf			
<i>Cerastium fontanum</i>	Common Mouse-ear	r			
<i>Cirsium arvense</i>	Creeping Thistle	o	r	o	
<i>Cochlearia danica</i>	Danish Scurvy-grass	o			
<i>Crambe maritimum</i>	Sea-kale	r			SCI
<i>Cymbalaria muralis</i> *	Ivy-leaved Toadflax		r	r	
<i>Elytrigia juncea</i>	Sand Couch	o	o	o	
<i>Elytrigia repens</i>	Couch	la	lf	f	
<i>Festuca rubra</i>	Red Fescue	lf	f	f	
<i>Galium aparine</i>	Cleavers	lf	o	f	
<i>Heracleum sphondylium</i>	Hogweed		r		
<i>Honckenya peploides</i>	Sea Sandwort	la		lf	
<i>Hypochaeris radicata</i>	Cat's-ear	o	o	o	
<i>Leymus arenarius</i>	Lyme-grass	o		la	
<i>Lolium perenne</i>	Perennial Rye-grass	o			
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	o		o	
<i>Ononis repens</i>	Common Restharrow	o		o	
<i>Plantago coronopus</i>	Buck's-horn Plantain	o	f		
<i>Plantago lanceolata</i>	Ribwort Plantain	o	r	o	
<i>Poa humilis</i>	Spreading Meadow-grass			o	
<i>Polygonum amphibium</i>	Amphibious Bistort	r			
<i>Potentilla anserina</i>	Silverweed		o	o	
<i>Potentilla reptans</i>	Creeping Cinquefoil			r	
<i>Rosa rugosa</i> *	Japanese rose			r	
<i>Rubus caesius</i>	Dewberry	o	o	la	

<i>Rumex crispus</i>	Curled Dock	o	o	o	
<i>Sedum acre</i>	Biting Stonecrop	r			
<i>Senecio jacobaea</i>	Common Ragwort	o		o	
<i>Senecio squalidus</i> *	Oxford Ragwort		r	r	
<i>Silene latifolia</i>	White Champion	r			
<i>Sonchus arvensis</i>	Perennial Sow-thistle			lf	
<i>Sonchus asper</i>	Prickly Sow-thistle			o	
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	r	o		
<i>Taraxacum officinale</i> agg.	Dandelion	o	o		
<i>Tripleurospermum maritimum</i>	Sea Mayweed	o		o	
<i>Tussilago farfara</i>	Colt's-foot	lf	o		
<i>Vicia hirsuta</i>	Hairy Tare		o		
Total 47 taxa; 5 non-native (11%)		33	22	27	

NS = nationally scarce; SCI = Species of Conservation Importance in North West England. * = non-native or introduced native.
d = dominant; a = abundant; f = frequent; o = occasional; r = rare; l = locally; v = very.

Table 3. Tablefit analysis of Hall Road samples

Site	NVC code	Community	Goodness of fit
2	SD1a	<i>Rumex crispus</i> – <i>Glaucium flavum</i> shingle; typical sub-community	28
3	MC6	<i>Atriplex hastata</i> – <i>Beta vulgaris</i> sea-bird cliff	29
4	SD3	<i>Matricaria maritima</i> – <i>Galium aparine</i> strandline	30

Fig. 1. Relation between species-richness and site area, Hall Road – Hightown shingle

