Birkdale Green Beach – a forty-year overview

Philip H. Smith, January 2026

Origin and development

The term “green beach” was invented in the Netherlands in the 1960s as “groene stranden” a type of vegetation associated with shores in the Rhine Delta region with similarities to features between Birkdale and Ainsdale on the Sefton Coast.

‘Birkdale Green Beach’ originated in 1986 as scattered patches of Common Saltmarsh-grass on the open shore about 100 m out from the dune front, just south of Birkdale (National Grid Reference SD321163) (Fig. 1). These rapidly accumulated silt and blown sand to form low hummocks which then became an intermittent line of embryo dunes up to 50 cm high (Fig. 2), later colonised by more typical dune-forming grasses, such as Sand Couch, Lyme-grass and, eventually, Marram.

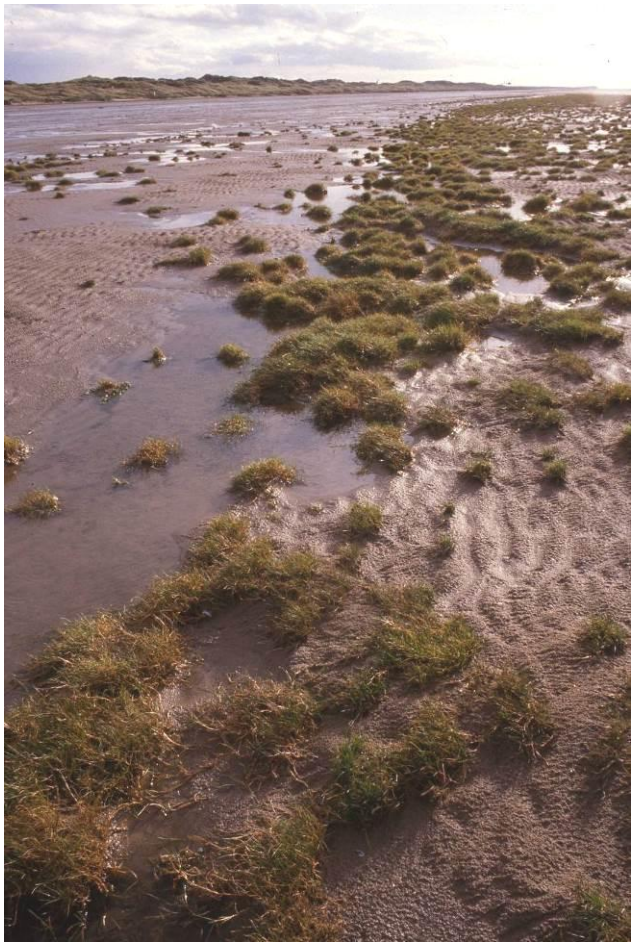

Fig. 1. Early stage in Green Beach formation, Birkdale 1987

Fig. 2. Embryo dunes, 'Even Newer Green Beach', June 2025

Behind the embryo dunes, saltmarsh vegetation initially developed, becoming richer in species as time progressed. The new ridge impeded runoff of rainfall and groundwater seawards, resulting a series of seasonally-flooded freshwater slacks (Fig. 3). Over a few years, the slacks developed a complex mosaic of dune slack, high-level saltmarsh, swamp and fen plant communities. Alder bushes germinating on old strand-lines from about 1998 grew to produce parallel lines of wet-woodland extending for over 2 km and covering an area of 1.85 ha by 2008 (Fig. 4). Over time, this 'carr' woodland became even more extensive, the Alder being joined by willows and Sea Buckthorn, forming dense thickets.

Fig. 3. Flooded slack, 'Newest Green Beach', January 2021

Fig. 4. Lines of Alder bushes on 'Birkdale Green Beach', summer 2007

Meanwhile, the Green Beach was still developing westwards, new embryo dune ridges cutting off sand-supply to the older ones which became low fixed dunes, while additional saltmarsh formed to the west of the dune ridges, especially in the northern section. These habitats developed southwards towards Ainsdale and, by 2015, the entire feature was over 4 km long and up to 200 m wide, covering an area of over 60 ha.

Reasons for Green Beach development

Birkdale is situated on the southern fringe of the Ribble Estuary at a transition point between saltmarsh and sand dune formation. The estuary has been silting up since the end of the last Ice Age, most material being derived from glacial sediments of sand and silt in the south-east Irish Sea and from eroding dunes at Formby Point, the latter transported north by long-shore drift. Between 1981 and 2002, the beach-level at Birkdale rose by an average rate of 2.4 cm per annum.

Usually, plants are prevented from growing on a sandy beach by wave action, especially during winter gales. However, as the foreshore at Birkdale became higher and wider it absorbed wave-energy, so that saltmarsh plants and then dune-forming species could survive winter storms. Once vegetation became established, the accretion rate increased, due to more efficient trapping of sand and silt.

From the 1920s until 1993, driving and parking of motor vehicles was permitted on Ainsdale-Southport beach, with up to 10,000 cars present on occasions. Coupled with mechanised beach-cleaning up to the dune toe, this inhibited embryo dune formation, preventing natural growth westwards of the dunes along this stretch. In 1993, Sefton Council restricted the driving of vehicles along the shore from Ainsdale to Southport. Also, the Council's mechanical beach cleansing regime changed in 1997, reducing damage to the frontal dunes. Then, in autumn 2004, a 400 m-long area of beach north of Ainsdale-on-Sea, contiguous with the existing 'Birkdale Green Beach', was fenced to exclude vehicles. The result was an increase in the rate of dune development, creating a series of additional Green Beach features to the south over a period of about 20 years, each responding to further parking restrictions. For recording purposes, these were named the 'New Green Beach', 'Newest Green Beach', 'Even Newer Green Beach' and 'Green Beach south extension' (Figs. 5, 6, 7). Each year, the physical attributes and changing

plantlife of these features were monitored and described in annual update reports, circulated to interested parties. A detailed scientific paper on the development and floristics of the 'New Green Beach' between 2005 and 2019 was published online in *British & Irish Botany* in 2021. Some of the main findings from 40 years of survey work are described below, a selection being summarised in Table 1.

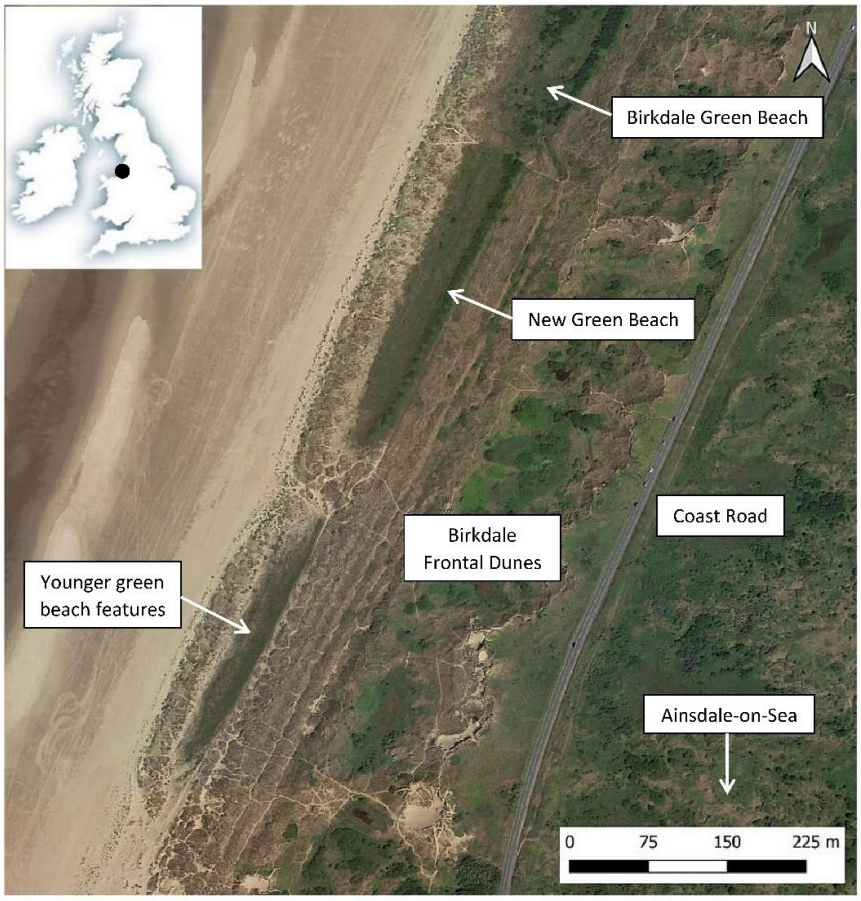

Fig. 5. Aerial photo of southern Green Beaches in 2020. "Younger Green Beach features" includes 'Newest' and 'Even Newer Green Beaches'

Fig. 6. Early stage in 'Even Newer Green Beach' ridge formation, July 2017

Fig. 7. Later stage in 'Even Newer Green Beach' ridge development, October 2022

1. The older (northern) features tended to support higher numbers of flowering (vascular) plants. Thus, 'Birkdale Green Beach' had the highest cumulative number of plants, though the smaller sites had a higher species-richness (Table 1).

2. The proportion of regionally or nationally notable higher plants ranged from 20 to 12.5%, the latter number being for the smallest and youngest site. These values are comparable with 17.6% of notable plants for the dune system as a whole, which is known to be particularly rich in uncommon plants. Many of these are dune slack specialists rarely found in the hinterland. Examples on the Green Beaches include Grass-of-Parnassus, Marsh Helleborine, Early Marsh-orchid, Baltic Rush, Variegated Horsetail and the very rare hybrid willow *Salix* × *friesiana.* Nationally notable mosses and liverworts (bryophytes) have also been recorded for the Green Beaches.
3. These sites were found to support relatively small numbers of non-native plants (14-3.6%), probably because of the harsh maritime conditions and distance from gardens. In contrast, the Sefton duneland as a whole has about 40% alien plants, most being garden-escapes and a few invasive. The main ecological threat to the Green Beaches is Sea Buckthorn, a rapidly growing spiny shrub that was introduced to the Sefton dunes in the 1890s. Thousands of Sea Buckthorn seedlings were removed by volunteers from the southern Green Beaches over recent decades. Unfortunately, the older northern section could not be cleared, with the result that it became heavily invaded by Sea Buckthorn (Fig. 8). However, several of the largest patches were removed mechanically by *Green Sefton* contractors in the 2025/26 winter (Fig. 9)

    Another important alien invader is Japanese Rose, which extensively colonised the inner edge of the Green Beaches (Fig. 10). All the patches were dug up during the *Dynamic Dunescapes* project in winter 2022/23 (Fig. 11), regrowth being sprayed the following summer with an approved herbicide. Another potentially invasive species is Pampas-grass, five young plants of which were removed from the ‘Newest’ and ‘Even Newer Green Beaches’ in 2024.

Fig. 8. Sea Buckthorn invasion of northern 'Birkdale Green Beach', June 2024

Fig. 9. Removal of Sea Buckthorn, northern 'Birkdale Green Beach', December 2025

Fig. 10. Japanese Rose invading 'New Green Beach' in August 2014

Fig. 11. Aerial photo of part of Birkdale Green Beach in 2023. Bare sand indicates where Japanese Rose was removed

4. The composition of Green Beaches flora changed markedly over time as plants typical of the saltmarsh habitat were replaced by those with much less tolerance of saline conditions. For example, the proportion of saltmarsh plants on the 'New Green Beach' fell from 39% in 2006 to 4% by 2019.
5. Analysis of Ellenberg Indicator Values for salinity, nitrogen, moisture and reaction showed that Green Beach flora became progressively adapted over time to lower salinity, lower fertility, drier conditions and to a less basic soil.
6. The rate of succession, from open to closed plant communities with growth of taller vegetation and shrubs, was particularly high, especially in the slacks, with mature dune slack, fen and carr habitats becoming established in under a decade from an unvegetated beach-plain. Rapid spread of Common Reed was a particular feature, together with smaller amounts of Sea Club-rush, Bulrush and Grey Club-rush (Fig. 12).

Fig. 12. Fen vegetation with abundant Common Reed, 'New Green Beach' 2015

7. The number of plants recorded annually in the southern Green Beach slacks increased for about 8 – 10 years before levelling off and then beginning to fall.

This was attributed to competition from taller-growing plants replacing smaller, less competitive species, together with a reduced area of open ground for colonisation.

8. A coastwide volunteer survey of the Red-list ‘vulnerable’ Grass-of-Parnassus in 2013 counted over 12,400 flowering plants on the southern section of the ‘New Green Beach’ (Fig. 13), this being 26% of the Sefton Coast population. Since then, the ‘New Green Beach’ counts have fallen but have been replaced by spectacular numbers of this iconic flower on the ‘Newest’ and ‘Even Newer Green Beach’.

Fig. 13. Grass-of-Parnassus, ‘New Green Beach’ August 2017

Table 1. Summary of Green Beach characteristics between Birkdale and Ainsdale.

Name	Area (ha)	Origin	Cumulative no. of higher plants	% notable plants	% non-native plants
Birkdale Green Beach	64	1986	335	19	14
New Green Beach	2.9	2005	246	17	9
Newest Green Beach	3.1	2008	261	17	13
Even Newer Green Beach	1.7	2016	196	20	11
Green Beach South Extension	1.3	2024	56	12.5	3.6

Assessment

'Birkdale Green Beach' has been described as "A truly remarkable oasis of wildness in 21st century Merseyside". It makes an outstanding contribution to the biodiversity of the Sefton Coast. In particular, the Green Beach provides a significant area of pioneer habitat in a relatively mature dune system which has suffered from over-stabilisation in recent decades. This is reflected in a high species-richness, especially of higher plants, representing nearly 30% of the entire Sefton Coast sand dune flora. They include many Red-listed basiphilous dune slack plants that are declining throughout Europe. The proportion of plants that are nationally or regionally notable (about 20%) is higher than the equivalent figure of 17% for the dune system as a whole. As a locality for rare mosses and liverworts the Green Beaches are nationally important. The development of Alder woodland is extremely unusual in such an exposed coastal location, Alder not being adapted to saline conditions.

The Green Beaches are one of the most important breeding sites for the endangered Natterjack Toad on the Sefton Coast, though numbers of spawn strings peaked in 2008, declining subsequently as vegetation matured. Notable breeding birds include Skylark, which is on the Red List of Species of Conservation Concern in the UK. Internationally important numbers of shorebirds, terns and gulls assemble to roost at

high-tide along the remoter, less disturbed, stretches of Green Beach. A high diversity of moths, beetles, flies, true bugs and spiders has been recorded, including several nationally notable species such as Northern Dune Tiger Beetle and Sandhill Rustic moth.

'Birkdale Green Beach' lies within the Sefton Coast SSSI and the Ainsdale & Birkdale Sandhills Local Nature Reserve. It is also a designated Ramsar wetland of international importance and is protected under the EU Birds and Habitats Directives as part of the Sefton Coast Special Protection Area and Special Area of Conservation within the *Natura 2000* network.

With sea-level rising by about 3 mm per annum, due to global warming, the Green Beaches provide valuable additional coast protection along more than 4 km of coastline. During the exceptional storm-surges of winter 2013/14, which removed up to 20 m of dune frontage at Formby Point, some overwash and erosion of the southernmost Green Beach embryo dunes took place. However, virtually no damage was caused to older sections, despite these being flooded to a depth of at least a metre, with tidal debris being washed through the Alder woodland to the rear.

Conservation management

Despite their relatively recent origin, older parts of the Green Beach now support dense beds of Sea Club-rush, Common Reed and Alder/willow carr, dominating and replacing more diverse earlier stage slack vegetation. This process used to be slowed by localised Rabbit grazing but disease has eliminated most of the Rabbits and domestic livestock have not, so far, been used on the Green Beaches. At present, the continuing southwards and westwards growth of these features is maintaining the pioneer communities. Invasive Sea Buckthorn is being kept in check in the south by active management, including by volunteers, while a start has been made by Sefton Council to remove large stands in the more northerly sections. Alder is a native colonist and has considerable wildlife interest, especially for invertebrates; as yet, only small areas of this shrub have been controlled. Ongoing scrub control, especially of Sea Buckthorn, is essential, while mowing (cut and collect) selected areas and/or the introduction of domestic livestock, especially cattle, could be used to lower the rate of vegetation succession. Regular monitoring of the sites should continue, in particular to identify and control potentially invasive plants. Three

scrapes were excavated in winter 2025/26 on the 'Newest Green Beach' as potential breeding sites for Natterjacks. Depending on their success, more scrapes could be justified.

Although visitor interest in Birkdale Green Beach has been encouraged in the north by the development by *Green Sefton* of a way-marked footpath, the 'Velvet Trail', much of the site remains relatively quiet. The area has great potential for educational visits and guided walks.

Acknowledgements

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Further reading

A great many reports, scientific papers and articles have been written about the Ainsdale/Birkdale Green Beaches. A representative selection is listed below.

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