

Bridgwater Bay NNR and SSSI –

Evolution in maps Pat Doody, March 2024

Introduction

Bridgwater Bay forms part of the Seven Estuary. At least three glacial cycles have influenced the area gouging-out channels as the ice sheets expanded, depositing glacial till as they retreated, with meltwater eroding the deposited sediments. Its origins lie in the infilling of the basin with sediment during the Holocene Marine transgression, which ended 4000 to 5,000 years ago. Bridgwater Bay NNR includes the estuary of the River Parrett, Steart Flats and the realignment site, whilst the Site of Special Scientific Interest extends southwards to include floodplain grazing marsh and northwards to include Berrow Flats. At the coastal margin there are a series of habitats, notably coastal shingle ridges and saltmarsh (Figure 01).

This note summarises the way this section of coast from Stolford to Fenning Island has evolved.

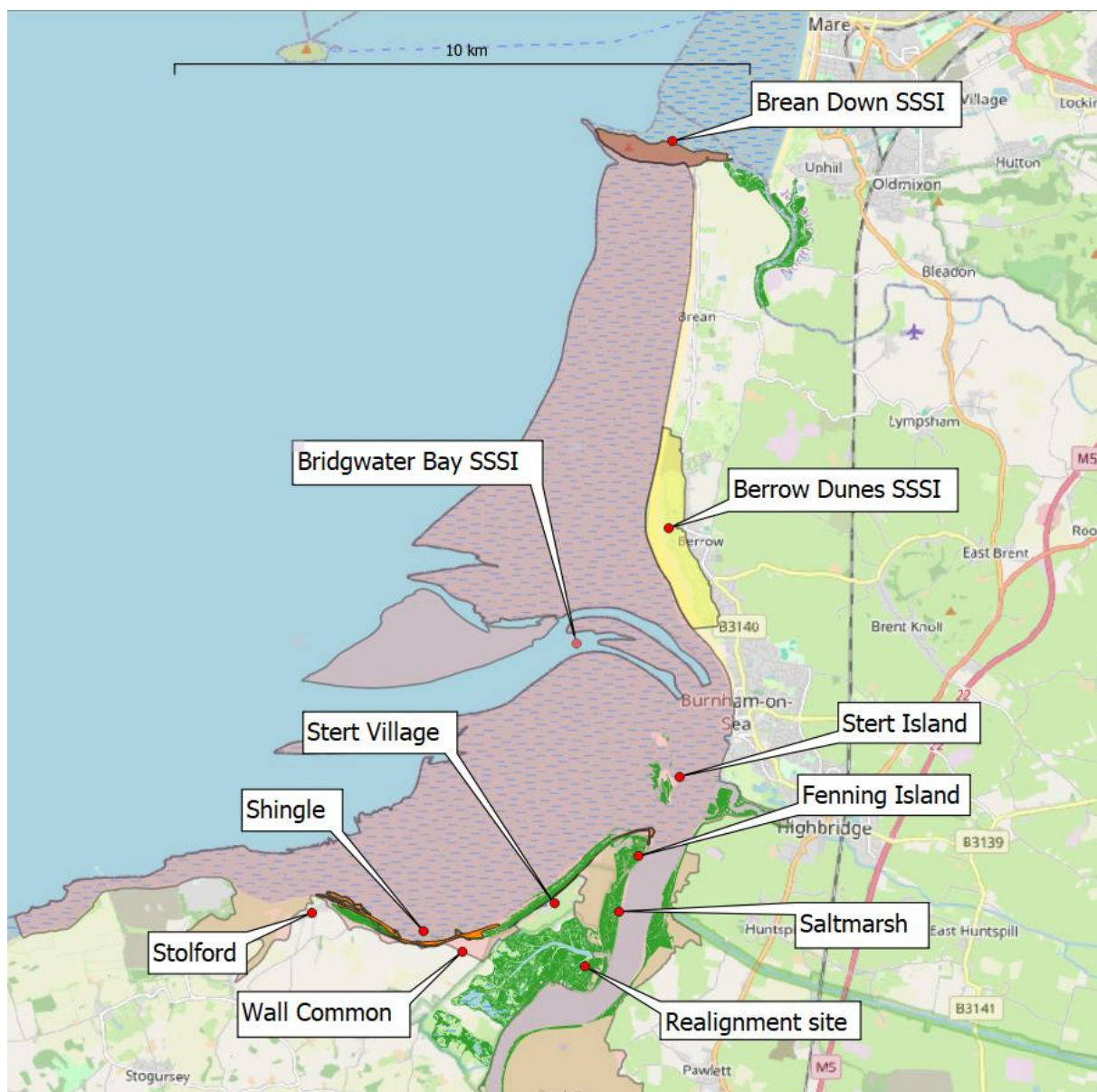


Figure 1 Bridgwater Bay key locations mentioned in the text and extant habitats

Change 1782-1822

In 1782 Stert 'village' was connected to Stert Point by a spit of land, a causeway (Figure 02). At that time the Point was referred to as a 'warren'. This may have implied it was composed of sand dunes, as, in other places in England and Wales, warrens were associated rabbit cultivation on sand dunes. The BGS map surveyed in the 1970s shows an area of sand dunes beneath what is now Steart village.

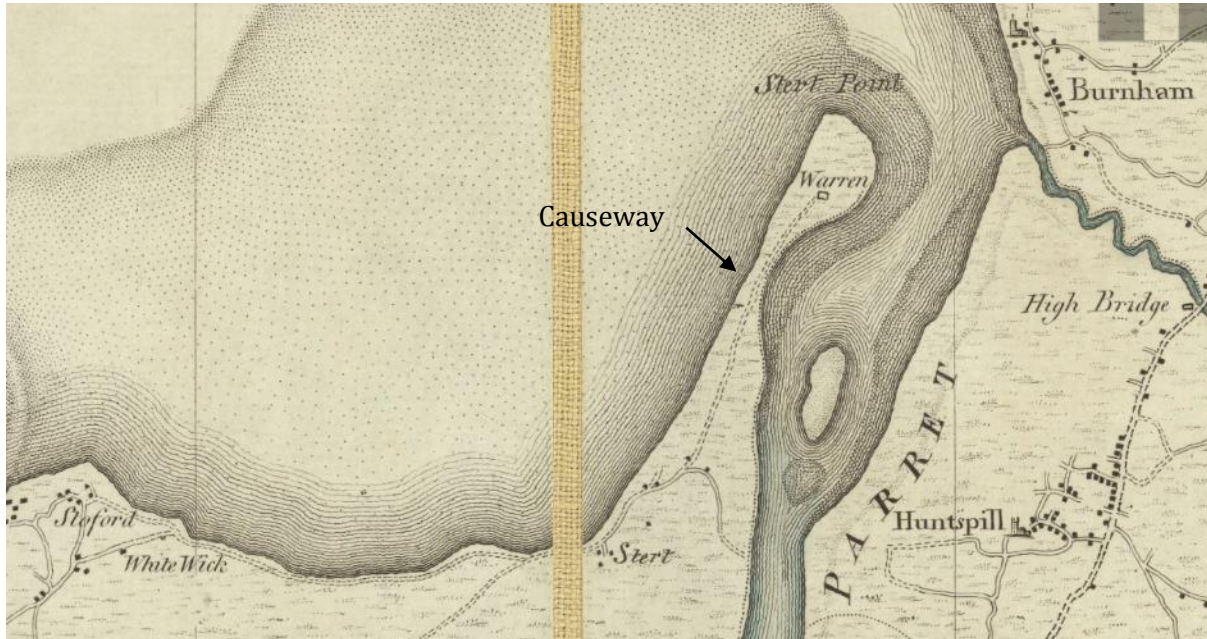


Figure 02 section of a map dated 1782, surveyed by Day & Masters 1767-1782

By 1822 this narrow neck (causeway) had been breached and Stert Point became an island. (Figure 03).

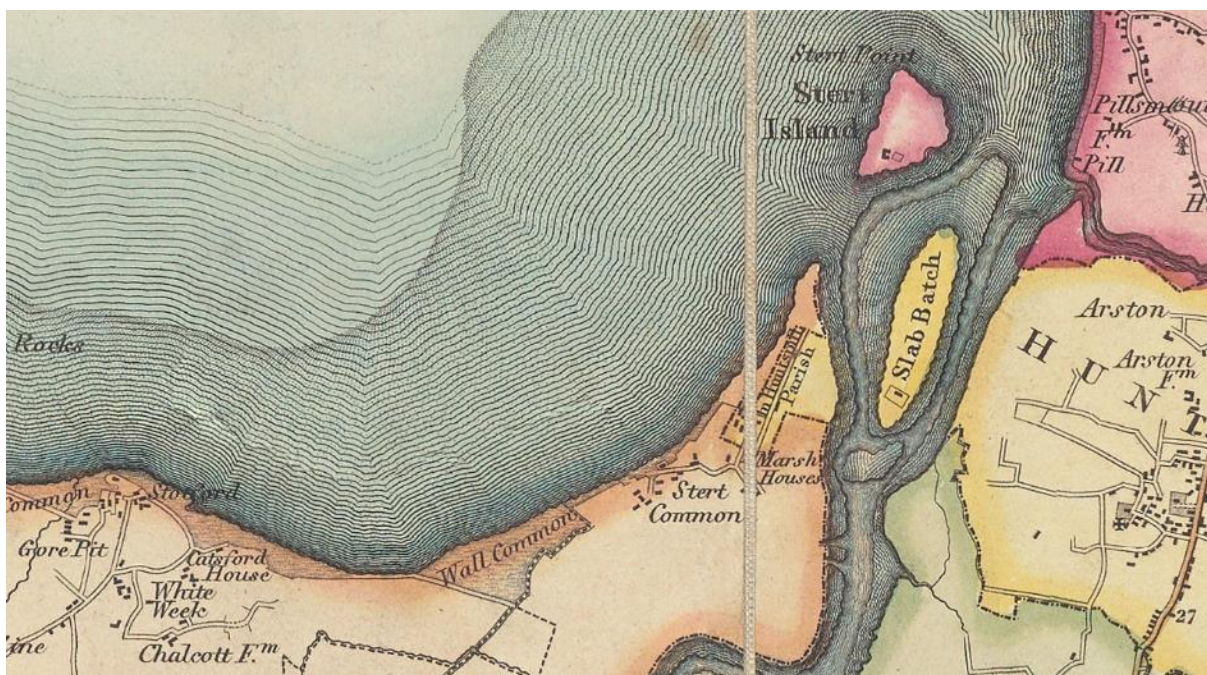


Figure 03 section of a map 1822, surveyed by Greenwood 1820-1821

Situated east of the Stert peninsular it only survived for about 70 years and on the BGS 1:63 360 scale map of 1834 it had eroded and reappeared as Fenning Island. This channel became cut off by the extension of the

shingle beach to form a spit around the Point. By the next OS map (surveyed in 1902) the channel has silted up and coalesced to form an extended area of 'Saltings'. By 1936 there were five individual recurved ridges. Reference is also made to the "most severe erosion appears to have taken place at the immediately east of the last groyne" (Kendall 1938 Figures 11, 12 and 13).

Change between 1902 and 2023

The Bristol Channel has one of the largest tidal ranges in the world, second only to the Bay of Fundy in Canada. Because of this, high tides are brief. However, when there are storms, these can effect major changes in the coastal habitats at or near High Water. Figures 04 and 05 provide a general picture of the overall change in the configuration of the coast. These are based on OS maps published 1902, BGS surveys 1969-70, published 1980, BGS 1:50000 published 1980 and Google Earth 2023. See below for the map series used.

Stolford to Wall Common

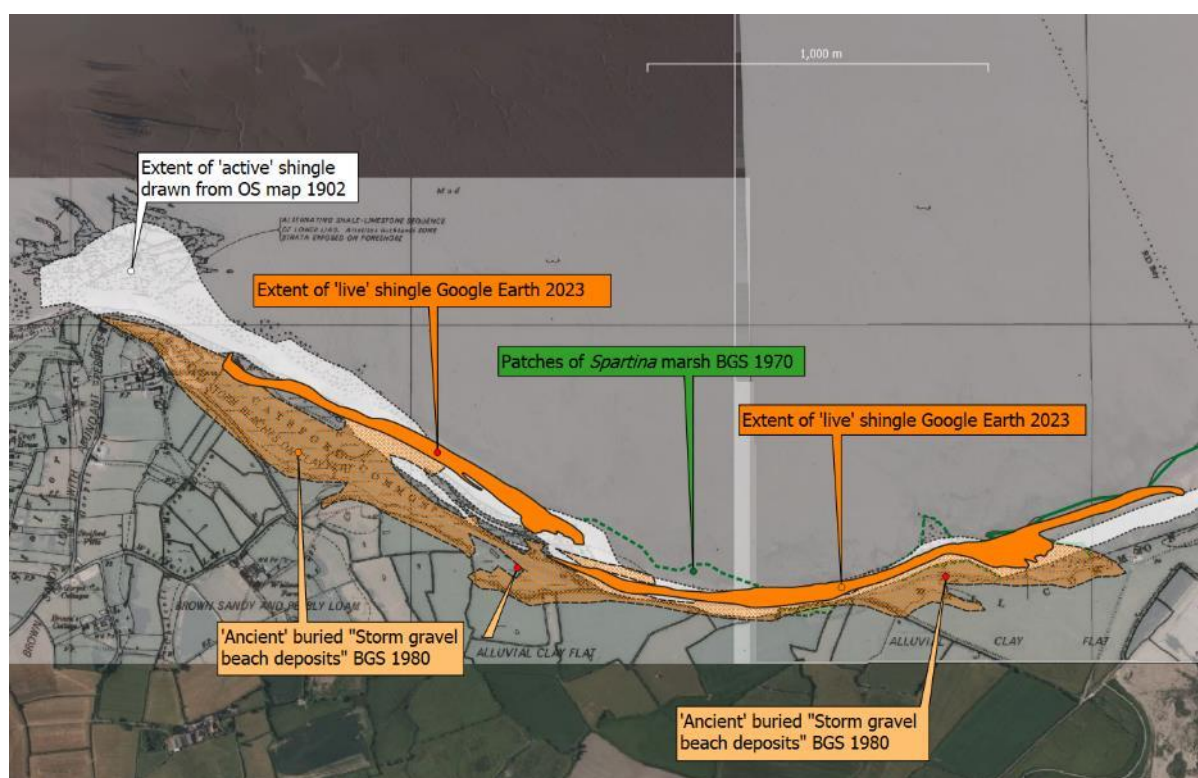


Figure 04 Stolford to Wall Common, change in shingle structures and saltmarsh from OS map published 1902, BGS map published 1980 and Google Earth 2023. Note there was no saltmarsh on the north facing coast before 1922

The general impression is of an eroding coastline. Within this there are both landward and seaward movement of habitats. In the west from Stolford to Wall Common a series of shingle beaches moving eastwards in response to natural longshore drift, lead to a stable foreshore over extended periods. More intensive storm events have caused significant movement of pebbles creating storm ridges. In places these have remobilised older ridges and created new ones, sometimes covering stable ridges further along the coast. Figure 04 summarises the sequence and shows that by 2023 there has been a significant overall loss of shingle habitat. This may stem from a combination of a reduction in availability of eroded material from the west and the rapid invasion by *Spartina anglica* onto the intertidal sand and mud, following its introduction in 1922.

Wall Common to Fenning Island

Although much narrower the shingle shore continues along the Steart peninsular to Fenning Island (still named as an island on modern OS maps). This has also eroded along the north shore of the Steart Peninsula. Channels have become realigned with tides moving sand and/or mud to cover saltmarsh. Against this background human activities have modified the natural functioning of the coast. Coast protection, notably associated with the construction of sea walls to protect Hinkley Power Stations, introduced species and grazing management are the most significant.

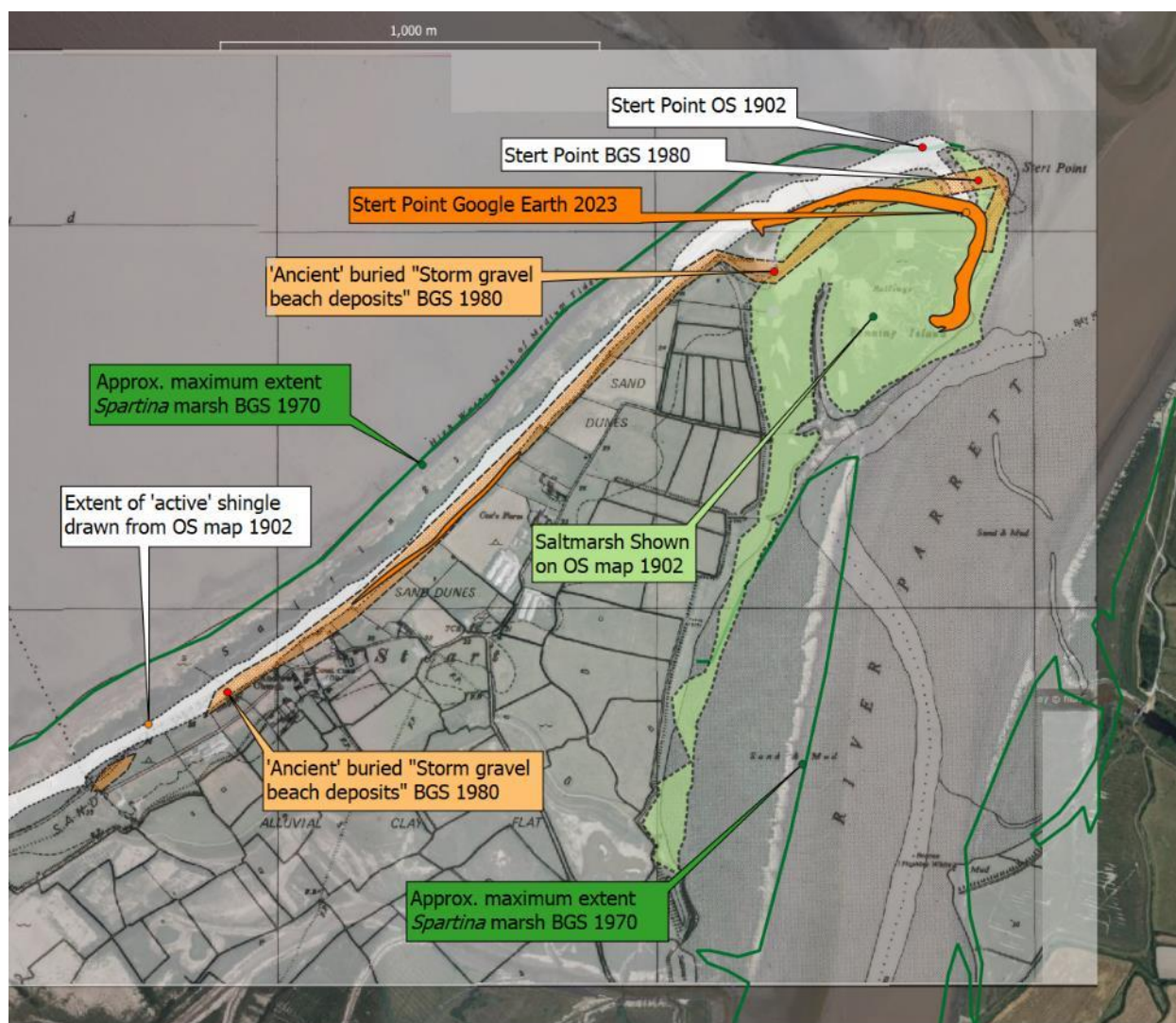


Figure 05 Steart Peninsular, change from 1902 – 2023 change in shingle structures and saltmarsh from OS map published 1902, BGS map published 1980 and Google Earth 2023. Note there was no saltmarsh on the north facing coast before 1922. The figure shows three of the several shingle recurves at Steart Point

For a general introduction see State of the Severn Estuary Report at <https://severnpartnership.org.uk/wp-content/uploads/sites/2/2015/10/SOSER.pdf>.

What do we know from this site?

Bridgwater Bay has evolved over thousands of years in the Holocene. Peat deposits indicative of vegetation of the valley floor have been dated to 8,400 BP (**B**efore **P**resent) (Heywood & Kidson 1982). The post Devensian Glacial rising sea level will have submerged the surface peat and forests, which have been dated to 7,000 BP at MLWS and 3,000 BP in front of the storm beach at Stolford (Kidson & Heywood 1973).

The maps show how the coast is evolving as sediments move in response to daily, monthly and yearly tidal cycles. Mudflats, sandflats and saltmarshes are the main habitats influenced by these forces. However, in the

Severn Estuary the large tidal range is also important, especially on high tides when storms occur. Although the timeframe is short, they can create shingle storm beaches. These can effect major change, overwhelming existing shingle ridges or helping to protect existing habitat, such as saltmarsh. The closure of the channel separating Stert from Fenning Island, shows how effective they can be as a barrier to tides and wave action.

The introduction of the invasive *Spartina anglica* and its rapid expansion is a lesson in the unintended consequence of human interference. This invasive species has had serious implications for intertidal feeding areas for important waterfowl populations in UK estuaries. Other Human activities interfere with the natural cycles of deposition and erosion, including construction of sea walls. Intensive grazing has implications for the species composition of saltmarsh vegetation and can exacerbate erosion of this habitat.

The recent (2014) breach in the sea wall along the River Parrett, represents a change in coastal management, where ‘working with nature’ is increasing seen as a more sustainable form of sea defence, than continuing to build and reinforce artificial barriers. These interactions are dealt with in more detail in separate notes on shingle and saltmarsh habitats. Berrow Dunes and Brean Down are also included as stand alone notes. They are all based on published material including a series of OS and BGS maps, and personal experience from occasional visits between 1980 and 2015.

- [Note 1 deals with the Shingle ridges of Steart Peninsula, draft](#)
- [Note 2 deals with Saltmarshes of the Steart Peninsular, draft](#)
- [Notes 3 and 4 deal with Brean Down and Berrow dunes, in prep.](#)



OS maps National Library of Scotland

OS Six Inch 1840s-1880s 1:10560 county layers Somerset Sheet XXXVIII.NW Surveyed: 1886, Published: 1886 showing Fenning Island, a reformed island derived from “Slab Batch”?

OS Six Inch 1888-1915 1:10560 Somerset Sheet XXXVIII.NW. Revised: 1902, Published: 1904 (Second Edition) showing the extended shingle recurve with Fenning Island attached to the Stert Peninsula;



References

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- Heyworth, A, and Kidson, C, 1982 Sea-level changes in southwest England and Wales. *Proc Geol Assoc* **93**, 91–111.
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