

# **Vascular plants and vegetation of the Birkdale Green Beach**

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### **Origin & Evolution**

The Birkdale green beach originated in 1986 as a sparse community of Common Saltmarsh-grass colonising the open beach over a distance of about 1km, up to 100m west of the existing dune frontage south of Weld Road. By 1988, the plant community included Sea Aster, Glasswort and Spear-leaved Orache (Atkinson & Houston 1993). These plants soon accumulated low mounds of blown sand and silt, the outer ones eventually forming embryo dunes colonised by Sand Couch. This process was similar to that which produced the 200m-long Tagg's Island, an embryo dune ridge which began to form in 1974 and isolated a 50m-wide lagoon flooded by a surface-water drain.

The green beach is a much larger feature and, by the late 1990s, extended from the beach barrier north of Ainsdale-on-Sea to Weld Road at Birkdale, a total distance of about 3km. Its area was estimated at 2.0ha in 1989, 3.7ha in 1992 and 12.5ha in 1997 (Taylor 1997). By 2000, in the vicinity of Tagg's Island, the green beach was up to 200m wide, tapering gradually to about 100m at the northern end and 50m at its southern extremity. Its central section was protected by an embryo dune ridge at least 1m high and up to 25m wide. The ridge was much more fragmented over the southern 1.5km, being entirely absent along some stretches while, elsewhere, there were up to three low, parallel ridges about 30m apart. A waterlogged lagoon or slack area east of the embryo ridges received surface water drainage from Tagg's Island and the so-called "Nile" outflow. It flooded to depths of up to about 30cm in spring 2000 but was largely dry during the period of this survey (July-September), except after periods of heavy rain.

Patches of Common Saltmarsh-grass were establishing on the shore 100m or more to the west of the main ridge, suggesting that further dune development may occur in the near future.

### **Vascular species**

A vascular plant list totalling 90 species was compiled for the green beach in 1997/98 (Table 1). However, vegetation changes are taking place here so rapidly that it was considered desirable to make a further study in July/August 2000. During a number of visits to all parts of the site, all vascular species encountered were listed. A total of 159 taxa was recorded, representing a 76% increase in species richness over two years. Only 8 taxa seen in 1997/98 were not refound in 2000 but the new list includes 68 plants not seen previously.

The taxa missing in 2000 are mainly ruderals and strandline plants whose occurrence may be expected to vary from year to year. Also missing was Reflexed Saltmarsh-grass, its saltmarsh habitat having almost entirely changed to freshwater swamp. A reduction in maritime influence may be responsible for the appearance of such plants as four species of willowherb, Yellowwort, Common Mouse-ear, Marsh Pennywort, Common Restharrow, Silverweed, Alsike Clover, White Clover, Colt's-foot and Bulrush. The status of several species has greatly increased since the first survey. They include Fool's Water-cress, Creeping Thistle, Great Willowherb, Cat's-ear, Saltmarsh Rush, Sea Rush, Water Mint, Common Reed, Common Fleabane, Celery-leaved Buttercup, Brookweed and Common Ragwort, as well as a number of notable species discussed in more detail below. Also striking is the increase of seedling shrubs,

particularly Sea Buckthorn and Alder, the latter having appeared for the first time since the 1997/98 survey

It is interesting that only 16 (10.1%) of the taxa recorded in 2000 are non-native, compared with an average of about 27% alien species for the dune system as a whole (Smith 1999).

### **Notable taxa in 2000**

Frosted Orache *Atriplex laciniata*: Several plants were noted on the southern strandline in August 2000. This species has a restricted distribution on the Sefton Coast and may not be recorded for several years at a time.

Long-bracted Sedge *Carex extensa*: A species typical of high-level salt-marshes which was first recorded on the green beach in 1997. A total of 32 individuals was counted in July 1998 on the east side of the lagoon, north of Taggs Island. This plant has greatly increased both in abundance and distribution, over 350 being located during the current survey. Most were situated on the western side of the lagoon, north of Taggs Island and on the east edge of the lagoon, south of Tagg's Island.

Distant Sedge *Carex distans*: A single individual was found on 30th July 2000 on the western edge of the marsh, north of Tagg's Island, while a second was located further south. This species is rather uncommon on the Sefton Coast being largely confined to a slack on Queen's Jubilee Nature Trail. Interestingly, P. Sturgess recorded it at Tagg's Island marsh in 1988.

Lesser Centaury *Centaureum pulchellum*: Lesser Centaury is a regionally rare species confined to under 10 sites on the Sefton Coast. It has greatly increased at the green beach and now occurs in spectacular abundance in the more sparsely vegetated parts of the lagoon, especially in the southern sector. This is by far its largest population in the Vice County.

Baltic Rush *Juncus balticus*: I have long predicted that this nationally scarce plant would eventually spread to the green beach from the Birkdale frontal slacks or Tagg's Island marsh where it is well established in its only English locality. The first patch, about 50cm in diameter, was found on 30th July 2000 on the eastern edge of the lagoon, opposite the southern extremity of Tagg's Island.

Parsley Water-dropwort *Oenanthe lachenalii*: Eighteen plants of this typical upper salt-marsh species were counted in the central area of the lagoon on 5th August 2000. Only two individuals were noted in 1998.

Hard-grass *Parapholis strigosa*: Large patches of this regionally rare grass occur in the southern sector of the lagoon. On the Sefton Coast, the only other recent records are at Marshside.

Sharp Club-rush *Schoenoplectus pungens*: In Britain, this nationally rare species is now only known from the Sefton Coast where it has been maintained by transplantation. It has recently spread naturally from a translocation site in Tagg's Island marsh to the green beach lagoon, just south of the Tagg's Island outflow. First found by D.H. Wrench in 1999, the growing patch measured about 7m x 4m in August 2000. It is situated in S21 *Scirpus maritimus* swamp where it is apparently competing successfully with Sea Club-rush.

Strawberry Clover *Trifolium fragiferum*: An early colonist of Tagg's island marsh, this regionally rare species is now flourishing in the central area of the green beach lagoon with occasional patches in the southern sector. It has a restricted distribution on the Sefton Coast, being found mainly in the northern slacks of the Birkdale frontal dunes.

## Vegetation

A total of 53 2x2m samples of vegetation were recorded in lagoonal areas using National Vegetation Classification methodology (Rodwell 2000). These were taken at roughly 100m intervals, though some were closer together. For each sample, all species were recorded on the Domin Scale together with percentage bare soil and mean sward height. These data were analysed by means of a Vespan programme on Windows which provides the nearest fit of the samples to NVC communities and sub-communities.

The northern section from Weld Road to the Nile outfall supports a very open plant community heavily grazed by Rabbits. Apart from the westernmost zone, the former sward of Common Saltmarsh-grass has been almost entirely replaced by Red Fescue and Toad Rush, with Creeping Bent most abundant on slightly raised knolls. There are also extensive beds of Sea Club-rush with a Creeping Bent understory. At the Nile, the vegetation becomes much taller and more luxuriant, reflecting the eutrophic nature of the drainage water which is subject to a clean-up by North West Water. Creeping Bent is still dominant here but there are also patches of Fool's Water-cress and Sea Club-rush. Most samples in this stretch accord with S21 Sea Club-rush swamp (Rodwell 1995).

The lagoon, for 0.75km south of the Nile, still shows signs of Rabbit grazing but at a much lower intensity. Here, there is a tall sward of Creeping Bent with large beds of Sea Club-rush interspersed with a great diversity of other plants, some typical of salt-marshes, others of dune slacks. In places, Common Reed and Bulrush are invading the Sea Club-rush patches. Most samples clearly belong to the S21c *Scirpus maritimus* swamp, *Agrostis stolonifera* sub-community, of Rodwell (1995). This sub-community is characterised by a tall, dense cover of Sea Club-rush (now *Bolboschoenus maritimus*) but with an open carpet of Creeping Bent and scattered Sea Arrow-grass, Sea Milkwort, Parsley Water-dropwort, etc. However, six samples most closely match SM19 Narrow Blysmus saltmarsh, despite the fact that Narrow Blysmus *Blysmus rufus* was not actually recorded on the site.

This section is flanked on the west by a well developed embryo dune ridge, whose vegetation consists mainly of Sand Couch with occasional patches of Lyme-grass and Marram, together with a wide range of ruderal species and scattered mobile-dune plants, such as Sea Spurge and Sea Holly (SD4 *Elymus farctus* foredune community).

The southern 1.5km of lagoon supports an open community with a higher proportion of salt-marsh plants, dominated by Common Saltmarsh-grass with occasional Sea Aster, Sea Milkwort, Sea Plantain, Sea Arrow-grass, Saltmarsh Rush, etc. The vegetation here consists of a mosaic of S21 Sea Club-rush swamp, SM28 Creeping Couch saltmarsh, SM18 Sea Rush saltmarsh and SM16 Red Fescue saltmarsh. The southernmost samples north of the Ainsdale beach barrier include some SM10 transitional saltmarsh, the final one being the most maritime as SM6 Common Cord-grass saltmarsh.

This section is still subject to fairly frequent marine overwash and there is a well-developed strandline at the back of the marsh, mostly according with the SD2 *Honckenya peploides* - *Cakile maritima* strandline community. Typical annuals here include Spear-leaved, Grass-leaved and Frosted Orache but also a great variety of casuals. Short sections of tidal debris have a sparse community dominated by Cleavers (the SD3 *Matricaria maritima* - *Galium aparine* strandline community), together with such unexpected species as Hybrid Crack-willow and Wild Angelica.

The pattern of samples suggests that the northern and central parts of the green beach lagoon are rapidly terrestrialising becoming dominated by Sea Club-rush swamp, except on the fringes, while, to the south, the sea has a much greater influence, the saltmarsh here supporting a high frequency of Common Saltmarsh-grass.

## Assessment

In the context of the Sefton Coast sand-dune system, the Birkdale green beach is an extremely important feature. For most of the 20th century, a low rate of new dune and slack formation, coupled with maturation and scrubbing-up of open dunes, contributed to declines of biota associated with early stages of dune development. Small changes in beach management practices at Birkdale, particularly the restriction of motor-vehicle access, has resulted in spectacular effects on dune dynamics over a short period of time. This may be interpreted as a "catching up" process, reversing the inhibition of vegetation development over the last 80 years caused by vehicles destroying pioneer plants.

As well as being of major interest to coastal physiographers, the green beach provides a hotbed of biodiversity. In addition to the great variety of vascular plants (over 150 taxa) and vegetation types discussed here, Lapwings (3-4 pairs), Ringed Plovers (about 7 pairs) and Skylarks (5 pairs) (A.S. Duckels pers. comm.) have begun to breed on the site, while Natterjack Toads are another successful recent colonist with large numbers of toadlets noted during this survey.

It is clear that vegetation changes are occurring rapidly and it will be interesting to observe these in future years. Plants likely to appear here include Saltmarsh Flat-sedge *Blysmus rufus* which does not seem to have been recorded on the Sefton Coast since 1987. It is possible that the lagoon will become, like Tagg's Island marsh, increasingly dominated by Common Reed and Sea Club-rush, with consequent loss of diversity. Without active management, there also seems likely to be substantial invasion by Alder and Sea Buckthorn scrub. However, new lagoonal features may form to seaward and maintain the interesting early stages of vegetation succession.

## References

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Table 1. Relative frequency of vascular taxa at Birkdale green beach in 1997/98 and 2000.

		1997/98	2000
<i>Agrostis stolonifera</i>	Creeping Bent	la	ld
<i>Alisma plantago-aquatica</i>	Water Plantain		r
<i>Alnus glutinosa</i>	Alder		o
<i>Ammophila arenaria</i>	Marram	vla	vla
<i>Angelica sylvestris</i>	Wild Angelica		vlf
<i>Apium nodiflorum</i>	Fool's-water-cress	lo	lf
<i>Arctium minus</i>	Lesser Burdock	r	r
<i>Arrhenatherum elatius</i>	False Oat-grass		r
<i>Artemisia vulgaris</i>	Mugwort		r
<i>Aster tripolium</i>	Sea Aster	f	o
<i>Atriplex glabriuscula</i>	Babington's Orache	r	r
<i>A. laciniata</i>	Frosted Orache	r	r
<i>A. littoralis</i>	Grass-leaved Orache	r	r
<i>A. portulacoides</i>	Sea Purslane	r	
<i>A. prostrata</i>	Spear-leaved Orache	f	lf
<i>Avena sativa</i>	Oat	r	
<i>Beta vulgaris maritima</i>	Sea-beet	lo	r
<i>Blackstonia perfoliata</i>	Yellow-wort		lo
<i>Bolboschoenus maritimus</i>	Sea Club-rush	la	ld
<i>Cakile maritima</i>	Sea Rocket	lo	r
<i>Carex arenaria</i>	Sand Sedge		r
<i>C. distans</i>	Distant Sedge		r
<i>C. extensa</i>	Long-bracted Sedge	r	lo
<i>C. flacca</i>	Glaucous Sedge	r	r
<i>C. littorale</i>	Seaside Centaury	r	r
<i>C. otrubae</i>	False Fox-sedge	r	o
<i>C. pulchellum</i>	Lesser Centaury	lf	la
<i>Cerastium fontanum</i>	Common Mouse-ear		lf
<i>Chamerion angustifolium</i>	Rosebay Willowherb		r
<i>Chenopodium album</i>	Fat-hen	lf	r
<i>C. rubrum</i>	Red Goosefoot	r	r
<i>Cirsium arvense</i>	Creeping Thistle	r	o
<i>C. vulgare</i>	Spear Thistle		r
<i>Cochlearia anglica</i>	English Scurvy-grass	lo	lo
<i>Cyperus longus</i>	Galingale		r
<i>Elytrigia juncea</i>	Sand Couch	la	la
<i>E. repens</i>	Common Couch	lf	vla

<i>Epilobium hirsutum</i>	Great Willowherb	r	o
<i>E. ciliatum</i>	American Willowherb		r
<i>E. montanum</i>	Broad-leaved Willowherb		r
<i>E. palustre</i>	Marsh Willowherb		o
<i>E. parviflorum</i>	Hoary Willowherb		o
<i>E. tetragonum</i>	Square-stalked Willowherb		r
<i>Erigeron canadensis</i>	Canadian Fleabane		lo
<i>Eryngium maritimum</i>	Sea Holly	r	lo
<i>Euphorbia paralias</i>	Sea Spurge	r	lo
<i>Euphrasia nemorosa</i>	Eyebright		r
<i>Festuca arundinacea</i>	Tall Fescue	r	r
<i>F. rubra</i>	Red Fescue	r	vla
<i>Filipendula ulmnia</i>	Meadow-sweet		r
<i>Galeopsis tetrahit</i>	Common Hemp-nettle		r
<i>Galium aparine</i>	Cleavers		vlf
<i>G. palustre</i>	Marsh Bedstraw		lo
<i>Glaucium flavum</i>	Yellow Horned-poppy	r	
<i>Glaux maritima</i>	Sea Milkwort	la	la
<i>Hippophae rhamnoides</i>	Sea Buckthorn	r	o
<i>Holcus lanatus</i>	Yorkshire-fog		o
<i>Honckenya peploides</i>	Sea Sandwort	r	r
<i>Hordeum sp.</i>	Barley	r	r
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort		vla
<i>Hypochaeris radicata</i>	Cat's-ear	r	o
<i>Impatiens glandulifera</i>	Indian Balsam	r	r
<i>Iris pseudacorus</i>	Yellow Iris		r
<i>Isolepis setacea</i>	Bristle Club-rush		r
<i>Juncus ambiguus</i>	Frog Rush	o	o
<i>J. articulatus</i>	Jointed Rush	o	la
<i>J. balticus</i>	Baltic Rush		r
<i>J. bufonius</i>	Toad Rush	a	la
<i>J. gerardii</i>	Saltmarsh Rush	lo	la
<i>J. inflexus</i>	Hard Rush	r	r
<i>J. maritimus</i>	Sea Rush	r	o
<i>Leontodon autumnalis</i>	Autumn Hawkbit		r
<i>L. saxatilis</i>	Lesser Hawkbit	o	o
<i>Leymus arenarius</i>	Lyme-grass	la	la
<i>Lobelia erinus</i>	Garden Lobelia		r
<i>Lolium perenne</i>	Perennial Rye-grass	r	o
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil		r
<i>L. pedunculatus</i>	Greater Bird's-foot-trefoil		r
<i>Lycopersicon esculentum</i>	Tomato	r	

<i>Lycopus europaeus</i>	Gypsywort	vlo	r
<i>Melilotus altissimus</i>	Tall Melilot		r
<i>Mentha aquatica</i>	Water Mint	r	lf
<i>Myosotis laxa caespitosa</i>	Tufted Forget-me-not	r	r
<i>O lachenalii</i>	Parsley Water-dropwort	r	r
<i>Odontites vernus</i>	Red Bartsia		r
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	r	r
<i>Oenothera fallax</i>	Intermediate Evening-primrose		r
<i>Ononis repens</i>	Common Restharrow		lo
<i>P. arviculare</i>	Knotgrass	r	r
<i>P. lanceolata</i>	Ribwort Plantain	r	r
<i>P. maculosa</i>	Redshank	r	r
<i>P. major</i>	Greater Plantain	r	r
<i>P. maritima</i>	Common Saltmarsh-grass	a	la
<i>P. maritima</i>	Sea Plantain	o	o
<i>P. oxyspermum raii</i>	Ray's Knotgrass	r	r
<i>Parapholis strigosa</i>	Hard-grass	vlf	vla
<i>Pastinaca sativa</i>	Wild Parsnip		r
<i>Persicaria lapathifolium</i>	Pale Persicaria	r	
<i>Phalaris arundinacea</i>	Reed Canary-grass		r
<i>Phragmites australis</i>	Common Reed	r	la
<i>Pisum sativum</i>	Garden Pea		r
<i>Plantago coronopus</i>	Buck's-horn Plantain	r	o
<i>Poa annua</i>	Annual Meadow-grass		o
<i>Polygonum arenastrum</i>	Equal-leaved Knotgrass		r
<i>Potentilla anserina</i>	Silverweed		vlf
<i>Puccinellia distans</i>	Reflexed Saltmarsh-grass	la	
<i>Pulicaria dysenterica</i>	Common Fleabane	r	o
<i>Ranunculus flammula</i>	Lesser Spearwort		r
<i>R. repens</i>	Creeping Buttercup		r
<i>R. sceleratus</i>	Celery-leaved Buttercup	o	lf
<i>Raphanus raphanistrum maritimum</i>	Sea Radish	r	r
<i>Rhinanthus minor</i>	Yellow-rattle		r
<i>Rorippa nasturtium-aquaticum</i>	Water-cress		r
<i>Rorippa palustris</i>	Marsh Yellow-cress		r
<i>Rosa rugosa</i>	Japanese Rose		r
<i>Rubus caesius</i>	Dewberry		r
<i>Rumex conglomeratus</i>	Clustered Dock		r
<i>R. crispus</i>	Curled Dock	lo	o
<i>R. obtusifolius</i>	Broad-leaved Dock	lo	r
<i>Sagina apetala</i>	Annual Pearlwort		r
<i>S. nodosa</i>	Knotted Pearlwort	o	vla



<i>Salicornia europaea</i> agg.	Glasswort	lf	lo
<i>Salix cinerea</i>	Grey Willow		r
<i>S. repens</i>	Creeping Willow		r
<i>S. x rubens</i>	Hybrid Crack-willow		r
<i>Salsola kali kali</i>	Prickly Saltwort	r	r
<i>Samolus valerandi</i>	Brookweed	lf	la
<i>Schoenoplectus pungens</i>	Sharp Club-rush		vla
<i>S. tabernaemontani</i>	Glaucous Bulrush	r	o
<i>Senecio jacobaea</i>	Common Ragwort	r	lf
<i>S. squalidus</i>	Oxford Ragwort		r
<i>S. vulgaris</i>	Groundsel	r	r
<i>Silene uniflora</i>	Sea Campion	r	
<i>Sisymbrium officinale</i>	Hedge Mustard		r
<i>Solanum dulcamara</i>	Bittersweet		r
<i>Sonchus arvensis</i>	Perennial Sow-thistle	r	lf
<i>S. asper</i>	Prickly Sow-thistle	o	o
<i>S. oleraceous</i>	Smooth Sow-thistle		vlf
<i>Sparganium erectum</i>	Branched Bur-reed		r
<i>Spartina anglica</i>	Common Cord-grass	lo	lo
<i>Spergularia marina</i>	Lesser Sea-spurrey	lo	r
<i>S. media</i>	Great Sea-spurrey	o	r
<i>Stellaria media</i>	Common Chickweed	r	
<i>Suaeda maritima</i>	Annual Sea-blite	o	lo
<i>Taraxacum</i> sect. <i>Ruderalia</i>	Dandelion	r	r
<i>Trifolium dubium</i>	Lesser Trefoil		r
<i>T. fragiferum</i>	Strawberry Clover	vla	la
<i>T. hybridum</i>	Alsike Clover		vlf
<i>T. pratense</i>	Red Clover		r
<i>T. repens</i>	White Clover		o
<i>Triglochin maritimum</i>	Sea Arrow-grass	o	lf
<i>T. palustris</i>	Marsh Arrow-grass	vlf	vlf
<i>Tripleurospermum maritimum</i>	Sea Mayweed	o	o
<i>Tussilago farfara</i>	Colt's-foot		o
<i>Typha angustifolia</i>	Lesser Bulrush	r	r
<i>T. latifolia</i>	Bulrush		lf
<i>Vicia sativa</i>	Common Vetch		r
<i>Viola tricolor tricolor</i>	Wild Pansy		r