cornwall environmental consultants LTD







Lelant Towans
Beach Dune Management Plan

CEC3683 Making Space for Sand
22 October 2026

Document Control

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Disclosure

The information, opinion and advice which we have prepared and provided is true and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct and the British Standard for Biodiversity – Code of Practice for Planning and Development (2013). We confirm that the opinions expressed are our true and professional bona fide opinions.

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Summary

Site and methods	
Purpose of report	To provide a Beach Dune Management Plan to guide restoration of habitats at Lelant Towans.
Site assessed	Lelant Towans
Area (ha)	c. 8.5 ha
Location:	Grid reference: SW 54434 38337 What3words: myths.marked.woven
Planning Authority involved	Cornwall Council
Survey methods	UK Habitat Classification Biodiversity Net Gain Condition Assessment
Date of assessment	UK Habitat Classification: September 2023 BNG Condition Assessment: March 2024
Weather on date of assessment	UK Habitat Classification – Sunny, ~20°C BNG Condition Assessment – Overcast ~8°C

1. Introduction

1.1. Background

1.1.1. Making Space for Sand is being delivered through Cornwall Council in collaboration with Cornwall Wildlife Trust (CWT), University of Plymouth (UoP), South West Coastal Monitoring (SWCM) and Cornwall Community Flood Forum (CCFF). The project is funded by DEFRA as part of the Flood and Coastal Resilience Innovation Programmes (FCRIP), which are managed by the Environmental Agency (EA). The programmes will drive innovation in flood and coastal resilience and adaptation to a changing climate.

1.1.2. The aim of the Making Space for Sand Project is to enable the creation of sustainable and resilient communities that can capitalise on their natural resource to increase economic and resilience opportunities. Encouraging the more sustainable use and development of the coastal fringe, will allow for a more natural, ecosystem approach to coastal management to be taken where traditional coastal protection is not possible.

1.1.3. Four zones have been identified to define the beach/dune area and are defined as:

1.1.4. Beach Zone – The wet beach area has been defined using Mean Low Water Spring (MLWS) and Mean High Water Spring (MHWS) contours extracted from all LiDAR data captured by SWCM. The Beach Zone will therefore encompass the area between the MHWS and MLWS contours, with volumes for this area extracted from each LiDAR surface.

1.1.5. Mobile Zone – This area is defined as the active dune face and embryo dune1 from MHWS +1 m to the back of the mobile area, often distinguished by vegetation depth or urban development. The Mobile Zone has been defined using aerial imagery from 2007 to 2021 and historic OS maps and has been verified through site visits.

1.1.6. Fixed Zone – This area is defined by permanent dune vegetation that may also include scrub or invasive species, effectively denoting vegetation atop sandy soil.

1.1.7. Developed Zone – This is defined as urban development areas (i.e., car parks, unnatural grassy areas, roads, houses etc.) which have been built atop previously present dune systems.

1.1.8. For the purpose of this report efforts have been concentrated on the Mobile and Fixed Zones as shown in Figure 1

1.2. Aims and objectives

1.2.1. This report details the specific plans for the dunes at Lelant and is supported by the overarching strategic document *CEC3683 Beach Dune Management Plan Strategic Overview*. The area covered by the BDMP principally comprises the dunes at Porth Kidney, while Lelant Towans extends further eastwards along the Hayle Estuary towards Lelant. For simplicity and consistency with the wider MS4S project, the BDMP study area is referred to as Lelant throughout this report.

1.3. Site location

1.3.1. The Lelant study area (Figure 1) lies on the North Cornwall coast, on the western side of the Hayle Estuary. The study area principally comprises the dune system at Porth Kidney, with Lelant Towans continuing eastwards along the estuary towards Lelant. The railway line runs immediately landward of the dunes within much of the study area, with the golf course beyond.

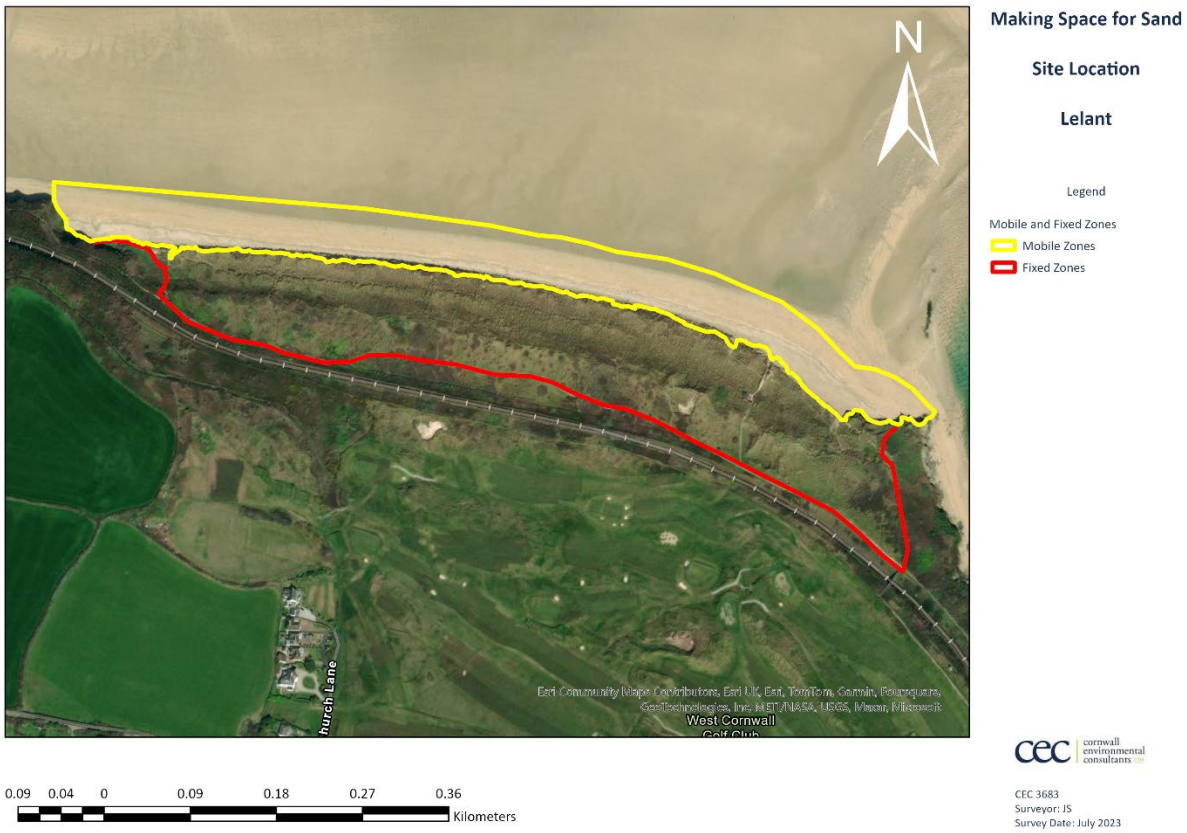


Figure 1: Site Location

1.3.2. The fixed zone dune area at Lelant includes a strip of dune grassland with scattered scrub, squeezed between the mobile zone and the railway. The mobile zone area is very narrow comprising the face of the dunes and then only 1-2m inland from the top of the dune face. There is one small area of mobile sand set slightly inland. The non-native invasive species, New Zealand flax was recorded in the area.

2. Shoreline Management Plan Policy Units

2.1.1. Shoreline Management Plan 2011 SMP2 - Cornwall Council

2.1.2. The Shoreline Management Plan (SMP), specifically SMP2 for Cornwall and the Isles of Scilly, is a strategic, long term coastal management policy document adopted by Cornwall Council. It provides a broad assessment of how the coast is likely to change over time and sets out recommended approaches for managing coastal erosion and flood risk in a sustainable way, more information about this plan can be found in the Beach Dune Strategic Overview Document.

2.1.3. Lelant is within Policy Development Zone 10 (PDZ 10) under Management Area (MA) MA27. There are two Policy Units (PUs) associated with Lelant, PU 27.1 is associated with the dune system and PU 27.2 is associated with the area of Lelant Towans, between the beach and the town. Within PU 27.1 the assigned policy for all time frames is No Active Intervention with a sub policy of No need to defend which means that where there are no assets at risk and no defences are present there is no requirement or intention to introduce defences and for PU27.2 which runs along the eastern side of the dune it is Managed Realignment (MR) which means to manage the coastal processes to realign the 'natural' coastline configuration, either seaward or landward, in order to create a future sustainable shoreline position.

2.1.4. PU27.2 has a sub policy of Placeholder which means that in some locations, MR has been used as a temporary placeholder pending further evidence, stakeholder agreement or policy development, with the expectation that it will be reviewed following future assessments.

Table 1: PU27.1 - Porth Kidney

Timeframe	SMP Policy	Sub Policy
Medium Term (2025 -2055)	No Active Intervention	No need to defend
Long Term (2055 - 2105)	No Active Intervention	No need to defend

Table 2: PU27.2 - Lelant Towans

Timeframe	SMP Policy	Sub Policy
Medium Term (2025 -2055)	Managed Realignment	Placeholder
Long Term (2055 - 2105)	Managed Realignment	Placeholder

2.1.5. N.B the short-term time frame ended in Cornwall in 2025.

2.1.6. Some recession of the dune line may be expected at Porth Kidney (PU27.1) in line with rising sea levels but the cliff line would be expected to remain stable, with little recession. The St Ives to St Erth railway line should generally remain at very low risk along this frontage, although in the medium to long term there is a potential risk where the hard cliff line meets the dunes – some probable recession here, possibly of up to 30m, could threaten a short section of the track. This should be monitored but the most sustainable solution would be an inland realignment of this track section.

2.1.7. At Lelant Towans there may be some loss of dune area and roll back of the shoreline expected in response to sea level rise but the estuary is expected to remain a net sink for sediment, therefore foreshore levels may raise themselves in response to sea levels.

2.1.8. The future response may partly depend on future dredging strategies and how much sediment is removed from within the estuary system. If loss is experienced this could impact on the golf links area. A managed realignment approach is preferred to accommodate the natural variability of this area and would allow a

managed approach to the risks to the wharf, railway line and golf links. This approach could also provide intertidal habitat benefits.

2.1.9. Although some limited future flood risk exists along the more developed Lelant frontage, actual recession under the NAI scenario is anticipated to be very limited. This indicates the current shoreline position is relatively sustainable. In addition, the St Erth to St Ives rail link runs along the entire length of the Lelant frontage immediately next to the shoreline. The importance of this local transport link to the wider economy and the perceived sustainability of the shoreline position dictate that a continued hold the line policy is preferred for the Lelant frontage.

2.1.10. A secondary driver for holding the line is the presence of The Saltings, a local access road which runs immediately behind the railway line. The low pressure on the frontage means there is no pressing requirement for managed realignment. A no active intervention approach however has been rejected due to the presence of the railway line as even minor erosion due to failure of defences would have a major impact.

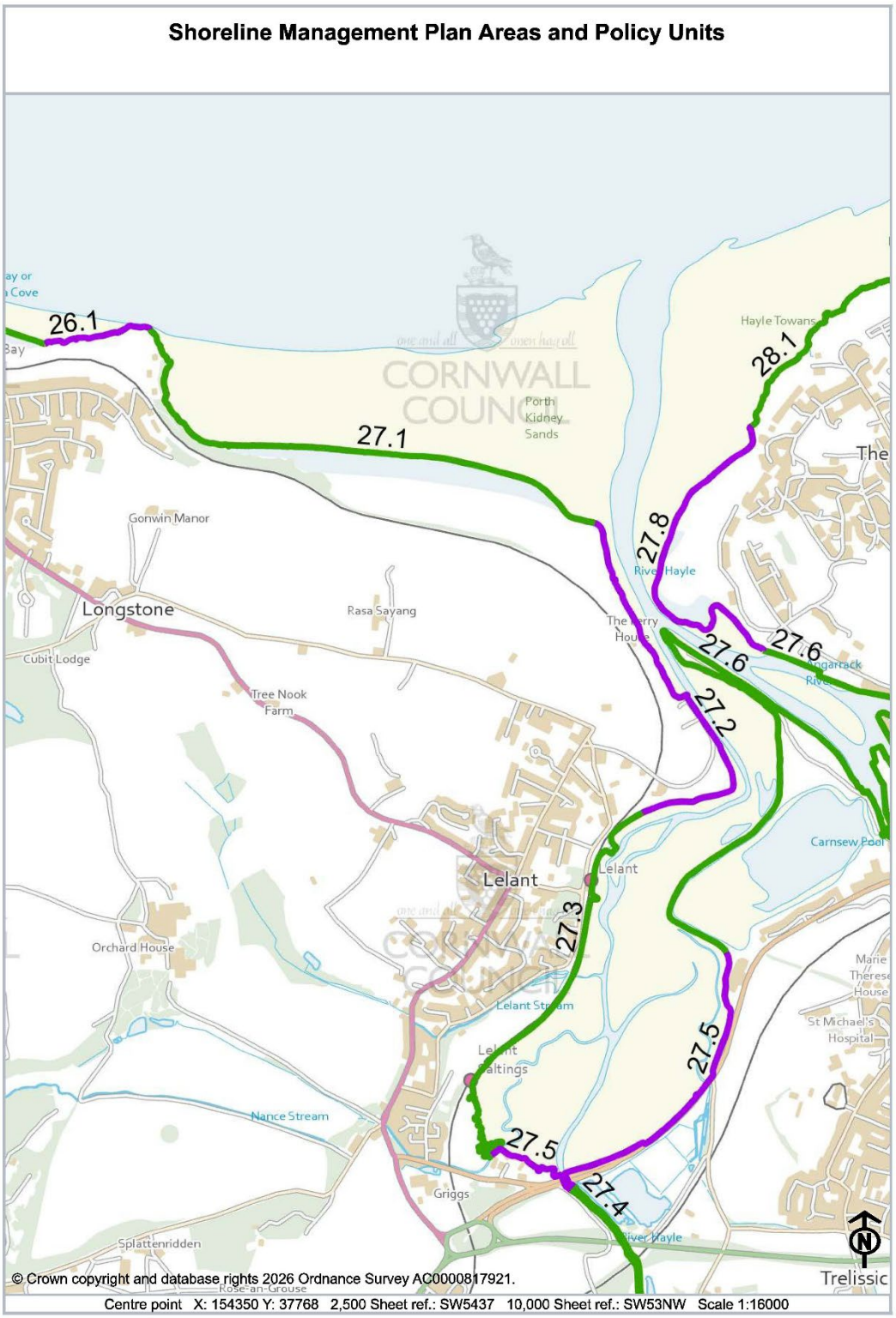


Figure 2: Shoreline Management Plan Areas and Policy Units

3. Historical Imagery and Mapping Change

3.1. Historical Imagery

3.1.1. A review of available historical map imagery (Georeferenced Maps viewer - Map images - National Library of Scotland , 2025) has been undertaken to assess the change in the dune at Lelant.

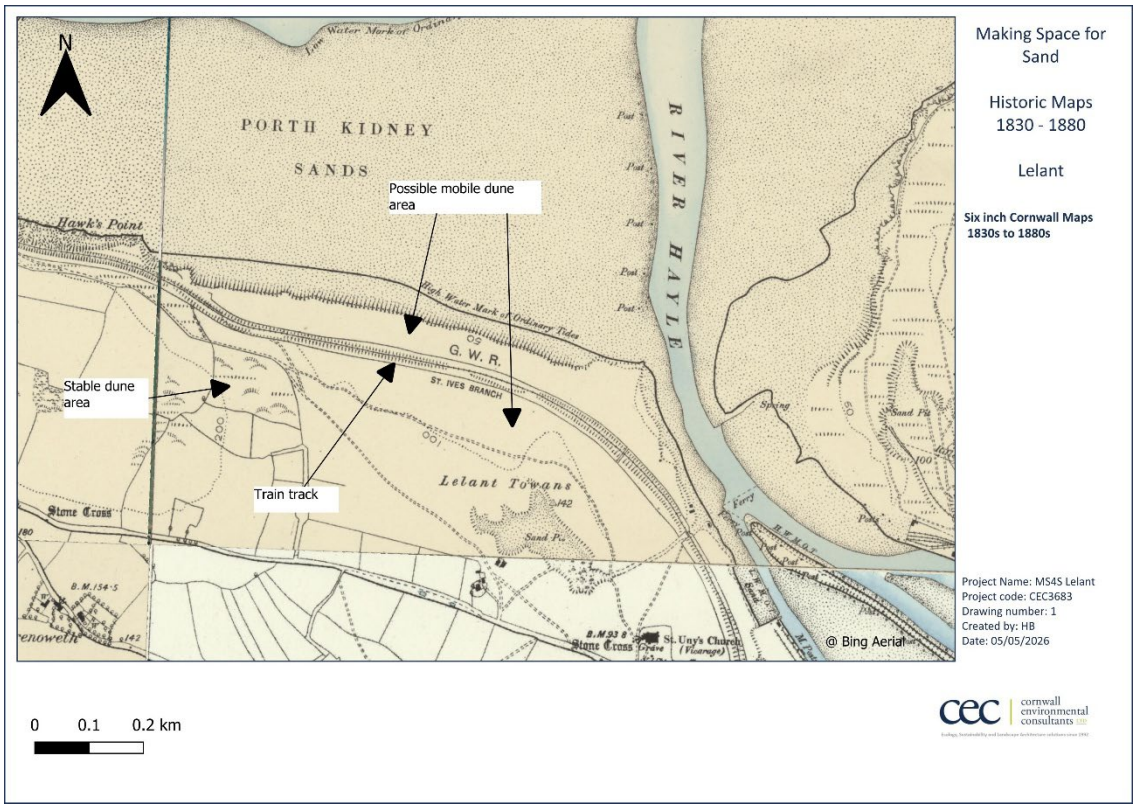


Figure 3: Historical Mapping from Lelant circa 1830-1880

3.1.2. The earliest maps date from the 1830s to 1880s (Figure 3 above). These historical maps show that the railway line was already established in its current position over 150 years ago. Its construction likely played a significant role in influencing sediment deposition and the subsequent development of the dune system in the area.

3.1.3. Notably, the maps indicate a lack of detailed markings or defined features in the areas immediately north and south of the railway. This absence of contouring or land use symbols suggests these were zones of mobile dunes. In contrast, markings are shown to the southwest of the railway, implying the presence of more stable dunes in that location.

3.1.4. In the present day the dunes now extend much closer to the high-water mark, suggesting that the system has stabilised over time with vegetation.



Figure 4: Historical Imagery from Lelant circa 1948-1974

3.1.5. The imagery from 1948-1974, Figure 4 above shows the dunes in the area north of the rail track and the vegetation reaches the high tide line as today.



Figure 5: Aerial Imagery of Lelant

3.1.6. Present day aerial photography (Figure 5) shows that there has not been much change in Lelant since the 1948 – 1974 maps. Dune vegetation is north of the rail track and south of the track is now a golf course with migration routes for sand being very limited.

4. Historic Features and Designations

4.1. Historic Features

4.1.1. A review of historical features has been undertaken from Cornwall Council's historic and natural environment mapping. See Figure 6

4.1.2. Historical Features within the site include:

- Medieval holy well
- Medieval chapel – documentary evidence
- Two demolished WW2 anti-aircraft battery sites
- Two demolished, one ruined and three remaining WW2 pillboxes

4.1.3. Historical Features within 200m of the site include:

- Prehistoric lithic scatter
- Possible iron age fort
- Early medieval and medieval field systems
- Post medieval stile
- Post medieval dock
- Post medieval mine and spoil heap
- Removed WW2 anti-aircraft battery

4.1.4. The post medieval mine is on the golf course and should be taken into consideration if any heavy works were to take place there.

4.1.5. Coastal erosion and dune mobility may expose currently buried archaeological and historical features within the dune system. If archaeological remains or other previously unrecorded historical features are exposed during management works or through natural erosion process, works in the immediate area should cease and advice sought from Cornwall Council's Strategic Historic Environment Service (Historic Environment Record team).

4.1.6. Cornwall Council Historic Environment Service: https://www.cornwall.gov.uk/her Email: her@cornwall.gov.uk Tel: 0300 1234 202

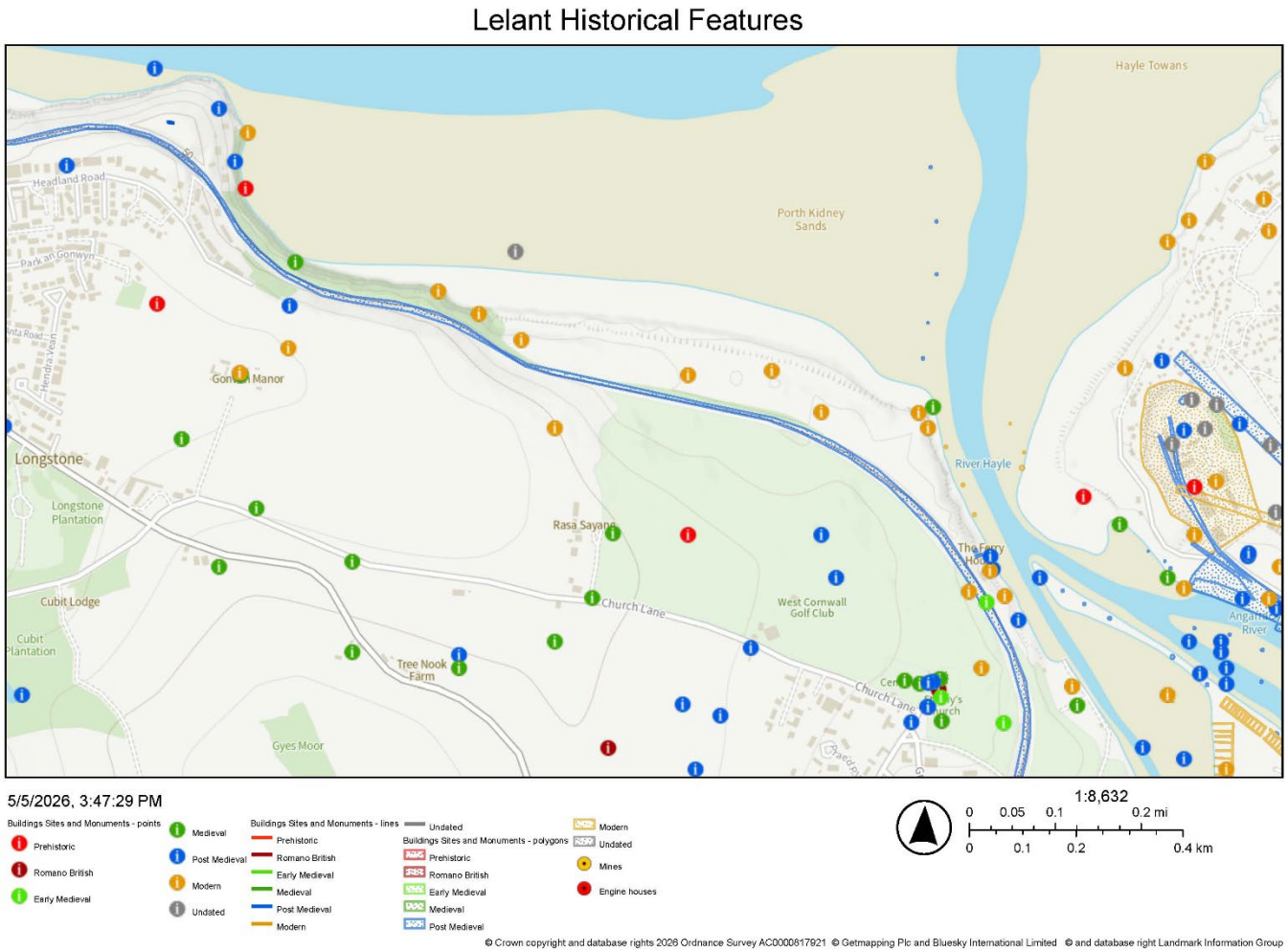


Figure 6: Historical Features at Lelant

4.2. Biological, Landscape and Geological Designations

4.2.1. Table 3 below identifies the statutory and non-statutory biological, landscape and geological designations within and adjacent to Lelant see Figure 7.

Table 3: Biological, landscape and geological designation affecting the site

Category	Designation Type	Name / Status	*Designated for
Biological	Special Area of Conservation (SAC)	None	N/A
Biological	Special Protection Area (SPA)	None	N/A
Biological	Marine Conservation Zone (MCZ)	None	N/A
Biological	Site of Special Scientific Interest (SSSI) - within	Hayle Estuary & Carrack Gladden	Habitats of Principal Importance (HPI) Mobile dunes, dune grassland and dune scrub and the Species of Principal Importance (SPI) Portland spurge (Euphorbia portlandica), bulbous meadowgrass (Poa bulbosa) and mountain St John's-wort (Hypericum montanum)
Biological	Local Nature Reserve (LNR)	None	N/A
Biological	County Wildlife Site (CWS) - adjacent	Adjacent to Hayle Estuary and Hayle Dunes System	HPI Intertidal Mudflats SPI Curlew Numenius arquata, herring gull Larus argentatus, black-tailed godwit Limosa limosa. HPI Coastal Sand Dunes SPI purple ramping-fumitory Fumaria purpurea; moss carder bumblebee Bombus moscorum; many moth and butterfly species including blood-vein Timandra comae, mottled rustic Caradrina morpheus, cinnabar Tyria jacobaeae, silver-studded blue Plebejus argus, small heath Coenonympha pamphilus and wall Lasiommata megera; toad Bufo bufo and slow-worm Anguis fragilis; linnet Carduelis cannabina, skylark Alauda arvensis and song thrush Turdus philomelos.
Landscape	Cornwall National Landscape	None	N/A
Landscape	Area of Great Landscape Value (AGLV)	St Ives, Carbis Bay and Lelant	The site lies within the St Ives, Carbis Bay and Lelant AGLV
Landscape	Conservation Area	None	N/A
Geological	Geological Site of Special Scientific Interest (SSSI)	None	N/A
Geological	Cornwall Geo Conservation Site	None	N/A
NB: Not all of the designations identified above fall within or directly overlap the site; some are adjacent to the dune system and have been included for ecological context. Dune restoration and management activities are unlikely to adversely affect these adjacent designations and would not normally require specific consent where works do not directly affect the designated site or its qualifying feature.			

*Please note that the species or habitat that the site is designated for will not necessarily be within the

Lelant dune system area.

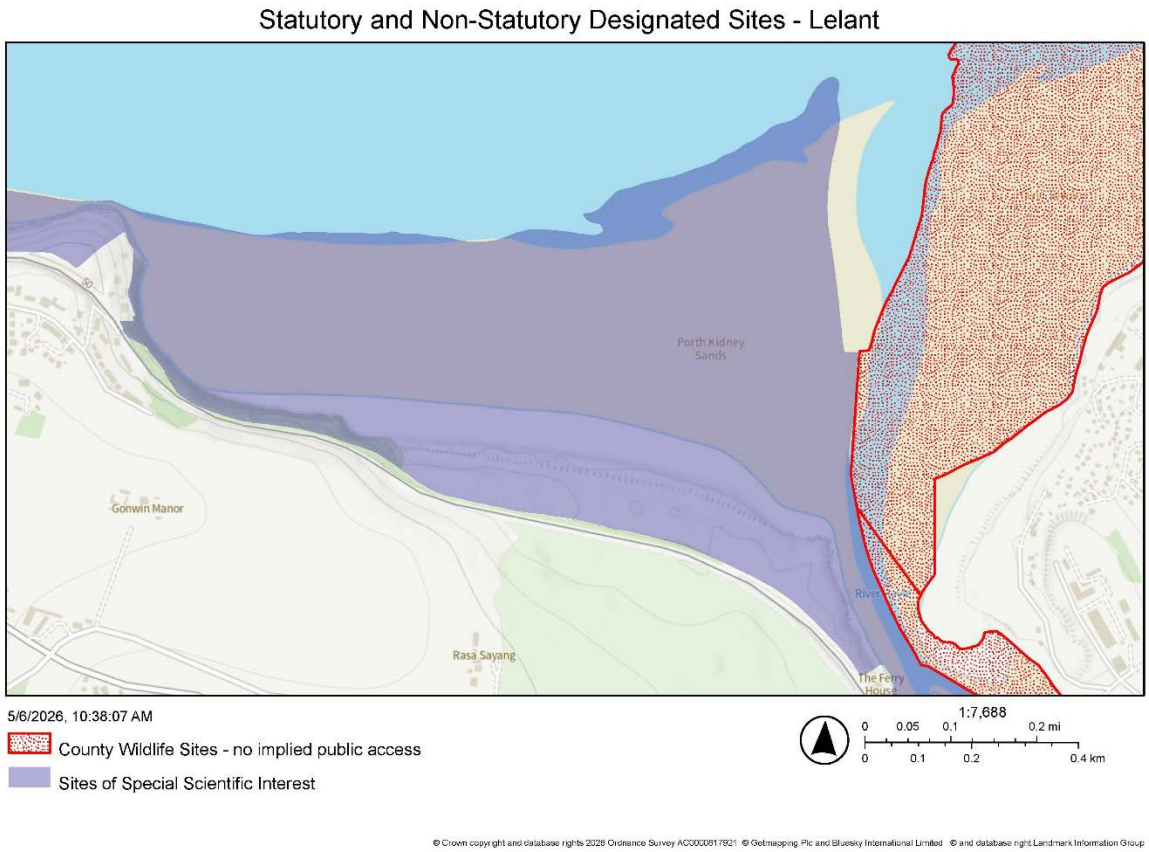


Figure 7: Statutory and Non-Statutory Designated Sites at Lelant

5. Ecology

5.1. Baseline

5.1.1. A baseline survey for Lelant Towans was undertaken in March 2022, this was then checked in July 2025, see Figure 8.



Figure 8: UK Habitat Classification Reference Polygons

Reference Ecosystems

5.1.2. Through the assessment of historic mapping, it is assumed that the reference ecosystem is a mosaic of shifting dune with marram and dune grassland. Although there is some of this habitat remaining, a significant amount has been lost to development and erosion, the remaining habitat is fragmented and under pressure from invasive species.

5.1.3. The UK Habitat Classification of shifting dune with marram refences the species marram, sea sandwort and sea couch. For dune grassland the species referenced are red fescue, lady's bedstraw, pyramidal orchid and wild thyme.

5.2. Habitat Mapping

5.2.1. As an output of the Making Space for Sands project habitat mapping was carried out at this location. This was completed based on UK Habitat Classification, with a project specific methodology for scrub habitat. This was due to there being no suitable classification of 'dune scrub'. As a result, any scrub on dunes was mapped within the scrub broad habitat category in order to make more meaningful restoration gains to dune habitat.

Site survey recorded habitats

Coastal Sand Dunes

5.2.2. Overall, the open dune area at Lelant equates to 0.24 ha, approximately 0.28% of the site and includes s3a5 embryonic shifting dune (0.08ha, <1%) and s3a6 shifting dune with marram habitats (0.16ha, 1.99%).

5.2.3. Embryonic shifting dune occurs in scattered fragments along the extreme seaward edge of the dunes but is generally of restricted occurrence, in consequence it is typically only present in small fragments, often too small to map, within a thin linear zone at the base of the dunes. Sand couch typically dominates forming broken cover over otherwise bare sand. The notable species prickly saltwort was recorded within an 'island' of embryonic dune at the eastern end of Lelant (polygon 1000), other species, such as sea rocket, were scarce during the survey. Embryonic dune is classified as a Habitat of Principal Importance.



Figure 9: Scattered fragment of embryonic dune at Lelant

5.2.4. Shifting dune with marram occupies the majority of the rest of the seaward edge of the dune system (the exception being where rocky cliffs support maritime cliff and slope vegetation. Typically, with increased stability moving inland shifting dune gives way to dune grassland or, perhaps with slightly increased shelter, scrub. Marram grass, able to withstand repeated bouts of inundation by windblown sand, is overwhelmingly dominant throughout, areas of bare sand are abundant and can be extensive; other species are typically few in number but notable species such as sea spurge, sea holly and sea bindweed can be characteristic. At Lelant, the shifting dune habitat is restricted to a narrow strip on the moderately sloping dune face typically up to about 10m wide, polygon. Shifting dune is classified as a Habitat of Principal Importance.



Figure 10: Shifting dune with marram at the seaward edge of the dune system

5.2.5. Fixed dune occupies by far the largest zone across the site overall, dune grassland (s3a7) has been mapped over an area of 6.2ha accounting for about 73% of the site. Dune grassland is also classified as a Habitat of Principal Importance.

5.2.6. Marram is consistently over-represented and dominates along the seaward edge and within more exposed locations where the community frequently occurs in an atypically species-poor, tussock-dominated form. Inland and / or with increased shelter marram dominance declines and within better developed stands the sward becomes more typical, shorter and more species-rich being dominated by red fescue and a suite of small herbs including species such common bird's-foot trefoil, ladies bedstraw and sand-hill screw-moss. Scrub is scattered throughout and has been separately mapped where it occurs in distinct stands (see below) but can at times blur transitions between the two habitats.



Figure 11: Dune grassland

5.2.7. The areas of dune grassland are not easily accessible and are sheltered from prevailing winds and support some non-native species including red valerian and New Zealand flax within areas of dune grassland across each of the sites. Scrub species, particularly Atlantic ivy, bramble and wild privet.

Vegetated Sea Cliffs

5.2.8. Maritime cliff and slope habitat occurs at the eastern end of Lelant where exposed rock faces support maritime grassland and rock crevice communities. Vegetation is largely restricted to ledges and crevices and includes species such as rock samphire and plantains. This habitat is difficult to map accurately due to the steep topography and limited accessibility but is recognised as a priority habitat feature, accounting for less than 0.4% of the site.



Figure 12: Buck's-horn plantain found on sea cliffs

Scrub

Dense scrub

5.2.9. Dense scrub (h3) has typically been mapped where species such as wild privet and old man's-beard dominate closed stands not otherwise assignable to any of the other UKHab scrub categories. It covers 1.2 ha, 14% of the total area. The extent of cover makes access problematic across quite extensive parts of the site. At Lelant dense scrub, predominantly Atlantic ivy and bramble becomes increasingly dominant toward the western end.

Mixed Scrub

5.2.10. Mixed scrub typically refers to more scattered groupings of different woody species (usually varying quantities of old man's-beard, bramble and Atlantic ivy) forming mosaics interspersed with marram. It has been mapped over 0.7 ha, 8.4% of the total area. Distinction from dense scrub is not always clear however, there is a high degree of overlap between the two categories and given the extent of the area and high number of polygons mapped it was not easy to consistently apply the distinction throughout the survey.

5.2.11. At Lelant mixed scrub stands were mapped along the eastern edges of the site (polygons 1016 & 1033).

Bramble scrub

5.2.12. Bramble dominated scrub was mapped most extensively along the southern edges at Gwithian (polygons 247, 251, 576, 585 and 590) and toward the centre on the coast and toward the western edges of Upton Towans (polygons 347 and 489, 507 and 543). This habitat type refers occupies 0.04 ha (<1% of the site).

5.2.13. Bramble scrub has a fixed condition within the BNG metric of poor.

Invasive Non-native Species

5.2.14. There are historic records for three Schedule 9 non-native invasive species on site; montbretia, three

cornered leek and entire-leaved cotoneaster. During the site visit these species were not recorded on site but were seen on neighbouring land. It is illegal to introduce or cause these species to spread in the wild. In addition, there are a number of other non-Schedule 9 non-native invasive species on site and on neighbouring land. These should be mapped and a management programme should be drawn up to control these species. Ideally this should be done in coordination with Network Rail and West Cornwall Golf Club.

5.2.15. Breakdown of the Habitat types and their percentage cover can be seen in Table 4

Table 4: Breakdown of baseline habitats - Lelant

Habitat Type	Percentage Cover %
Embryonic Dune	0.99
Shifting Dune with Marram	1.9
Dune Grassland	73.5
Vegetated Sea Cliffs	0.44
Scrub	23

*Numbers may not add up to 100% due to rounding errors.

5.2.16. The data collected at Lelant Towans shows that there is some scattered scrub cover which could eventually over stabilise the dune and decrease its resilience. Additionally, the presence of more scrub at this density will cause an increase in organic matter in the substrate which when breaking down will increase the nutrient loading on the dunes, detrimental to the desired dune habitat.

5.2.17. The mobile dune is restricted to a narrow strip on the moderately sloping dune face typically up to about 10m wide.

5.2.18. There are a number of possibilities for Biodiversity Net Gain by the enhancement and creation of habitats of a higher distinctiveness, this is predominantly associated with the management of scrub at the site.

Biodiversity Net Gain (BNG)

5.2.19. A BNG Baseline has not been undertaken for Lelant, despite this, there are a number of possibilities for qualitative enhancement, expansion and creation of habitats of a medium and high distinctiveness, this is mainly associated with the management of scrub within the site.

6. Coastal Change

6.1. Understanding Coastal Change

6.1.1. Coastal change refers to the natural and human induced processes that will change features of the coastline. These can be caused by a number of factors, either in isolation or combination. These include erosion, sediment deposition, sea level rise, storm events and human activity. Observations of change can be made, however they cannot be entirely managed and so building resilience is fundamental to adapt to these changes.

6.2. Topographic data

6.2.1. Since 2008, approximately 52 topographic surveys have been undertaken across the Hayle Estuary survey unit. This survey unit extends beyond Lelant Towans to include profiles on both sides of the estuary entrance and therefore represents broader morphological change across the estuary rather than Lelant Towans in isolation.

6.2.2. Analysis of the combined profile area (comprising the mobile and beach zones) indicates an overall declining trend between 2008 and 2026, with a calculated erosion rate of approximately -68.5 m²/year, equivalent to 0.66% of the average combined profile area per year (Figure 13). Considerable variation is evident between individual surveys, indicating periods of profile loss and subsequent recovery; however, the longer-term trend remains one of declining profile area. Considerable variation is evident between individual surveys, indicating periods of sediment loss and subsequent recovery; however, the longer-term trend remains one of declining profile area.

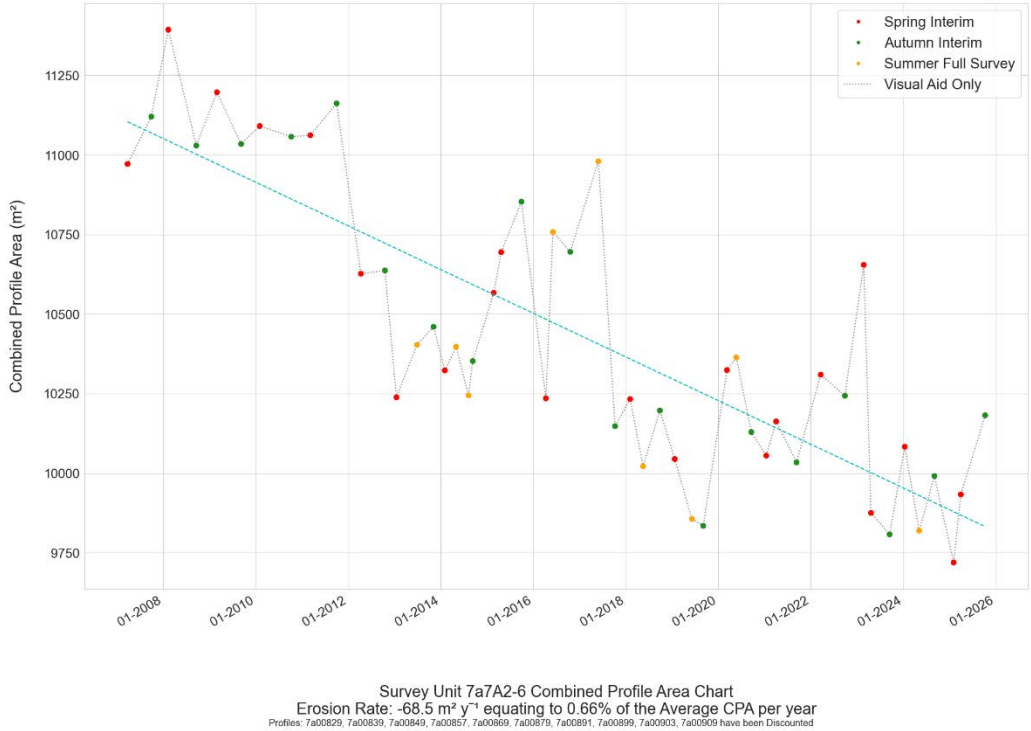


Figure 13: The combined profile analysis for Hayle Estuary, including spring (red dot), summer (yellow dot) and autumn (green dot) completed between 2008 and 2026

6.3. LiDAR Data

6.3.1. In addition to the topographic surveys, LiDAR (Light Detection and Ranging) is used to gather data. This is a remote sensing technology that measures distances to the Earth's surface, creation precise, 3D maps of environments. It is increasingly used in topographic surveys, and environmental monitoring. See Figure 14 for the Beach Zone Volume over time, and Figure 15 for the Mobile Zone (dune) Volume over time. The R2 values show how well the trend line explains the variation in the data, with values closer to 1 indicating a stronger fit and values closer to 0 indicating a weaker fit.

6.3.2. Volumes extracted from 11 LiDAR flights between 2007 and 2023 show an overall decline in both the Beach and Mobile Zones, although the patterns differ. Beach Zone volume fluctuates considerably, reaching its highest recorded level around 2012 before subsequently declining to its lowest recorded level in 2023. This variability is reflected in the relatively low R^2 value of 0.42. In comparison, the Mobile Zone shows a much stronger and more sustained decline, reducing from approximately 85,000 m^3 at the beginning of the monitoring period to around 30,000 m^3 in 2023. Although some short-term recovery is evident, the high R^2 value of 0.85 indicates a much more consistent long-term decline in Mobile Zone volume.

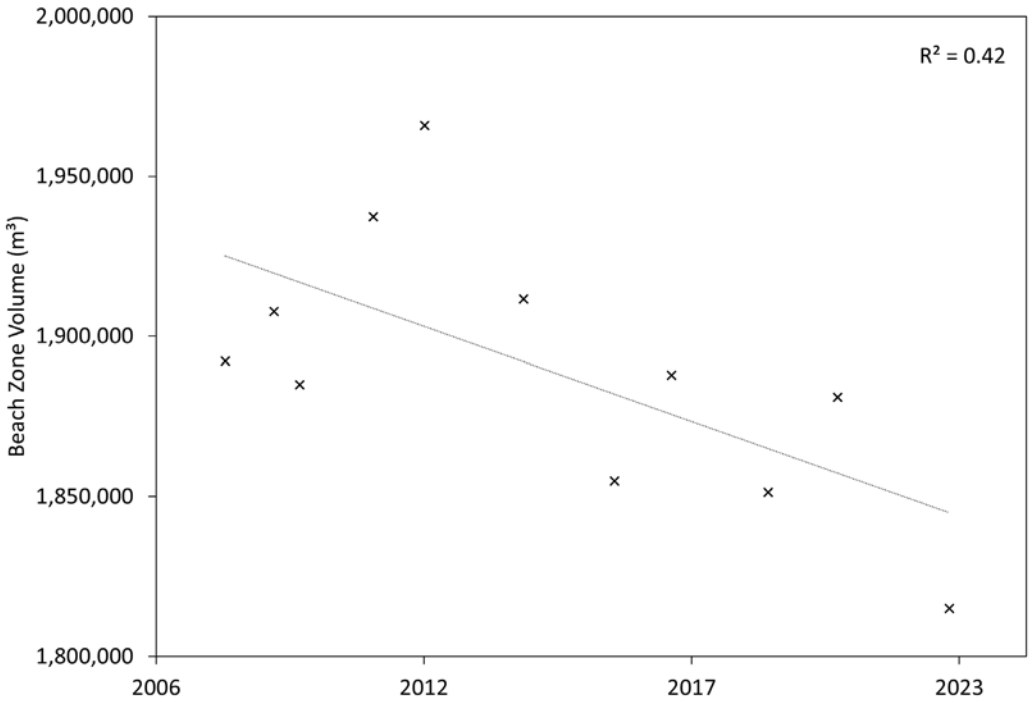


Figure 14: Beach Zone Volume 2007 - 2023

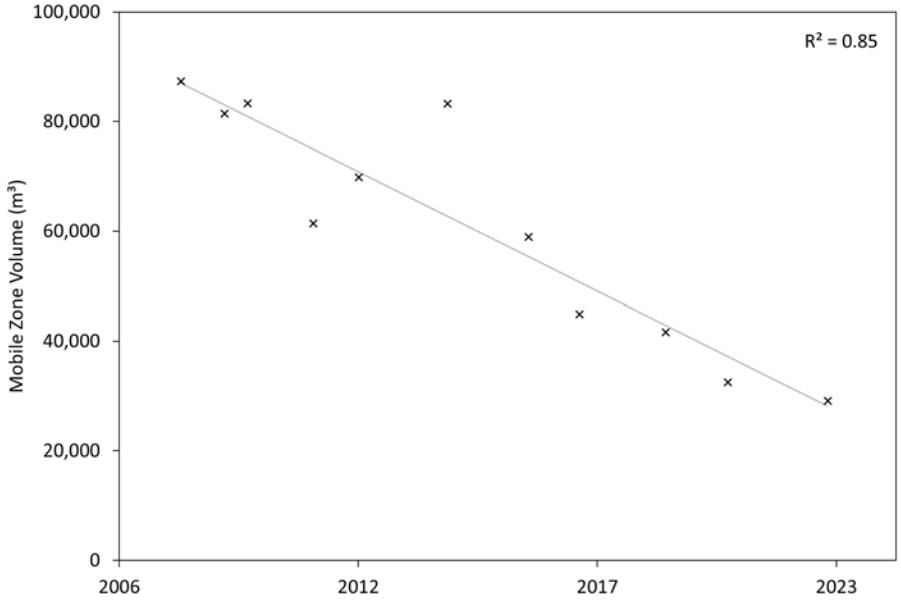


Figure 15: Mobile Zone Volume 2007 – 2023

6.3.3. Beach volume is extracted from the Mobile and Beach Zone for 11 LiDAR flights between 2007 and 2023 (Figure 16). The Mobile Zone shows a strong erosive trend, losing approximately 67% of volume between 2008 and 2023.

6.3.4. Similarly, the Beach Zone has also shown a positive trend of erosion, losing 4% of total volume between the same survey dates, however, greater fluctuation is expected within the Beach Zone due to the influence of the Hayle River.

6.3.5. The Dune Toe contours have shown dune retreat, by approximately 14 m, to the western extent of the beach.

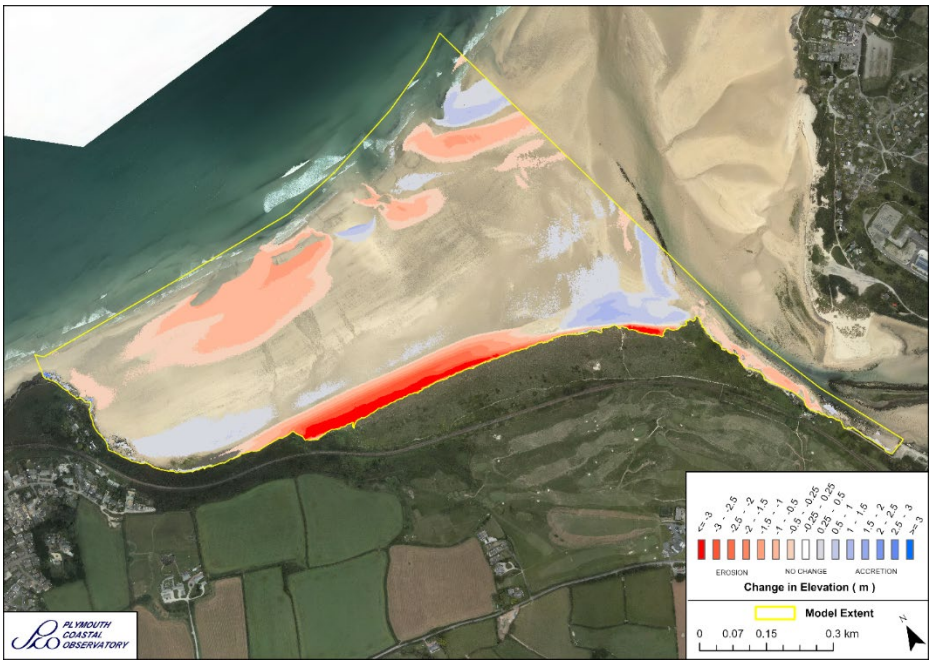


Figure 16: LiDAR Change in elevation model

6.3.6. Figure 16 shows the overall change in elevation across the beach and mobile zone areas as a visual model from 2007 to 2024, shows that erosion has been concentrated along the seaward dune frontage, with substantial reductions in elevation evident along parts of the dune toe. Areas of both erosion and accretion are present across the wider beach, demonstrating ongoing redistribution of sediment within the system.

6.4. Dune Toe Modelling

6.4.1. Sediment is defined as natural material that has broken down by weathering and erosion, this includes sand, silt and clay. Movement of sediment on beach areas forms part of natural geomorphological process, however changes in weather including more extreme storm events can result in a greater loss of sediment from our beaches.

6.4.2. The toe of the dune is defined as where the dune and beach separate, the data collected defines this as the vertical limit of the beach profile that is impacted by wave action. This has been determined by the sum of Mean High Water Spring level, and the wave runup height during 1% exceedance events.

6.4.3. In the case of Lelant Towans, it can be seen from the report that the modelling from 2007-2020 that the dune is retreating (~-0.91m/yr) and losing volume (~-2.59m3/m/yr). Large volume losses were observed at Lelant Towans greater volume loss is observed between September 2009 –March 2011, and between Feb 2016 – April 2017, than was seen during the particularly energetic winter of 2013-14.

Please note that the p-value shows how likely the observed data would be if there were no real effect: small p-values (close to 0) suggest the data are unlikely under that assumption, and large p-values (close to 1) suggest the data are compatible with no effect. In this case both p-values are 0.01 and so the results are statistically significant.

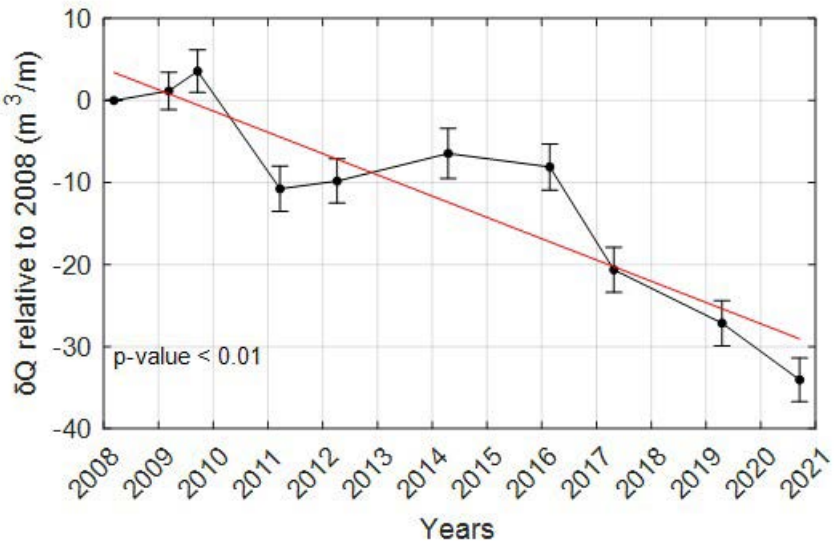


Figure 17: Time series change for change in dune volume at Lelant from 2008 -2021

6.4.4. Figure 17 shows the change in dune volume, as calculated from LiDAR data, relative to 2008. The black dots indicate the change in volume relative to the 2008 baseline, the error bars show the variation within the data and the red line shows the linear regression. The graph shows an overall decline in dune volume, reaching approximately 34 m³/m below the 2008 baseline by 2020, with particularly notable losses between 2009–2011 and 2016–2017.

6.4.5. Figure 18 shows the change in dune toe position relative to 2008, derived from LiDAR data. Again, the black dots indicate the change relative to the 2008 baseline, the error bars show the variation within the data and the red line shows the linear regression. The graph indicates an overall landward retreat of the dune toe, which was approximately 10 m landward of its 2008 position by 2019, with a maximum recorded retreat of approximately 18 m in 2017.

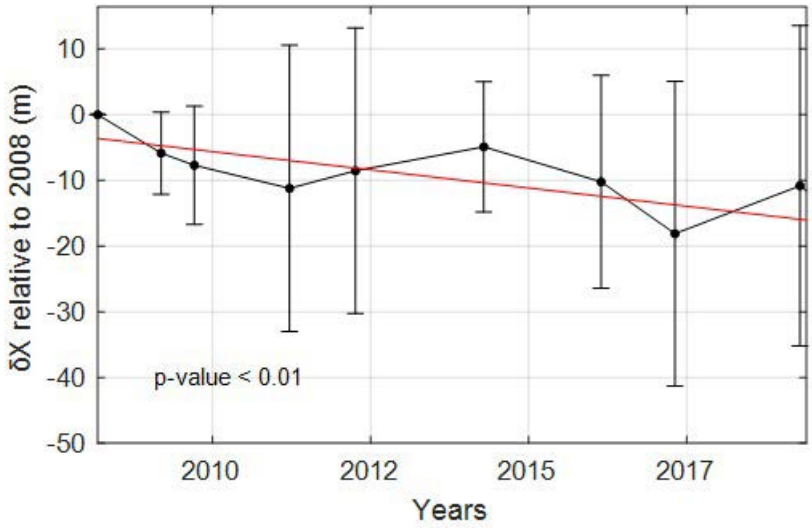


Figure 18: Time series change for change in dune toe at Lelant 2008-2019

6.5. Predicting future change

National Coastal Erosion Risk Mapping (NCERM)

6.5.1. The National Coastal Erosion Risk Mapping (NCERM) is an initiative by the Environment Agency to project areas in England at risk from coastal erosion. The latest dataset was updated in 2024 and published in early 2025 (data.gov.uk).

6.5.2. This mapping provides a baseline of coastal erosion for the coastline of England. The national coastal erosion risk map (NCERM) shows the areas at risk of coastal erosion until 2105. Predicting the exact position of an eroding shoreline over time is difficult. The influence of sea level rise on erosion rates in the longer term is also uncertain. The rate of erosion can vary depending on the geology and the natural processes at the coast. Hard rocks are worn away slower than softer material such as sand. This means erosion may not be the same along a stretch of coast.

6.5.3. Erosion risk zones displayed on the map include the area between the backshore feature (such as a cliff) and the Mean High Water Spring (MHWS) tidal position. These are shown for three climate change scenarios:

6.5.4. Present Day (2020) – uses historical erosion rates to provide future projections without calculating any impacts of climate change and rising sea levels. Shown in Figure 19 and Figure 20 as beige.

6.5.5. Climate Change Higher Central –uses sea level rise data from 70th percentile (UK Climate Projections 2018 (UKCP18) Representative Concentration Pathway (RCP)8.5 climate projection. Shown in Figure 19 and Figure 20 as light purple.

6.5.6. Climate Change Upper End – uses sea level rise data from 95th percentile UKCP18 Representative

Concentration Pathway (RCP) 8.5 climate projection. Shown in Figure 19 and Figure 20 as dark purple.

6.5.7. This means using the Climate Change Upper end as an example, that 95% of the possible scenarios fall below this level, while 5% fall above it. The RCP 8.5 value is a scenario used in climate modelling that considers the continued growth and production of greenhouse gas emissions. When planning for coastal change these worst-case scenarios, through more precautionary, help ensure that coastal management is, in the longer term, more resilient.

6.5.8. Unless otherwise stated, the erosion risk zones are based on the scenario that the Shoreline Management Plan (SMP) policy for the area has been delivered. A change in the policy, or the ability to deliver the policy intent, may affect the erosion projections.

6.5.9. The map provides the best estimate of coastal erosion risk at a national scale. It uses the best available national and local data along with methods which can be applied at a national scale. The erosion projections associated with NCERM are intended for guidance and cannot provide details for individual properties. The NCERM data considers the predominant risk at the coast and frontages considered to be more at risk from flood risk or areas of complex cliff are not always included.

National Coastal Erosion Risk Map Projections (NCERM)

6.5.10. The NCERM projection lines show the latest projected erosion lines based on a range of different scenarios. For the example of modelling how this may impact the mapped habitats, the projections of 'No Future Intervention' for the long term (to 2105) have been used.

6.5.11. The area at risk of coastal erosion for Lelant under No Future Intervention with Present Day Climate is 26m by 2055 and 64m by 2105, for Climate Change Higher Central it is 39m (2055) and 124m (2105) and for Climate Change Upper End it is 43m (2055) and 143m (2105) see Figure 19 and Figure 20.

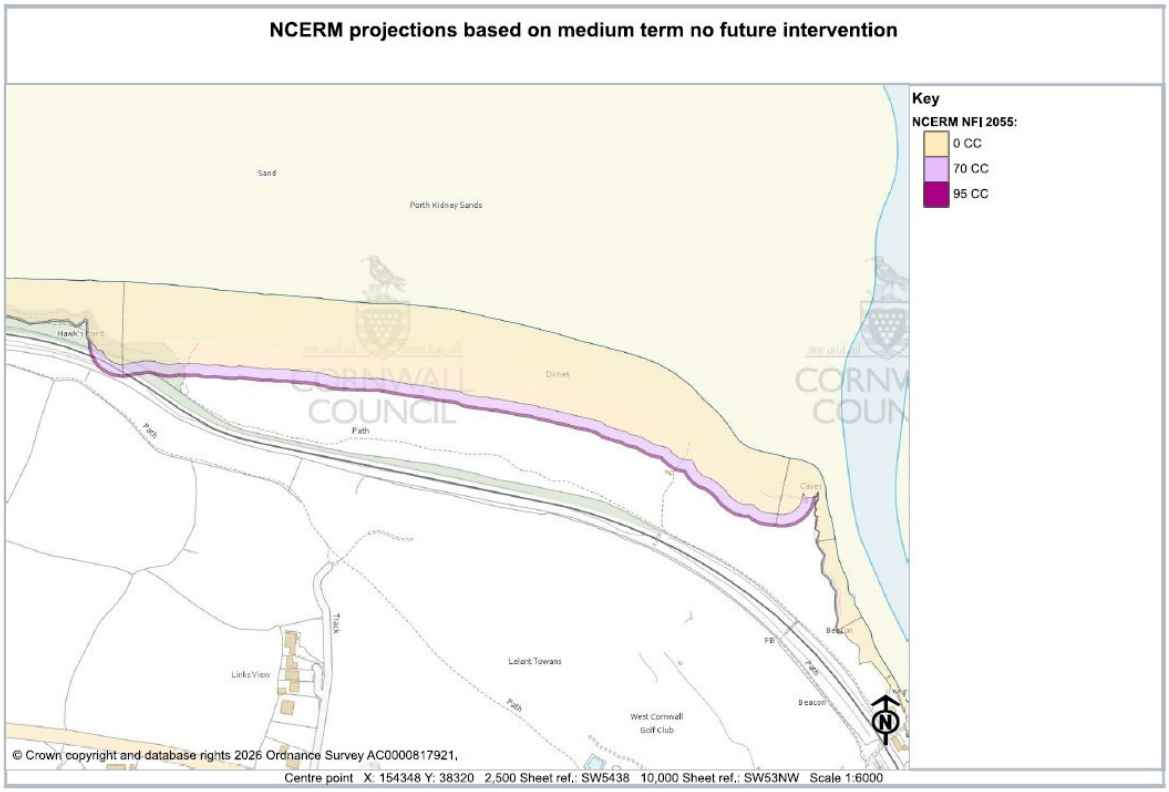


Figure 19: NCERM medium term projections, based on no future intervention

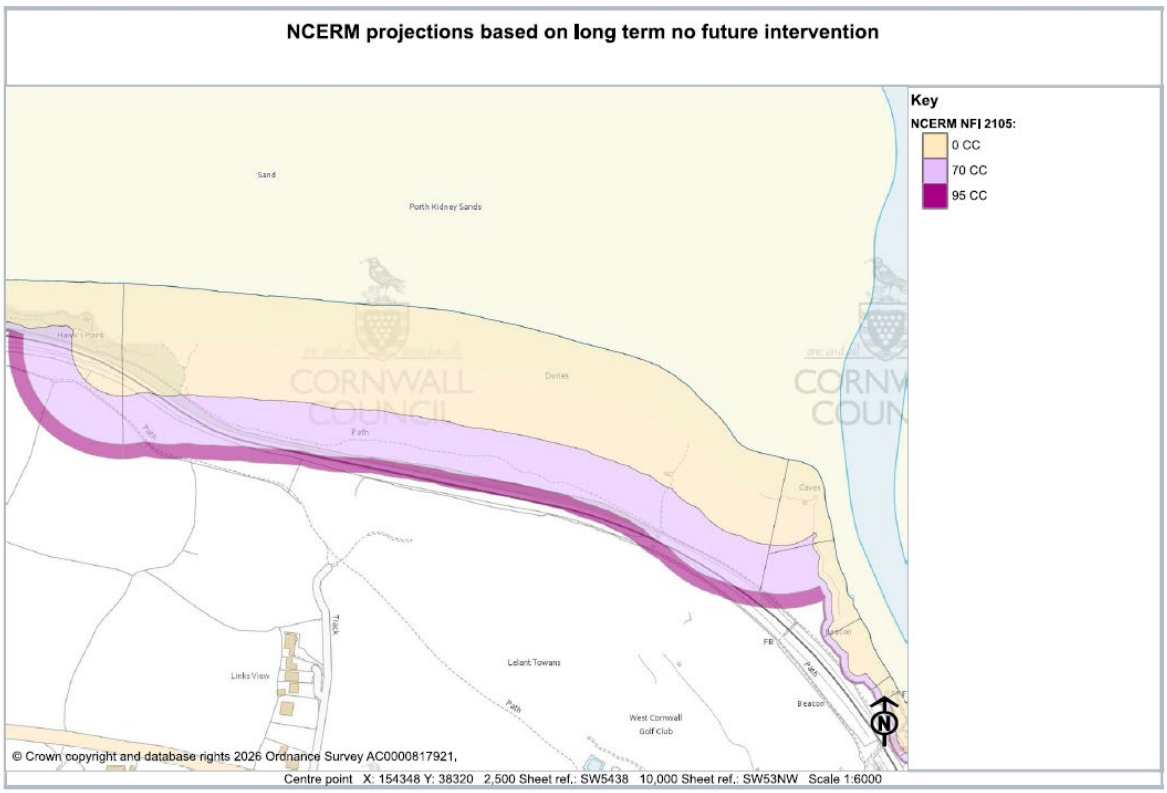


Figure 20: NCERM long term projections, based on no future intervention

Bruun Rule Projections

6.5.12. As part of the Making Space for Sands project, the University of Plymouth have analysed 31 dune systems within the Making Space for Sand project, full results can be seen in the Dune Evolution Report and accompanying paper 'Predicting dune evolution on a regional scale for coastal management' (Brodie et al 2025). The main aim of the paper is to develop and evaluate an approach for coastal managers to predict the future position of the beach-dune interface as a result of sea level rise (SLR) along a varied coastline.

6.5.13. To achieve this aim, the following objectives have been set:

- quantify dune change (dune toe position and dune sediment volume) for 31 Cornish dune sites using airborne LiDAR;
- develop a robust methodology for extracting the environmental parameters required for applying the Bruun Rule;
- apply the Bruun Rule to 31 Cornish beach-dune sites;
- relate the historic rates of dune change with the Bruun Rule predictions; and
- evaluate the use of the Bruun Rule in combination with historic rates of retreat for predicting the impact of SLR on dune systems on a regional scale

6.5.14. In the case of Lelant Towans, the estimated retreat rate using the Bruun Rule is ~0.26 m/year, with the modelling indicating a total retreat of ~33 m from the 2020 dune toe position by 2100, based on the 50% confidence estimate.

6.5.15. At Lelant Towans, both dune volume and dune toe position show an overall erosional trend, indicating ongoing sediment loss and landward retreat of the dune frontage.

6.5.16. Where projections and modelling take place, a 'confidence interval' is applied. The confidence interval is a range of values in which the true value lies. In the case of the Bruun rule projections, where there is a 5% confidence, this indicates a low probability of this occurrence, whereas a 95% confidence indicates an almost certain chance. The Bruun rule projection lines are shown at 50% confidence, meaning that there is an equal chance of the dune to retreating to this point as not, with the 90% interval applied (the range from 5%-95%).

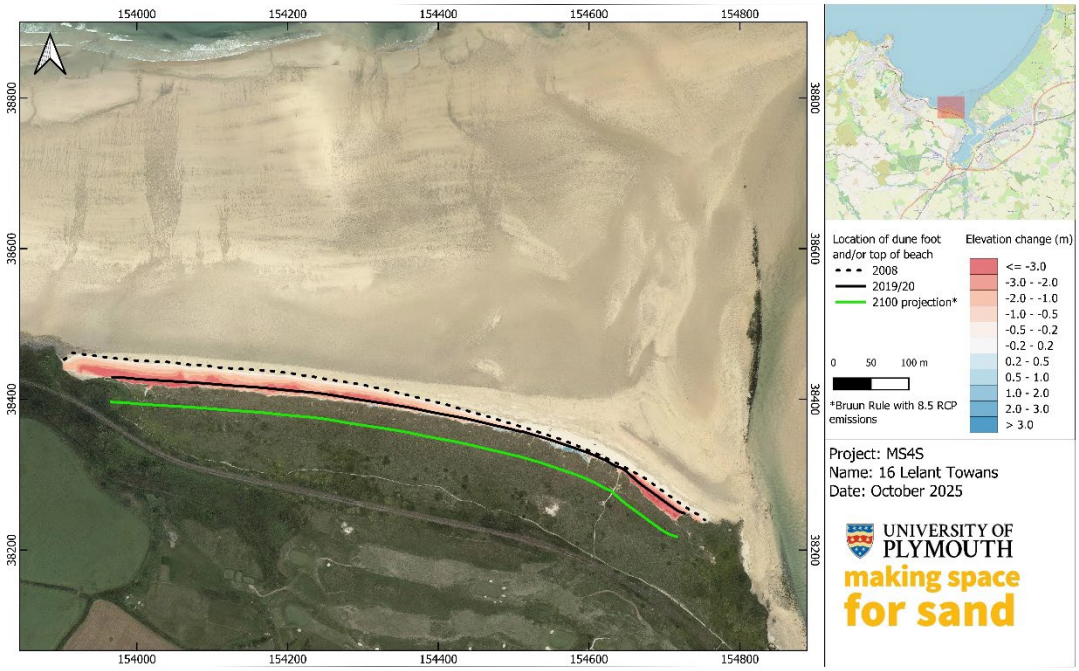


Figure 21: Elevation changes, historic dune toes and Bruun Rule projection lines for Lelant

6.5.17. The visual presented in Figure 21 shows projected changes in elevation and the dune toe at Lelant Towans.

6.5.18. The areas of pink show a decrease in elevation from erosion of sediment, the small areas of blue, to the centre and east of the dune, show an increase in elevation. The visual shows that largely, across the length of the current dune toe, there will be a decrease of sediment from the beach area. The deeper the shade of red or blue, the greater the level of erosion or accumulation.

6.5.19. The dotted black line shows the dune toe location in 2008, the solid black line marks the edge of the dune toe and/or the top of the beach as seen by data collected in 2019/2020.

6.5.20. The solid green line marks the projected rate of erosion by 2100 at 50% confidence, by using the Bruun Rule. This assumes the highest baseline climate change scenario where emissions continue to rise throughout the twenty-first century, Representation Concentration Pathway (RCP 8.5).

6.6. Habitat loss from modelling predictions

6.6.1. By using modelling and the baseline habitat data, predictions in habitat loss can be calculated.

Table 5: Projected Habitat Loss and Retention from NCERM Mapping

Habitat Type	Area Loss	% Loss	Area Retained	% Retained
Dense scrub	1.19	100	0	0
Bramble scrub	0.05	100	0	0
Mixed scrub	0.71	99	0.007	0.9
Maritime Cliffs and Slopes	0.04	100	0	0
Embryonic dunes	0.08	100	0	0
Shifting dune with marram	0.17	100	0	0
Dune grassland	6.23	99.89	0.007	0.1
Total	8.46	99.83	0.014	0.17

* Figures may not add up to 100 due to rounding errors

6.6.2. Analysis of the mapped habitat information (Table 5) shows that under the NCERM long term, no future intervention scenario there will be a loss of 8.46ha of habitat, 99.83% of the land mapped. Within this, a total of 6.48ha of dune habitat is at risk of being lost.

6.6.3. The exercise of predicting habitat loss from projections is repeated below, made under the Bruun rule projections.

6.6.4. Using the predicted dune toe line from the Bruun rule data, the potential habitat loss up to 2100 can be estimated.

6.6.5. If this prediction were to hold true, a total habitat loss is projected to be 2.41ha.

Table 6: Habitat Loss and Retention for Lelant from the Bruun Rule

Habitat Type	Area Loss	% Loss	Area Retained	% Retained
Dense scrub	0.102	8.5	1.09	91.5
Bramble scrub	0	0	0.04	100
Mixed scrub	0	0	0.71	100
Maritime Cliff and Slopes*	0.04	100	0	0
Embryonic dune	0.08	100	0	0
Shifting dune with marram	0.15	90.8	0.02	9.1
Dune grassland	2.03	32.5	4.21	67.5
Total	2.41	28.38	6.09	71.62

* Numbers may not add up to 100 due to rounding errors

6.6.6. The loss and retention data from the Bruun Rule projections draws few parallels to that of the NCERM projections, the following limitations must be considered when comparing the data:

- The projections are from two different scenarios – NCERM showing no future interventions, at 5% confidence up to 2105 and Bruun being 50% confidence up until 2100.
- Bruun Rule projections are limited to the sandy dune frontage. Where the projected retreat line terminates within the mapped habitat area, it has therefore been extended to the boundary of the study area to enable calculation of potential habitat loss.

6.6.7. When comparing both data sets, there is a much greater proportion of habitat loss from the NCERM projections, with an almost complete loss of the entire dune area. The NCERM, however, predicts a total loss of embryonic dune, and a 90% loss of shifting dune, and only a 32% loss dune grassland is predicted to be retained.

6.6.8. The extension of the Bruun Rule projection has resulted in the mapped loss of cliff habitat; however, this should be treated with caution, as cliff response to coastal erosion will differ from that of the sandy dune system and is not directly represented by the Bruun Rule modelling.

6.6.9. The modelling indicates that Lelant is likely to experience continued coastal erosion and landward adjustment over the longer term, although the scale of predicted habitat loss varies considerably between the two approaches. The Bruun Rule indicates a more gradual retreat of the sandy dune frontage, with approximately 2.41 ha of the 8.5 ha mapped habitat area potentially lost, whereas the NCERM projection encompasses almost the entire mapped habitat area. Despite this difference, both approaches indicate increasing pressure on the beach–dune system as sea levels rise and the shoreline retreats. Maintaining space for natural landward migration and allowing the dune system to respond dynamically to coastal change will therefore be important in retaining its long-term resilience and coastal protection function.

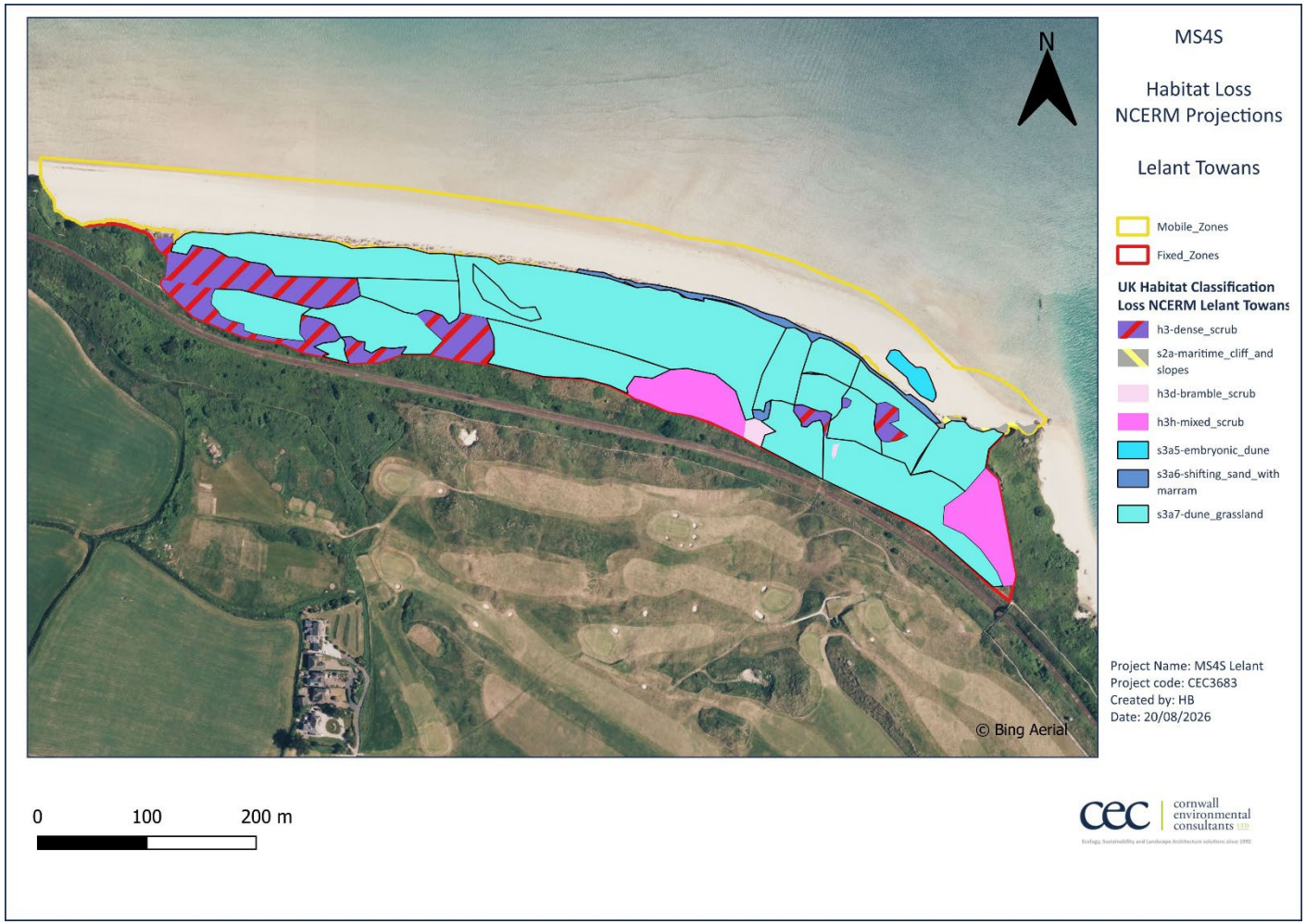


Figure 22: Projected Habitat Loss (NCERM)



Figure 23: Projected Habitat Retention (NCERM)

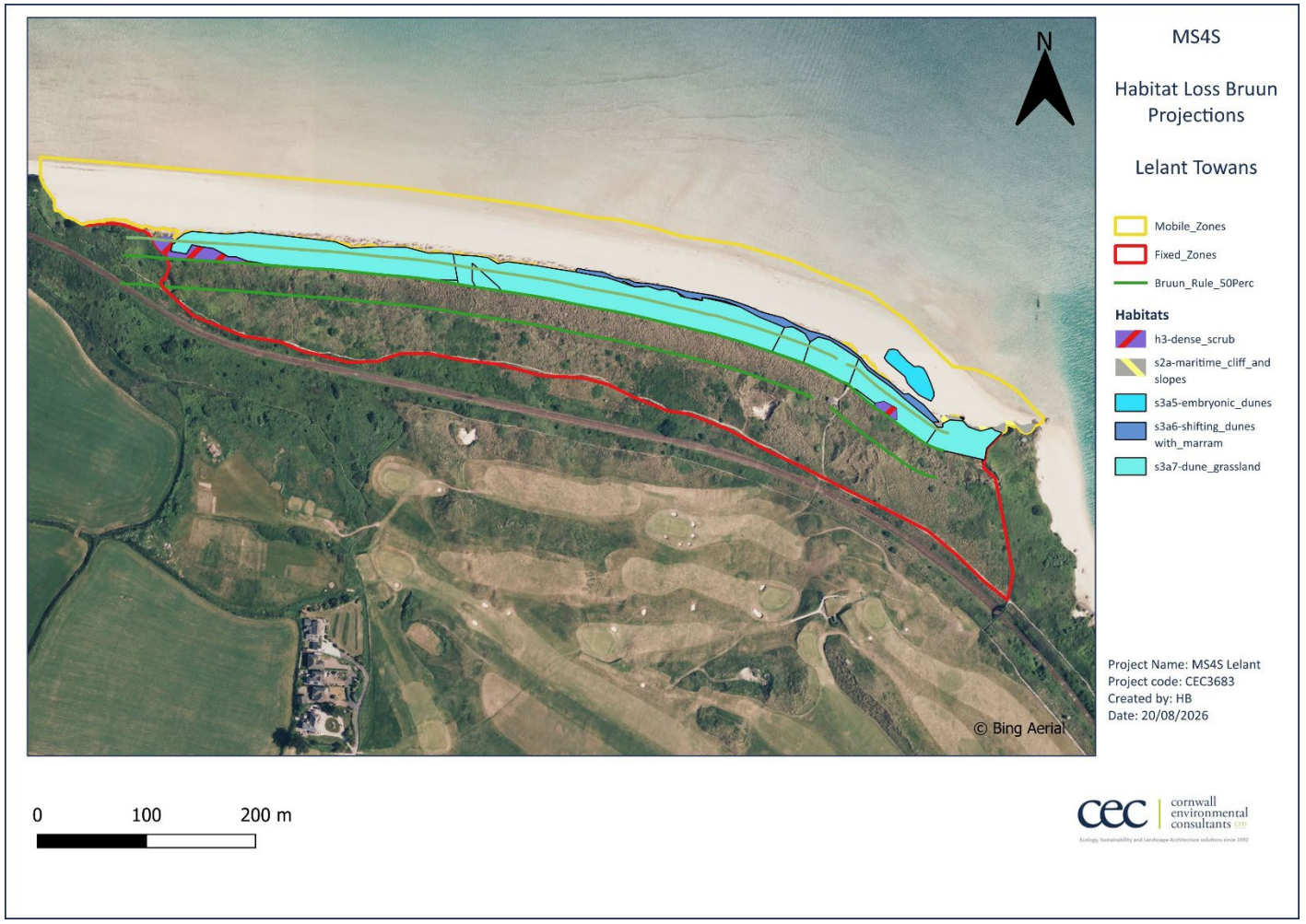


Figure 24: Projected Habitat Loss (Bruun Rule)

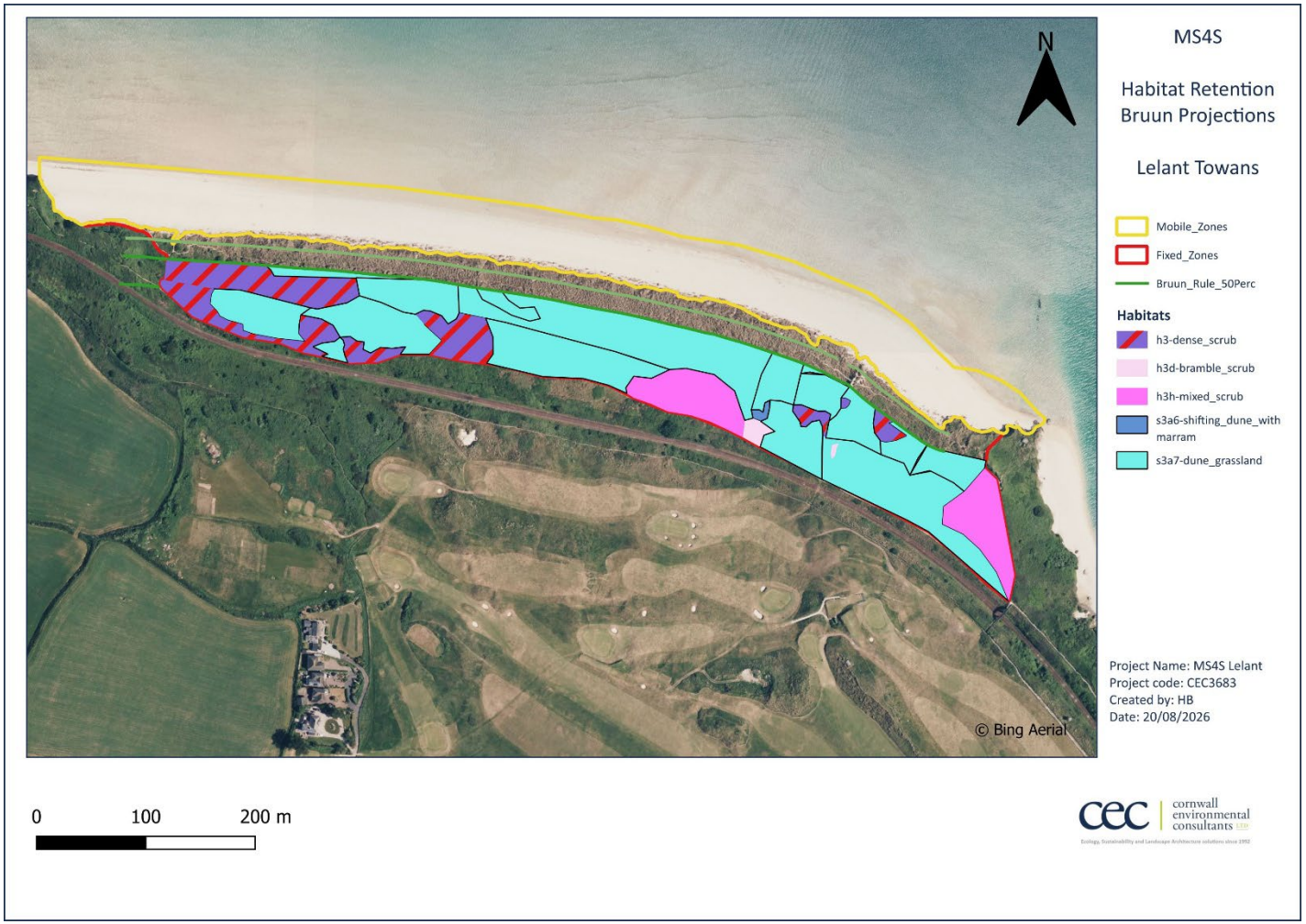


Figure 25: Projected Habitat Retention (Bruun Rule)

6.7. Infrastructure at risk

6.7.1. A map showing the relationship between the projected NCERM erosion extents and adjacent infrastructure is provided below in Figure 26.

6.7.2. At Lelant, the projected NCERM erosion extents encompass a substantial area of the golf course and extend towards sections of the St Erth to St Ives railway line, which runs landward of the dune system. These assets have different functions and levels of vulnerability; however, the modelling indicates that continued coastal retreat could increasingly affect their operation and use. In particular, the proximity of the railway highlights the potential for longer-term coastal change to affect strategically important transport infrastructure.

6.7.3. It is important to note that the NCERM projections represent potential future erosion extents rather than the point at which impacts will first occur. As the coastline retreats towards the projected extents, infrastructure may experience increasing coastal influence, including erosion, storm damage, changes in drainage and disruption to access or operation. Infrastructure may therefore be affected before the projected erosion extent directly reaches an asset. The NCERM projections should consequently be used as a strategic indicator of future risk and to inform long-term adaptation planning.

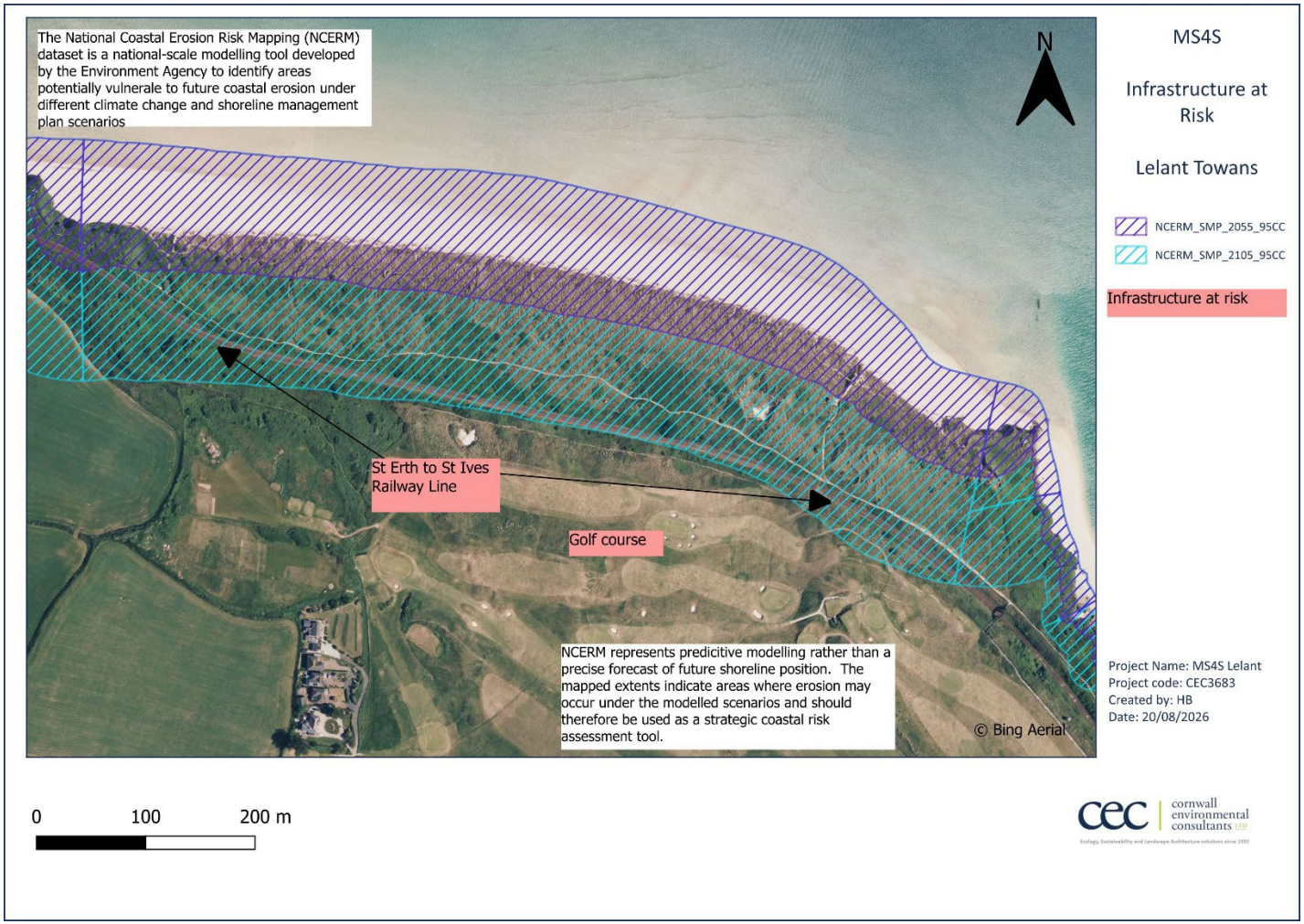


Figure 26: Infrastructure at risk Lelant Towans

7. Management Plans

Full details for the timelines for management and seasonal restriction can be found in the document CEC3683 Beach Dune Management Plan Strategic Overview.

7.1. Strategic Context and Vision

7.1.1. Lelant lies within a dynamic coastal environment where the dune system is already experiencing sediment loss and landward retreat. The dunes are relatively narrow and are constrained landward by the St Erth to St Ives railway line and the adjoining golf course. Management must therefore balance the ecological benefits associated with natural dune processes against the need to avoid unnecessarily increasing instability where this could affect strategically important infrastructure.

7.1.2. The Shoreline Management Plan establishes a No Active Intervention approach for PU27.1 Porth Kidney, with a sub-policy of No Need to Defend, reflecting the absence of assets requiring protection, and Managed Realignment for PU27.2 Lelant Towans, with a sub-policy of Placeholder, indicating that the policy remains subject to further assessment and review. In the longer term, both approaches recognise that some landward adjustment of the coastal system is likely to occur. Management within the dune system should therefore avoid unnecessary artificial stabilisation while also avoiding interventions that deliberately accelerate dune mobility adjacent to the railway.

7.1.3. In accordance with the SMP, the long-term management approach at Lelant Towans is to:

- retain and enhance a functioning mosaic of embryonic dune, shifting dune, dune grassland and appropriate dune scrub;
- manage scrub selectively where it is reducing dune habitat quality, while retaining areas that provide ecological value or where clearance could increase erosion risk;
- monitor invasive non-native species and prevent encroachment onto the dunes;
- allow natural sediment movement and dune adjustment where this can occur without creating unacceptable risk to the railway, while recognising that longer-term infrastructure adaptation may ultimately be required to accommodate continued coastal retreat;
- use monitoring to identify changes in dune condition, erosion and infrastructure risk and adapt management accordingly; and
- coordinate future management with the existing site manager, Network Rail, the golf course and relevant statutory bodies where their interests may be affected.

7.2. Baseline Condition and Key Issues

7.2.1. The majority of the mapped site comprises dune grassland, with the active shifting dune restricted to a narrow strip along the seaward frontage. Scrub accounts for a substantial proportion of the remaining habitat and becomes increasingly dominant in some areas. The principal management issues are therefore the restricted width of the shifting dune, scrub encroachment, invasive non-native species and the limited opportunity for unrestricted landward dune migration.

Habitat condition and scrub encroachment

7.2.2. Dune grassland forms the dominant habitat and includes areas of shorter, more species-rich vegetation as well as less diverse marram-dominated stands. Dense and mixed scrub is locally extensive and has the potential to further stabilise the dune, increase organic matter within the substrate and reduce the extent and diversity of open dune habitats.

7.2.3. Scrub should not, however, be regarded as universally undesirable. It can provide valuable habitat for birds and other species and may also contribute locally to dune stability. Scrub management should therefore be selective and informed by ecological objectives, with priority given to preventing further expansion into higher-value open dune habitat rather than seeking wholesale removal.

7.2.4. The invasive non-native species New Zealand flax has previously been recorded within the dune system although was not found on the most recent survey, however, it was recorded on adjoining land, alongside other non-native invasive species. Management should therefore focus on preventing the establishment and spread of invasive non-native species (INNS) within the dune system, with particular attention given to potential colonisation from neighbouring land.

Coastal erosion and infrastructure constraints

7.2.5. Monitoring and modelling indicate an ongoing erosional trend, including loss of dune volume and landward movement of the dune toe. The railway immediately landward of the dunes significantly limits opportunities for unrestricted dune roll-back.

7.2.6. Management should therefore seek to retain the ecological resilience of the existing dune system without undertaking measures specifically intended to create substantial new areas of mobile sand or deliberately destabilise the frontal dune. Any intervention that could materially alter sediment movement or increase erosion close to the railway should be discussed with Network Rail and appropriate coastal specialists before implementation.



Figure 27: Lelant dune system is constrained by the St Erth to St Ives train track

7.2.7. Excessive sand movement could also present a risk to the railway, with wind-blown sand potentially accumulating on the tracks and affecting railway operations, drainage and maintenance requirements.

Management should therefore avoid creating extensive areas of bare sand or removing vegetation that currently helps limit sand movement towards the railway. Small-scale disturbance may still be appropriate in selected locations where it would benefit dune habitats without increasing risks to railway infrastructure.

7.2.8. The Bruun Rule and NCERM projections indicate differing timescales for potential coastal retreat at Lelant. While the Bruun Rule suggests that significant landward retreat may occur over a relatively long period, NCERM indicates that erosion could affect areas close to the railway considerably sooner. Neither projection should be regarded as a definitive indication of when the railway may become vulnerable, particularly as individual storm events could result in substantial erosion over a short period. Management should therefore recognise that the viability of retaining the railway in its current position may need to be reviewed earlier than suggested by longer-term projections, with monitoring used to inform decisions on future adaptation.

7.3. Required Consents and Coordination

7.3.1. The site lies within the Hayle Estuary and Carrack Gladden SSSI and management activities should be reviewed against the requirements of the designation. Appropriate consent or assent should be obtained where required before works commence.

7.3.2. Land manager approval will be required for practical works.

Works Adjacent to the Railway

7.3.3. Any proposed management works close to the railway at Lelant should be discussed with Network Rail at an early stage where they could affect railway infrastructure or operational safety. This includes scrub and vegetation clearance, excavation, ground disturbance and activities that could destabilise the dunes, increase wind-blown sand or affect railway drainage and embankments.

7.3.4. Network Rail's Asset Protection and Optimisation (ASPRO) team should be consulted to establish whether formal consent, an asset protection agreement or additional safety measures are required. Depending on the nature and proximity of the works, requirements may include site-specific risk assessments and method statements, restrictions on machinery and access, protection of underground services, and arrangements for working safely near operational railway infrastructure. Works must not encroach onto railway land without the necessary authorisation, and machinery, equipment and vegetation must not be allowed to obstruct or endanger the railway.

7.3.5. Particular care should be taken when removing vegetation close to the railway, as established root systems may contribute to the stability of dune slopes and embankments. Large-scale clearance or activities intended to increase sand mobility should not be undertaken where these could compromise railway safety or infrastructure.

7.3.6. Any future proposal involving the realignment or relocation of the railway would require substantial additional feasibility assessment and consultation with Network Rail, relevant landowners and other stakeholders. This would need to consider potential effects on adjacent land uses, including the golf course, as well as the nearby SSSI and any associated ecological consenting requirements. Such proposals are beyond the scope of routine dune management recommended within this plan.

7.3.7. Further information on working near railway infrastructure is available from Network Rail's Asset Protection and Optimisation team: https://www.networkrail.co.uk/our-work/looking-after-the-railway/asset-protection-and-optimisation/

7.4. Past / Recent Management and Management Constraints

7.4.1. Lelant Towans is currently managed by the RSPB; however, detailed information regarding recent practical habitat management and site-specific conservation objectives was not available during preparation of this BDMP. The RSPB was contacted to seek information on current management activities and priorities, including those relating to birds, but no further information had been received at the time of writing.

7.4.2. Recommendations within this BDMP should complement existing RSPB management arrangements. Prior to significant habitat management being undertaken, the recommendations should be reviewed with the RSPB to ensure that existing conservation objectives, particularly those relating to breeding, wintering and passage birds, are taken into account. The timing and location of works should be adjusted where necessary to avoid conflicts with priority species.

7.4.3. No established community group undertaking regular practical management of the dune system has been identified through the Making Space for Sand project. Consequently, future management should be based primarily on actions that can realistically be delivered by the site manager, contractors or partner organisations. Community involvement may be developed where suitable local interest and capacity are identified but should not be relied upon for the delivery of essential management.

7.5. Future Management

7.5.1. Management of the Lelant dune system must respond to ongoing coastal erosion and scrub encroachment, while recognising the limited space available for landward dune movement due to the St Erth to St Ives railway and adjoining golf course. As the coastline retreats, the railway and adjoining land uses may prevent the dunes from migrating inland, resulting in coastal squeeze and the progressive loss of dune habitat. The Bruun Rule and NCERM projections indicate differing timescales for coastal retreat, with NCERM suggesting that the railway could become vulnerable considerably sooner than indicated by the Bruun Rule. Significant storm events could also accelerate erosion, meaning that adaptation, potentially including inland realignment of the railway, may need to be considered earlier if identified trigger points are reached.

7.5.2. The overarching approach should therefore be to maintain and enhance a resilient, naturally functioning dune system, allowing natural coastal processes and landward adjustment where practicable, while avoiding management that could unnecessarily destabilise the dunes or increase risk to the railway. INNS are not currently considered a significant management issue, although continued surveillance is recommended due to their presence on neighbouring land. Management should complement existing RSPB conservation objectives and be adapted as further information on current site management becomes available.

Table 7: Future Management at Lelant

Action	Short Term	Medium Term	Long Term	Who
Scrub management	Identify areas where scrub is expanding into dune grassland and established scrub where intervention may be required to prevent progression towards dense scrub or woodland. Prioritise small-scale,	Review the response of individual scrub management compartments and extend targeted or rotational management where this has successfully maintained habitat diversity without	Continue adaptive scrub management as the dune system changes. Allow habitat boundaries to adjust naturally in response to coastal retreat rather than attempting to maintain them in	RSPB / Land manager

Action	Short Term	Medium Term	Long Term	Who
	phased management, retaining a mosaic of scrub and open dune habitat and avoiding large-scale clearance, particularly close to the dune frontage and railway. Works close to the railway should be subject to the consultation and consent requirements outlined in Section 7.3.	causing undesirable sand movement.	fixed positions.	
INNS Management	No INNS were recorded within the site during the most recent survey; therefore, active control is currently a low priority. Monitor for colonisation, particularly from known INNS on neighbouring land, and remove new occurrences promptly before they become established.	Continue periodic surveillance, particularly along site boundaries and areas adjoining known off-site INNS. Coordinate with neighbouring land managers where this would help prevent spread onto the dunes.	Maintain surveillance as part of routine habitat monitoring and respond rapidly to any new INNS establishment.	RSPB / land manager; neighbouring landowners where appropriate
Bare sand, access and early successional habitat	Identify suitable locations where existing access and low levels of trampling can be allowed to maintain small areas of bare sand and early successional habitat. Where additional bare sand creation is beneficial, use small-scale interventions in suitable locations away from areas where increased sand movement could affect the railway. Do not routinely plant or stabilise these areas;	Monitor the extent and condition of bare sand and early successional vegetation. Maintain suitable access routes where low-level disturbance is providing ecological benefit and, where necessary, create additional small patches of bare sand to maintain habitat diversity.	Maintain a shifting mosaic of bare sand, early successional vegetation and established dune habitat, allowing individual areas to succeed naturally while using appropriate access or targeted disturbance to provide replacement areas over time. Adapt locations as the dune system changes.	RSPB / land manager

Action	Short Term	Medium Term	Long Term	Who
	allow natural colonisation and succession.			
Railway and infrastructure adaptation planning	Establish liaison with Network Rail and use existing coastal monitoring to track changes in erosion and dune morphology in relation to the railway. Begin development of an **adaptation plan**, identifying potential trigger points for when further investigation or intervention may be required.	Review and develop the adaptation plan as monitoring improves understanding of coastal change including following significant storm events. Consider the feasibility, timing and implications of different adaptation options before erosion presents an immediate risk to the railway. Avoid dune management measures that could unnecessarily increase risk to the railway.	Implement the appropriate adaptation response if identified trigger points are reached. In accordance with the SMP, this could ultimately include **inland realignment of the affected section of railway** where maintaining its existing position is no longer sustainable. Any future realignment should consider opportunities to provide additional space for natural dune roll-back and habitat development.	Network Rail with relevant landowners / coastal authorities / ecological and coastal specialist advice
Monitoring and adaptive management	Establish fixed-point photography and record habitat condition, scrub and INNS extent, erosion features and significant sediment movement. Review existing RSPB monitoring where available to avoid duplication	Review results periodically and modify management techniques and priorities in response to ecological and geomorphological change.	Continue long-term monitoring to identify when changes in coastal processes, habitat distribution or infrastructure risk require a change in management approach.	RSPB / land manager with ecological and coastal specialist input
Signage and interpretation	Consider discreet interpretation at existing access points only where there is a clear benefit in explaining dune habitats or management. No additional signage is currently required for access management.	Review the need for interpretation if recreational use or management requirements change.	Provide or adapt interpretation only where future changes in access, coastal processes or habitat management justify it.	RSPB / land manager

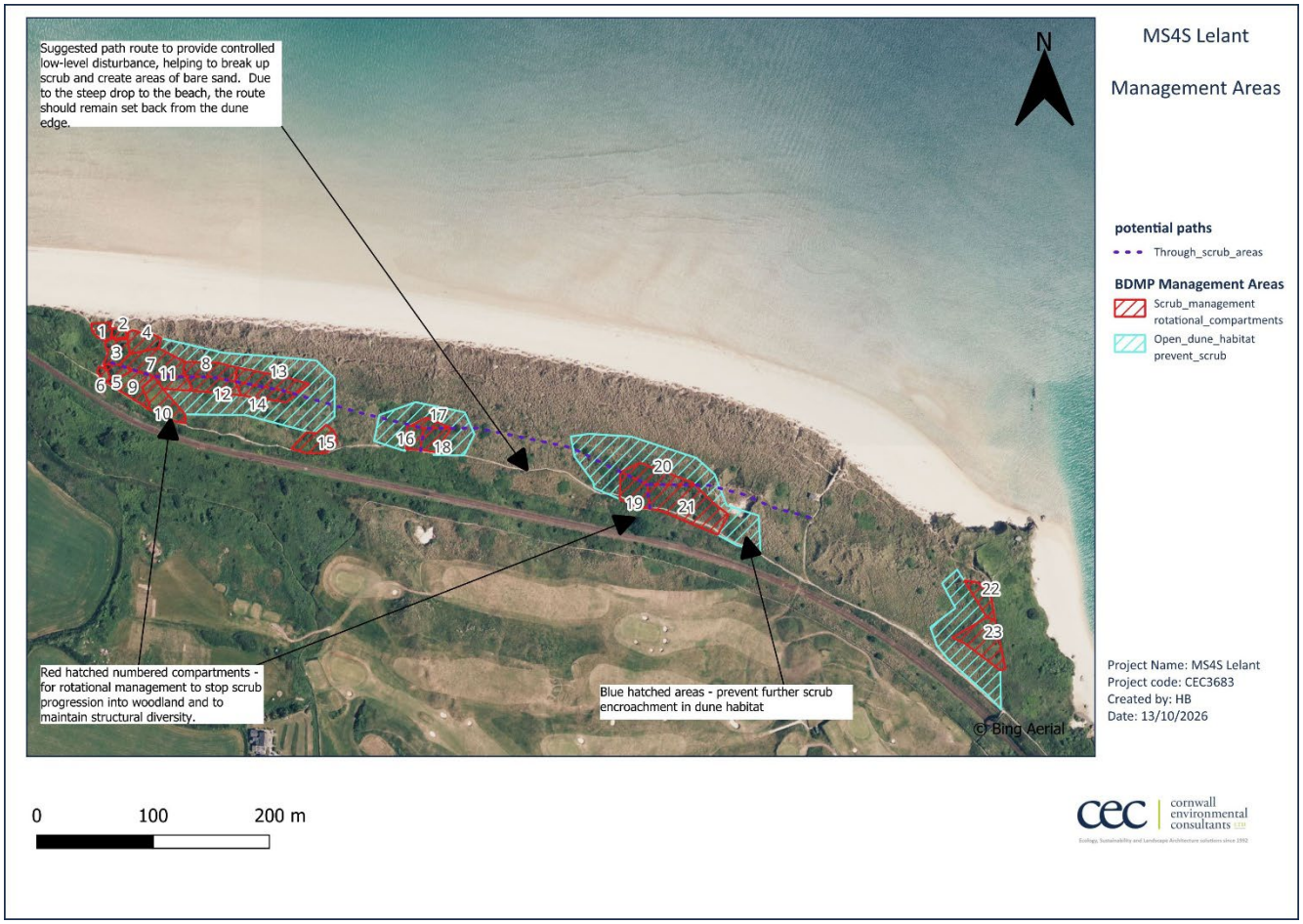


Figure 28: Management Areas

7.6. Short-Term Management

7.6.1. Short-term management should focus on improving habitat diversity within the existing dune system while avoiding interventions that could increase instability close to the railway or steep seaward dune edge. Management should initially be small-scale and targeted, with monitoring used to inform subsequent works.

Scrub Management

7.6.2. Large-scale scrub clearance is not recommended; instead, scrub should be selectively reduced and managed to prevent further encroachment into dune grassland and shifting dune habitat, while periodic management of selected compartments should maintain a varied age and structure and prevent the development of extensive dense scrub or progression towards woodland.

7.6.3. Management should retain a mosaic of scrub and open dune habitat, with irregular and scalloped edges created where appropriate to increase habitat diversity and provide a gradual transition between scrub and open dune vegetation.

7.6.4. Numbered scrub compartments are identified on the Management Areas Plan (Figure 28). Where resources and suitably trained personnel are available, selected compartments should be managed over an indicative five-year cycle (Table 8) with works distributed across the site so that adjoining

compartments are not managed within the same year.



Figure 29: Scrub to be managed so as not to encroach on dune habitat

7.6.5. The five-year rotation should be regarded as an indicative framework rather than a requirement to manage every compartment within that period. The extent of works undertaken each year should reflect available resources, ecological need and the response of previously managed areas. Where resources are limited, priority should be given to areas where scrub is actively expanding into dune grassland or shifting dune habitat. Where brush cutters are used, works should only be undertaken by appropriately trained and competent personnel. Before works commence, the necessary landowner approvals, ecological consents and, where relevant, Network Rail requirements should be confirmed in accordance with Section 7.3.

Table 8: Indicative five-year scrub management rotation refer to Figure 28

Year	Compartments proposed for management
Year 1	1, 6, 11, 16, 21
Year 2	2, 7, 12, 17, 22
Year 3	3, 8, 13, 18, 23
Year 4	4, 9, 14, 19, 24
Year 5	5, 10, 15, 20, 25



Figure 30: Scrub to be managed rotationally

Bare Sand and Access

7.6.6. Existing low levels of recreational access should be viewed as an opportunity to provide beneficial small-scale disturbance rather than as a significant pressure on the dune system. A potential informal route through areas of scrub is identified on the Management Areas Plan (Figure 28). If implemented, this could help break up continuous scrub, expose small areas of bare sand and provide opportunities for early successional dune vegetation to develop.



Figure 31: Path creating areas of bare sand

7.6.7. Any new route should remain well set back from the seaward dune edge due to the steep drop to the beach. Its location should be agreed with the land manager and assessed for potential effects on the railway before implementation. Bare areas created through access or management should generally be

allowed to recolonise naturally, with subsequent monitoring to ensure that management does not result in excessive wind-blown sand affecting railway infrastructure.

INNS

7.6.8. No INNS were recorded within the site during the most recent survey and active control is therefore a low priority. Periodic checks should nevertheless be undertaken, particularly close to site boundaries, to identify colonisation from INNS present on neighbouring land. Any new occurrences should be controlled at an early stage before they become established.

Signage and Interpretation

7.6.9. Recreational pressure at Lelant is relatively low, although the South West Coast Path runs along the top of the dunes. Additional signage is not currently considered necessary for access management. However, opportunities for discreet interpretation, such as a small sign or QR code at an existing access point, could be considered where this would help explain the importance of the dune habitats, coastal processes and the purpose of management activities.

Monitoring and Railway Adaptation

7.6.10. Existing coastal monitoring should continue to be reviewed alongside fixed-point photography and habitat monitoring to identify changes in dune morphology, erosion, scrub extent and habitat condition. Liaison with Network Rail should begin to ensure that coastal change affecting the dune frontage and its relationship with the railway is considered sufficiently early within future infrastructure planning.

7.6.11. An adaptation plan should be developed for the section of railway potentially affected by future coastal retreat. This should identify appropriate monitoring and trigger points at which more detailed assessment of future options would be required, rather than waiting until erosion presents an immediate risk to the railway.

7.7. Medium-Term Management

7.7.1. Medium-term management should be adaptive, using the results of the initial management and monitoring to determine whether interventions are achieving the desired increase in habitat diversity without causing undesirable dune instability.

Scrub and Bare Sand Management

7.7.2. Review the effectiveness of scrub management within the identified compartments and continue selective removal where scrub is encroaching into dune grassland or reducing habitat diversity. Where initial management has been successful, additional compartments may be managed on a phased and rotational basis, informed by the response of previously treated areas and the need to retain a varied habitat mosaic.

7.7.3. Monitor the proposed informal access route and other areas of naturally occurring disturbance to determine whether they are successfully maintaining small areas of bare sand and early successional vegetation. Where beneficial, low-level disturbance should be allowed to continue. Additional small areas of bare sand may be created where required, provided this would not increase instability towards the railway or seaward dune edge.

7.7.4. Allow individual bare areas to recolonise naturally rather than maintaining the same areas permanently. Where necessary, new areas of disturbance can be introduced elsewhere to maintain a changing mosaic of bare sand, early successional vegetation and established dune grassland.

INNS and Interpretation

7.7.5. Continue periodic surveillance for INNS and respond promptly to any new colonisation. Any future need for interpretation should be reviewed in response to changes in recreational use or management requirements, with additional signage only considered where there is a clear benefit.

Coastal Change and Infrastructure

7.7.6. Continue to review coastal monitoring in relation to the railway. The railway adaptation plan should be periodically updated as understanding of coastal change improves, including review of the identified trigger points and the feasibility of potential adaptation options. This should enable longer-term decisions to be considered before emergency intervention becomes necessary.

7.8. Long-Term Management

7.8.1. Long-term management should recognise that the position and composition of the Lelant dune system will continue to change in response to coastal processes and sea-level rise. The objective should be to retain a resilient and diverse dune system rather than attempting to maintain existing habitat boundaries or the present shoreline position indefinitely.

Habitat Management

7.8.2. Continue adaptive scrub management to prevent excessive stabilisation, progression of scrub to woodland and loss of open dune habitat, while retaining a mosaic of scrub, dune grassland, early successional vegetation and naturally occurring bare sand. Management areas should change in response to the evolving dune system rather than remaining fixed to those identified on the current Management Areas Plan.

7.8.3. Access routes should similarly be allowed to adjust as the coastline changes. Routes affected by erosion or changes in dune morphology should be relocated where necessary, with opportunities for low-level disturbance to continue contributing to habitat diversity where this can be achieved safely.

Coastal Adaptation and Railway

7.8.4. If monitoring indicates that continued coastal retreat is approaching a point at which the resilience or safe operation of the railway may be affected, the appropriate response identified through the adaptation planning process should be progressed in conjunction with Network Rail and the relevant coastal authorities.

7.8.5. Depending on the rate of coastal change and the findings of adaptation planning, future measures could include inland realignment of the affected section of railway where maintaining it in its existing position is no longer sustainable. Any future realignment should consider opportunities to provide additional space for landward dune migration and habitat development, alongside engineering, operational, ecological and land ownership requirements.

7.8.6. The management plan should therefore remain a living document, reviewed in response to monitoring, significant coastal change and any future changes to infrastructure or land management. This will allow management to continue supporting natural dune processes while responding appropriately to changing ecological and infrastructure constraints.

8. Appropriate Management Techniques

8.1. Scrub Management

8.1.1. Scrub is the principal vegetation management issue within the Lelant dune system. Scrub forms a valuable component of the habitat mosaic and wholesale removal is not recommended; however, continued expansion could result in the loss of open dune grassland, reduce habitat diversity and, in some areas, allow the development of increasingly dense scrub and progression towards woodland. Management should therefore focus on limiting further spread, particularly where scrub is encroaching into dune grassland or other open dune habitats, while periodically managing established scrub to maintain a varied age and structure. Established scrub has been divided into numbered management compartments, as shown on the Management Areas Plan (Figure 28), to facilitate a phased and rotational approach. Management should be targeted and undertaken on an indicative five-year rotation, subject to available resources and ecological need, with non-adjoining compartments managed where practicable to avoid extensive clearance in any one area. This approach should retain a varied mosaic of scrub, grassland, bare sand and early successional habitat while preventing scrub from becoming increasingly dominant across the dune system.

8.1.2. No INNS were recorded within the dune system during the most recent survey and their management is therefore currently a low priority. However, INNS were present in a previous survey and are present on neighbouring land therefore the site should be monitored for future colonisation. Where INNS become established, many of the physical removal techniques used for scrub may also be appropriate, depending on the species concerned. Particular consideration must be given to the handling and disposal of INNS material to prevent accidental spread and to ensure compliance with relevant waste and biosecurity requirements.

8.1.3. See Table 9 for potential scrub removal methods, which can also be used for INNS removal, and their suitability for use within the Lelant dune system.

Table 9: Scrub Management Techniques

Management Type	Advantages	Constraints	Suitable course of action for the site
Heavy plant	Fast for large areas of invasives Effective at removing large root systems Invasives less likely to grow back Less physically demanding	Requires good site access for machinery Limited by steep slopes Not suitable for sensitive areas – may damage good surrounding habitat Expensive – machinery and operative	No – large scale removal of scrub is not required at this site
Small plant	Fast removal of above ground plant material Effective at weakening persistent species	Limited by very steep slopes May damage surrounding vegetation (but more able to select than heavy	Yes –brush cutters are ideal particularly for the rotational management of

	Minimal set up required Ideal for narrow access	machinery) Require equipment and trained operative Risk of regrowth	scrub. These would also be useful for creating paths through scrub.
Hand digging	Very precise Minimal impact on surrounding vegetation Minimal set up required	Labour intensive Slow progress – can lead to disheartened volunteers Risk of re-growth	Yes – particularly suitable for small-scale, targeted removal of invasive species and young scrub encroaching into dune grassland or other open habitats. Could be undertaken by staff or suitably supervised volunteers where resources allow, but is less appropriate for rotational management of larger areas of established scrub
Herbicide Treatment	Can treat inaccessible areas Effective for persistent species If done correctly (i.e. weed wipe, spot spraying) reduces off-target damage to other dune vegetation. Best used when infestations are localised, preventing the species from forming dense thickets. Less physically demanding	Expensive machinery and operative Risk of poisoning non-target animals and plants if not applied carefully. Timing is restricted to late summer to early autumn due to high leaf area and good herbicide uptake. Chemical use may be limited by site sensitivity, proximity to water, other legal restrictions. Requires careful handling and legal compliance Will need a trained professional to carry out. May need repeat applications Not popular with the public	No – there are no large stands of invasive species for which herbicide treatment would be considered necessary. See sections in 8.1.5 and 8.1.6
Grazing	Good for large areas Can reach rough terrain Can create habitat	Difficult to implement due to high visitor pressure; requires fencing and	Yes – If funding and resourcing were available,

	diversity Low cost compared to machinery	ongoing management; risk of conflict with dog walkers and public access; potential for uneven grazing and trampling in sensitive dune areas	low density goat grazing would be beneficial – to keep the dune / scrub mosaic

8.1.4. As mentioned in the table, herbicides are not recommended for this site, and in general the use of herbicides within dune systems should be considered only as a last resort for the control of invasive non-native species where there is a clear ecological justification. Alternative management approaches should be considered first, and herbicide should only be used where non-chemical methods are unlikely to provide effective control, would result in greater ecological damage, or are not realistically achievable due to site constraints, available resources or the scale of the infestation. Sometimes herbicides are used within designated areas because the habitats are so delicate, and this is the least disruptive way of dealing with invasives, but this should be discussed and agreed by Natural England.

8.1.5. Where herbicide use is deemed necessary, application should be undertaken by trained and certified operators using the minimum quantity required to achieve the management objective. Herbicides should be applied in a highly targeted manner, for example through stump treatment, weed wiping or spot application to regrowth, rather than through broad-scale spraying. This helps minimise impacts on non-target species, reduces damage to surrounding dune vegetation and supports the long-term restoration of naturally functioning dune habitats.

8.1.6. No significant stands of invasive non-native species (INNS) requiring active management were identified within the Lelant dune system at the time of preparation of this BDMP. Consequently, INNS control is not identified as a current management priority. However, the establishment and spread of INNS should continue to be monitored as part of routine site management. Table 10 is included as a reference to provide appropriate removal and disposal methods should INNS become established during the lifetime of the plan.

Table 10: Disposal of Invasive Species

Disposal type	Advantages	Constraints	Suitable course of action for the site
Burying INNS (with permit)	Allows on-site disposal Suitable for rhizomatous plant material such as Japanese rose	Requires an environmental permit. Conditions of permit must be followed. Not suitable for sensitive habitats without permission	No – although space isn't limited, access to bring a digger on site is prohibitive
Burying INNS without permission	Cost effective Avoids need for permit	Must comply with RPS178 conditions Only allowed on land of low habitat value (Sand dunes are not considered low value)	No – as above
Burning INNS on site	Reduces volume of	Requires a D7 exemption	Yes – in winter

	waste Effective for killing plant material so regrowth doesn't occur	Must comply with local byelaws Poor air quality	there is likely to be low visitor access
Composting	Low cost On site disposal	Not suitable for some INNS as some fragments may survive composting and regrow – therefore monitoring is required	Yes – Only within an area of lower value habitat (scrub)
Off-site disposal (licenced waste carrier)	Most secure and compliant disposal method Suitable for contaminated soil and plant material Full audit trail via waste transfer notes	Requires use of a licensed waste carrier Waste must be taken to an authorised landfill or disposal site. Higher cost	Yes – suitable for large scale disposal
NB. Never chip invasive species, many of them can regenerate from small pieces.			

8.2. Marram planting and other salt tolerant species

8.2.1. Following scrub management, disturbed areas should normally be allowed to recolonise naturally. Natural regeneration is preferable to active planting, as it allows vegetation appropriate to local conditions to establish and avoids unnecessary intervention within the dune system.

8.2.2. Where monitoring identifies that vegetation has failed to recover naturally after two to three years, small-scale planting of appropriate native dune and salt-tolerant species may be considered. Planting should only be undertaken where there is a clear ecological benefit and should use locally appropriate species and, where practicable, material of local provenance. Planting should not be used routinely to stabilise naturally mobile areas of dune. See Table 11 for

Table 11: Suitable species for planting into the dunes.

Common name	Scientific Name
Lady's bedstraw	*Galium verum*
Sand sedge	*Carex arenaria*
Sea bindweed	*Calystegia soldanella*
Sea holly	*Erygium maritimum*
Sea rocket	*Cakile maritima*
Sea spurge	*Euphorbia paralias*



Figure 32: Sea holly - salt tolerant species

8.3. Access

8.3.1. No significant access-management or sand-trapping interventions are currently proposed at Lelant. Existing informal access should generally be retained and allowed to respond naturally to changes within the dune system. Where localised management is required to protect sensitive vegetation, newly disturbed areas or areas undergoing habitat management, low-key measures such as post-and-rope fencing or chestnut paling may be appropriate. Any intervention should be small-scale, temporary where possible and responsive to changing site conditions.



Figure 33: Example of post and rope fencing at Porthtowan

8.4. Signage

8.4.1. Signage at Lelant should generally be small-scale and proportionate to the level of management being undertaken. Simple signs or small discs may be used where necessary to explain temporary access restrictions, scrub management or other habitat-management works and to encourage visitors to avoid sensitive or recovering areas. QR codes can be incorporated into these signs to provide access to further information without requiring larger or more visually intrusive interpretation infrastructure.

8.4.2. More substantial interpretation boards are not currently considered necessary but could be considered in the future if visitor pressures increase or if there is a need to provide greater information about the dune system, its wildlife or ongoing management. Any future signage should be located carefully so that it does not impede natural dune processes or become vulnerable to coastal change.

8.4.3. See Figures 35-42 below for examples of signs that can be used on the dunes:



Figure 34: Example of small disk explaining why access is restricted



Figure 35: Example of discreet sign showing the way through the scrub at Widemouth



Figure 36: Simple cost-effective signpost



Figure 37: Example of a sign highlighting a special species



Figure 38: Example of interpretation board – history trail at Summerleaze, Bude



Figure 39: Example of rubbing trail at Par Sands



Figure 40: Example of interpretation board at Widemouth Bay



Figure 41: Example of interpretation board at Par Sands

8.5. Biodiversity Net Gain

8.5.1. A BNG baseline has not been undertaken for Lelant, despite this, the success of the above management techniques, namely the management of scrub will improve habitat condition to allow a qualitative enhancement.

9. Monitoring

Overview

9.1.1. Monitoring is an essential part of dune management at Lelant, particularly because management is intended to remain small-scale and adaptive within a dune system that is already experiencing coastal erosion and landward retreat. Monitoring should be used to assess the response of dune grassland and scrub to rotational management, identify further scrub encroachment or progression towards woodland, detect the establishment of invasive non-native species (INNS), and record changes in bare sand, access and dune morphology.

9.1.2. Monitoring also has an important role in understanding longer-term coastal change and its implications for the St Erth to St Ives railway immediately landward of the dunes. A pragmatic approach should make use of routine inspections by the RSPB/land manager, fixed-point photography and existing freely available coastal datasets, supplemented by professional ecological or coastal advice where resources allow. Monitoring should inform both adaptive habitat management and the development of trigger points for future railway adaptation, allowing changes to be considered before coastal erosion presents an immediate risk to infrastructure.

Scrub Management

9.1.3. The numbered scrub management compartments shown on the Management Areas Plan provide a framework for monitoring the effectiveness of rotational scrub management.

- Record which compartments are managed, the date and approximate extent of works undertaken.
- Establish fixed-point photographs within or overlooking managed compartments to record vegetation response.
- Record regeneration of scrub following management and whether repeat intervention is required.
- Monitor the boundaries between scrub and dune grassland to identify continued encroachment into open dune habitat.
- Record whether management is maintaining a varied age and structure of scrub and preventing progression towards extensive dense scrub or woodland.
- Monitor for any undesirable increase in bare sand or sediment mobility following scrub management, particularly close to the railway or seaward dune edge.
- Use the results to determine the timing and extent of subsequent rotational management rather than treating the indicative five-year programme as a fixed requirement

INNS Monitoring

9.1.4. Although no INNS were recorded during the most recent survey, previous records and the presence of INNS on neighbouring land mean that periodic surveillance should continue.

- Check site boundaries and areas adjoining known off-site INNS for new colonisation.

- Record any new occurrences using GIS, geo-referenced photographs or other appropriate mapping.
- Remove small new occurrences promptly where practicable before they become established.
- Monitor treated locations for regrowth.
- Where appropriate, coordinate management with neighbouring landowners to reduce the potential for reinvasion.

Bare Sand, Early Successional Habitat and Access

9.1.5. Existing access and small areas of disturbance have the potential to contribute positively to habitat diversity at Lelant by maintaining patches of bare sand and early successional vegetation. Monitoring should therefore focus on whether disturbance remains beneficial rather than seeking to remove it automatically.

- Record the location and approximate extent of significant areas of bare sand and early successional vegetation.
- Use fixed-point photography to record natural colonisation and succession.
- Monitor the proposed informal access route, if established, and other desire lines to determine whether they are providing useful low-level disturbance.
- Record any excessive widening, vegetation loss or development of erosion features.
- Identify any areas where access or management appears to be increasing sediment mobility towards the railway or creating unsafe routes close to the seaward dune edge.
- Allow individual bare areas to recolonise naturally and identify alternative locations for small-scale disturbance where required to maintain a changing habitat mosaic.

Professional Ecological Survey – Resources Dependent

9.1.6. Where resources allow, a periodic dune condition assessment by a suitably qualified ecologist would provide a more detailed assessment of changes in habitat extent and condition, scrub cover and structure, INNS presence, bare sand and early successional habitat and the overall diversity of the dune mosaic.

9.1.7. A professional ecological review approximately every five years would also provide an opportunity to assess whether the scrub compartment programme remains appropriate as the dune system changes. This should be coordinated with any existing RSPB ecological monitoring to avoid duplication and to ensure that management continues to complement site-specific conservation objectives, including those relating to birds.

South West Coastal Monitoring Programme (SWCM)

9.1.8. The South West Coastal Monitoring Programme provides long-term coastal monitoring data that can be used to understand changes affecting the Lelant dune system. Existing topographic survey data, LiDAR and aerial imagery provide an important evidence base for assessing changes in beach levels, dune morphology, dune toe position and sediment movement over time.

9.1.9. These datasets should be reviewed periodically alongside local fixed-point photography and habitat monitoring. Particular attention should be given to whether observed coastal change remains consistent

with the longer-term erosional trend identified within this BDMP and whether erosion is reducing the width of dune habitat between the coast and railway.

Railway and Coastal Change

9.1.10. The proximity of the St Erth to St Ives railway means that monitoring of coastal change should form an important component of longer-term management. The purpose of this monitoring is not to prevent natural coastal change, but to identify sufficiently early when erosion or changes in dune morphology may require further investigation or adaptation planning.

- Monitor changes in the position of the dune edge relative to the railway using available coastal monitoring data, aerial imagery and site observations.
- Record significant erosion, dune-face retreat or other morphological change following major storm events.
- Review SWCM data and relevant coastal erosion projections periodically to determine whether observed change remains consistent with predicted trends.
- Maintain liaison with Network Rail where monitoring identifies increasing erosion risk or significant change close to railway infrastructure.
- Develop and periodically review agreed trigger points at which more detailed coastal or engineering assessment should be undertaken.
- If trigger points are approached or exceeded, review the adaptation options identified for the railway rather than waiting until erosion presents an immediate operational risk

Adaptive Management

9.1.11. Monitoring results should be used to periodically review the management programme. The location and frequency of scrub management, access management and other interventions should be adjusted in response to observed ecological and geomorphological change rather than seeking to maintain the habitat pattern shown on the current Management Areas Plan indefinitely.

9.1.12. In the longer term, monitoring should provide the evidence needed to balance the maintenance of a diverse dune habitat mosaic with natural coastal change and the infrastructure constrains presented by the railway.

Table 12: Monitoring table

Timescale	Monitoring focus	Activities	Frequency	Lead/Responsibility
Short term	Scrub compartments	Record compartments managed; establish photo points; monitor regrowth, scrub structure and response of adjacent dune grassland	Annually, following management	RSPB / Land manager
	Scrub encroachment	Monitor scrub margins and identify expansion into dune habitat	Annually	RSPB / Land manager
	INNS	Check for new colonisation, particularly along boundaries	Annual during routine	RSPB / Land manager

Timescale	Monitoring focus	Activities	Frequency	Lead/Responsibility
		and adjoining known off-site INNS; map and remove new occurrences where practicable	inspections	
	Bare sand & early successional habitat	Record extent, natural colonisation and vegetation development using fixed-point photography	Annually	RSPB / Land manager
	Access	Monitor informal routes and desire lines; identify beneficial disturbance, excessive trampling or erosion	Annual / seasonal	RSPB / Land manager
	Coastal change	Record significant erosion, dune-face retreat and sediment movement; undertake additional observations following major storms	Routine observations + following significant storms	RSPB / Land manager
Medium Term	Rotational scrub management	Review response of managed compartments and use results to determine which compartments require subsequent management	Annually / following management	RSPB / land manager; ecologist where required
	Habitat mosaic	Assess balance of scrub, dune grassland, bare sand and early successional vegetation and whether scrub is progressing towards woodland	Every 3 – 5 years	RSPB / land manager; ecologist if resourced
	Access & habitat response	Review whether low-level disturbance is providing ecological benefit and relocate or modify access where necessary	Annually	RSPB / land manager
	Coastal trends	Review SWCM data, aerial imagery and other available coastal information against observed site change	Every 5 years	RSPB / land manager with coastal specialist input where required
	Railway vulnerability	Review erosion and dune morphology in relation to the railway and assess progress towards agreed adaptation trigger points	Every 5 years, or sooner following significant change	Network Rail / RSPB / relevant landowners and coastal specialists
Long term	INNS	Maintain low-level surveillance and rapid	As required	RSPB / land manager

Timescale	Monitoring focus	Activities	Frequency	Lead/Responsibility
		response to new establishment		
	Ecological review	Review habitat condition, scrub extent and structure, open dune habitat and effectiveness of management	Every 5 – 10 years	Ecologist / RSPB / land manager
	Geomorphological trends	Review long-term topographic, LiDAR and shoreline data to identify changes in dune position and morphology	Ongoing / as new monitoring becomes available	SWCM / land manager / coastal specialists
	Railway adaptation	Review and implement adaptation measures if monitoring indicates trigger points are being approached or reached	As required	Network Rail with relevant landowners / authorities
	Adaptive management	Review the BDMP and adjust management areas, scrub compartments and interventions in response to ecological and coastal change	Every 5 – 10 years or following significant change	RSPB / land manager with ecological and coastal specialist input

9.2. Funding

9.2.1. As the area is under a No Active Intervention policy there is unlikely to be any public funding for flood or erosion management, so in the future other sources of funding will be required.

9.2.2. Finding community and environmental grants is easiest when you use a combination of databases, government services, environmental organisations and corporate or charitable funders. Helpful places to look include:

9.2.3. Grant search databases

9.2.4. GrantFinder, Grants Online, and Funds Online – large databases covering national and local funding.

- Charity Excellence Framework – free “Funder Finder” tool.
- 360GrantNav – lets you explore UK funder data.
- My Funding Central – for smaller charities and community groups.

9.2.5. Government and local authority portals

- Find a Grant (GOV.UK) – official government funding search.
- Local councils – often run “Community Chest,” climate funds, community ownership funds, or small local grant schemes.
- DEFRA – supports environmental and biodiversity initiatives.

- Landfill Communities Fund – delivered through bodies like Enovert for local green projects.

9.2.6. Environmental organisations and trusts

- The Wildlife Trusts – share opportunities for community nature work.
- Groundwork – grants and support for environmental improvements.
- National Lottery Community Fund – major funder of community led projects.
- Environmental Funders Network (EFN) – connects to environmental philanthropic funders.

9.2.7. Corporate and foundation schemes

- Aviva Community Fund – resilience and climate related projects.
- Veolia Environmental Trust – biodiversity and green space improvements.
- Tesco Stronger Starts and Asda Foundation – small local community grants.
- Naturesave Trust – conservation and sustainability funding.

9.2.8. Energy and sustainability specific funding

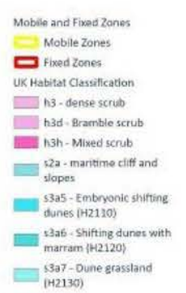
- Community Energy Fund – renewable energy projects.
- Salix Finance – public sector decarbonisation.
- Ashden Trust – climate and sustainable development focus.

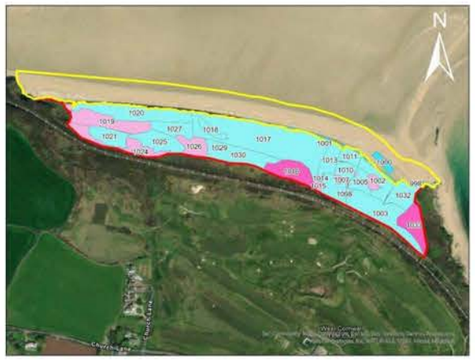
9.2.9. Tips for searching

- Use keywords like “biodiversity,” “climate action,” “sustainability,” “green space,” “community garden.”
- Contact local CVS (Council for Voluntary Service) for tailored advice.

9.2.10. Check local supermarkets – many run small community grant scheme.

10. Pictogram





BEACH

SHIFTING DUNE
Where the embryo dunes have created stability in the substrate, marram establishes further stabilising the substrate by allowing more sand to accumulate. With more organic matter water retention increases and microhabitats allow a wider diversity of vegetation to colonise.

DUNE GRASSLAND
the diversity of species will out compete marram, red fescue being a key competitor this leads to an increase in the humic content of the substrate making it more suitable for the establishment of scrub species. Blowouts and other exposed bare sand areas are an important feature of the dune landscape and ecology. Erosion within these areas can be accelerated by excess trampling and wind.



KEY DUNE SPECIES



Galium verum – Ladies bedstraw and upright plant, with 1 – 3cm long leaves in whorls of 8 – 12, with 2 – 3mm yellow flowers in dense clusters from June to September.



Daucus carota – Wild carrot a perennial with leaves divided into narrow leaflets, and dense umbels (umbrella-like) flowers which initially look reddish, but bloom into white flowers from June to September.



Salsola kali– Prickly saltwort is a salt loving annual with fleshy, short, spine-tipped leaves that can be found growing just above the strandline. Flowers and fruit are small and inconspicuous – flowers are white, solitary, 5-petaled and surrounded by spine-tipped tepals.



Ammophila arenaria – Marram grass, dense grey/green spiky tufts of rolled, long, thin leaves, flowers July and August, it's fibrous roots stabilise the dunes.



Lotus corniculatus – Bird's foot trefoil is a perennial plant in the pea family. With a height from 5 – 50 cm, leaves with 5 leaflets, clusters of yellow flowers with reddish buds, blooming May till September.

OPPORTUNITIES AND CONSTRAINTS

1. Lelant Dunes are in the Hayle Estuary & Carrack Gladden Site of Special Scientific Interest, designated for its dune habitats and for Portland spurge, bulbous meadow grass and mountain St John's-wort to name but a few priority species.

2. Scrub Management – Large-scale scrub clearance is not recommended; instead, scrub should be selectively reduced and managed to prevent further encroachment into dune grassland and shifting dune habitat, while periodic management of selected compartments should maintain a varied age and structure and prevent the development of extensive dense scrub or progression towards woodland

3. Coastal erosion and Infrastructure constraint – Monitoring and modelling indicate an ongoing erosional trend, including loss of dune volume and landward movement of the dune toe. The railway immediately landward of the dunes significantly limits opportunities for unrestricted dune roll-back.

4. Bare Sand - Due to the proximity of the railway, large-scale dune disturbance or de-stabilisation is not recommended; however, small-scale disturbance, such as creating informal paths through scrub, could help maintain areas of bare sand and successional habitat.

UNWANTED PLANTS IN THE DUNE ECOSYSTEM



Phormium tenax – New Zealand flax (recorded on one survey) is a nonnative evergreen perennial, up to 2m in height with straplike leaves with a taller flowering spike flower



Buddleja davidii - Buddleia is a fast-growing, invasive shrub that readily colonises disturbed ground, spreading rapidly by wind-dispersed seed and outcompeting native vegetation. This can be seen just outside of the site boundary



Centranthus ruber - Red valerian (recorded on one survey) is a nonnative woody-based perennial, up to 1m in height with grey-green leaves and dense clusters of crimson, pink or white, slightly fragrant flowers from late spring to autumn

Photographic credits – Cornwall Environmental Consultants : Dr Sally Lucker – Budding Nature : Cornwall Wildlife Trust

LELANT Making Space for Sand

11. References

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12. List of Appendices

A. Schedule 9 Wildlife and Countryside Act 1981 as amended Part II

PART II

PLANTS

Common name	***Scientific name***
[F18Alexanders, Perfoliate]	[F18Smyrnium perfoliatum]
[F18Algae, Red]	[F18Grateloupia luxurians]
[F18Archangel, Variegated Yellow]	[F18Lamiastrum galeobdolon subsp. argentatum]
[F18Azalea, Yellow]	[F18Rhododendron luteum]
[F19[F18Balsam, Himalayan]]	[F19[F18Impatiens glandulifera]]
[F18Cotoneaster]	[F18Cotoneaster horizontalis]
[F18Cotoneaster, Entire-leaved]	[F18Cotoneaster integrifolius]
[F18Cotoneaster, Himalayan]	[F18Cotoneaster simonsii]
[F18Cotoneaster, Hollyberry]	[F18Cotoneaster bullatus]
[F18Cotoneaster, Small-leaved]	[F18Cotoneaster microphyllus]
[F18Creeper, False Virginia]	[F18Parthenocissus inserta]
[F18Creeper, Virginia]	[F18Parthenocissus quinquefolia]
[F18Dewplant, Purple]	[F18Disphyma crassifolium]
[F19[F18Fanwort]]	*[F19[F18Cabomba caroliniana]]*
[F18Fern, Water]	*[F18Azolla filiculoides]*
[F18Fig, Hottentot]	*[F18Carpobrotus edulis]*
[F18Garlic, Three-cornered]	[F18Allium triquetrum]
[F19Hogweed, Giant]	[F19Heracleum mantegazzianum]
[F19[F18Hyacinth, water]]	*[F19[F18Eichhornia crassipes]]*
[F20Kelp, Giant]	[F20Macrocystis angustifolia]
[F20Kelp, Giant]	[F20Macrocystis integrifolia]
[F20Kelp, Giant]	[F20Macrocystis laevis]
Kelp, Giant	Macrocystis pyrifera

***Changes to legislation:** Wildlife and Countryside Act 1981, SCHEDULE 9 is up to date with all changes known to be in force on or before 06 May 2026. There are changes that may be brought into force at a future date. Changes that have been made appear in the content and are referenced with annotations. (See end of Document for details) View outstanding changes*

[F20Kelp, Japanese**]**	**[**F20Laminaria japonica**]**
[F18Knotweed, Giant**]**	**[**F18Fallopia sachalinensis**]**
[F18Knotweed, Hybrid**]**	**[**F18Fallopia japonica x Fallopia sachalinensis
[F18Knotweed, Japanese**]**	**[**F18Fallopia japonica**]**
[F21Knotweed, Japanese**]**	**[**F21Polygonum cuspidatum**]**
[F18Leek, Few-flowered**]**	***[**F18 Allium paradoxum**]***
[F18Lettuce, water**]**	***[**F18 Pistia stratiotes**]***
[F18Montbretia**]**	**[**F18Crocosmia x crocosmiiflora**]**
[F19**[**F18Parrot's-feather**]]**	***[**F19**[**F18 Myriophyllum aquaticum**]]***
[F19**[**F18Pennywort, Floating**]]**	***[**F19**[**F18 Hydrocotyle ranunculoides**]]***
[F18Potato, Duck**]**	**[**F18Sagittaria latifolia**]**
[F19**[**F18Primrose, Floating Water**]]**	**[**F19**[**F18Ludwigia peploides**]]**
[F19**[**F18Primrose, Water**]]**	**[**F19**[**F18Ludwigia grandiflora**]]**
[F18Primrose, Water**]**	**[**F18Ludwigia uruguayensis**]**
[F18Rhododendron**]**	**[**F18Rhododendron ponticum**]**
[F18Rhododendron**]**	**[**F18Rhododendron ponticum x Rhododendron maximum**]**
[F19**[**F18Rhubarb, Giant**]]**	**[**F19**[**F18Gunnera tinctoria**]]**
[F18Rose, Japanese**]**	**[**F18Rosa rugosa**]**
F22	**F22**
. . .	. . .
[F18Seafingers, Green**]**	**[**F18Codium fragile**]**
[F21Seafingers, Green**]**	**[**F21Codium fragile tomentosoides**]**
[F20Seaweed, Californian Red**]**	**[**F20Pikea californica**]**
[F20Seaweed, Hooked Asparagus**]**	**[**F20Asparagopsis armata**]**
Seaweed, Japanese	Sargassum muticum
[F20Seaweeds, Laver (except native species)**]**	**[**F20Porphyra spp except -**]**
	[F20p. amethystea**]**
	[F20p. leucosticta**]**
	[F20p. linearis**]**
	[F20p. miniata**]**
	[F20p. purpurea**]**
	[F20p. umbilicalis**]**

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[F18Stonecrop, Australian Swamp (otherwise known as New Zealand Pygmyweed)**]**	**[**F18Crassula helmsii**]**
[F20Wakame**]**	**[**F20Undaria pinnatifida**]**
[F19**[**F18Waterweed, Curly**]]**	***[**F19**[**F18*Lagarosiphon major***]]***
[F23**[**F18Waterweeds**]][**F23Waterweeds (except Nuttall's Waterweed)**]**	**[**F23**[**F18All species of the genus Elodea.**]][**F23All species of the genus Elodea, except Elodea nuttallii**]**

Textual Amendments

F18 Entries in Sch. 9 Pt. 2 added (E.W.) (6.4.2010) by The Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England and Wales) Order 2010 (S.I. 2010/609), **art. 2(4)**

F19 Words in Sch. 9 Pt. 2 omitted (E.W.) (1.12.2019) by virtue of The Invasive Alien Species (Enforcement and Permitting) Order 2019 (S.I. 2019/527), art. 1(1), **Sch. 4 para. 1(3)(b)(i)** (with art. 1(2)(4)) (as amended by S.I. 2019/1213, regs. 1, **2(2)**)

F20 Words in Sch. 9 Pt. 2 added (17.3.1992) by S.I. 1992/320, **art. 3**

F21 Entries in Sch. 9 Pt. 2 removed (E.W.) (6.4.2010) by virtue of The Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England and Wales) Order 2010 (S.I. 2010/609), **art. 2(5)**

F22 Words in Sch. 9 Pt. 2 omitted (E.) (4.5.2021) by virtue of The Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England) Order 2021 (S.I. 2021/236), arts. 1(b), **2(3)**; and words in Sch. 9 Pt. 2 omitted (W.) (10.9.2025) by virtue of Legislation (Procedure, Publication and Repeals) (Wales) Act 2025 (asc 3), s. 9(2)(d), **Sch. 1 para. 53(b)**

F23 Words in Sch. 9 Pt. 2 substituted (E.W.) (1.12.2019) by The Invasive Alien Species (Enforcement and Permitting) Order 2019 (S.I. 2019/527), art. 1(1), **Sch. 4 para. 1(3)(b)(ii)** (with art. 1(2)(4)) (as amended by S.I. 2019/1213, regs. 1, **2(2)**)

Note. The common name or names given in the first column of this Schedule are included by way of guidance only; in the event of any dispute or proceedings, the common name or names shall not be taken into account.**]]**

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