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Five Estuaries Offshore Wind Farm Ltd.

Lesser Black-backed Gull Compensation Site Suitability Report

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1. Introduction

This report presents a summary of the key findings from site visits to Steep Holm Island, Somerset and Orford Ness and the Alde-Ore Estuary, Suffolk in October and December 2023 respectively. The aim of these site visits was to determine the suitability of potential compensatory measures for breeding lesser black-backed gulls (*Larus fuscus*) at the two sites.

1.1 Background

The Five Estuaries Wind Farm (VE) is a proposed extension to the operational Galloper Offshore Wind Farm. The VE wind turbine generators (WTGs) will be situated within two array areas to the east of the Galloper OWF and situated approximately 37 km off the Suffolk coast (at its closest point).

The Alde-Ore Estuary Special Protection Area (AEO SPA) is located 15 km away from the VE array areas, which lies within the mean-max foraging range + 1 SD of breeding lesser black backed gull (Woodward *et al*. 2019, NatureScot, 2023), a qualifying feature of the AOE SPA. Given the proximity of VE to the AOE SPA and results of a preliminary assessment, it is deemed likely that there will be an Adverse Effect on Site Integrity (AEoSI) in relation to lesser black-backed gull qualifying feature of the AEO SPA from VE. Therefore, compensation for this effect will be required.

The lesser black-backed gull breeds in north and west Europe from northern Russia, through Fennoscandia, North Sea coasts, British Isles, Iceland, Greenland and as far south as northwestern Spain and Portugal. The species has also increased dramatically in North America in recent decades and now is widespread on the US eastern seaboard in winter. Summering records in North America are now widespread and hybridisation with American herring gull (*Larus smithsonianus*) has been documented (Ellis *et al.* 2014). Although lesser black-backed gull is a migratory species and post-breeding, UK and Irish birds typically migrate along the western seaboard of Europe to spend at least some of the non-breeding period in Iberia or northwest Africa. The population underwent a significant increase through the 20th century and during this time, they became less migratory and can now be found within much of the breeding range throughout the year as they exploited anthropogenic food sources (Mitchell *et al.* 2004; JNCC, 2021).

Lesser black-backed gulls breed colonially often with other gull species, especially herring gulls. Colonies are found on offshore islands and within freshwater waterbodies, on coastal cliffs, sand dunes, salt marshes, moorland, and roofs of buildings. Seemingly, many sites that are either inaccessible to ground predators (e.g. islands and urban roofs) or where ground

predators are particularly scarce (e.g. narrow peninsulas or moorlands managed as shooting estates) can be attractive to nesting lesser black-backed gulls. Although often sharing breeding habitats with herring gulls, lesser black backed gull nest sites and foraging strategies generally differ. Lesser black-backed gulls typically prefer more vegetated areas for nesting and forage over larger distances than herring gulls.

As with herring gull, lesser black-backed gulls have been subject to culling and clutch destruction in the past, most notably during the 1970 and 1980s. In some instances, lesser black-backed gulls have been incidental victims of direct efforts to reduce numbers of the formerly more abundant herring gull. Lesser black-backed gulls are generalist, opportunistic foragers and have been able to capitalise on increased food availability through fishery discards and at landfill sites during the 20th century. However, reforms to the latter in recent years has impacted foraging behaviour with potential impacts on demography (Langley *et al*., 2021; Pons, 1992).

1.2 Site Selection and compensation measures

VE Ltd. have short-listed potential compensation measures for lesser black-backed gull and following subsequent stakeholder engagement, it was considered compensation by predator exclusion fencing and habitat creation or management at breeding sites would be the most feasible and effective for lesser black-backed gull (Five Estuaries Offshore Wind Farm Limited, 2022). Further details on the ecological evidence for the proposed compensation measures and the preliminary site selection process area are available within the 'Lesser black-backed gull compensation – ecological evidence preliminary site selection and roadmap' (Five Estuaries Offshore Wind Farm Limited, 2023a).

The preliminary site selection assessed lesser black-backed gull colonies within and outside SPAs for their feasibility as potential locations for compensation delivery. Further details on the potential for compensation measures at each of the selected sites is available in 'The 'Lesser black-backed gull compensation – site selection note' (Five Estuaries Offshore Wind Farm Limited, 2023b).

In brief, due to the proximity to the VE site, and connectivity in the breeding and migration seasons between the proposed sites and AOE SPA, (based on the tracking data from Orford Ness, Thaxter et al., (2012)) the AOE SPA was considered a suitable location for compensation delivery. However, as discussed in the 'Lesser black-backed gull compensation - ecological evidence, preliminary site selection and roadmap' (Five Estuaries Offshore Wind Farm Limited, 2023a), compensation measures should aim to maintain the national site network coherence. Therefore, while prioritising sites nearby, and with connectivity the AOE SPA is desired, alternative sites for compensation near other SPAs, were also be considered should compensation at sites connected to AOE SPA be deemed unfeasible (e.g., following further stakeholder engagement or landowner discussions). Details on the prioritisation of potential

sites, based on connectivity with SPAs is available in the 'Lesser black-backed gull compensation - ecological evidence, preliminary site selection and roadmap' (Five Estuaries Offshore Wind Farm Limited, 2023a).

Following the site selection process, site visits were made to Steep Holm Island and Orford Ness in October and December 2023 respectively to assess the current habitat available to nesting lesser black-backed gulls and to identify the most suitable locations for potential compensation measures for each site.

1.3 Site descriptions

1.3.1 Steep Holm

Steep holm is a small island in the Bristol Channel, approximately 5 km west-northwest of Brean Down in Somerset (**Figure 1**). The island rises on average 61 m above sea level (highest point 78 m) and covers an area of 0.2 km^2 at high tide which increases 0.25 km^2 at low tide due to a large pebble bar at the east side which is exposed at low tide. Its top surface measures approximately 800 m in length and 250 m wide (Lewis, 1936). The island is formed of carboniferous limestone and is often considered a continuation of the Mendip Hills at Brean Down (Coysh et al. 1977). Steep Holm is uninhabited with exception of a small team of volunteers who manage the landscape and tourism during the summer months. The Island is protected as a nature reserve and is designated a Site of Special Scientific Interest (SSSI; NE, 1983) due to its diverse plant communities, including wild peony (*Paeonia mascula*; the only UK site for this species) and colonies of nesting seabirds, namely gulls. The cliffs surrounding the island are partially vegetated (mostly by tree mallow (*Lavatera arborea*)) and alexanders (*Smyrnium olusatrum*). A variety of buck's-horn Plantain (*Plantago coronopus*) which occurs in cracks on the vertical cliffs is unique to Steep Holm (Legg & Parsons, 1990). At the east side of the island a small patch of sycamore woodland persists and apart from a few isolated trees and larger bushes near the centre of the island is the only tree cover on the island. The plateau is dominated by dense thickets of alexanders (*Smyrnium olusatrum*) a community which is scarce in the UK (NE, 1983). Elsewhere on the island, bramble scrub persists in areas which are not occupied by alexanders. The Barracks building in the centre has a small garden of non-native plant some of which have spread to other areas of the island. The island is dotted with disused concreate look-out bunkers and batteries which were used during the world wars.

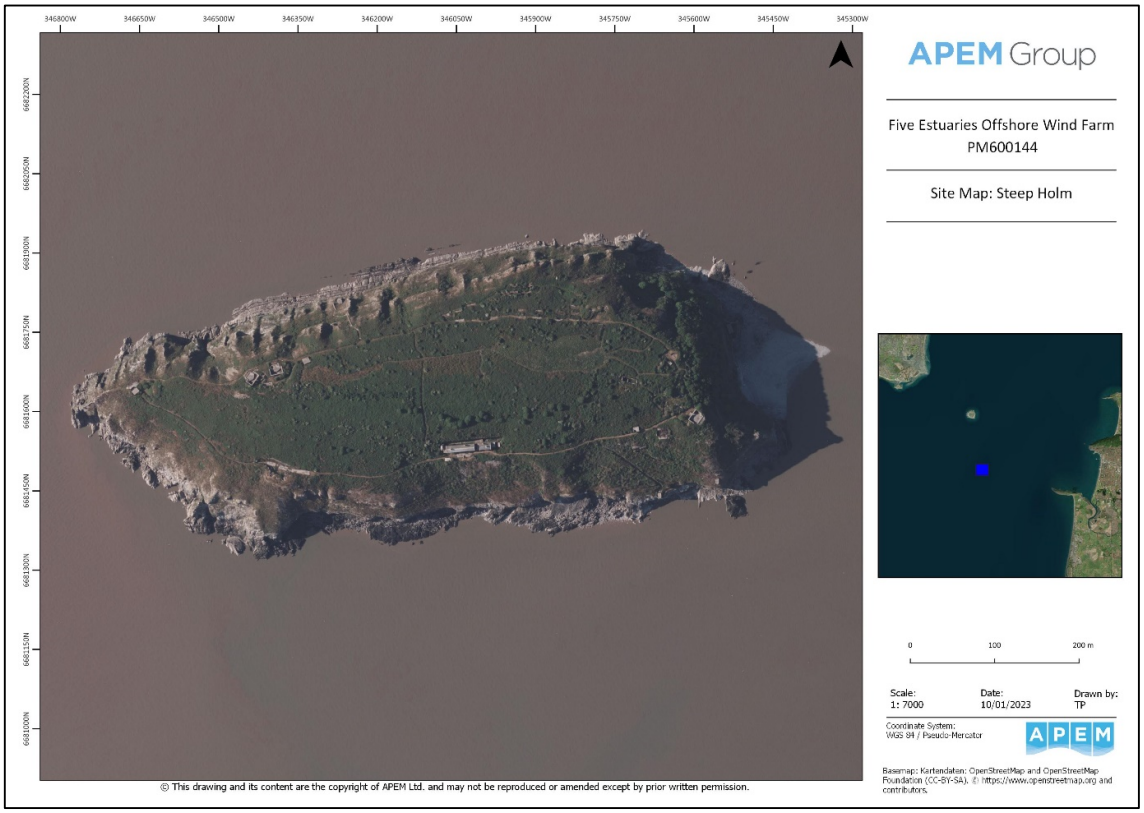

Figure 1: Steep Holm Site Map

1.3.2 Orford Ness

Orford Ness is a cuspate foreland shingle spit on the Suffolk coast, connected to the mainland at Aldeburgh and stretches southward along the coast to Orford and opposite Shingle Street (**Figure 2**). The area is an internationally important area for nature and contains a significant portion of European vegetated shingle, an internationally scarce habitat (JNCC, 1999). Along with Havergate Island the site is a National Nature Reserve and forms a part of the Alde-Ore Estuary SSSI (NE, 1992a), SPA (JNCC, 2012) and Ramsar (NE, 1992b), plus the Alde, Ore & Butley Estuaries and Orfordness-Shingle Street Special Areas of Conservation (SACs; JNCC, 2023a/b). Orford Ness was formerly controlled by the Ministry of Defence which conducted military tests during the world wars and the Cold War. In the late 1960s Cobra Mist radar station was built on the peninsula. The station closed in 1973 but was used for the Orford Ness transmitting station into the 1980s, and as a radio station for the Foreign Office and then the BBC (National Trust, 2023a). Cobra Mist still own the land around the station, but most of Orford Ness is now owned and managed by the National trust. The Orford Ness National Nature Reserve is not publicly accessible in order to protect the fragile habitats and due to the lasting danger from the areas former military use. Access is however available on selected open days under supervision by the National Trust (National Trust, 2023b). The habitat across Orford Ness is mostly freshwater marshland with rank grassland and some areas of developed phragmites reedbed usually along small pools and ditches. To the east the shingle bank rises over the area and runs the entire length of the Ness.

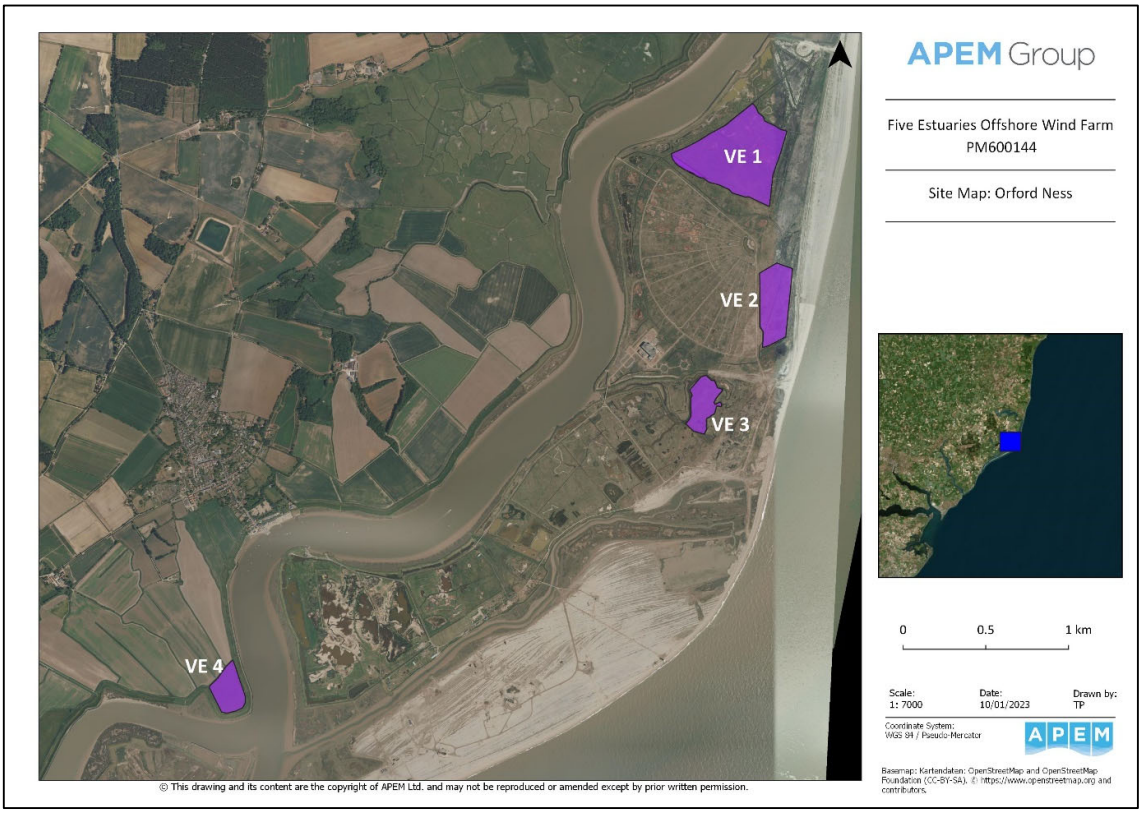

Figure 2: Orford Ness site map. Including VE parcels (1 – 4).

2. Methods

2.1 Site visit timeframes

Site visits were made to Steep Holm Island on Sunday 15th October and to Orford Ness on Wednesday 13th December 2023. An additional site south of Orford village was visited on Thursday 14th December.

Surveys were conducted by APEM's in-house ornithologist, Toby Phelps, who is experienced in ornithological data recording and has an extensive knowledge of seabird breeding ecology. The surveys were designed to collect data across the entire sites, however, due to access issues at Orford Ness only the Cobra Mist owned land could be fully surveyed, with an overview of the inaccessible land possible. There were no access issues at Steep Holm. There were no weather limitations during the visits to either site. Full details of survey conditions and timings are presented in **Table 1**.

Table 1: Weather conditions and timings for both site visits.

Date	Site	Temperature (°C)	Wind (Beaufort scale)	Visibility	Precipitation	Cloud cover (x/8)	Start Time	End Time
15/10/2023	Steep Holm	12	F1-2 ENE	>3 km	None	4	09:00	15:45
13/12/2023	Orford Ness	8	F3-4 NE	>3 km	None	8	09:40	13:00
14/12/2023	Orford (VE 4)	7	F1 W	>3 km	None	8	09:40	11.00

2.2 Objectives

The main objective of the site visits was to assess the habitat suitability for breeding lesser black-backed gulls to inform potential compensation measures planned by VE Ltd. To supplement the observations, photographic evidence of landscapes, habitats and breeding evidence was also collected during the visits to aid in the classification of nesting habitat availability and to assess the suitability of both sites to proposed compensation measures. Moreover, whenever possible engagement with on-site staff or site managers was sought to provide additional information about the areas.

In addition to the above, the following data was also recorded during the site visits:

- Presence of any invasive plants nearby to potential gull nesting sites.
- Presence of avian predators in the vicinity of gull nesting sites (birds of prey and corvids);
- Presence or signs of potential mammalian predators within the sites;
- Presence and locations of footpaths near colonies and information boards (if any) about nesting seabirds; and
- Presence of any potential disturbance stimuli in the area.

3. Results

3.1 Habitat suitability for breeding Lesser black-backed gulls.

3.1.1 Steep Holm

According to the seabird monitoring programme (SMP; JNCC, 2023) there were 390 apparently occupied nests (AONs) on Steep Holm in 2023 (340 AONs from the circle path and plateau plus the addition of 15% for cliff AONs). Although it was not possible to accurately map nesting sites during the visit due to the time of year, anecdotal evidence and signs of past breeding can be used to gather an overview of the key breeding areas for Lesser black-backed gulls on the island.

The majority of lesser black-backed gulls nest to the west side of the island and on the plateau in the centre. The species is often found breeding amongst the herring gulls although the plateau is mostly dominated by lesser black-backs as they prefer the denser vegetation and herring gulls prefer the cliffs. From discussions with the Kenneth Allsop Memorial Trust group who manage the island, it appears the gulls will nest in most places that allow. Including in the garden and around the rear side of the barracks. The island has a single circular footpath plus a series of smaller footpaths around the plateau. These are open throughout the season regardless of the gulls nesting which can bring visitors within close proximity to the colonies. There is limited effort to reduce numbers visiting the plateau during the peak breeding season (May – June) and instead advice is given in relation to avoiding aggressive gulls rather than to mitigate against disturbance.

Within the key nesting areas mentioned above the habitat is largely well vegetated but low cover. At the west side of the island alexanders and tree mallow dominate approximately 0.5 – 1 m tall (see **Appendix – Site Visit Photographs: West side of Steep Holm**). The plateau is dominated by alexanders at a similar height (approximately 0.5 m) and provides a good cover for nesting lesser black-backed gulls (see **Appendix – Site Visit Photographs: Plateau**). However, it was difficult to fully appreciate the extent of the alexanders cover as most of it had died back by the time of the site visit. The plateau is surrounded by tall (1+ m) bramble and elder scrub which is encroaching on the plateau and reducing available nesting habitat for gulls. It is estimated that between 30 – 40 % of the plateau is now covered with bramble scrub and so is inaccessible to nesting lesser black-backs. During the visit I estimated that the current open area (absent of bramble) stretched approximately, 100 m long east – west and 30 m wide. Similarly, bramble scrub is spreading across the west side of the island with the potential to reduce habitat there as well.

Due to the time of year, there was no nesting gull activity on the island, although there was evidence of breeding across the island. Including old nests and dead gulls (both herring and lesser black-backed).

3.1.1 Orford Ness

It was not possible to accurately map nesting sites / colonies as the visit was made outside of the lesser black-backed gull breeding season. Anecdotal evidence, however, suggests that gulls bred on Orford Ness (on what is now the National Trust land, where VE1 is situated) through the late 20th Century but underwent a significant decline from its peak of 20,000 pairs in the 1980s to 10,000 pairs by the turn of the century. Declines continued through the early 2000s and although the site was still the main gull colony in c.2005, the area was abandoned by 2010. Nowadays, the main lesser black-backed gull colony nearby is on Havergate Island which held a population of 1,524 AONs in 2023 according to the SMP database (JNCC, 2023). it is thought that birds from the original colony on Orford Ness moved over to Havergate Island and further afield as lesser black-backed gulls now breed widely around Felixstowe as well with particular concentrations around the docks. In addition, a small colony of herring and lesser black-backed gulls persist on the flat roof of the former radar station on Orford Ness consisting of approximately 60 pairs of the former and five of the latter (Bolton & Davis, 2023).

The drivers of the decline are not fully understood but relate to heavy predation pressure (mostly by foxes) particularly during the later years of the colony's existence. There were attempts to reduce predation by digging out ditches around the nesting colony into wider (3 m) canals, although this proved unsuccessful in prevent foxes getting to nesting birds. There is no evidence that these modifications made the site less suitable for the nesting gulls, but the continued predation pressure eventually led to the disappearance of the colony.

Further discussion with Cobra Mist staff and Mark Bolton and Sarah Davis from the RSPB suggested that local land use changes may have also contributed to declines. For example, the decline in the formerly strong nearby fishing industry which would have been an important food resource for gulls. Most gulls nesting in the area now typically travel inland to forage on pig fields and even as far as Cambridge landfill (Finney 2023; Bolton & Davis 2023. (See Green *et al.* 2023 for tracking data of lesser black-backed gulls at Orford Ness during the breeding season).

The overall habitat across the area was broadly similar and appeared suitable for nesting lesser-black backed gulls. Across the wider Cobra Mist land, the habitat is mostly long grass about 30 – 50 cm and would provide suitable cover for breeding gulls. The land at VE2 is predominately the same long grass but there are some areas of scattered bramble, piles of debris (e.g., wooden beams and old wire), and patches of bare shingle. In addition, heavy rain prior to the site visit resulted in several pools and area of wet ground across the site (see **Appendix – Site Visit Photographs: VE2**). Throughout other areas of the Cobra Mist land, the habitat was mostly grassland and ruderal vegetation. Some larger ponds also had patches of phragmites reedbed along the edges. The west and southwest sections of the land parcel

were extensively flooded. Apart from the locations mentioned above, no gulls have attempted to nest on any other areas of the Cobra Mist land in the past (Bolton & Davis, 2023).

Due to access issues prior to the site visit it was not possible to walk over the National Trust land (VE1 and 3), but these were instead viewed from the shingle embankment at approximately 300 m distance. VE1 is broadly similar to the grassy habitat present across Orford Ness. The vegetation appeared to be about 40 – 50 cm in height although may have been taller in some locations. As mentioned, the site is criss-crossed with ditches and wider canals, which were unsuccessful anti-predator measures that were installed when gulls bred at this location. Due to recent heavy rain, there were several areas of standing water across VE1 during the visit (see **Appendix – Site Visit Photographs: VE1**).

VE3 is used by the National Trust to dig clay to maintain sections of the sea wall. As a result, there are several large lagoons from past clay excavations that have now filled with water. Overall, the habitat is tall grassland predominately (approximately 30 – 50 cm in height) with no obvious areas of debris visible. Like other areas, the flat landscape and sufficient vegetation cover appears to be suitable for nesting gulls (see **Appendix – Site Visit Photographs: VE3**).

An additional site (VE4) just south of Orford village was also visited. This is a small grassy field surrounded by arable farmland to the west and river Alde to the east (see **Appendix – Site Visit Photographs: VE4**). The site is also very close to the north side of Havergate Island (see **Figure 2**). At the time of the visit the vegetation was quite low (max. 30 cm) presumably as this site is used to graze animals ('Sheep grazing' sign on surrounding fence), although there were none in the field during the visit. Therefore, to improve the suitability of this site for breeding lesser black-backed gulls, the vegetation would have need to grow up sufficiently high to conceal any nest sites. VE4 is also surrounded by a public footpath which runs on top an embankment on the river's edge and narrowly between the fields on the west side. This would be expected to cause significant disturbance to nesting gulls if they were to utilise this site and therefore suggests that VE4 would not be suitable as a lesser black-backed gull compensation site.

3.2 Presence of invasive plants

3.2.1 Steep Holm

The Barracks and the old farm ruins at the centre and east side of the island have a small garden with several non-native species. Some of these such as caper spurge (*Euphorbia*

lathyrism) were noted growing outside the confines of the garden, although no invasive plants were recorded in numbers or densities to impact nesting gulls on the island.

3.2.2 Orford Ness

No non-native invasive plant species such as Japanese knotweed (*Fallopia japonica*)were recorded during site visits to Orford Ness and nearby VE4.

3.3 Presence of avian and mammalian predators

3.3.1 Steep Holm

A pair of peregrines lingered for a day on the island during the site visit, they were seen sporadically but were not seen actively hunting. Only a handful of herring gulls were recorded all as fly overs most at the west side of the island and none were recorded on the island. A short-eared owl and merlin spent some time on the island in the morning although neither lingered. The latter two birds certainly relate to passage migrants and would not be present during the breeding season.

No mammalian predators were recorded during the visit to Steep Holm. According to Legg & Parsons (1990) hedgehogs are on the island which could impact on eggs or newly hatched young (Jackson & Green, 2000) although the size of the population is unknown. No rodents were seen during the visit however, what appeared to be rodent traps were recorded at two sites on the island (see **Appendix – Site Visit Photographs: Rodent traps**). Although, when asked about mammals on the island the volunteer staff were adamant there were no rats on Steep Holm.

Although not a predator, muntjac deer are very abundant on the island to the point where their density may impact on nesting gulls. During the site visit, approximately 15 were recorded in all areas of the island, although there may have been some double counting. Most sightings were around the plateau in the middle of the island and where a significant portion of Steep Holm's lesser black-backed gulls breed. Muntjac were introduced to Steep Holm in 1977 (Legg & Parsons, 1990) and are an invasive and rapidly increasing species across southern Britain (Moore, 2021). The density of muntjac on Steep Holm may impact breeding gulls through increased disturbance to nesting birds and trampling of eggs and young. Moreover, deer are known to opportunistically take eggs which could have significant consequences for the breeding gull population on the island (Vazquez *et al*. 2023). Indirectly, muntjac can affect breeding gulls by impacting the suitability of available habitat. For example, the encroachment of bramble scrub across the plateau is likely being slowed by the

grazing pressure of the deer. However, more work would be needed to quantify the impacts of muntjac on the island's vegetation cover.

3.3.2 Orford Ness

A buzzard and 3 marsh harriers seen at several areas of Orford Ness were the only birds of prey recorded. A great black-backed gull was seen on the beach east of VE2 and approximately 20 herring gulls were present on the roof of the radar station.

No mammalian predators were recorded during the site visit, although 7 grey seals were seen hauled out on the shingle beach. The coastline is an important pupping site for this species.

Chinese water deer were very abundant on Orford Ness. Approximately 20 were seen during the visit across the Cobra Mist land (VE2 and one deer seen near VE3) and were usually flushed from thicker vegetation during the walk over. The deer population on Orford Ness is apparently controlled annually by the National Trust although the Cobra Mist staff were unsure of numbers involved. Chinese water deer may impact nesting gulls in similar ways as discussed for muntjac deer on Steep Holm. The presence of Chinese water deer at high densities at Orford Ness could affect nesting birds through increased disturbance and trampling of eggs and young. Moreover, deer are known to opportunistically take eggs which could have significant consequences for the breeding gull population at Orford Ness (Vazquez *et al.* 2023). Intensive grazing pressure from high densities of Chinese water deer may reduce the vegetation height and make areas less suitable for nesting lesser black-backed gulls. However, more work would be needed to quantify the impacts of Chinese water deer on the vegetation cover at Orford Ness.

3.4 Footpaths and signage

3.4.1 Steep Holm

The island has a single circular footpath plus two additional paths that intersect the middle of the island from north-south and east-west. The latter two paths meet on the plateau (near the trig point) and so can bring people near nesting gulls in the breeding season. As previously mentioned, there is no process to limit access to these areas during the breeding season, although visitors are discouraged to walk past nesting gulls due to their aggressive behaviours. Elsewhere on the island the slopping tree mallow covered cliffs are far enough away from the footpath to allow limited disturbance to nesting gulls (**Appendix – Site Visit Photographs: Signage and information**).

Within the barracks there is some information about nesting birds on the island, but it is limited, and all of the available booklets / posters are generic and old. The Steep Holm Wildlife book (Legg & Parsons, 1990) is sold at the Barracks but there is nothing equivalent which is more recent. The most recent information available was 'Steep Holm Natural History 2008/9' that provided some details on the island gull populations in 2008 and 2009. There is no other signage or information about nesting gulls elsewhere on the island.

3.4.2 Orford Ness

Orford Ness is only accessible to the public via the National Trust ferry from Orford Quay during designated open days. The National Trust reserve is open every weekend and selected weekdays from the end of March to the end of October. There is no public access to the site outside of these months. Visitors are able to walk freely around the site but there are several notices to encourage visitors to stay on paths due to the danger of unexploded ordinances. A single gravel track leads to the radar station and the Cobra Mist land and southward towards the south side of Orford Ness. This track runs close past VE2 (see **Figure 2**) and near a newly constructed anti-predator fenced area just east of the radar station. There are no other footpaths across Orford Ness. There is no information or signage about nesting gulls on Orford Ness. However, on the shingle bank to the north there is a 'No access' National Trust sign.

VE4 just south of Orford village is surrounded by a public footpath on all sides (see **Appendix – Site Visit Photographs: VE4**). Adjacent to the river and between VE4 and the surrounding farmland. The proximity of these footpaths to the site suggests that anthropogenic disturbance would be high and therefore lesser black-backed gulls would be unlikely to take up VE4 as a colony site without a diversion to the footpath.

3.5 Anthropogenic disturbance

As the site visits were outside of the breeding season there was no disturbance events recorded on nesting gulls. In total 15 people (including five volunteers) visited Steep Holm during the site visit.

As mentioned, Orford Ness is not open outside of the period March to October , so apart from two Cobra Mist staff on site, no other people were encountered on my visit. Four walkers were recorded on the footpaths passing VE4 during my visit. All had dogs either uncontrolled or leashed.

4. Limitations

There were some limitations to the data collected during the site visits. Firstly, there was just a single visit to each site and more visits (particularly during the breeding season) would be needed to highlight other important factors influencing the suitability of the sites for lesser black-backed gull compensation. As the visits were outside of the summer months the extent of the vegetation cover at the sites could not be fully determined as there had been notable die back (such as alexanders on Steep Holm) during the visits.

Due to access issues only the Cobra Mist land was visited at Orford Ness. Although VE1 and 3 were seen from a distance, walking over these areas would be useful to gain a more detailed understanding of the habitat types and potential suitability as a colony site. Also, Orford Ness was visited after considerable rainfall and large areas were flooded. Additional visits would be useful to understand the extent of permanent open water at the site.

However, despite limitations raised above, the site visits were suitable to determine the general habitat types and the current suitability of available habitat for breeding lesser black-backed gulls; in order to identify the most suitable sites for compensation measures for the species.

5. Discussion

5.1 Habitat suitability and anti-predator fencing

5.1.1 Steep Holm

From discussions with the Kenneth Allsop Memorial Trust group, most of the lesser black-backed gulls breed on the plateau in the middle of the island and towards the west side amongst alexanders. Although it was not possible to assess the full extent of the alexander cover in the breeding season, approximately an area of 100 m long east – west and 30 m wide of alexanders and nettles is available on the plateau for nesting gulls (estimated during the site visit). The most significant limiting factor for breeding gulls here appears to be the encroachment of bramble scrub which has reduced the available open area by between 30 – 40%. Therefore, any compensation at this site could look to increase nesting habitat for gulls through vegetation management. Moreover, fencing around the key colony areas (e.g. the plateau) would likely benefit nesting birds by keeping out the island's abundant muntjac population, preventing disturbance and reducing grazing pressure on grassland, allowing grass to grow taller. Further work could be undertaken to understand the population size of hedgehogs on the island and the inclusion of finer mesh fencing towards the base of ant-predator fences around colony areas could be used to prevent hedgehogs accessing the colonies, preventing chick and egg predation if there is a pressure.

5.1.2 Orford Ness

One of the drivers of the decline in breeding lesser black-backed gulls at Orford Ness was heavy predation pressure from foxes (Bolton & Davis, 2023). Therefore, the area could benefit from the construction of anti-predator fencing to encourage formation of new gull colonies.

The habitat across Orford Ness is generally the same long grass and it seems that VE1 – 3 would be suitable to construct anti-predator fencing to encourage gulls to nest. However, a visit during the summer months to see the full height of the vegetation would be useful to allow greater targeting. VE2 has several patches of old debris such as wire and wood beams and bramble scrub which would need to be cleared prior to construction of a predator fences. VE2 and 3 are approximately 300 – 400 m away from a fenced area as part of another project to encourage nesting gulls. This was set up with an anti-predator fence in 2022 but has so far been unsuccessful in attracting nesting gulls. The habitat at this location is similar to VE1 – 3 with a majority long grass coverage and similar issues surrounding the attracting of gulls back to this location may also apply. Around the radar station and tracks the habitat was mostly short grass and so appeared less suitable for nesting gulls. Discussions with Cobra Mist staff determined that no gulls had bred on these areas in the past.

VE4, just south of Orford Village is a small field of grazed pasture and the current habitat stated does not appear suitable for nesting gulls. Grazing pressure would need to be reduced here to allow the grass to grow sufficiently tall in order to conceal nest sites and to be more attractive to nesting gulls. However, the site is surrounded by a public footpath and therefore does not seem suitable for a compensation site due to expected high levels of anthropogenic disturbance and additionally the potential conflicts that may arise between residents and territorial gulls. During the short visit to VE4, a total of four walkers were recorded on the footpaths, however as this area is a popular tourist destination is expected to be considerably higher in the breeding season.

5.2 Mammalian predator controls

5.2.1 Steep Holm

No mammalian predators were recorded during the visit although presumed rodent traps may suggest there are, despite volunteer staff reporting otherwise. Further work, potentially employing the use of camera traps to record nocturnal activity would be useful to gather a better understanding of mammalian predators on the island. Muntjac are very abundant on the island and could impact negatively on nesting gulls. Controlling numbers of this invasive species could benefit breeding seabirds on Steep Holm.

5.2.2 Orford Ness

Although not predators, Chinese water deer are very abundant on Orford Ness and may impact on nesting gulls due to their density. The National Trust apparently cull the deer every year although details on numbers were not available during the visit. Further work, potentially employing camera traps to record nocturnal activity would be useful to gather a better understanding of pressures exerted by mammalian predators at the sites.

6. Recommendations

Further visits would need to be undertaken to gather more information on the suitability of the sites as potential colony locations and to better inform potential compensation measures. In addition, visits during the breeding season would be useful to map the distribution of nesting gulls (both lesser black-backed and herring) and better understand the extent of occupied and unoccupied nesting habitat which can inform the location of compensatory anti-predator fences. Moreover, targeted nocturnal surveys or the deployment of camera traps would be useful to confirm the presence of mammalian predators at both Steep Holm and Orford Ness.

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8. Appendix – Site Visit Photographs

8.1 Steep Holm

8.1.1 Plateau

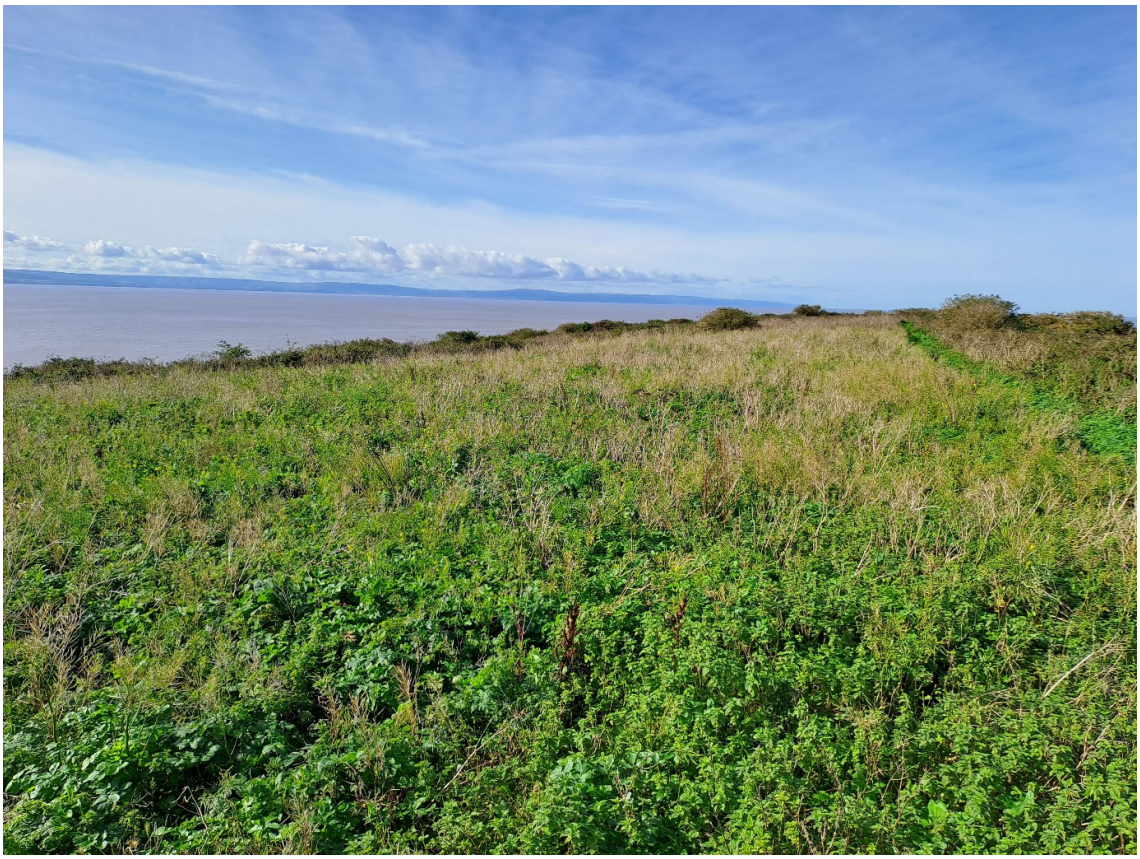

Figure 3: Steep Holm plateau with alexanders and nettles, surrounded by bramble and elder scrub.

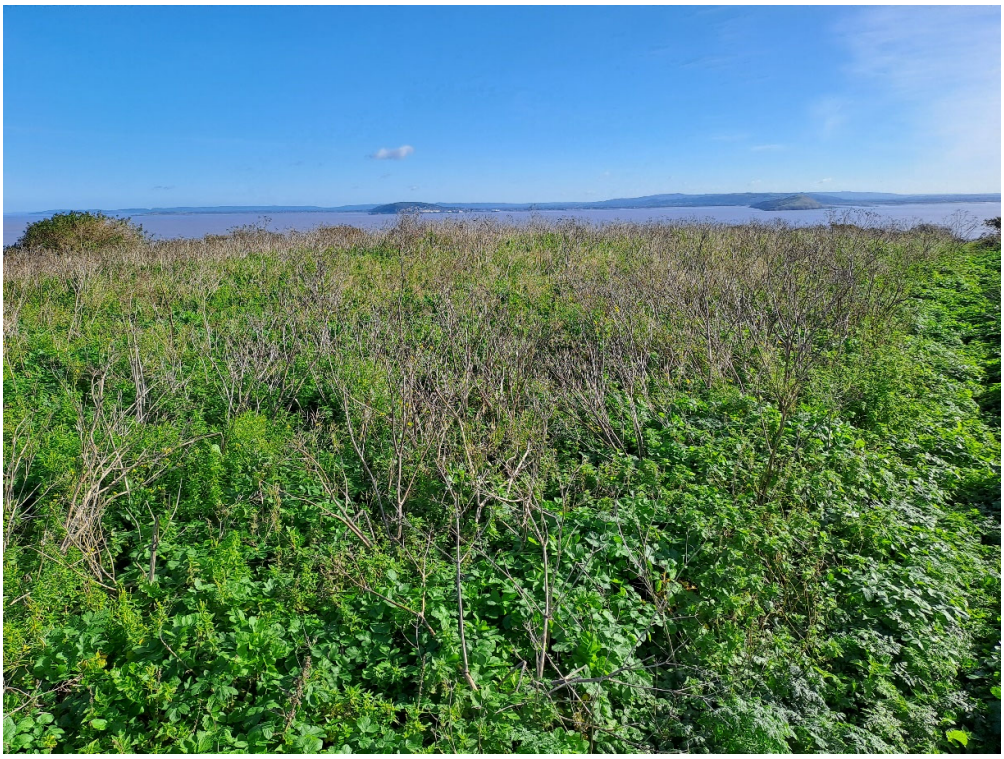

Figure 4: Steep Holm plateau facing east towards the North Somerset coast in the distance.

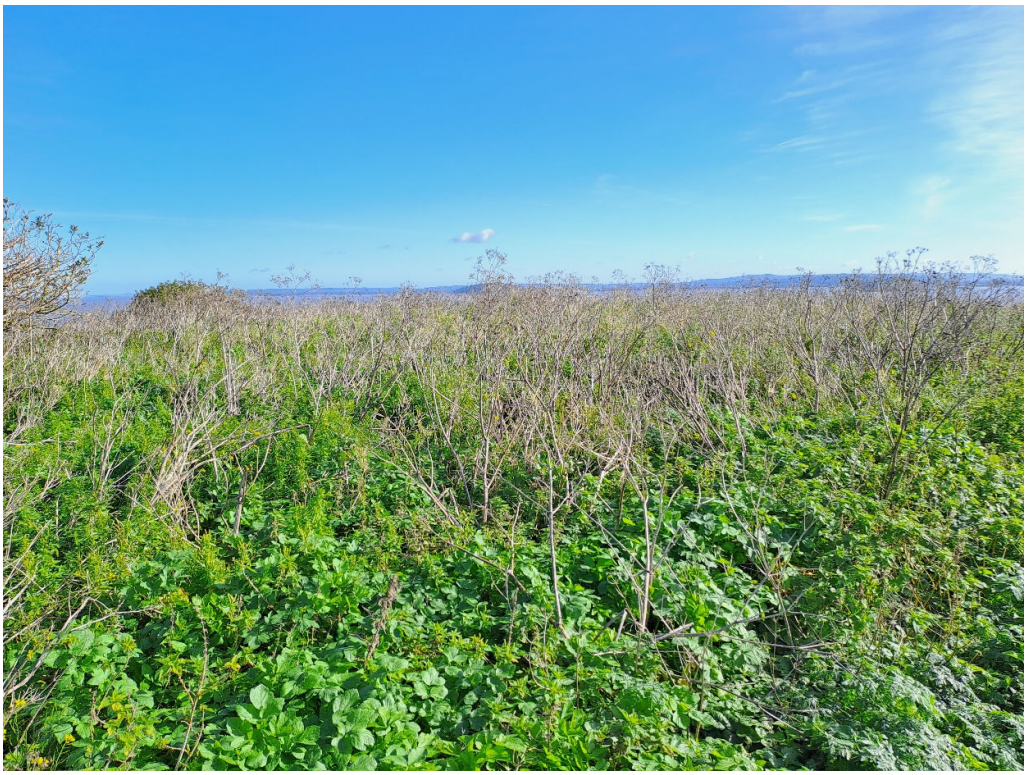

Figure 5: A close up of alexanders on the plateau.

8.1.2 West side of Steep Holm

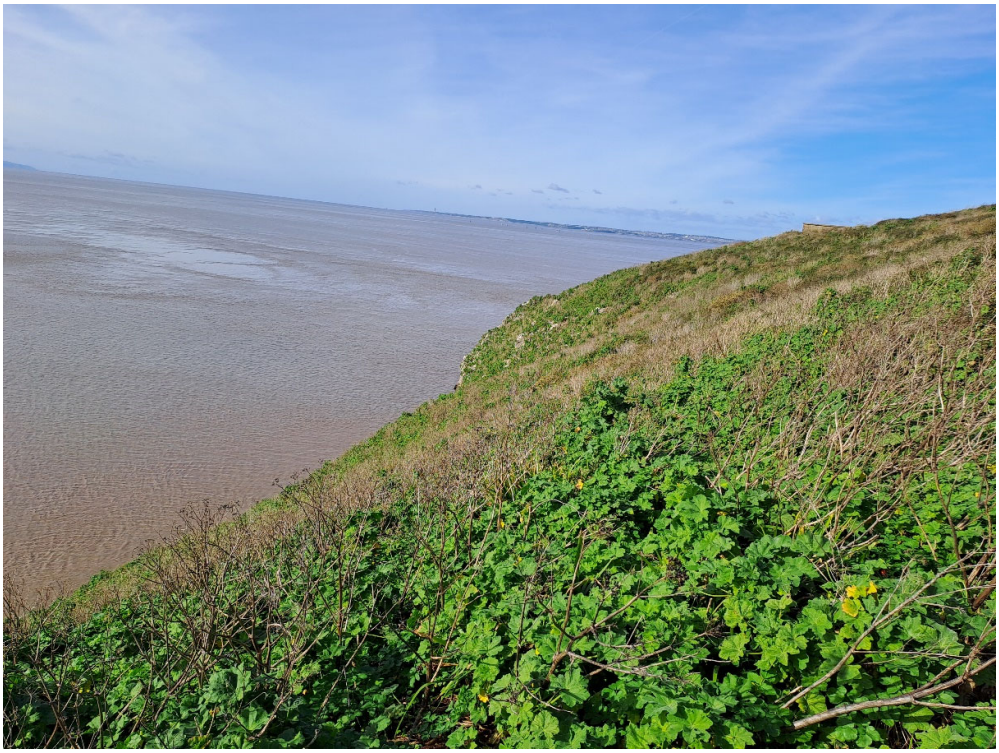

Figure 6: Tree mallow and alexanders covered cliff tops on north-west side. Facing north towards the Welsh coast.

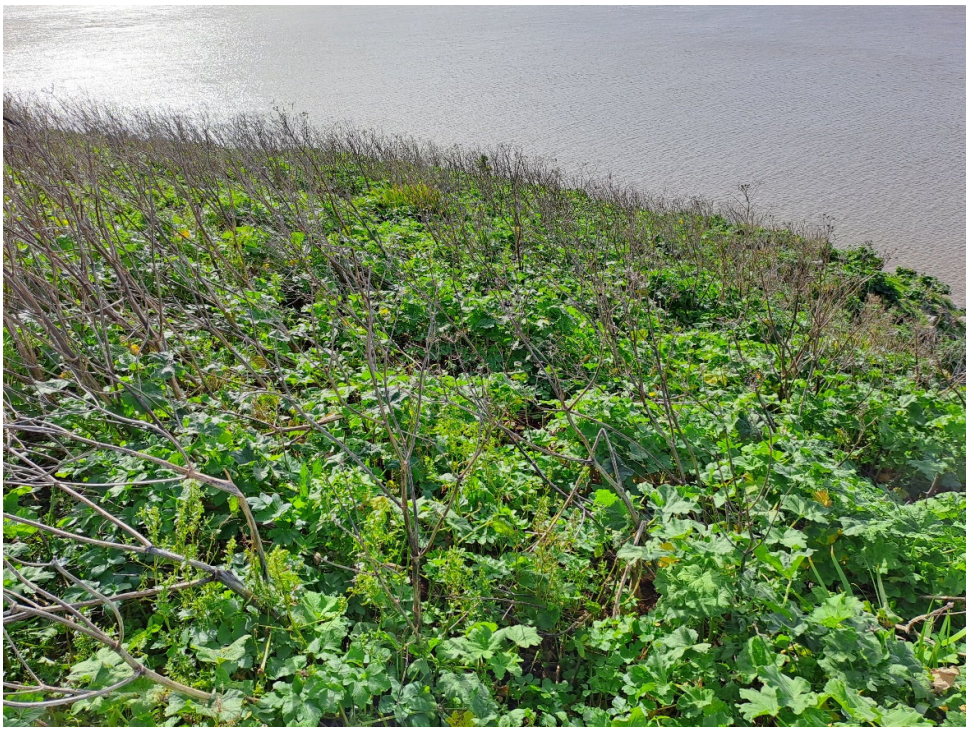

Figure 7: Close up of tree mallow and alexanders covered cliff tops.

Figure 8: Tree mallow and alexanders on south facing cliffs.

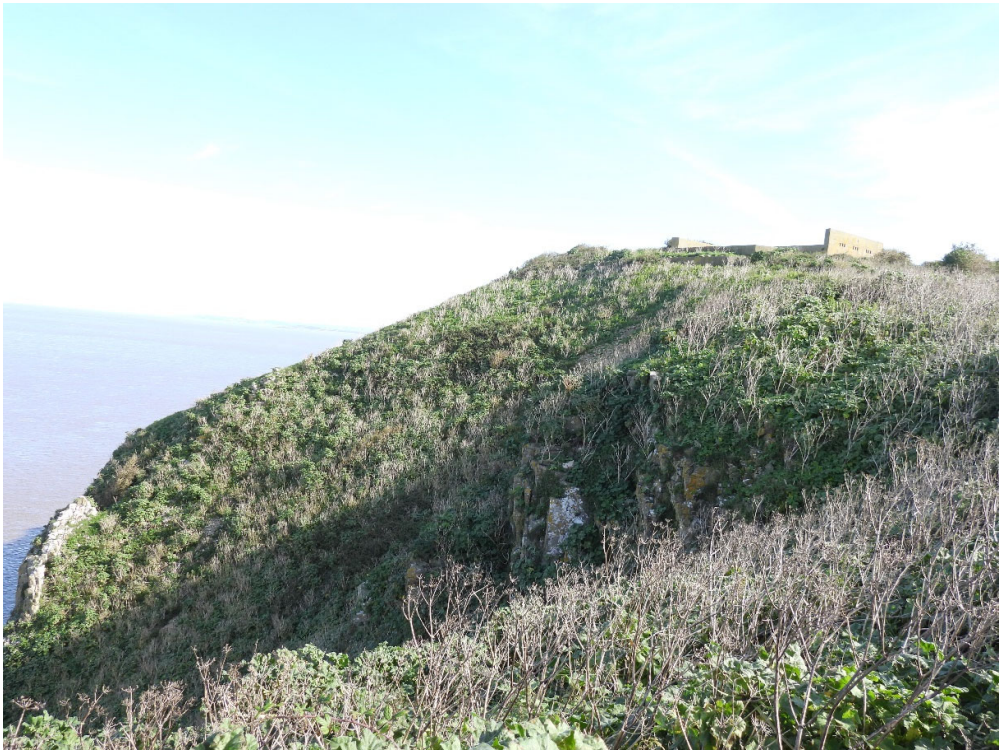

Figure 9: Tree mallow and alexanders cover cliff slopes on the west side of Steep Holm, facing north towards the Welsh coast.

Figure 10: Vegetation cover on cliff tops at the northwest side of Steep Holm.

Figure 11: Extent of tree mallow and alexanders cover across north facing cliff at the west of Steep Holm.

8.1.3 Rodent traps

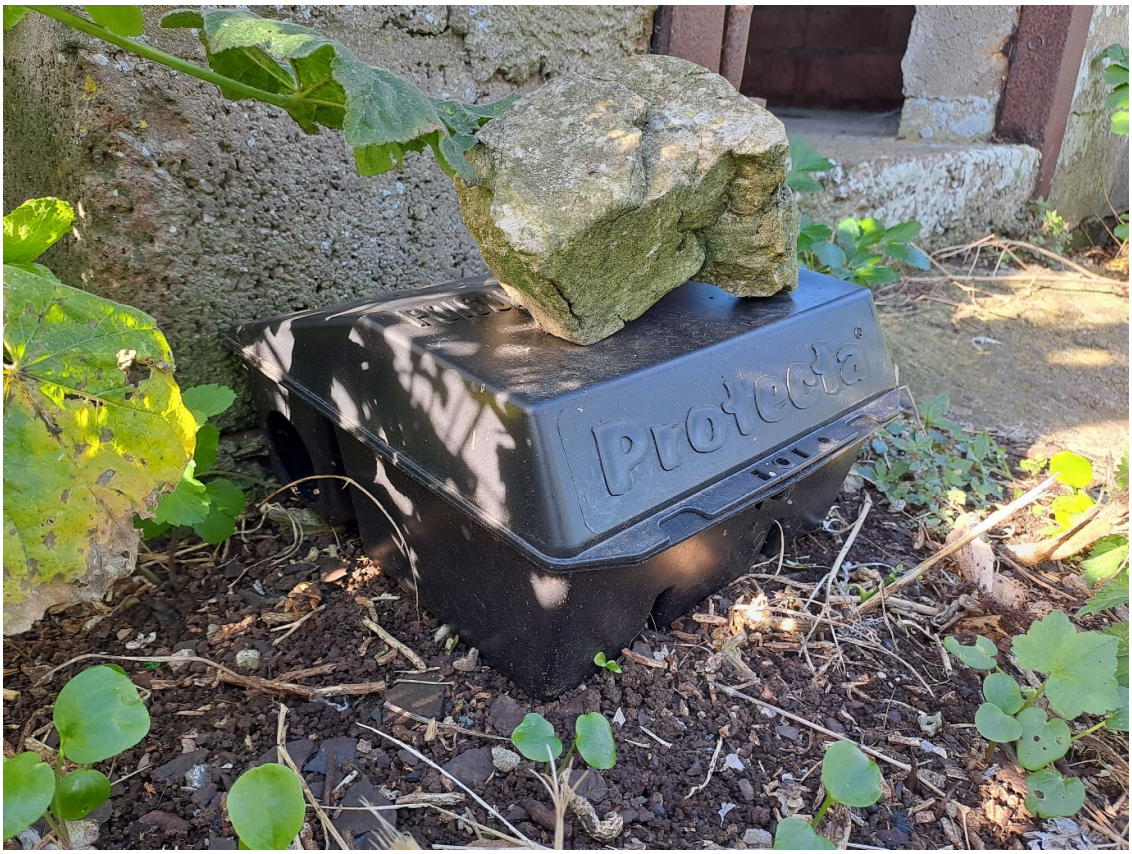

Figure 12: Rodent box located at ST 22498 60678.

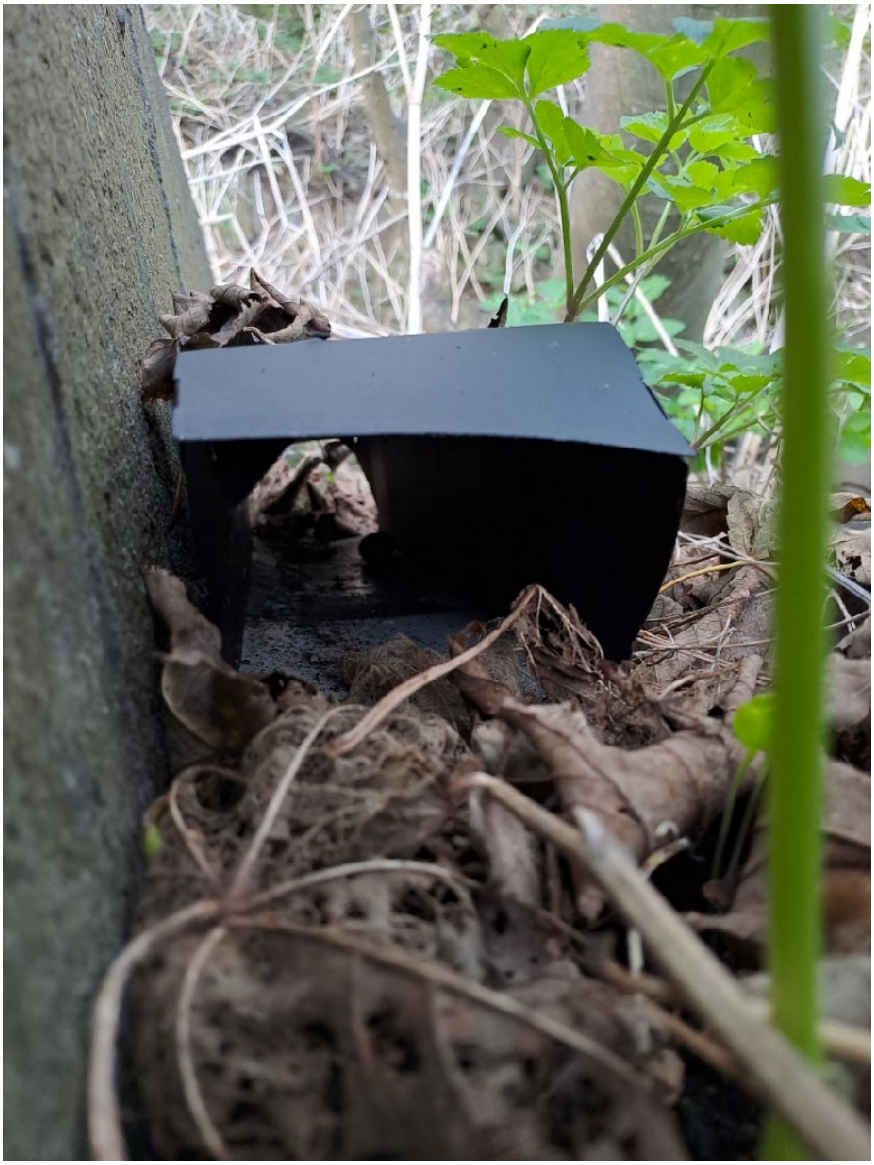

Figure 13: Rodent box located at approximately ST 23142 60779.

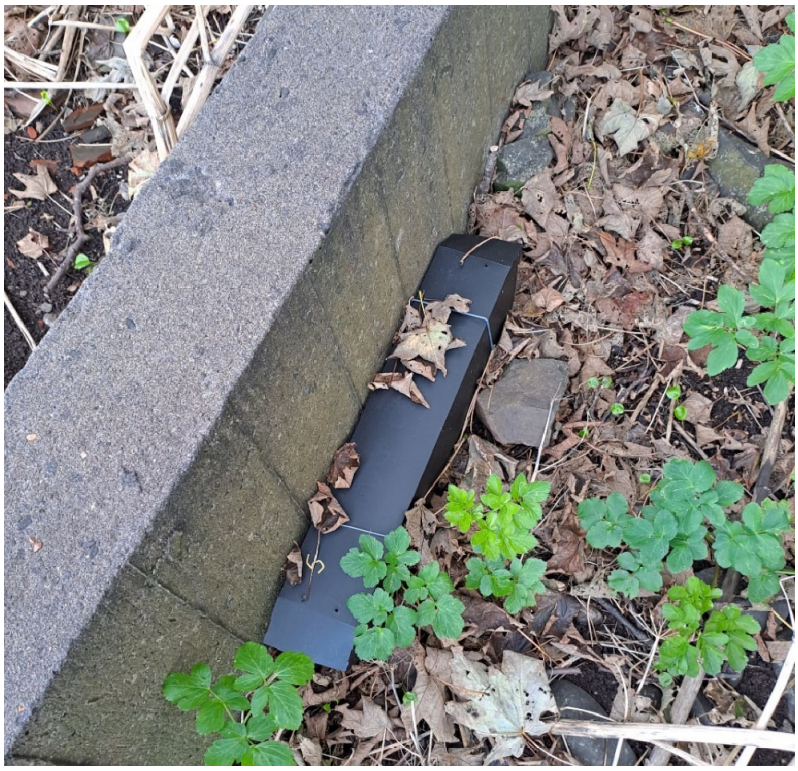

Figure 14: Rodent box located at approximately ST 23142 60779.

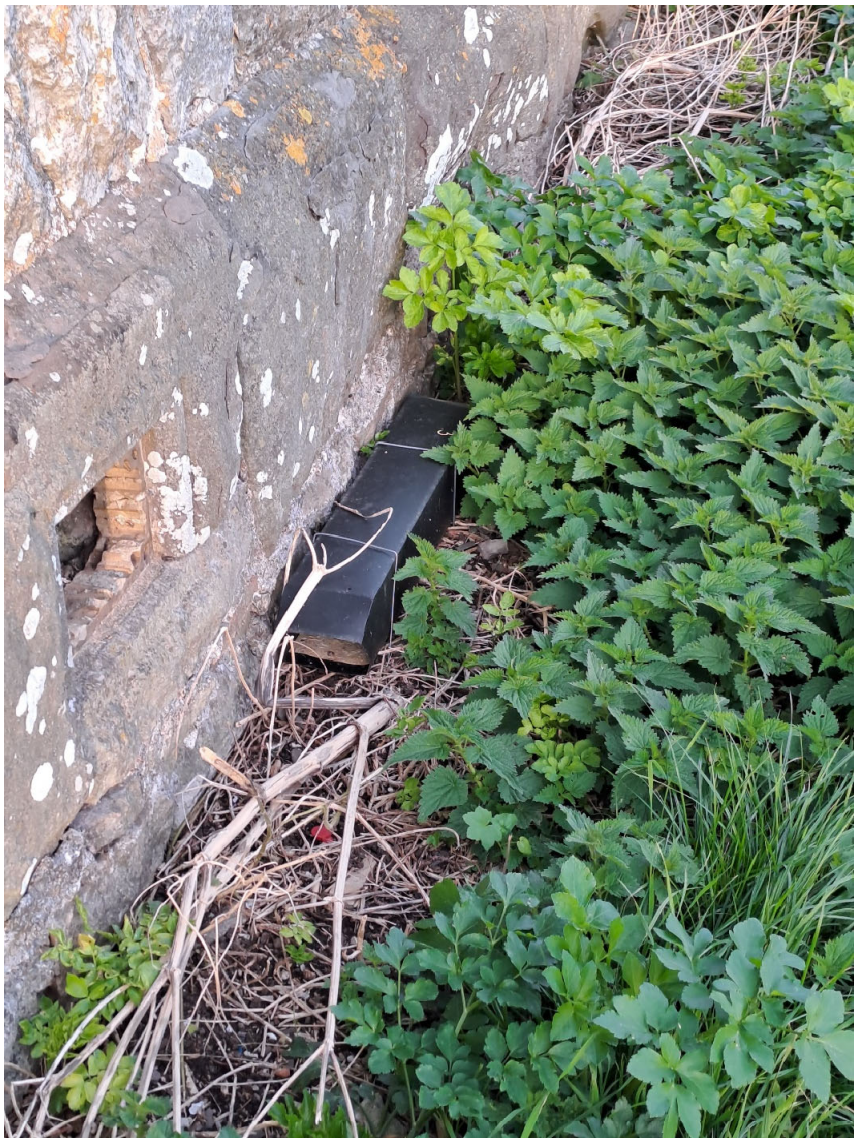

Figure 15: Rodent box located at approximately ST 22870 60600.

8.1.4 Footpaths

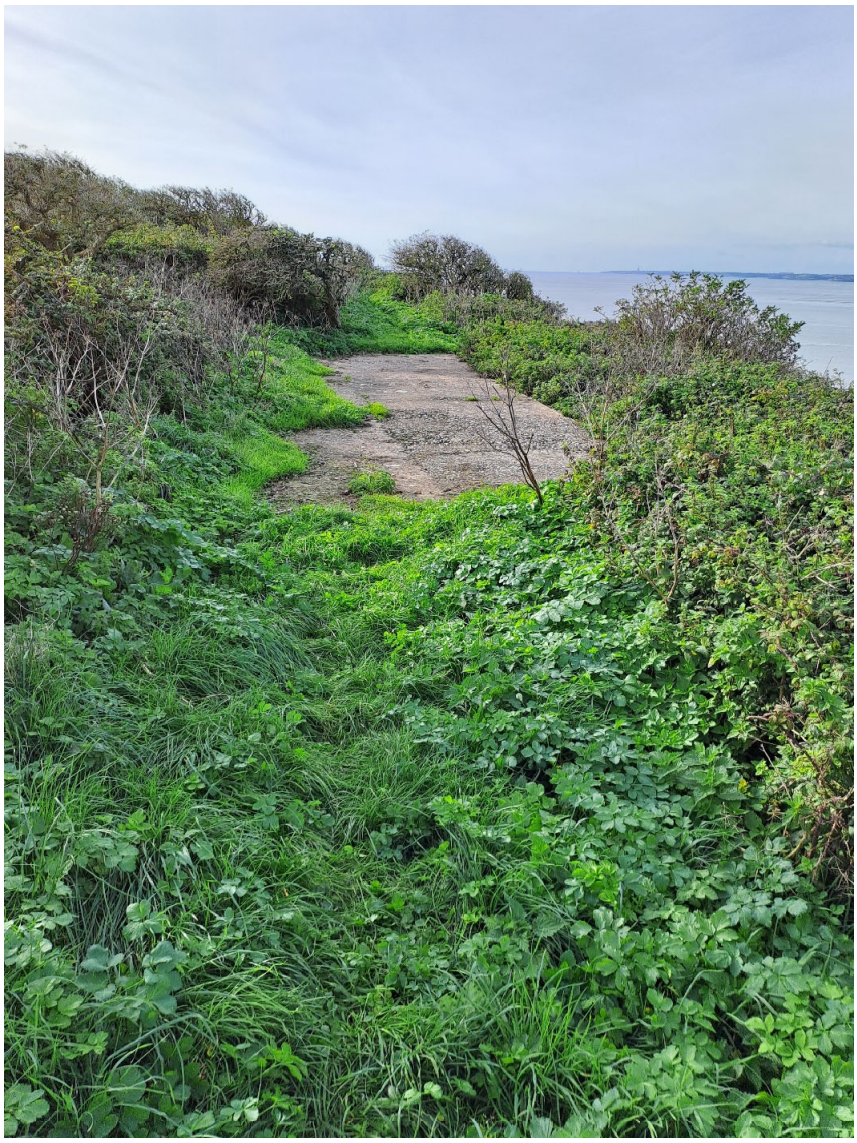

Figure 16: footpath on south side of Steep Holm looking east towards the North Somerset coast.

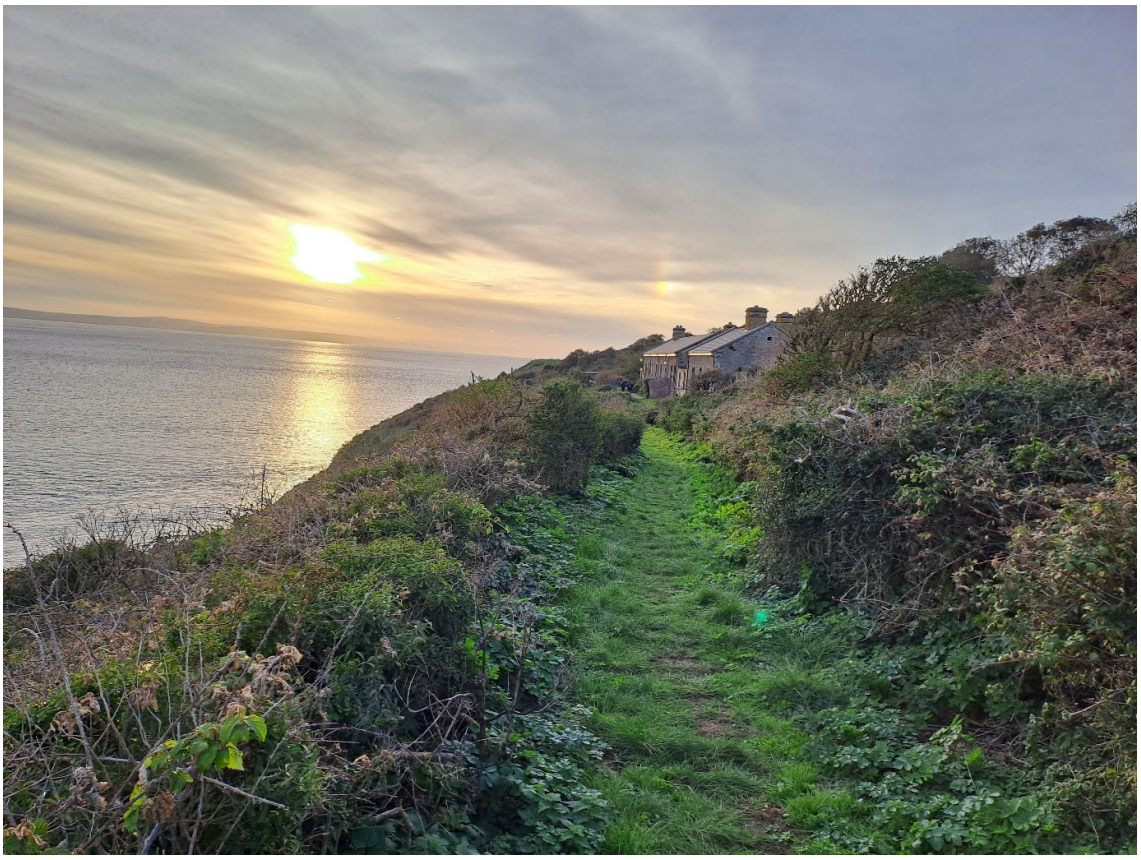

Figure 17: South footpath facing west towards the Barracks buildings.

8.1.5 Signage and information

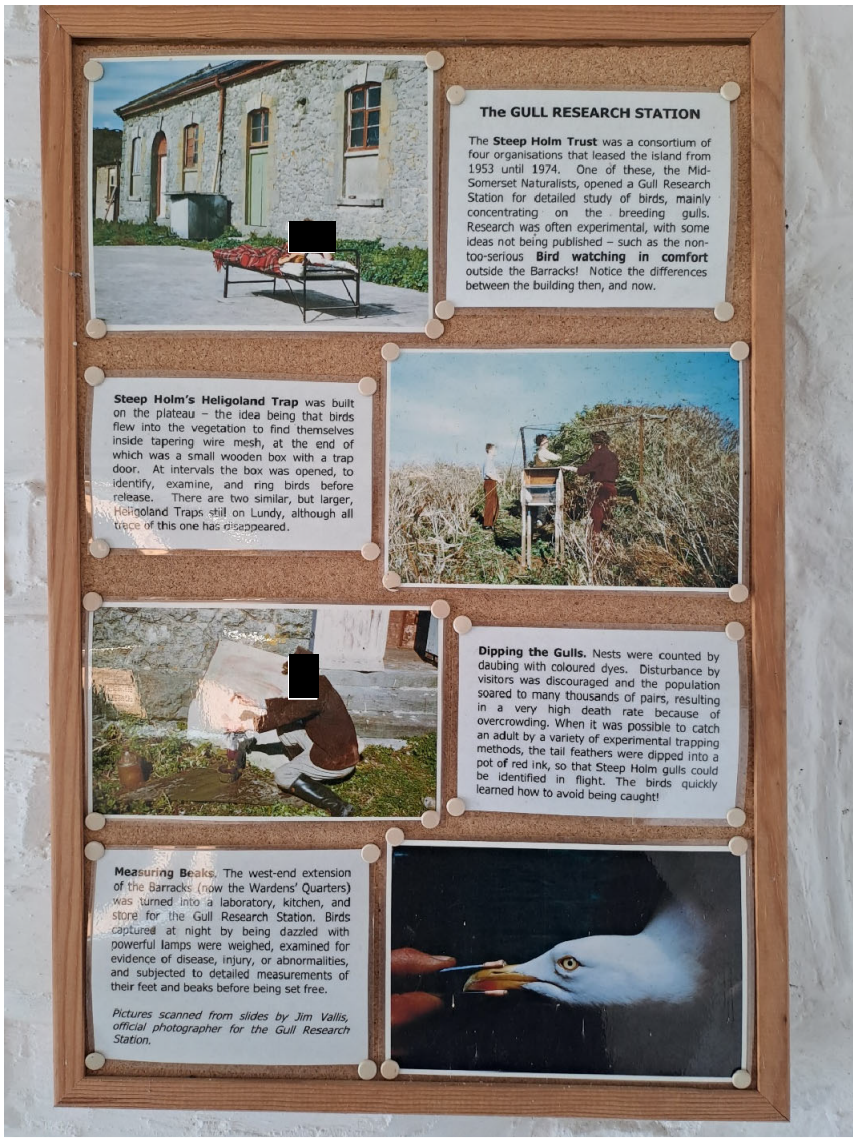

Figure 18: Information board about past studies on breeding gulls on Steep Holm. Located in the small museum in the Barracks.

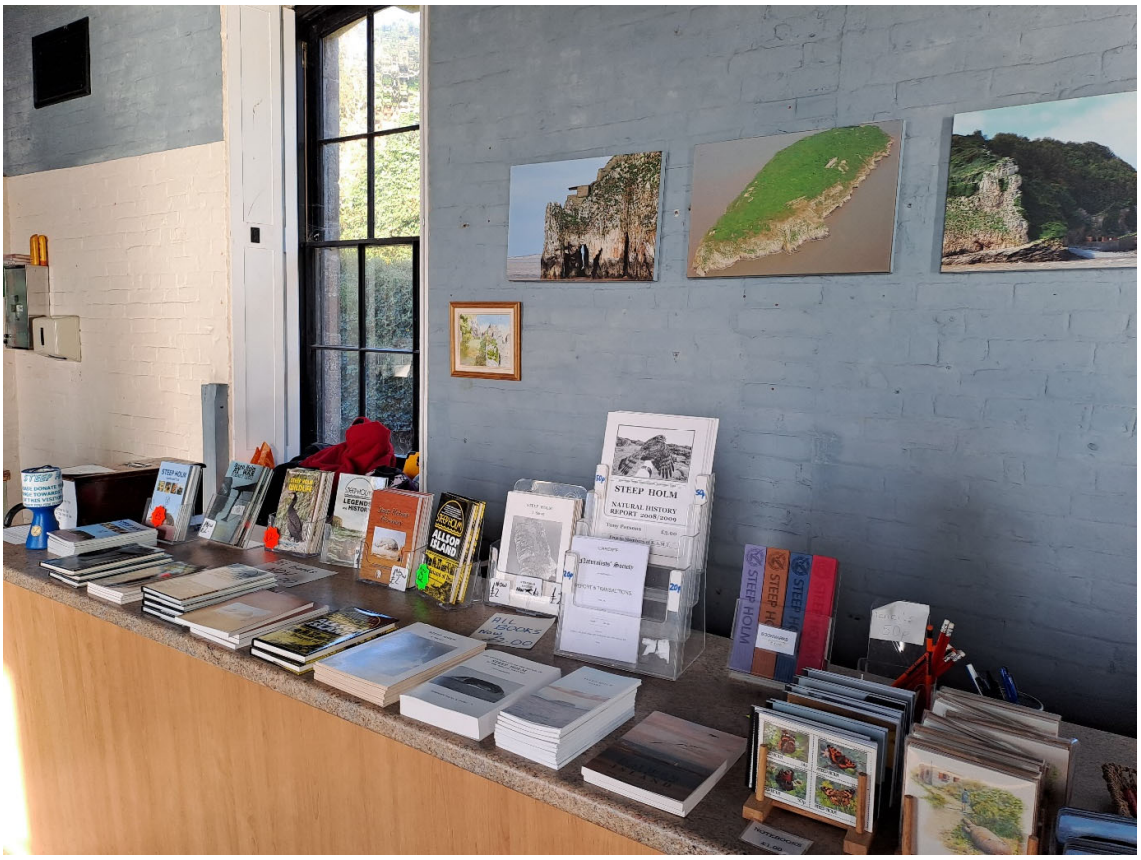

Figure 19: Main information stall in the Barracks. Although many leaflets and books are outdated.

8.1.6 Additional animal photos

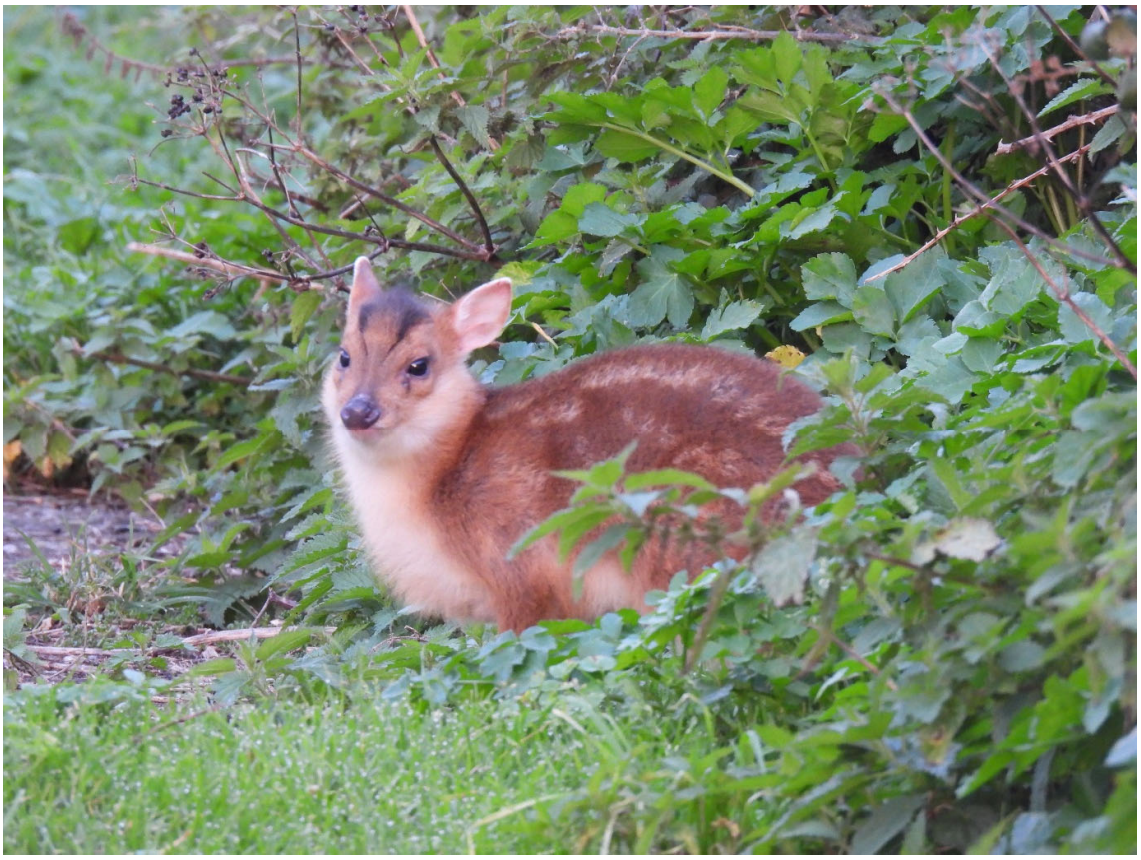

Figure 20: Immature muntjac deer on the footpath at the east side of Steep Holm.

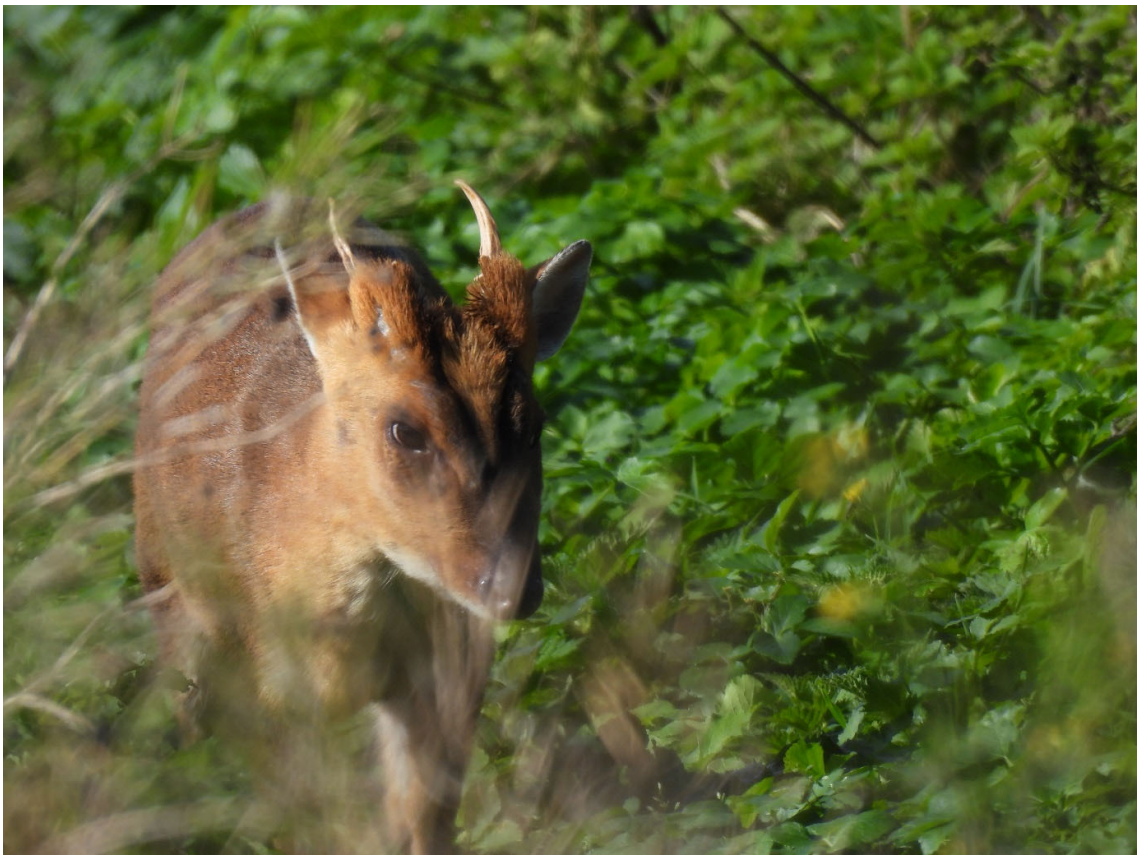

Figure 21: Muntjac deer on the plateau.

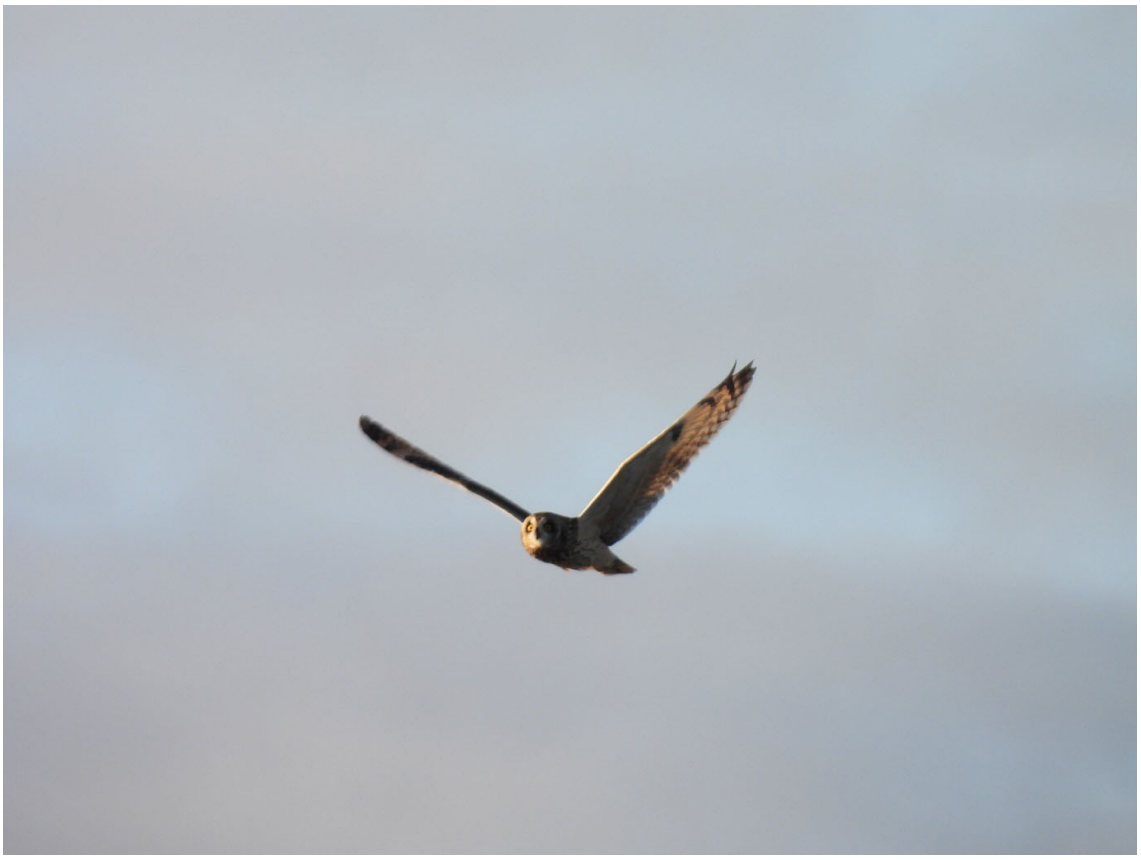

Figure 22: Short-eared owl. A migrant to Steep Holm and would not present a predation threat to nesting gulls in the summer.

8.2 Orford Ness

8.2.1 VE1

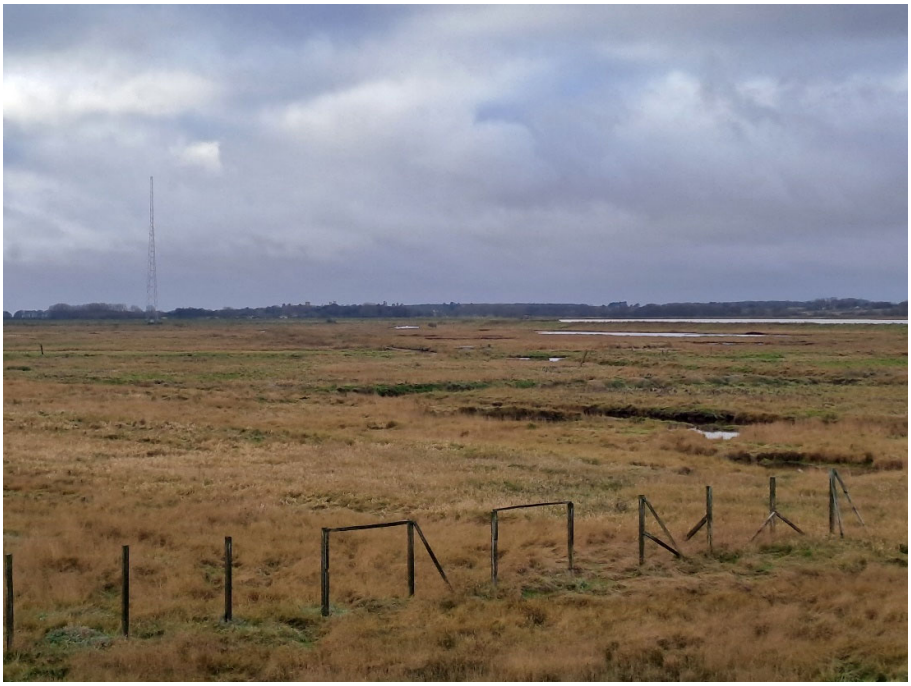

Figure 23: VE1 viewed from TM 45811 52579. Facing southwest.

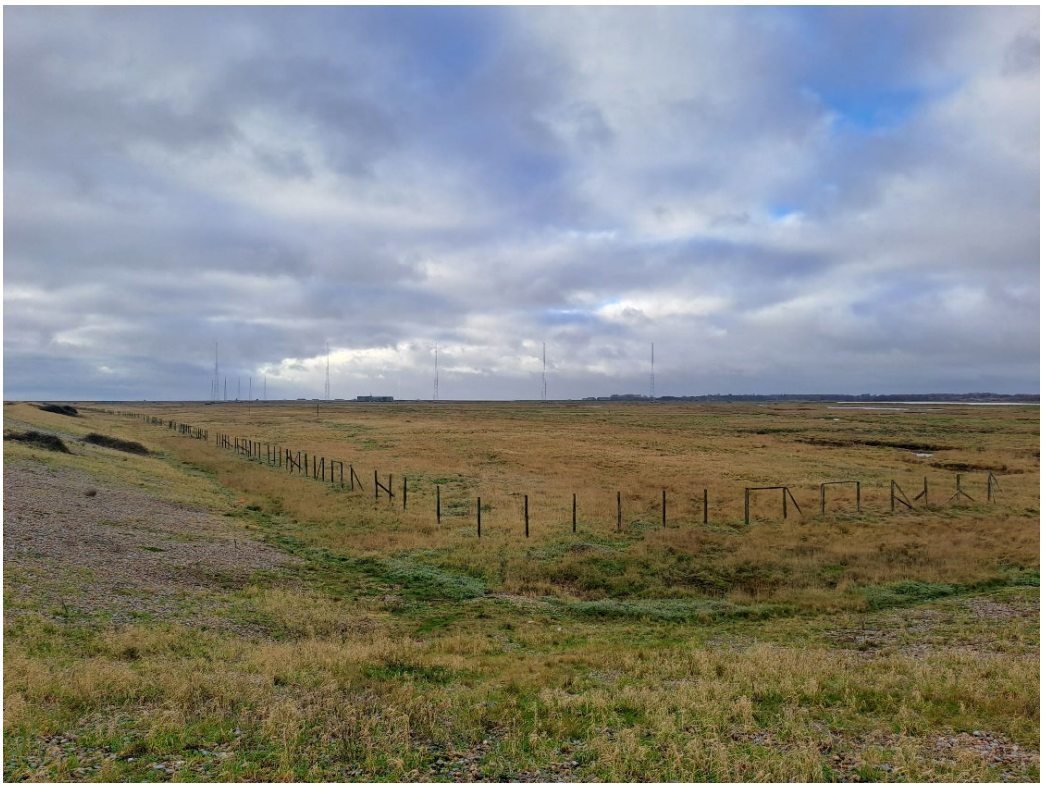

Figure 24: VE1 viewed from TM 45811 52579. Facing southwest.

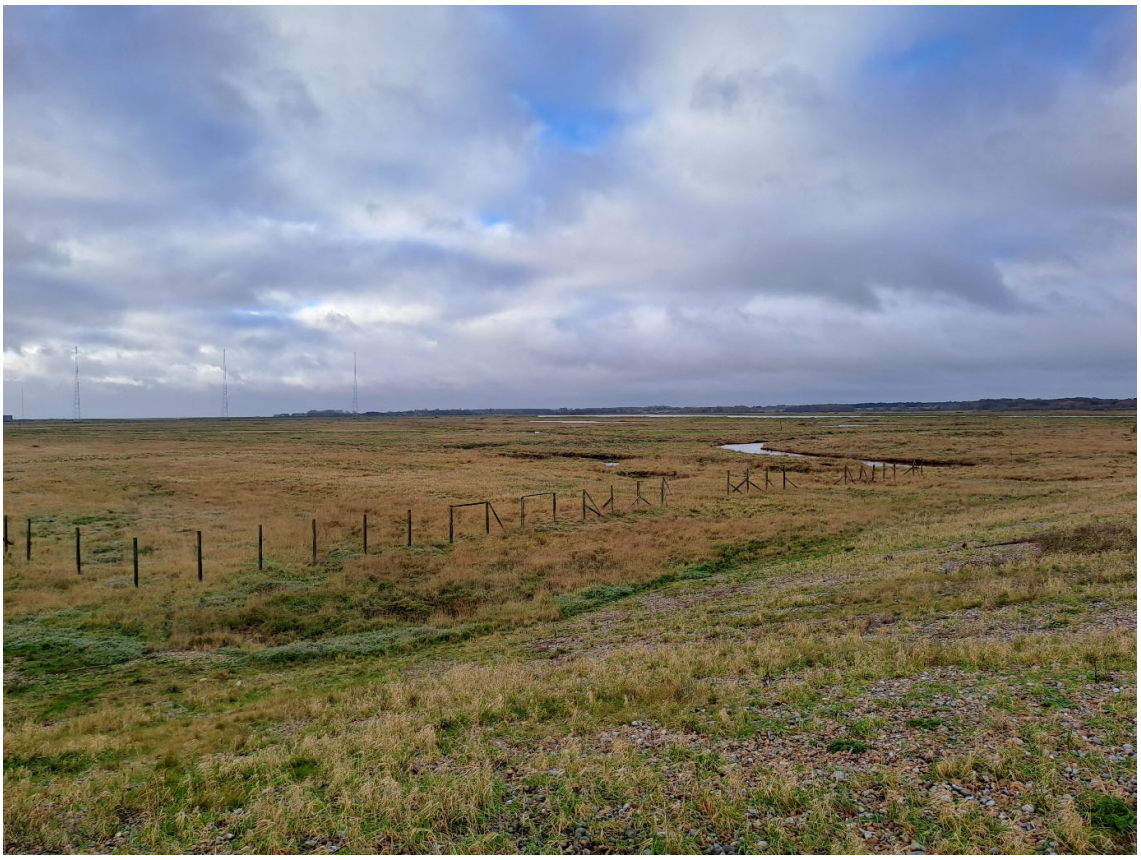

Figure 25: VE1 viewed from TM 45811 52579. Facing southwest.

8.2.2 VE2

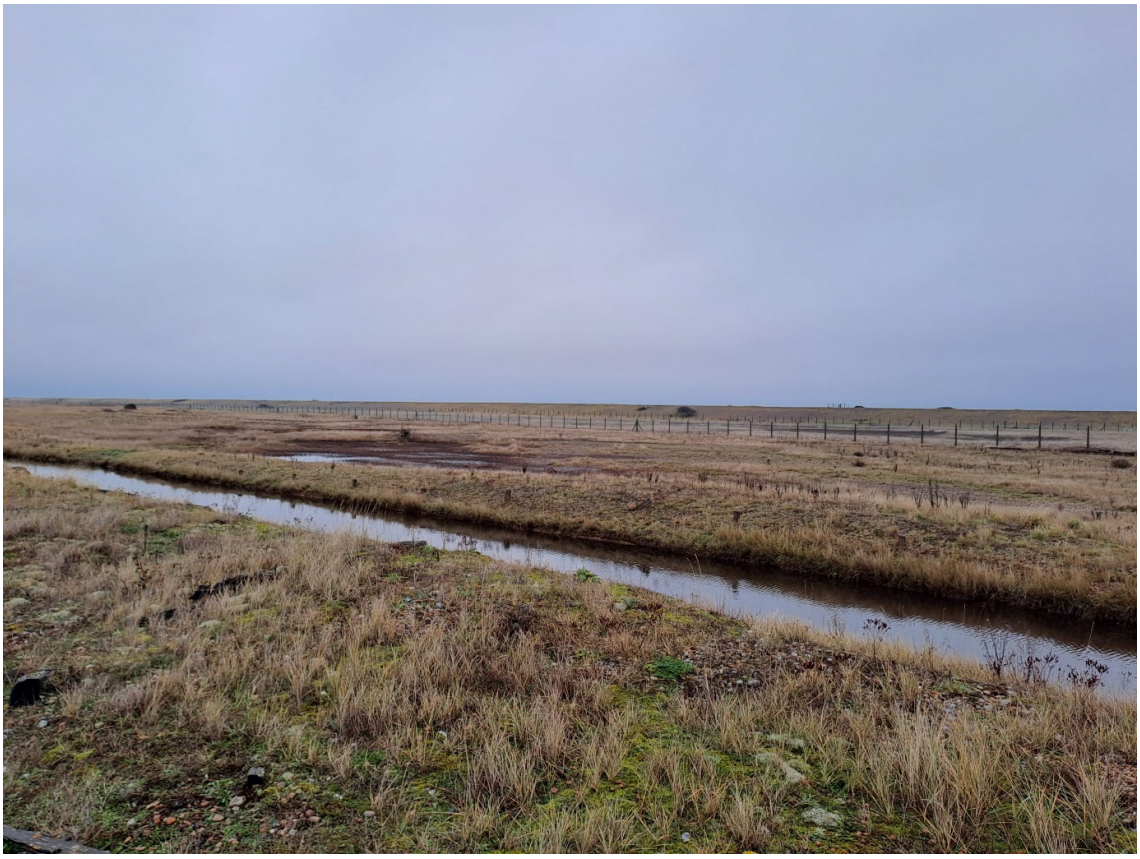

Figure 26: VE2 viewed from TM 45449 50923. Facing east.

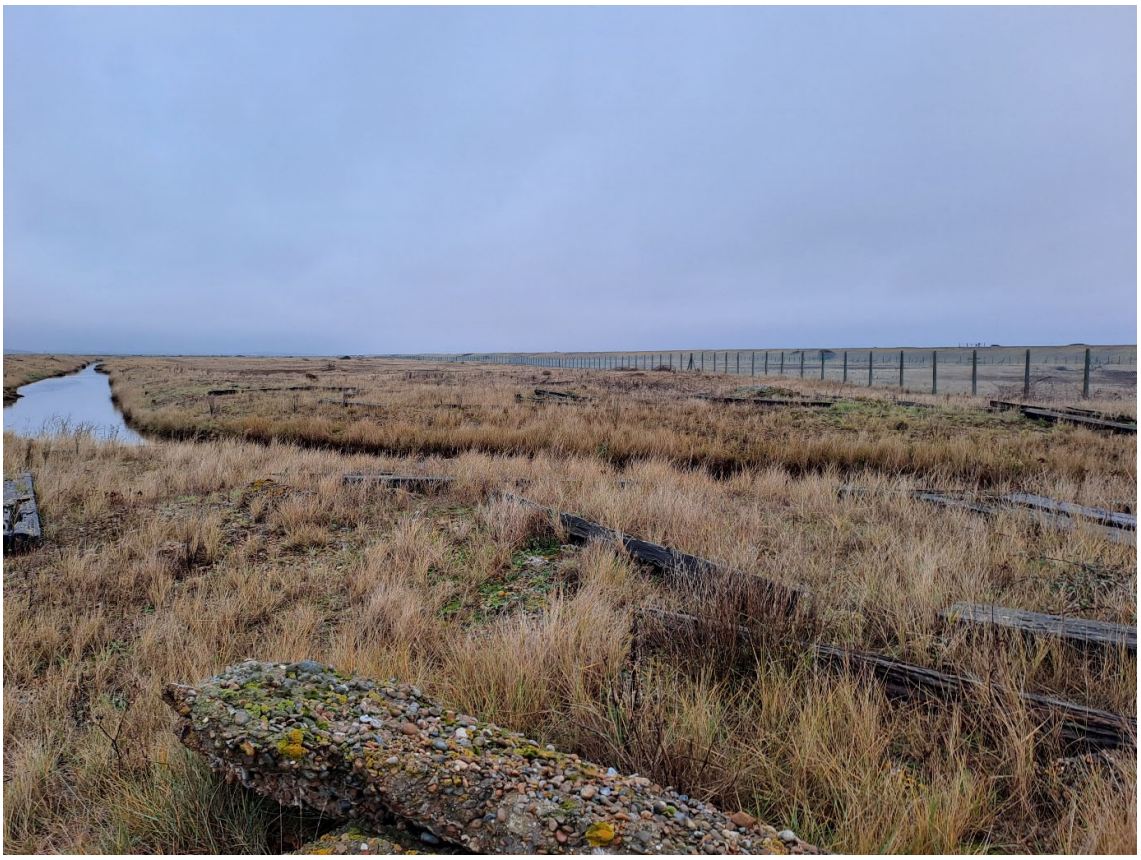

Figure 27: VE2 viewed from TM 45460 50859. Facing north.

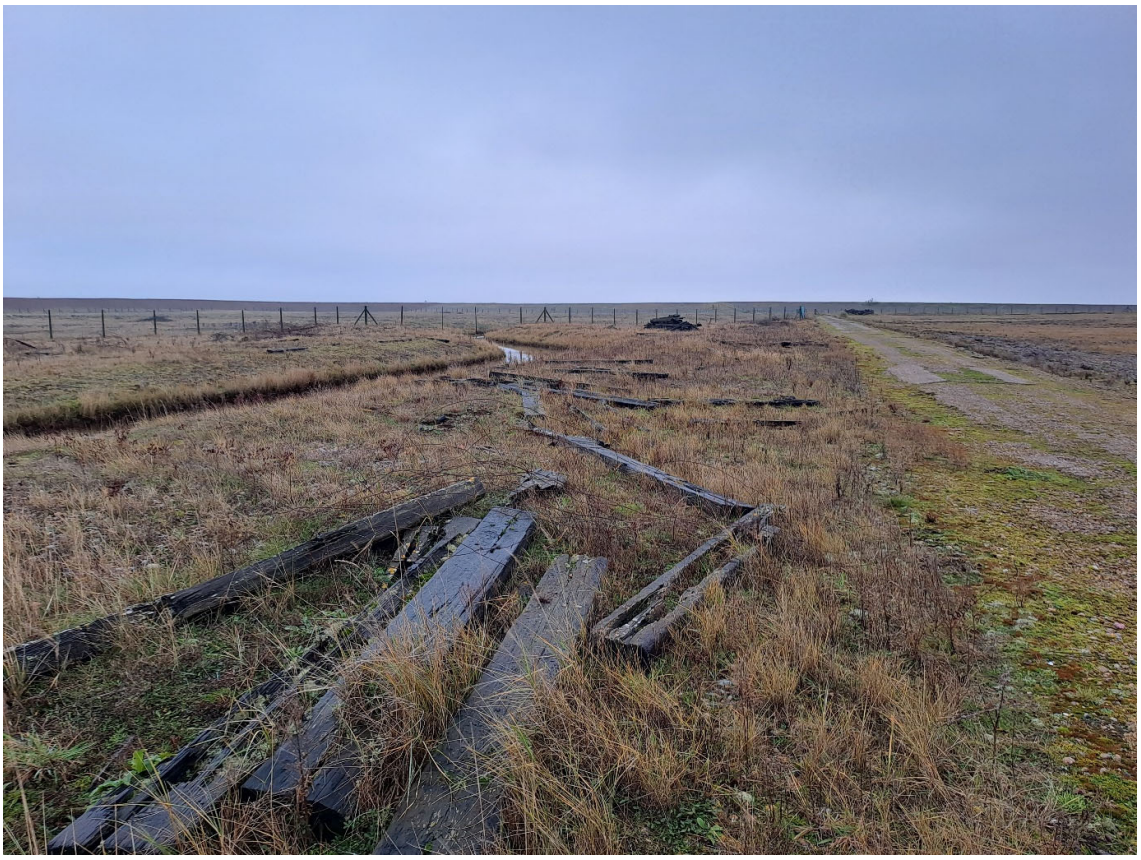

Figure 28: VE2 viewed from TM 45444 51048. Facing southeast.

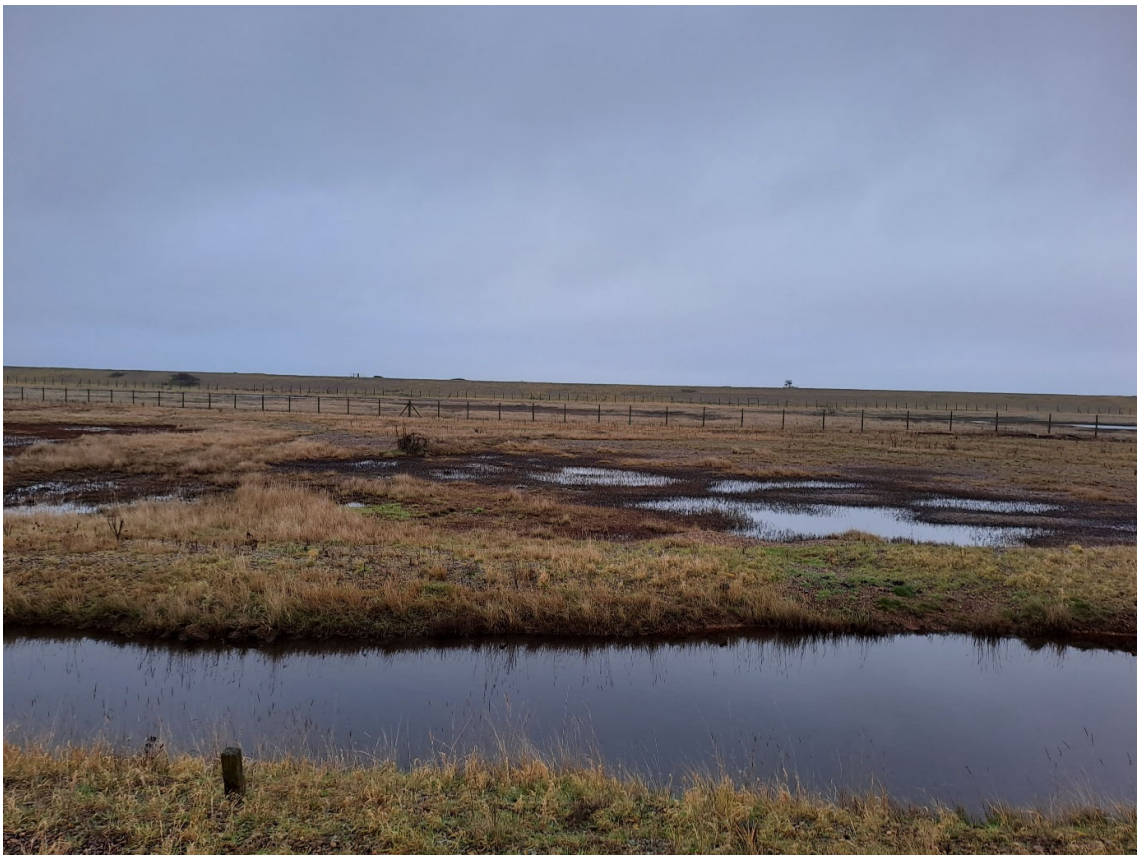

Figure 29: VE2 viewed from TM 45444 51048. Facing east.

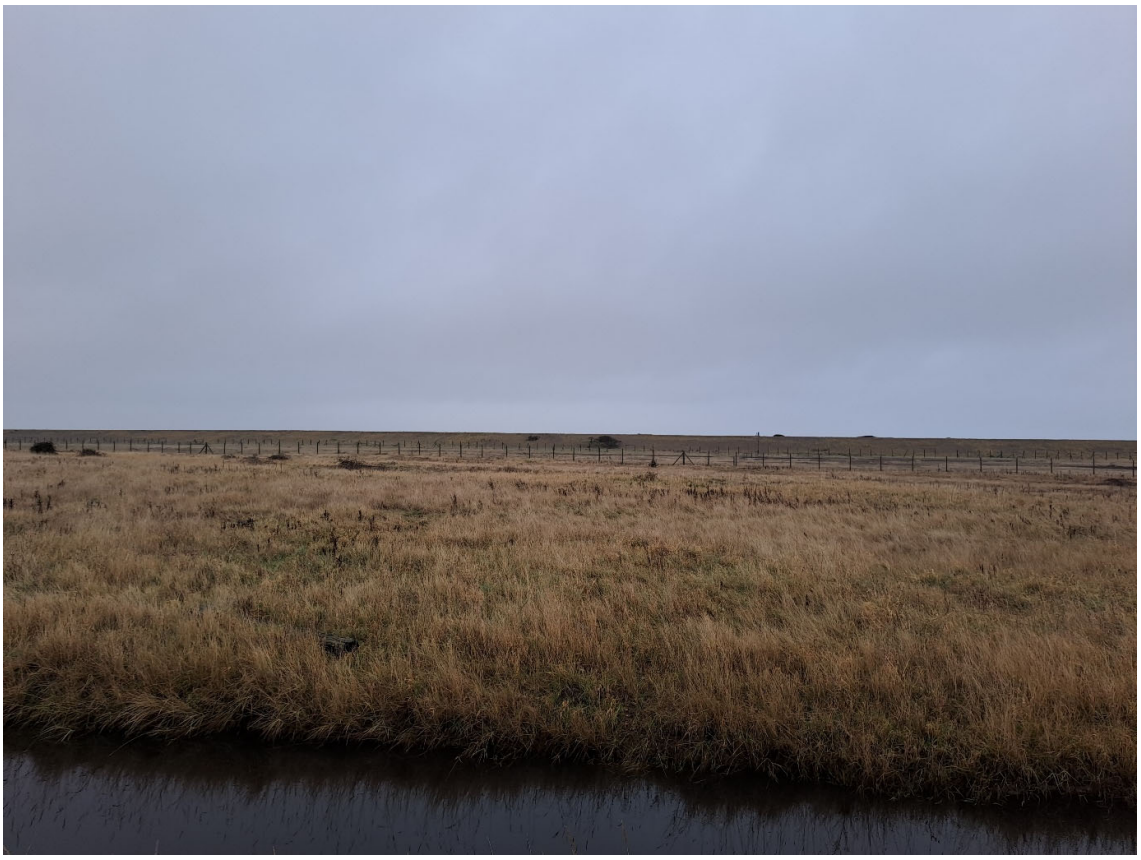

Figure 30: North section of VE 2 viewed form TM 45433 51159. Facing east.

8.2.3 VE3

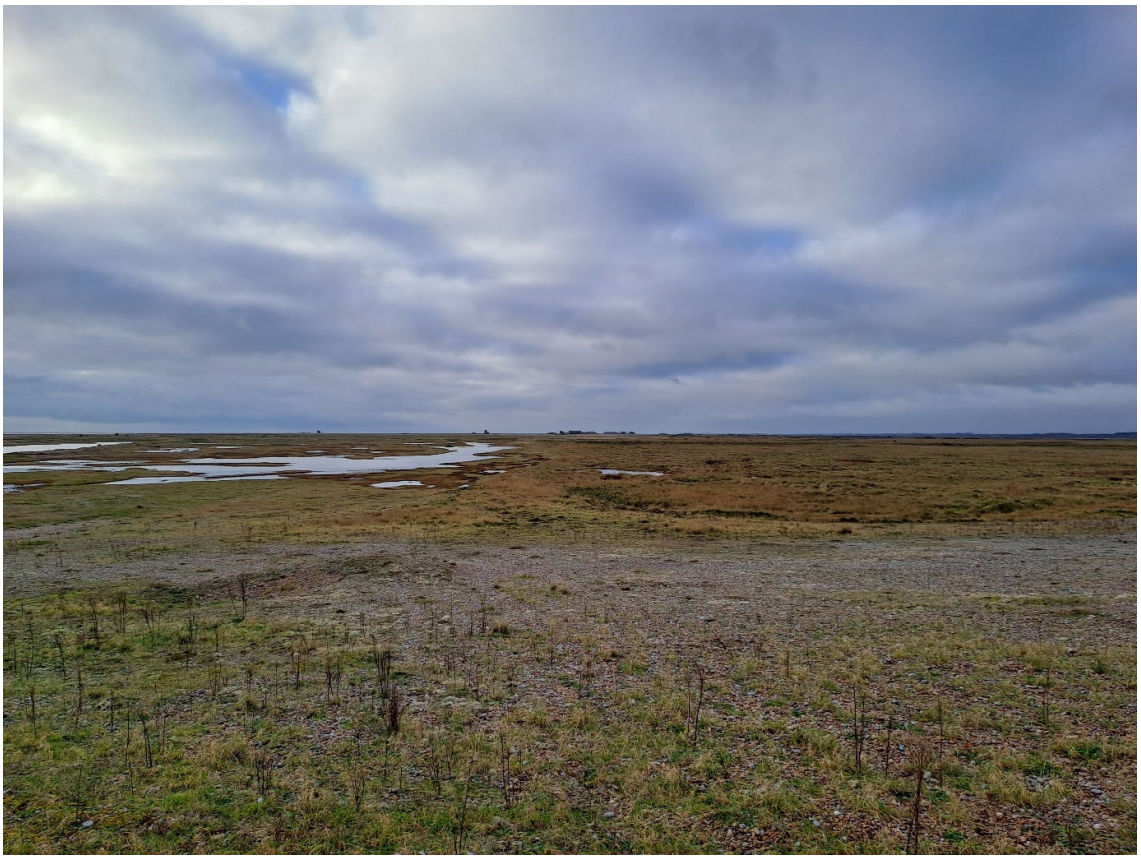

Figure 31: VE3 viewed from shingle embankment (TM 45402 50601). Facing southwest.

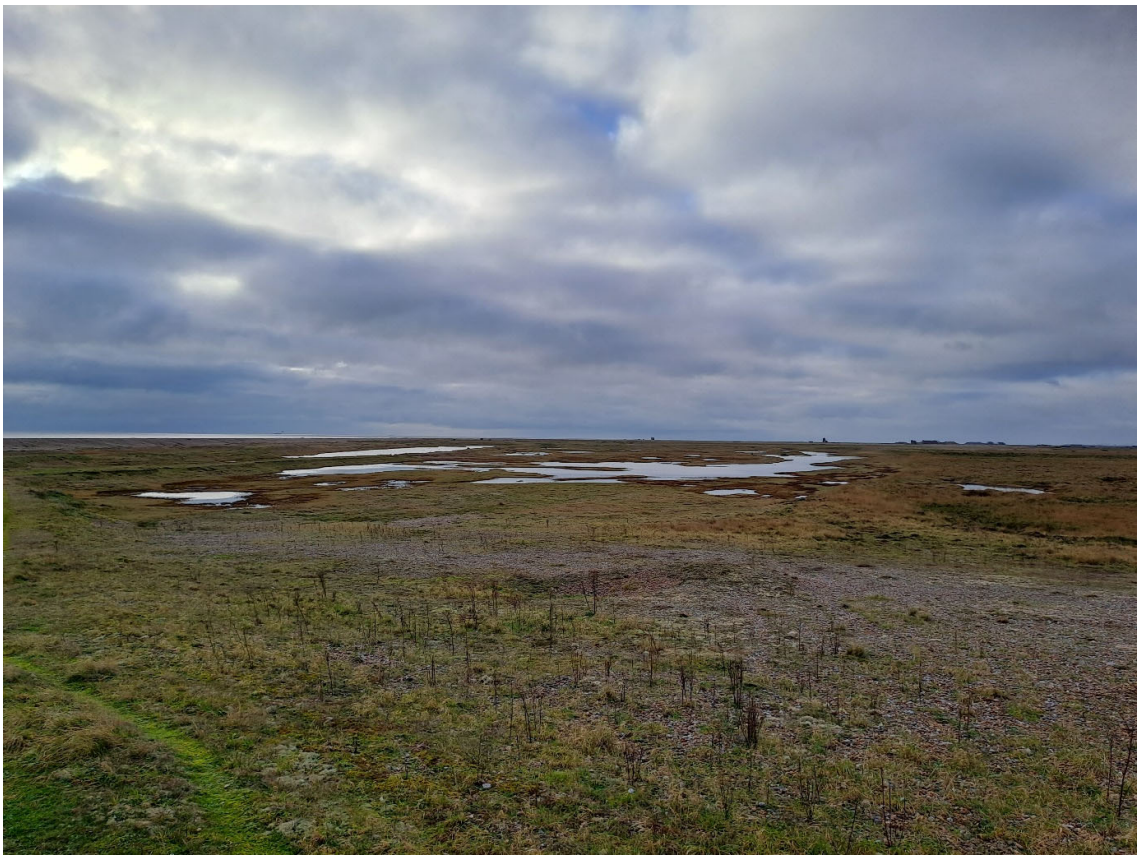

Figure 32: VE3 viewed from shingle embankment (TM 45402 50601). Facing south.

8.2.4 VE4

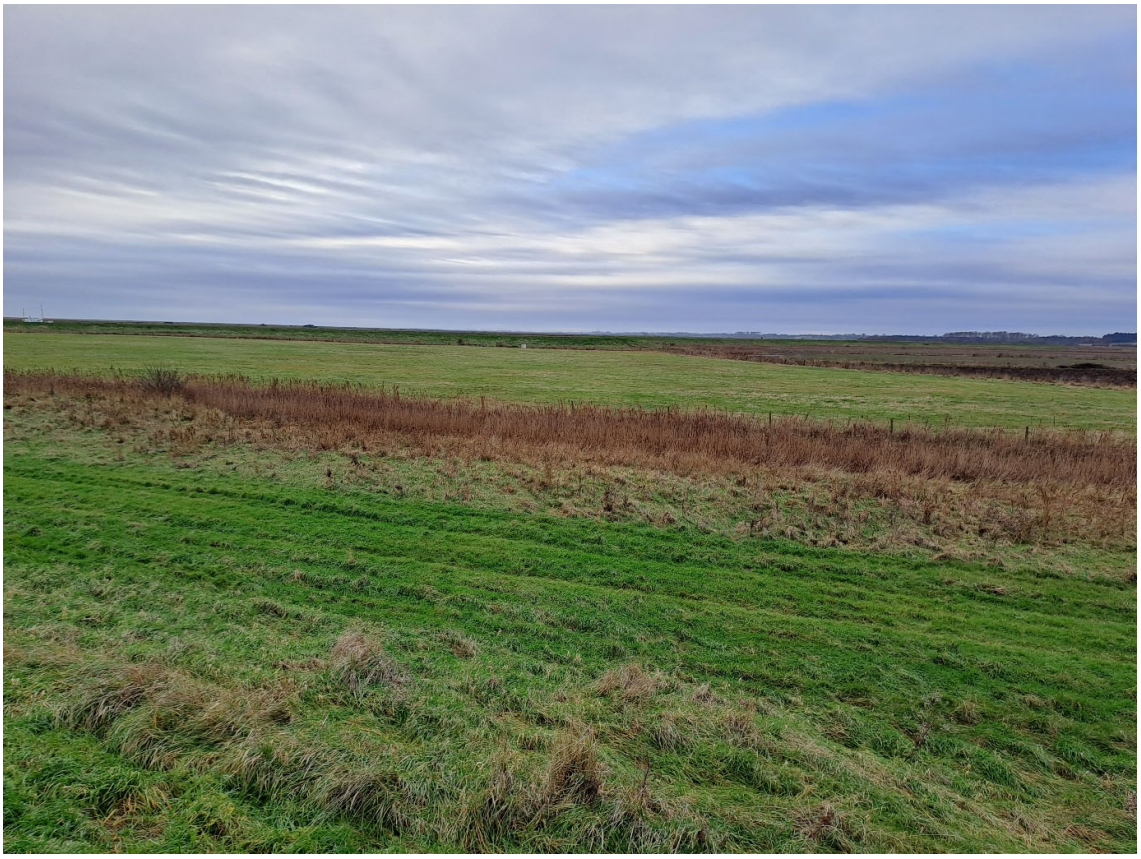

Figure 33: VE4 viewed from TM 42424 48687. Facing west.

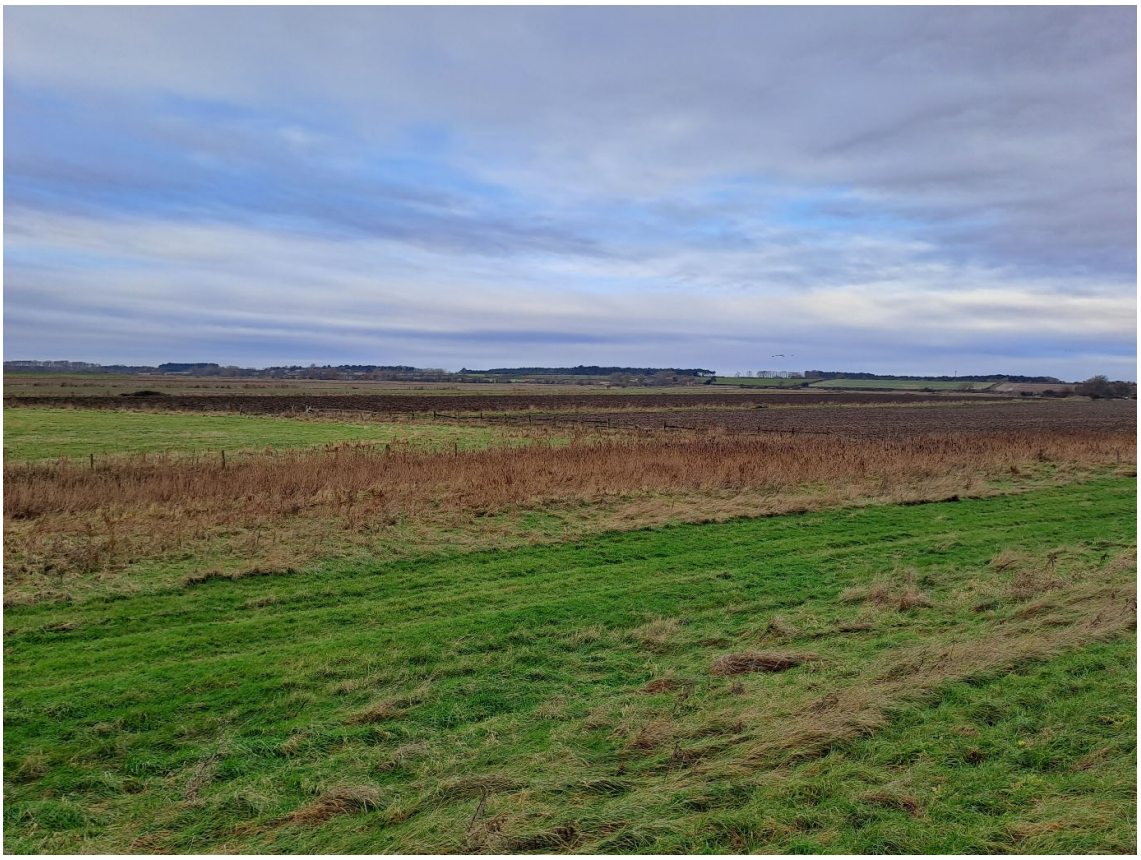

Figure 34: VE4 viewed from TM 42424 48687. Facing northwest.

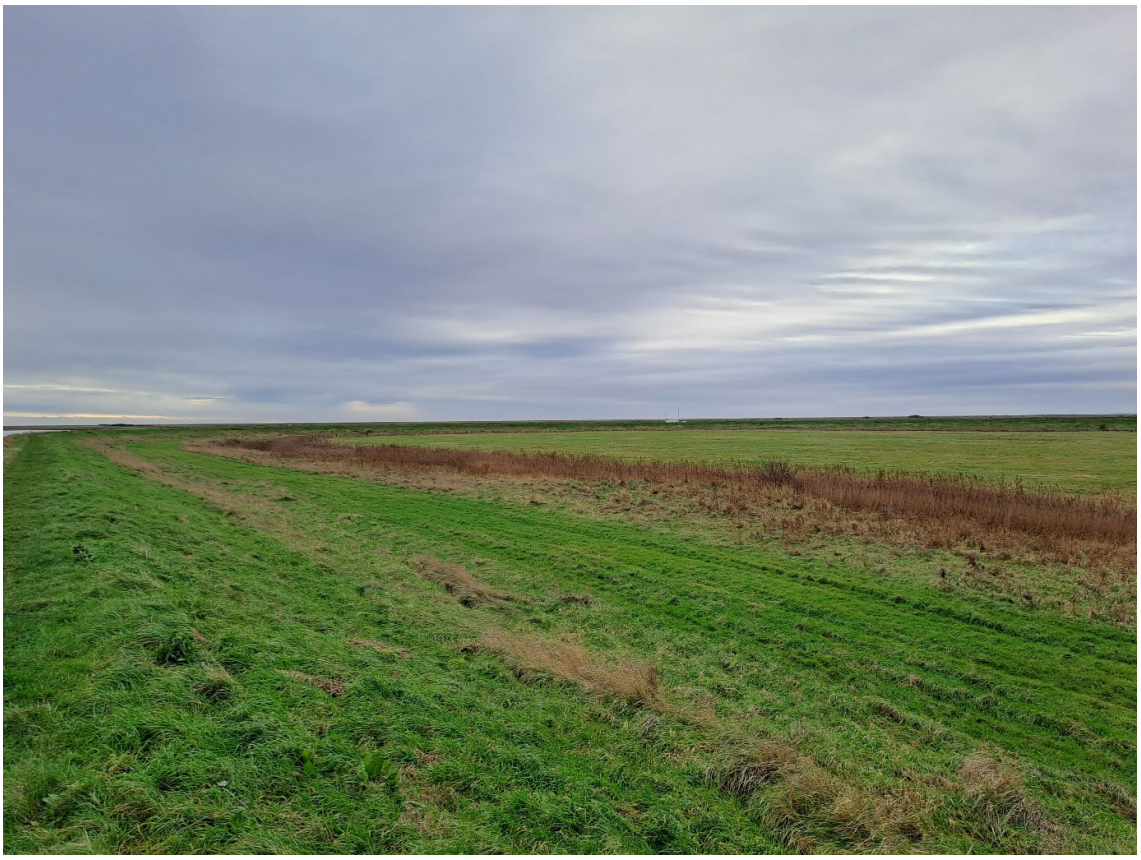

Figure 35: VE4 viewed from TM 42440 48661. Facing south.

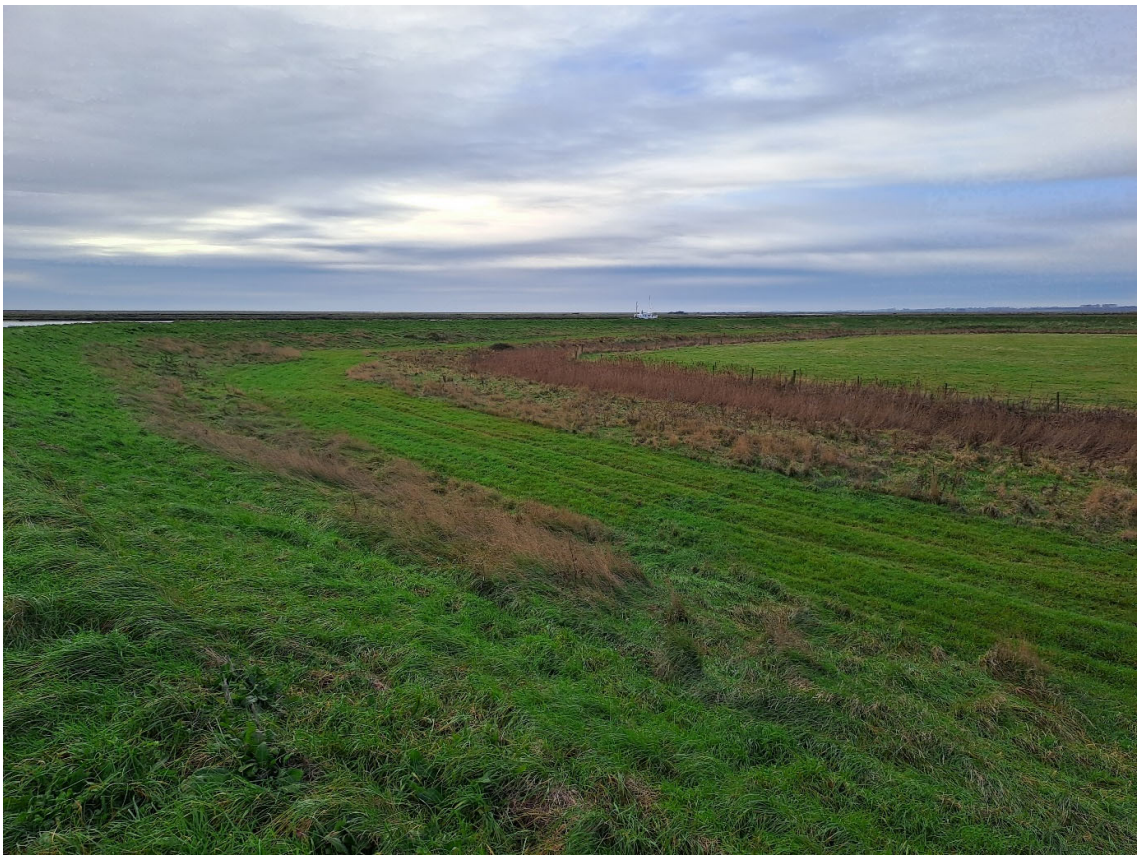

Figure 36: VE4 viewed from TM 42497 48518. Facing southwest.

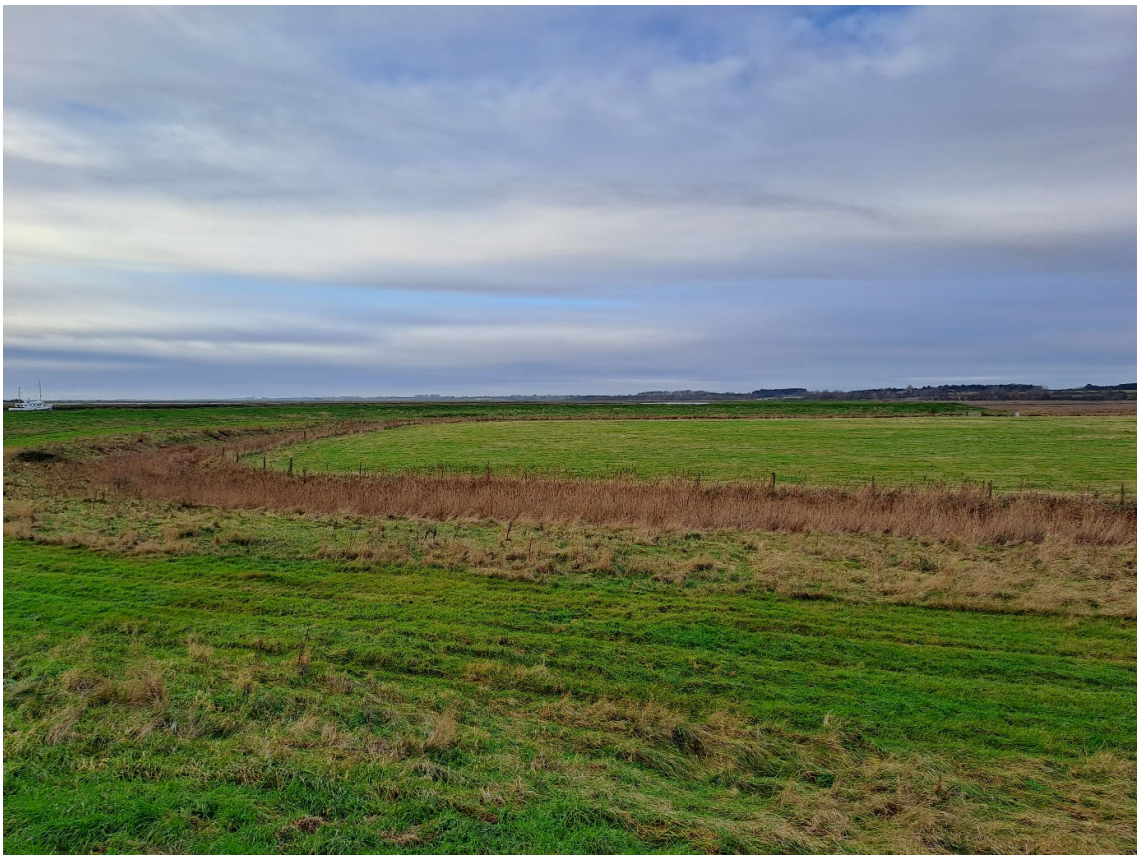

Figure 37: VE4 viewed from TM 42501 48482. Facing west.

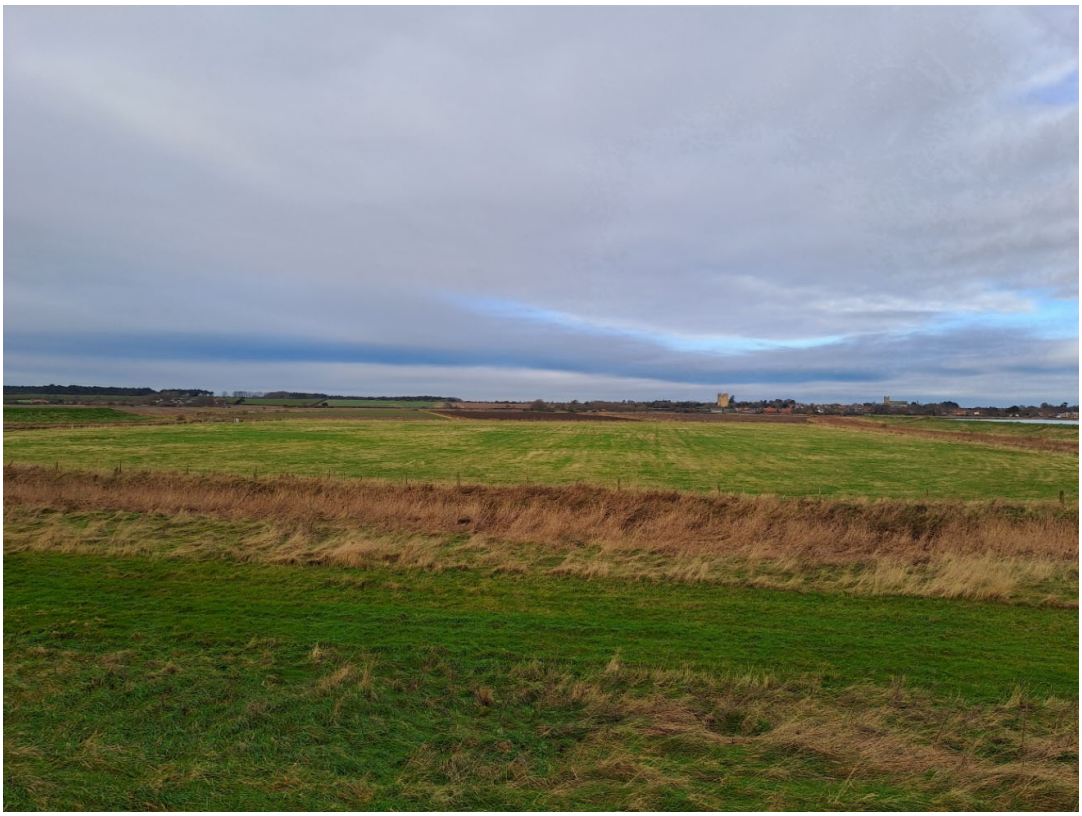

Figure 38: VE4 viewed from TM 42418 48397. Facing north.

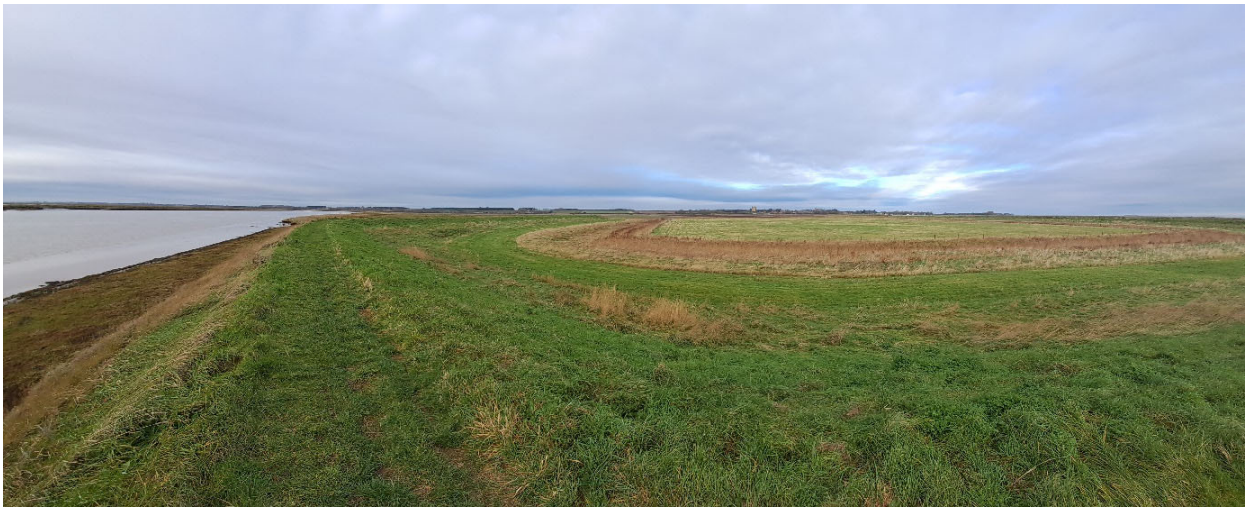

Figure 39: VE4 wide angle viewed from TM 42383 48394. Facing northwest.

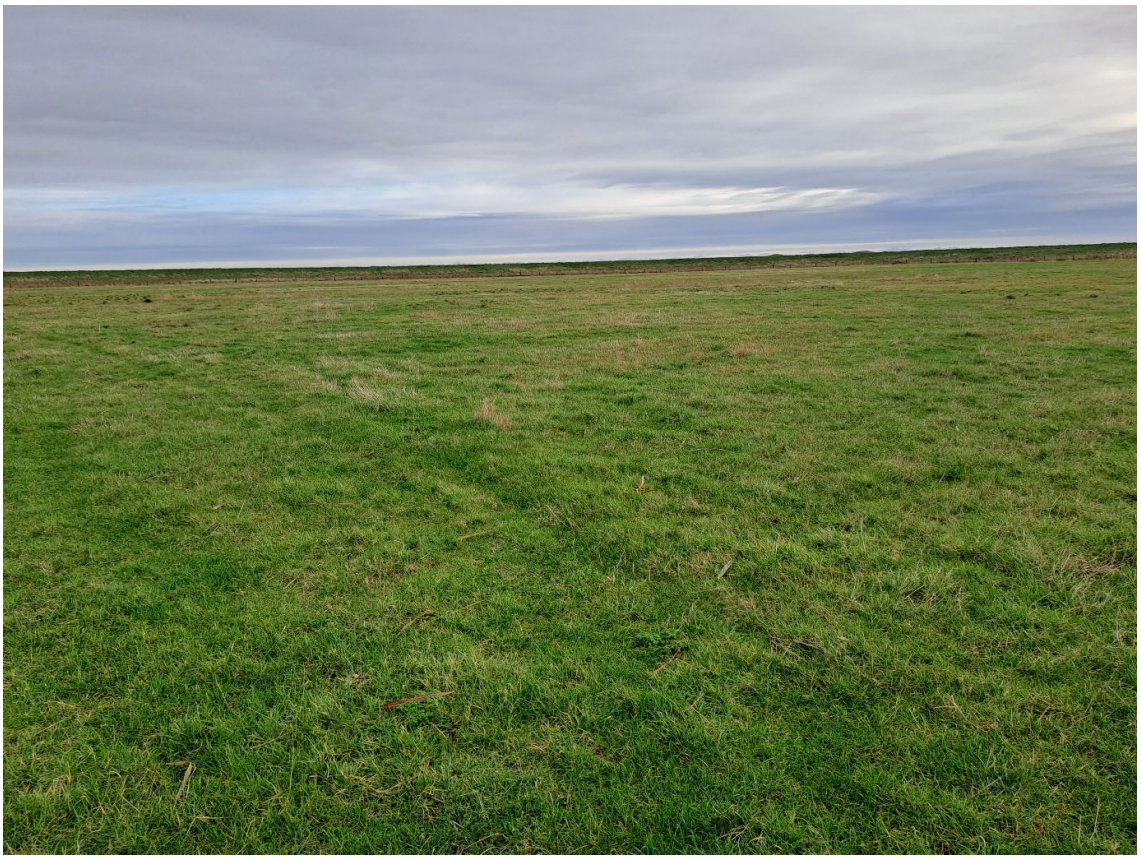

Figure 40: Short grassland of VE4. Viewed from TM 42265 48533. Facing southeast.

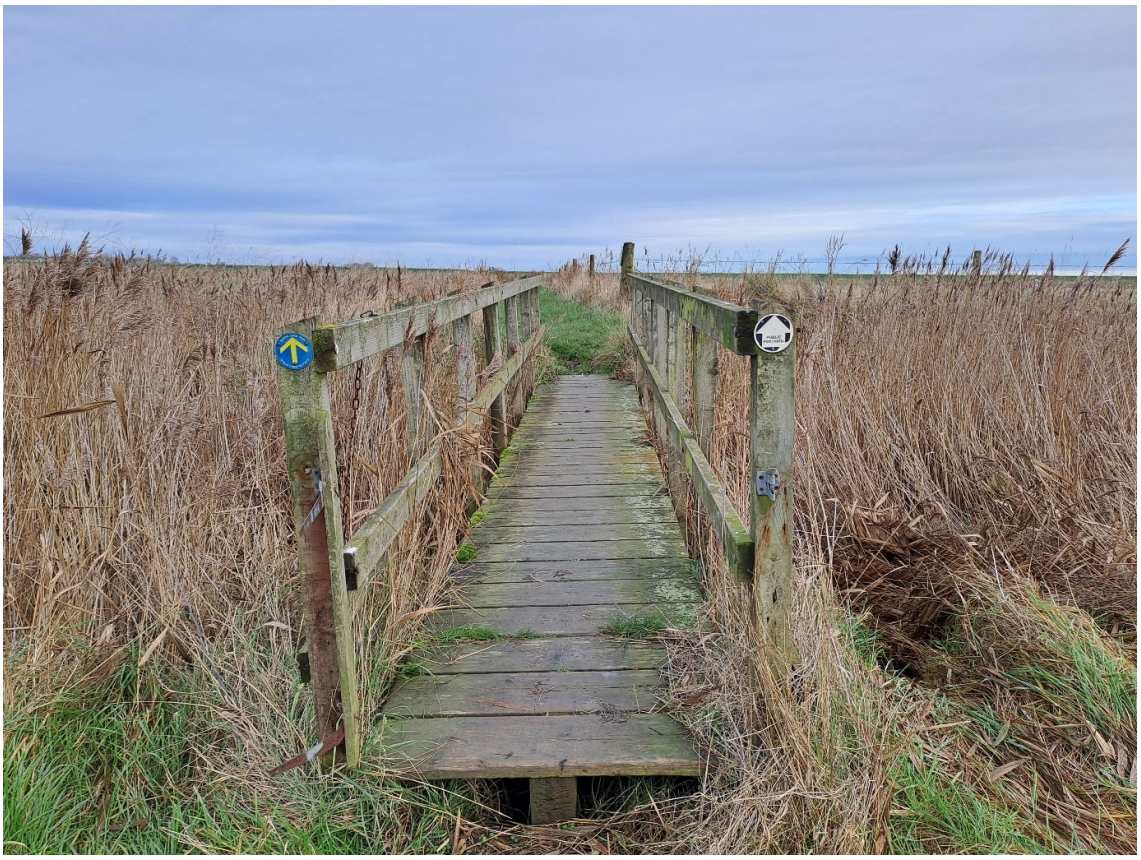

Figure 41: Footpath at the north side of VE4 TM 42378 48743.

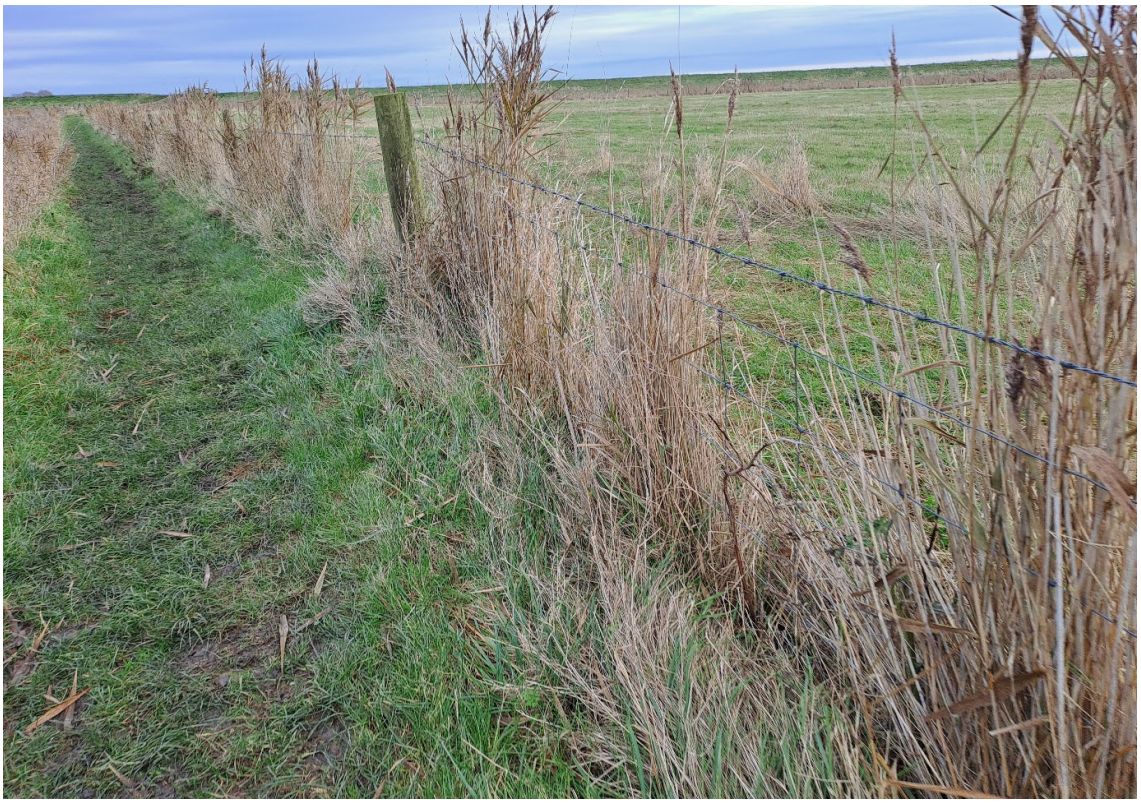

Figure 42: Footpath at the north side of VE4 TM 42303 48648.